R-022-204.2

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DOCUMENTATION SUPPORTING FERNALD ENVIRONMENTAL MANAGEMENT PROJECT SAFE SHUTDOWN REMOVAL ACTION NUMBER 12 JUNE 1993

06/29/93

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REPORT

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DOCUMENTATION SUPPORTING

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

SAFE SHUTDOWN

REMOVAL ACTION NO. 12

5-17-93

SAFE SHUTDOWN REMOVAL ACTION NUMBER 12

PROCEDURE UPDATES INSTRUCTIONS

MAY 17, 1993

The following are updates to the Safe Shutdown Removal Action Number 12 procedures. Please file as noted.

- INDEX
  - Replace all pages with new index.

- TABLE 1
  - Replace all pages with new Table 1.

- U.S. Dept. of Energy Order 5820.2A, Radioactive Waste Management
  - General Supporting Documentation
  - No change.

- U.S. Dept. of Energy, Radiological Control Manual DOE/EH-0256T*
  - General Supporting Documentation
  - New document. A copy of this document is available upon request.

- SSOP-0103, FEMP Site Document System
  - General Supporting Documentation
  - Replaces PP-0103. Insert this document, dated 10/14/92, as first document following table.

- PO-D-007, Document Periodic Review Program
  - General Supporting Documentation
  - No change. Follows SSOP-0103.

- FMPC Site Health and Safety Plan*
  - General Supporting Documentation
  - No change. A copy of this document is available upon request.

- RM-0006, Industrial Safety
  - General Supporting Documentation
  - New document. Insert after FMPC Site Health and Safety Plan.

- RM-2086, Chemical Hazard Communication Program
  - General Supporting Documentation
  - New document. Insert after RM-0006.

- RM-FMPC-0002, Centralized Training Program Manual*
  - General Supporting Documentation
  - No change. A copy of this document is available upon request.

- RM-0007, FEMP Respiratory Requirements Manual
  - General Supporting Documentation
  - New document. Insert after RM-FMPC-0002.

- IM-7006, Incident Building Evacuation Manual
  - General Supporting Documentation
  - New document. A copy of this document is available upon request.

- SSOP-0077, Building Emergency Procedure
  - General Supporting Documentation
  - Replaces canceled document PP-0125. Remove all pages of PP-0125. Insert SSOP-0077, dated 9/30/92, after IM-7006.

- RM-0012, Quality Assurance Program Description*
  - General Supporting Documentation
  - Replaces FMPC-2139. A copy of this document is available upon request.

- SSOP-0036, Quality Assurance Project Plans
  - General Supporting Documentation
  - No change. Follows SSOP-0077.

- SSOP-0716, Control of Processes
  - General Supporting Documentation
  - New document. Insert after SSOP-0036.

- SSOP-0082, Quality Improvement
  - General Supporting Documentation
  - New document. Insert after SSOP-0716.

- SSOP-0023, Deviation and Corrective Action Reporting
  - General Supporting Documentation
  - Re-issued to update procedure. Remove old procedure, and insert new procedure, dated 6/25/92, after SSOP-0082.

- SSOP-0100, Readiness Review Process
  - General Supporting Documentation
  - New document. Insert after SSOP-0023.

- FMPC-2214, Environmental Restoration*
  - General Supporting Documentation
  - A copy of this document is available upon request.

- Shutdown/Facility Acceptance and Criteria Plan
  - General Supporting Documentation
  - No change. Follows SSOP-0100.

- SSOP-0067, Spill Incident Reporting and Clean-Up
  - General Supporting Documentation
  - Replaces FMPC-503. Remove all pages of FMPC-503. Insert

SSOP-0067, dated 11/20/92, after Shutdown/Facility Acceptance and Criteria Plan.

- SSOP-0059, Control and Tracking of Chemical Substances
  - General Supporting Documentation
  - No change. Follows SSOP-0067.

- SSOP-0027, Control of Box Type Containers
  - General Supporting Documentation
  - New document. Insert after SSOP-0059.

- RM-0005, FEMP Lot Marking and Color Coding System
  - General Supporting Documentation
  - New document. Insert after SSOP-0027.

- SOP 20-C-011, Physical Inventory of Nuclear Materials
  - General Supporting Documentation
  - Replaces SOPs 1-C-903, 2-C-904, 4-C-903, 5-C-911, 6-C-902, 8-C-504, 9-V-903, and 11-C-215. Remove all pages of the previous document. Insert this document, dated 4/1/93, after RM-0005.

- PO-D-023, Shift Orders
  - General Supporting Documentation
  - No change. Follows SOP 20-C-011.

- U.S. Dept. of Energy Order 5820.2A, Radioactive Waste Management
  - Step 1
  - No change. Follows PO-D-023.

- SSOP-0002, Completing the Material Evaluation Form
  - Step 2
  - No change. Follows DOE Order 5820.2A.

- SSOP-0039, Handling Containers of Unidentified Material
  - Step 2
  - New document. Insert after SSOP-0002.

- SOP 20-C-625, Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment
  - Step 2
  - New document. Insert after SSOP-0039.

- Amended Consent Decree
  - Step 2
  - No change. Follows SOP 20-C-625.

- SOP 1-C-101, Sampling Residue and Waste Materials
  - Step 2
  - No change. Follows Amended Consent Decree.

- SOP 20-C-805, Sampling Drummed Waste for Hazard Identification
  - Step 2
  - No change. Follows SOP 1-C-101.

- SOP 20-C-912, Checking Scale Operation
  - Step 3
  - New document. Insert after SOP 20-C-805.

- SOP 20-C-904, General Nuclear Safety Requirements
  - Step 3
  - Re-issued to update procedure. Remove old procedure. and insert new procedure, dated 1/13/93, after SOP 20-C-912.

- SOP 20-C-917, Hydrogen Monitoring and Removing Nucfil Vent Plugs from Drums
  - Step 3
  - New document. Insert after SOP 20-C-904.

- SOP 20-C-910, Venting Potentially Explosive Drums
  - Step 3
  - New document. Insert after SOP 20-C-917.

- SOP 20-C-918, Preparation for and Movement of Unvented Drums
  - Step 3
  - New document. Insert after SOP 20-C-910.

- SOP 1-C-608, Storage of Radioactive Material
  - Step 3
  - Re-issued to update procedure. Remove old procedure, and insert new procedure, dated 12/9/92, after SOP 20-C-918.

- SOP 20-C-801, Storage of Enriched Material
  - Step 3
  - Re-issued to update procedure. Remove old procedure, and insert new procedure, dated 11/13/91, after SOP 1-C-608.

- SOP 20-C-100, Moving and Storing Depleted, Normal, and Enriched Uranium Materials <20% and Thorium Metal and Materials
  - Step 3
  - Replaces SOP 20-C-101. Remove all pages of SOP 20-C-101. Insert SOP 20-C-100, dated 2/16/93, after SOP 20-C-801

- SSOP-0060, Packaging Radioactive Material for Offsite Shipment
  - Step 3
  - Re-issued to update procedure. Remove old procedure, and insert new procedure, dated 3/1/93, after SOP 20-C-100.

- PO-S-06-001, Movement of Hazardous Waste
  - Step 3
  - No change. Follows SSOP 0060.

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- SSOP-0044, Controlling the Generation of Construction/Maintenance Waste
  - Step 3
  - No change. Follows PO-S-06-001.

- SOP 20-C-604, Control and Utilization of Contaminated Trash Dumpsters
  - Step 3
  - Re-issued to update procedure. Remove old procedure, and insert new procedure, dated 12/8/92, after SSOP-0044.

- SOP 2-C-923, Trash Baler Operation
  - Step 3
  - Re-issued to update procedure. Replace current procedure with procedure dated 7/1/92.

- FMPC-307, Control and Accountability of Nuclear Materials
  - Step 3
  - No change. Follows SOP 2-C-923.

- SSOP-0061, FMPC Work Request/Order Procedure
  - Step 4
  - Replaces FMPC-0715. Remove all pages of FMPC-0715, and insert SSOP-0061, dated 9/17/92, after FMPC-307.

- PP-FMPC-0719, Energy Control (Lockout and Tagout)
  - Step 4
  - No change. Follows SSOP-0061.

- SSOP-0069, Freon Management
  - Step 4
  - New document. Insert after PP-FMPC-0719.

- FMPC-508, Safety Analysis Documentation Program
  - Step 4
  - No change. Follows SSOP-0069.

- PO-0712, Risk Assessment and Management (RAM) System Policy
  - Step 5
  - No change. Follows FMPC-508.

- SM-0001, Risk Assessment and Management (RAM) System Manual
  - Step 5
  - No change. Follows PO-0712.

- SSOP-0014, Documentation of a Subject Matter Expert (SME)
  - Step 5
  - New document. Insert after SM-0001.

- Safe Shutdown Health and Safety Plan
  - Step 5
  - New document. Insert after SSOP-0014.

- PP-0518, National Environmental Policy Act (NEPA) Document Process
  - Step 6
  - No change. Follows Safe Shutdown Health and Safety Plan.

- SSOP-0031, National Environmental Policy Act (NEPA) Document Process
  - Step 6
  - No change. Follows PP-0518.

- FMPC-505, Radiation Control
  - Step 7
  - Document canceled. Remove all pages of FMPC-505. This document was replaced by DOE/EH-0256T found in the General Supporting Documentation Section.

- PO-D-028, Preparation and Implementation of Work Package
  - Step 7
  - No change. Follows SSOP-0031.

- FMPC-516, Control of Permits for Accomplishing Hazardous Work
  - Step 7
  - No change. Follows PO-D-028.

- SP-P-35-016, Radiation Work Permits
  - Step 7
  - New document. Insert after FMPC-516.

- PP-FMPC-5010, Management of Low Level Waste (LLW)
  - Step 7
  - No change. Follows SP-P-35-016.

- SOP 20-C-606, Hazardous Material Spill Clean-Up
  - Step 7
  - No change. Follows PP-FMPC-5010

- SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers
  - Step 7
  - Replaces SOP 20-C-605. Remove all pages of SOP 20-C-605 and insert SSOP-0035, dated 10/26/92, after SOP 20-C-606.

- SOP 20-C-500, Inspecting RCRA Waste Load/Unload Staging Areas
  - Step 7
  - No change. Follows SSOP-0035.

- SSOP-0008, Preparing and Trnasferring Uncharacterized Waste the the Controlled Holding Area
  - Step 7
  - No change. Follows SOP-20-C-500.

- SSOP-0028, Controlling Portable Ventilation Devices and Vacuum Cleaners
  - Step 7
  - Re-issued to update procedure. Remove old procedure, and insert procedure dated 12/14/92 after SSOP-0008.

- SOP 20-C-700, Norclean Portable Vacuum Operation
  - Step 7
  - No change. Follows SSOP-0028.

- SOP 20-C-701, Operation of Spencer & Hoffman Portable Dust Collectors
  - Step 7
  - Re-issued to update procedure. Remove old procedure, and insert procedure dated 12/14/92 after SOP 20-C-700.

- SOP 20-C-014, Wet and Dry Systems Clean-Out
  - Step 7
  - New document. Insert after 20-C-701.

- SSOP-0075, Packaging Low Level Radioactive Waste (LLRW) in Drums for Off-Site Shipment;
- SSOP-0078, Packaging Low Level Radioactive Waste (LLRW) into ISO Containers for Off-Site Shipment;
- SSOP-0079, Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Off-Site Shipment;
  - Step 7
  - These procedures replace SSOP-0024. Remove all pages of SSOP-0024, and sequencially insert SSOP-0075, SSOP-0078, and SSOP-0079, dated 12/14/92, following SOP 20-C-014.

- PP-0314, Packaging, On-Site Movement and Off-Site Shipment of Material
  - Step 7
  - No change. Follows SSOP-0079.

- SOP 20-C-601, Refinery Sump
  - Step 7
  - No change. Follows PP-0314.

- SOP 8-C-116, Filtering Refinery Thickener Underflow
  - Step 7
  - No change. Follows SOP 20-C-601.

- SOP 8-C-115, Filtration of Uranium Bearing Slops
  - Step 7
  - Re-issued to update procedure. Remove old procedure, and insert new procedure, dated 11/3/92, after SOP 8-C-116.

- SOP 8-C-605, EIMCO Filter Operation
  - Step 7
  - New document. Insert after SOP 8-C-115.

- SSOP-0003, Receiving, On-Site Movement and Off-Site Shipment of Non-Radioactive Hazardous Material
  - Step 7
  - No change. Follows SOP 8-C-605.

- Task Specific Health & Safety Plan for Decontamination of Various Areas of Existing Fixed or Removable Contamination
  - Step 8
  - No change. Follows SSOP-0003.

- SOP 20-C-612, Industrial Cleaning
  - Step 8
  - New document. Insert after Task Specific Health & Safety Plan for Decontamination of Various Areas of Existing Fixed or Removable Contamination.

- SOP 20-C-610, Bird Carcass and Dropping Removal
  - Step 8
  - New document. Insert after SOP 20-C-612.

- SOP-C-709, Baghouse Type Dust Collector Filter Removal/Replacement
  - Step 8
  - No change. Follows SOP 20-C-610.

- SOP 20-C-600, Overpacking Defective Containers
  - Step 8
  - New document. Insert after SOP 20-C-709.

- SOP 20-C-916, Cleaning Sump Systems
  - Step 8
  - New document. Insert after SOP 20-C-600.

- SOP 43-C-413, Handling Waste Material with the Industrial Vacuum Loader Truck (Supersucker)
  - Step 8
  - New document. Insert after SOP 20-C-916.

- FMPC-303, Management of Government Property
  - Step 9
  - No change. Follows SOP 43-C-413.

- SSOP-0034, Nuclear Materials Disposition Order Management
  - Step 9
  - No change. Follows FMPC-303.

- PO-D-035, Shipment of Low Level Radioactive Waste Requirements
  - Step 9
  - No change. Follows SSOP-0034.

- SSOP-0081, Radiologically Non-contaminated Asbestos Containing Material Waste (ACM) Disposition
  - Step 9
  - New document. Insert after PO-D-035.

Procedure Update Instructions - Continued

- SP-P-35-010, Unrestricted Release of Materials from the FEMP
  - Step 9
  - Re-issued to update procedure. Remove old procedure, and insert procedure dated 8/7/92 after SSOP-0081.

SAFE SHUTDOWN REMOVAL ACTION NUMBER 12

INDEX

MAY 17, 1993

A. Program Overview

B. Enclosure - Part One

I. General Supporting Documentation

- U.S. Department of Energy Order 5820.2A, Radioactive Waste Management. (See document at Step 1)
- U.S. Department of Energy Radiological Control Manual DOE/EH-0256T*
- SSOP-0103, FEMP Site Document System
- PO-D-007, Document Periodic Review Program
- FMPC Site Health and Safety Plan*
- RM-0006, Industrial Safety
- RM-2086, Chemical Hazard Communication Program
- RM-FMPC-0002, Centralized Training Program Manual*
- RM-0007, FEMP Respiratory Protection Requirements Manual
- IM-7006, Incident Building Evacuation Manual*
- SSOP-0077, Building Emergency Procedure
- RM-0012, Quality Assurance Program Description*
- SSOP-0036, Quality Assurance Project Plans
- SSOP-0716, Control of Processes
- SSOP-0082, Quality Improvement
- SSOP-0023, Deviation and Corrective Action Reporting
- SSOP-0100, Readiness Review Process

General
Continued

- FMPC-2214, Environmental Restoration and Waste Management Site Specific Plan*
- Shutdown/Facility Acceptance and Criteria Plan
- SSOP-0067, Spill Incident Reporting and Clean-up
- SSOP-0059, Control and Tracking of Chemical Substances
- SSOP-0027, Control of Box Type Containers
- RM-0005, FEMP Lot Marking and Color Coding System
- SOP 20-C-011, Physical Inventory of Nuclear Materials
- PO-D-023, Shift Orders

* Copies of these documents will be made available upon request.

II. Implementing Procedures

Step 1. Preliminary Assessment of Process Facilities

- U.S. Department of Energy Order 5820.2A Radioactive Waste Management

Step 2. Characterize Process Equipment and Hold-Up Materials

- SSOP-0002, Completing the Material Evaluation Form
- SSOP-0039, Handling containers of Unidentified Material
- SOP 20-C-625, Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment
- Amended Consent Decree
- SOP 1-C-101, Sampling Residual and Waste Materials
- SOP 20-C-805, Sampling Drummed Waste for Hazard Identification

Step 3. Transfer Existing Inventories of Chemicals, Materials, and Uranium Materials from Process Buildings to Approved Storage Locations

- SOP 20-C-912, Checking Scale Operation
- SOP 20-C-904, General Nuclear Safety Requirements
- SOP 20-C-917, Hydrogen Monitoring and Removing Nucfil Vent Plugs from Drums
- SOP 20-C-910, Venting Potentially Explosive Drums
- SOP 20-C-918, Preparation for and Movement of Unvented Drums
- SOP 1-C-608, Storage of Radioactive Material
- SOP 20-C-801, Storage of Enriched Material
- SOP 20-C-100, Moving and Storing Depleted, Normal, and Enriched Uranium Materials <20% and Thorium Metal and Materials
- SSOP-0060, Packaging Radioactive Material For Offsite Shipment
- PO-S-06-001, Movement of Hazardous Waste
- SSOP-0044, Management of Soil, Debris, and Waste from a Project
- SOP 20-C-604, Control and Utilization of Contaminated Trash Dumpsters
- SOP 2-C-923, Trash Baler Operation
- FMPC-307, Control and Accountability of Nuclear Materials

Step 4. Energy Source Isolations, Lock & Tag-Out of Process

Equipment

- SSOP-0061, FEMP Work Request/Order Procedure
- PP-FMPC-0719, Energy Control (Lockout & Tagout)
- SSOP-0069, Freon Management
- FMPC-508, Safety Analysis Documentation Program

Step 5. Prepare Safety Documentation

- PO-0712, Risk Assessment and Management (RAM) System Policy
- SM-0001, Risk Assessment and Management (RAM) System Manual
- SSOP-0014, Documentation of a Subject Matter Expert
- Safe Shutdown Health and Safety Plan

Step 6. Prepare NEPA Documentation

- PP-0518, National Environmental Policy Act (NEPA) Program
- SSOP-0031, National Environmental Policy Act (NEPA) Document Process

Step 7. Transfer of Substance from Process Equipment and Associated Support Systems

- PO-D-028, Preparation and Implementation of Work Package
- FMPC-516, Control of Permits for Accomplishing Hazardous Work
- SP-P-35-016, Radiation Work Permits
- PP-FMPC-5010, Management of Low Level Waste (LLW)
- SOP 20-C-606, Hazardous Material Spill Clean-up
- SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers

- SOP 20-C-500, Inspecting RCRA Waste Load/Unload and Staging Areas
- SSOP-0008, Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area
- SSOP-0028, Controlling Portable Ventilation Devices and Vacuum Cleaners
- SOP 20-C-700, Norclean Portable Vacuum Operation

Step 7
Continued

- SOP 20-C-701, Operation of Spencer & Hoffman Portable Dust Collectors
- SOP 20-C-014, Wet and Dry Systems Clean-out
- SSOP-0075, Packaging Low Level Radioactive Waste (LLRW) In Drums for Offsite Shipment
- SSOP-0078, Packaging Low Level Radioactive Waste (LLRW) into ISO Containers for Offsite Shipment
- SSOP-0079, Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Offsite Shipment
- PP-0314, Packaging, On-Site Movement and Off-Site Shipment of Material
- SOP 2-C-601, Refinery Sump
- SOP 8-C-116, Filtering Refinery Thickener Underflow
- SOP 8-C-115, Filtration of Uranium Bearing Slops
- SOP 8-C-605, EIMCO Filter Operation
- SSOP-0003, Receiving, On-Site Movement and Off-Site Shipment of Nonradioactive Hazardous Material

Step 8. Control Loose Contamination

- Task Specific Health & Safety Plan for Decontamination

of Various Areas of Existing Fixed or Removal Contamination, June 5, 1991

- SOP 20-C-612, Industrial Cleaning
- SOP 20-610, Bird Carcass and Dropping Removal
- SOP 20-C-709, Baghouse Type Dust Collector Filter Removal/Replacement
- SOP 20-C-600, Overpacking Defective Containers

Step 8
Continued

- SOP 20-C-916, Cleaning Sump Systems
- SOP 43-C-413, Handling Waste Materials with the Industrial Vacuum Loader Truck (Supersucker)

Step 9. Disposition of Surplus Property

- FMPC-303, Management of Government Property
- SSOP-0034, Nuclear Materials Disposition Order Management
- PO-D-035, Shipment of Low Level Radioactive Waste Requirements
- SSOP-0081, Radiologically Non-Contaminated Asbestos Containing Material Waste (ACM) Disposition
- SP-P-35-010, Unrestricted Release of Materials from FMPC

STEP	REGULATION/PROCEDURE	COMMENTS
General	U.S. Department of Energy Order 5820.2A, Radioactive Waste Management (see document at Step 1)	This order establishes policies, guidelines, and minimum requirements by which the Department of Energy (DOE) manages its radioactive and mixed waste and contaminated facilities.
	U.S. Department of Energy Radiological Control Manual DOE/EH-0256T*	This manual establishes practices for the conduct of radiological control activities.
	SSOP-0103, FEMP Site Document System	This procedure establishes the document control system by which Fernald Environmental Restoration Management Company (FERMCO) develops, processes, and controls the site documents at the Fernald Environmental Management Project (FEMP).
	PO-D-007, Document Periodic Review Program	This procedure defines the document periodic review program for documents.
	FMPC Site Health and Safety Plan*	This site plan provides the overall means for planning and implementing the job site characterization, health and safety training, and job orientation for personnel.
	RM-0006, Industrial Safety	This requirements manual provides the safety standards and requirements for operating the Fernald Environmental Management Project (FEMP).
	RM-2086, Chemical Hazard Communication Program	The purpose of this manual is to provide information that will increase knowledge of workplace chemical hazards, promote an understanding of the Hazard Communication Program at the FEMP, and encourage personnel to comply with OSHA Requirements.
	RM-FMPC-0002, Centralized Training Program Manual*	This site manual establishes the requirements for all personnel involved in the development and delivery of training. The manual is prepared in accordance with DOE Order 5480.18. The manual also references the DOE Training Accreditation Program (TAP) Manuals.

STEP	REGULATION/PROCEDURE	COMMENTS
General Continued	RM-0007, FEMP Respiratory Protection Requirements Manual	This requirements manual identifies respiratory requirements and provides practical guidance on the issuance, use, and care of respiratory protection equipment at the FEMP.
	IM-7006, Incident Building Evacuation Manual*	The purpose of this manual is to give guidance to all employees at the FEMP with regard to the evacuation of their respective work areas when an emergency occurs.
	SSOP-0077, Building Emergency Procedure	This procedure provides instructions to all FEMP employees for emergency response action to be taken during abnormal situations at the FEMP.
	RM-0012, Quality Assurance Program Description*	This document establishes the QA requirements for FERMCO and all other contractor and subcontractor organizations performing work at the FEMP.
	SSOP-0036, Quality Assurance Project Plans	This procedure assigns responsibilities and identifies the requirements for developing QAPjPs for FERMCO data generation activities. The Amended Consent Agreement establishes the need for quality assurance plans in accordance with EPA requirements.
	SSOP-0716, Control of Processes	This procedure provides instruction for FERMCO to maintain a program for the control of processes affecting the quality of items or services at the FEMP.
	SSOP-0082, Quality Improvement	This procedure provides instructions for establishing and implementing quality principles, practices, techniques, and responsibilities and promotes continual quality improvement of processes and products at the FEMP.
	SSOP-0023, Deviation and Corrective Action Reporting	This procedure describes the process for the identification, response, evaluation, and resolution of deviations and corrective actions required at the FEMP.

STEP	REGULATION/PROCEDURE	COMMENTS
General Continued	SSOP-0100, Readiness Review Process	This procedure establishes the conditions and/or requirements to be used by Fernald Environmental Restoration Management Corporation (FERMCO) for implementing a Readiness Review (RR) process. This procedure also provides a systematic and documentable approach for validating planned actions and for ascertaining and recording that a state of readiness to proceed has been achieved.
	FMPC-2214, Environmental Restoration and Waste Management Site Specific Plan*	This site specific plan provides a detailed, comprehensive overview of environmental restoration and waste management corrective actions and related concerns.
	Shutdown/Facility Acceptance and Criteria Plan	This document includes general information on the current status of all shutdown facilities at the FEMP and provides a general overview of Safe Shutdown activities.
	SSOP-0067, Spill Incident Reporting and Clean-Up	This procedure provides instructions for FERMCO to maintain a policy at the FEMP by which all spill incidents are contained, cleaned up, classified, reported to responsible FEMP organizations, and reported to off-site organizations in accordance with all applicable state and federal regulations and laws.
	SSOP-0059, Control and Tracking of Chemical Substances	This procedure covers the "cradle-to-grave" tracking, record keeping, and reporting required for chemical substances stored or used at the FEMP.
	SSOP-0027, Control of Box Type Waste Containers	This document details the tracking of box-type waste containers (white metal and International Shipping Organization) from purchase to final shipment off site.
	RM-0005, FEMP Lot Marking and Color Coding System	This manual details identification markings for containers of material on-site at the FEMP.

STEP	REGULATION/PROCEDURE	COMMENTS
General Continued	SOP 20-C-011, Physical Inventory of Nuclear Materials	The purpose of this document is to establish the procedure for conducting a physical inventory of nuclear materials and recoverable residues annually or as directed by the DOE.
	PO-D-023, Shift Orders	The shift orders are essential in providing a means for management to communicate Administrative Instructions to operating personnel. Shift orders are required when information such as special operations, administrative directions, and other short term matters need to be communicated to the shift supervisor and the operation crew.

* Copies of these documents will be made available upon request.

NOTE: ACTIVITIES REFERENCED UNDER THE INDIVIDUAL STEPS CAN BE FOUND ON THE LOGIC DIAGRAM IN FIGURE 2

STEP	REGULATION/PROCEDURE	COMMENTS
Step 1 Preliminary Assessment of Process Facilities - refer to Activity 1	U.S. Department of Energy Order 5820.2A, Radioactive Waste Management	Chapter V, "Decommissioning of Radioactively Contaminated Facilities", Section 3d, requires baseline data including the type, form, quantity, and location of hazardous chemical and radioactive materials and information on factors that could influence the selection of decommissioning alternatives.
Step 2 Characterize Process Equipment and Hold Up Materials - refer to Activities 2, 3, 4, and 5	SSOP-0002, Completing the Material Evaluation Form	This site standard operating procedure provides guidance for the proper completion of the Material Evaluation Form in order to classify substances or material.
	SSOP-0039, Handling Containers of Unidentified Material	The purpose of this document is to provide instruction for the processing of unidentified or mis-labeled containers of material/substance.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 2 Characterize Process Equipment and Hold Up Materials (continued) - refer to Activities 2, 3, 4, and 5	SOP 20-C-625, Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment	The purpose of this procedure is to allow waste generators to evaluate bulk waste streams designated as LLRW.
	Amended Consent Decree	This document provides for the evaluation of materials not located in the appropriate hazardous waste storage units at the FEMP. The evaluation is to determine if such materials are hazardous or mixed wastes by reason of the criteria established in 40 CFR 262.11.
	SOP 1-C-101, Sampling Residual and Waste Materials	The purpose of this document is to establish the procedure for taking representative samples of residues and waste at Plant 1 and Resource Conservation and Recovery Act (RCRA) Storage facilities.
	SOP 20-C-805, Sampling Drummed Waste for Hazard Identification	The purpose of this document is to establish the procedure for sampling drummed waste.
Step 3 Transfer Existing Inventories of Chemicals, Materials, and Uranium Materials from Process Buildings to Approved Storage Locations - refer to Activities 9, 10, 11, and 12	20-C-912, Checking Scale Operation	The purpose of this document is to establish the procedure for checking Site Services Department scales prior to operation.
	SOP 20-C-904, General Nuclear Safety Requirements	The purpose of this procedure is to define the criteria for nuclear safety handling and storage.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 3 Transfer Existing Inventories of Chemicals, Materials, and Uranium Materials from Process Buildings to Approved Storage Locations (continued) - refer to Activities 9, 10, 11, and 12	20-C-917, Hydrogen Monitoring and Removing Nucfil Vent Plugs from Drums	This document provides the procedure for monitoring the atmosphere inside drums containing materials that could evolve hydrogen gas and for removing Nucfil 013 vent plugs.
	20-C-910, Venting Potentially Explosive Drums	This document provides the procedure for venting drums containing materials that could evolve hydrogen gas.
	20-C-918, Preparation for and Movement of Unvented Drums	This document provides the procedure for safe moving and handling of unvented drums containing potential hydrogen generating material.
	SOP 1-C-608, Storage of Radioactive Material	The purpose of this departmental procedure is to provide the requirements for storing radioactive material.
	SOP 20-C-801, Storage of Enriched Material	The purpose of this document is to establish the procedure for storing enriched material.
	SOP 20-C-100, Moving and Storing Depleted, Normal, and Enriched Uranium Materials <20% and Thorium Metal and Materials	The purpose of this document is to provide the procedure for the on-site movement of uranium with an enrichment of less than 20 percent and thorium.
	SSOP-0060, Packaging Radioactive Material for Off-Site Shipment	This document provides the procedure for packaging radioactive material for off-site shipment.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 3 Transfer Existing Inventories of Chemicals, Materials, and Uranium Materials from Process Buildings to Approved Storage Locations (continued) - refer to Activities 9, 10, 11, and 12	PO-S-06-001, Movement of Hazardous Waste	The purpose of this procedure is to establish a set of guidelines and practices to be used by motor vehicle operating personnel when transporting RCRA and other hazardous wastes.
	SSOP-0044, Controlling the Generation of Construction/Maintenance Waste	This document provides the procedure for controlling and minimizing construction and maintenance waste while maintaining worker safety standards and environmental protection requirements.
	SOP 20-C-604, Control and Utilization of Contaminated Trash Dumpsters	This procedure provides instructions to waste generators for filling specially marked dumpsters with contaminated trash that is in compliance with governing regulations.
	SOP 2-C-923, Trash Baler Operation	The purpose of this document is to establish the procedure for preparing contaminated trash for shipment to a burial site.
	FMPC-307, Control and Accountability of Nuclear Materials	This document states that FERMCO shall maintain control and accountability of nuclear materials at the FEMP in accordance with DOE orders.
Step 4 Isolate, Lock & Tagout Process Equipment, Piping Systems, & Associated Utilities - refer to Activity 8	SSOP-0061, FMPC Work Request/Order Procedure	This procedure provides instructions for requesting, approving, and controlling service activities performed by the Maintenance and Support Services Section of the Site Services Department at the FEMP.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 4 Isolate, Lock & Tagout Process Equipment, Piping Systems, & Associated Utilities (continued) - refer to Activity 8	PP-FMPC-0719, Energy Control (Lockout and Tagout)	This site procedure establishes the controls to ensure that all processes, machines, and/or equipment are isolated from all potentially-hazardous energy before personnel are allowed to perform any servicing, inspecting, maintenance, or construction activities where unexpected energization, start-up, or release of stored energy could cause injury to personnel or harm to the environment.
	SSOP-0069, Freon Management	This procedure provides direction for the recovery and recycling of commonly used freons by FERMCO at the FEMP.
	FMPC-508, Safety Analysis Documentation Program	This site procedure ensures that potential hazards are systematically identified for proposed operations; reasonable measures have been taken to eliminate, control, or mitigate the hazards; and potential risks have been evaluated.
Step 5 Prepare Safety Documentation - refer to Activity 6	PO-0712, Risk Assessment and Management (RAM) System Policy	New and modified facilities, restoration activities, process systems, and components shall be assessed for risks at least three times, and each of these assessments shall be designated by the phase it supports: (A) Design; (B) Operational; and (C) Decommissioning.
	SM-0001, Risk Assessment and Management (RAM) System Manual	This procedure is part of the Risk Assessment and Management (RAM) System, and is subordinate to IN-6034. Described herein are the methods and forms to be used for the performance of RAM System risk assessments and the preparation of Risk Assessment Reports (RARs), Risk Management Plans (RMPs), and Risk Managment Reports (RMRs).
	SSOP-0014, Documentation of a Subject Matter Expert (SME)	The purpose of this document is to establish the procedure for documenting a subject matter expert (SME) when required by procedures such that information is provided in a consistent and auditable form.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 5 Prepare Safety Documentation (continued) - refer to Activity 6	Safe Shutdown Health & Safety Plan	This plan warns against chemical, physical, biological, and safety hazards that are possible during Safe Shutdown activities. It describes required training, medical surveillance, personal protective equipment, decontamination, required documentation, and emergency and contingency plans.
Step 6 Prepare NEPA Documentation - refer to Activity 7	PP-0518, National Environmental Policy Act (NEPA) Program	FERMCO shall ensure that all actions/projects at the FEMP regarding potential environmental impacts comply with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), DOE Guidelines and Orders, and Secretary of Energy Notices.
	SSOP-0031, National Environmental Policy Act (NEPA) Document Process	The purpose of this procedure is to provide the steps to obtain approval for a NEPA document from initiation through DOE official and final approvals. NEPA documents support the requirements of the NEPA Program at the FEMP (refer to Site Policy and Procedure PP-0518 for information on the NEPA Program).
Step 7 Transfer Substances from the Process Equipment and Associated Support Systems - refer to Activities 11 & 12	PO-D-028, Preparation and Implementation of Work Package	This procedure shall apply to non-routine field activities performed by Site Services personnel that are not identified by existing Site or Site Services Procedures.
	FMPC-516, Control of Permits for Accomplishing Hazardous Work	This procedure establishes positive means for controlling work tasks that involve hazardous or potentially hazardous materials, equipment, operations, or activities to maintain employee health and safety and assure environmental compliance. The procedure describes the responsibilities and means for control of work by FERMCO employees, subcontractor personnel, and/or others involved with any of the following activities: working with asbestos; working on a chemically-hazardous system; working near open flame and/or welding; working with a radioactive material; and entering or working in a confined space.
	SP-P-35-016, Radiation Work Permits	This document assigns responsibilities and establishes the procedure initiation of, the use of, and termination of Radiation Work Permits (RWP).

STEP	REGULATION/PROCEDURE	COMMENTS
Step 7 Transfer Substances from the Process Equipment and Associated Support Systems - refer to Activities 11 & 12	PP-FMPC-5010, Management of Low Level Waste (LLW)	This procedure establishes the policy of managing and controlling the generation of low level waste to minimize waste production in a manner that is consistent with established environmental standards.
	SOP 20-C-606, Hazardous Material Spill Clean-Up	This procedure defines the requirements for reporting, containing, controlling, and cleaning hazardous material leaks and spills.
	SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers	This procedure provides the instructions for establishing and maintaining a Satellite Accumulation Area (SAA), accumulating hazardous waste in SAA containers and interim containers, and preparing SAA containers and interim containers for transfer to storage at the FEMP.
	SOP 20-C-500, Inspecting RCRA Waste Load/Unload and Staging Areas	The purpose of this document is to establish the procedure for inspecting areas used for loading/unloading and staging containers of RCRA material.
	SSOP-0008, Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area	This document provides the procedure for the preparation and transport of uncharacterized waste to the Controlled Holding Area (CHA) located at the center of Building 64.
	SSOP-0028, Controlling Portable Ventilation Devices and Vacuum Cleaners	The purpose of the document is to establish the procedure for assigning ownership and controlling the movement of HEPA filter equipped portable vacuum cleaners and portable ventilation (negative air) devices used at the Fernald Environmental Management Project (FEMP).
	SOP 20-C-700, Norclean Portable Vacuum Operation	The purpose of this document is to establish the procedure for operating Norclean vacuum units.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 7 Transfer Substances from the Process Equipment and Associated Support Systems (continued) - refer to Activities 11 & 12	SOP 20-C-701, Operation of Spencer & Hoffman Portable Dust Collectors	The purpose of this document is to establish the procedure for operating the Spencer & Hoffman portable dust collectors.
	SOP 20-C-014, Wet and Dry Systems Clean-Out	This document provides the procedure for removing residue from both wet and dry systems at the FEMP.
	SSOP-0075, Packaging Low Level Radioactive Waste (LLRW) in Drums for Off-Site Shipment	This document provides the instructions for packaging low level radioactive waste (LLRW) in drums for shipment off-site from the FEMP.
	SSOP-0078, Packaging Low Level Radioactive Waste (LLRW) into ISO Containers for Off-Site Shipment	This procedure provides the instructions for packaging low level radioactive waste (LLRW) into ISO containers for shipment off-site from the FEMP.
	SSOP-0079, Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Off-Site Shipment	This procedure provides the instructions for packaging low level radioactive waste (LLRW) in metal boxes for shipment off-site from the FEMP.
	PP-0314, Packaging, On-Site Movement and Off-Site Shipment of Material	It is the policy of the FERMCO to ensure that the packaging, on-site movement, and off-site shipment of hazardous and non-hazardous materials, including radioactive materials, is conducted in a safe manner that provides for the protection of the public and the environment and is in compliance with the applicable federal, state, and local regulations, Department of Energy (DOE) Orders and Directives, and FERMCO policies and procedures.
	SOP 2-C-601, Refinery Sump	This document establishes the procedure for processing waste water through the Refinery Sump System and is also applicable to processing uranyl nitrate solutions from the Refinery Storage Tanks.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 7 Transfer Substances from the Process Equipment and Associated Support Systems (continued) - refer to Activities 11 & 12	SOP 8-C-116, Filtering Refinery Thickener Underflow	This procedure is applicable to the Plant 8 filters and associated equipment used to process refinery thickener underflow received from the Refinery Sump System.
	SOP 8-C-115, Filtration of Uranium Bearing Slops	The purpose of this document is to provide the procedure for precipitating and filtering uranium from the Process Plant's waste water streams.
	SOP 8-C-605, EIMCO Filter Operation	The purpose of this document is to establish the procedure for operating the EIMCO Filter System (East and West Filters)
	SSOP-0003, Receiving, On-Site Movement and Off-Site Shipment of Non-Radioactive Hazardous Material	This document defines the procedure for receiving, on-site movement, and off-site shipment of non-radioactive hazardous material.
Step 8 Control of Loose Contamination - refer to Activity 13	Task Specific Health & Safety Plan for Decontamination of Various Areas of Existing Fixed or Removable Contamination, June 5, 1991	This document provides detailed information and controls necessary to remove loose contamination from the Process Facilities.
	20-C-612, Industrial Cleaning	This document provides the procedure for cleaning industrial facilities and equipment.
	20-C-610, Bird Carcass and Dropping Removal	This document defines criteria for disposal of bird carcasses and droppings.
	SOP 20-C-709, Baghouse Type Dust Collector Filter Removal/Replacement	The purpose of this document is to provide the procedure for removing and replacing baghouse type dust collector filters.
	20-C-600, Overpacking Defective Containers	The purpose of this document is to establish the procedure for overpacking defective containers.

STEP	REGULATION/PROCEDURE	COMMENTS
Step 8 Control of Loose Contamination (continued) - refer to Activity 13	SOP 20-C-916, Cleaning Sump Systems	This procedure is for cleaning all sump systems located at the FEMP.
	43-C-413, Handling Waste Materials with the Industrial Vacuum Loader Truck	This document establishes the procedure for using the Vacuum Loader Truck (Supersucker) for handling waste liquids, liquid sludges, and solids.
Step 9 Disposition of Surplus Property - refer to Activities 14 through 24	FMPC-303, Management of Government Property	This procedure identifies the responsibilities and requirements of the property management system which includes the acquisition, receipt, maintenance, utilization, protection, storage, subcontractor/vendor control, inventory, disposition, movement, and removal of non-nuclear, government-owned property at the FEMP.
	SSOP-0034, Nuclear Materials Disposition Order Management	This procedure provides the controlling order requirements for nuclear material disposition activities from order receipt through material release.
	PO-D-035, Shipment of Low Level Radioactive Waste Requirements	This document defines the requirements for the shipment of Low Level Radioactive waste.
	SSOP-0081, Radiologically Non-Contaminated Asbestos Containing Material Waste (ACM) Disposition	This document provides a protocol to permit disposition of ACM Waste produced in a Radiologically Non-controlled area as non-radiological.
	SP-P-35-010, Unrestricted Release of Materials from FMPC	This safety document establishes the radiation levels for unrestricted release of materials from the site.

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WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO		SITE STANDARD OPERATING PROCEDURE Page 1 of 44
Title: **FEMP SITE DOCUMENT SYSTEM**		DOCUMENT NO: SSOP-0103 REVISION NO. 0
Authorization: H. F. Daugherty, President	Replaces: PP-0103, Dated 08-28-91, Rev. 0	Effective Date: 10-14-92

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
10-14-92	0	Procedure required to establish new Site Document System per Request No. S92-165, initiated by L. A. Tilney.

1.0 PURPOSE

This procedure establishes the document control system by which Westinghouse Environmental Management Company of Ohio (WEMCO) develops, processes, and controls the site documents at the Fernald Environmental Management Project (FEMP). Additional objectives of this procedure are to define when a document is required and the type of site document that must be developed.

2.0 SCOPE

This procedure outlines (1) the criteria for determining whether a site document is required; (2) the instructions for initiating, developing, validating, reviewing, approving, authorizing, revising, controlling, implementing, and cancelling site documents; (3) document implementation and use; (4) the FEMP document hierarchy; (5) the types of site documents; (6) document control and support functions; and (7) the required elements of a department procedure program.

The procedure applies to all FEMP organizations and complies with DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities" and Site Requirement RM-0012, "Quality Assurance Program Description".

3.0 DEFINITIONS

Action Memo - A transmittal form used to initiate specific activities during the processing of documents in the Site Document System. including review, comment resolution, and approval.

Charter (CH) - A document identifying the functions of a department, committee, or board.

Department Document - A document detailing administrative, technical, or operational activities within a department.

Document Review Coordinator (DRC) - An individual assigned to represent a department for tracking the internal review, comment resolution, and approval of a site document.

Driver - Operational, technical, and administrative standards imposed on WEMCO or the FEMP by agreement, law, contract, regulations, DOE Directives, or Corporate Directives.

Information Manual (IM) - A site document providing information on a subject for FEMP personnel.

3.0 DEFINITIONS (cont.)

Major Revision - A change to a document that is 20% or more of the document text.

Minor Revision - A change to a document that is less than 20% of the document text.

One-time Deviation - A task requiring deviation from normal procedure that will be accomplished one time.

Orientation - A class provided by Documentation Control (DC) to introduce the Site Document System to SMEs, DRCs, and other applicable personnel.

Plan (PL) - A site document defining the strategy and goals for establishing and implementing an activity, program, or system. (A plan is a document that defines what work will be done, not how work will be done. It is not an instructional document and is not to be used when performing work. This definition is not applicable to site work plans.)

Policy (PO) - A site document that defines the fundamental principles that govern FEMP organizations.

Safety Analysis Report (SAR) - A report that documents the adequacy of safety analysis for a nuclear facility to ensure that the facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations.

Site Document - A document detailing FEMP administrative, technical, and/or operational subject matter affecting more than one department/contractor organization.

Site Document Change (SDC) - The form by which an urgent change is processed and issued.

Site Document Request (SDR) - The form used to initiate development of the document draft and the processing of the document through the Site Document System.

Site Document System - The system controlling site documents at the FEMP that governs the performance of administrative, technical, and operational activities.

3.0 DEFINITIONS (cont.)

Site Requirement (SR) - A site document, previously titled a requirements manual, defining and establishing federal and state regulations/laws or management practices that are applicable to the FEMP. All organizations are responsible for implementing site requirements, as applicable, through a department procedure. (A site requirement is not an instructional document and is not to be used when performing work.)

Site Standard Operating Procedure (SSOP) - A type of site document providing detailed operating or administrative instruction for an ongoing activity/process (a sequence of actions).

Site Work Plan (SWP) - A site document providing detailed operating instructions for a required activity which will not be repeated.

Subject Matter Expert (SME) - An individual qualified, or previously qualified, and experienced in the applicable activity who has been documented per SSOP-0014 and is responsible for the content and update of document.

User - An individual who has been or will be directly involved in utilizing the document.

Validation - The process of ensuring that a procedure or other instructional document is correct. The process will involve a walk-through of the procedure (where the procedure is used in the work area and verified under work conditions) or a table-top review (a step by step examination of the procedure with appropriate personnel during a meeting).

4.0 RESPONSIBILITIES

Site employee/User shall be responsible for notifying management when a document appears to be incorrect or when a new document is needed.

Department Managers or Designee

- Reviewing and approving the need for a new document or revision to an existing document.
- Reviewing and approving the initial draft.
- Implementing review controls per this procedure and resolving overdue actions.
- Approving final document (if it affects that department).

4.0 **RESPONSIBILITIES** (cont.)

- Initiating training, as required, for an issued site document.
- Establishing and maintaining a department document program and department charter per this procedure.
- Determining what site/department documents are needed to support the functions and responsibilities of their organization.
- Ensuring assigned SMEs complete orientation of the Site Document System as scheduled by Documentation Control.

The Documentation Control (DC) Manager

- Establishing and maintaining a document system to develop, issue, and control site documents.
- Providing orientation classes on the Site Document System and document development to Subject-Matter Experts, Document Review Coordinators, and other applicable personnel.
- Providing technical writers to write documents/revisions and comment resolutions with the SME and User.
- Providing an Editor to assist the SME, Technical Writer, and User with document development.
- Ensuring internal and external document actions are tracked throughout the processing phase of a document.
- Providing word processing support to prepare site documents.
- Providing controlled and non-controlled site documents to WEMCO and subcontractor employees.
- Resolving problems and issues throughout the processing of a site document.

The Subject-Matter Expert (SME)

- Conducting research to verify a new document, revision, or urgent change is required.
- Developing a flowchart for a procedure or work plan.
- Developing a document outline of the process/activity.

4.0 **RESPONSIBILITIES** (cont.)

- Providing the Technical Writer with the information from which the writer will develop the draft.
- Validating the document.
- Resolving comments with Technical Writer.
- Completing the orientation class on the Site Document System and document development.

Document Review Coordinators (DRC) shall be responsible for tracking the department reviews, comment resolution, and approval of a site document.

The WEMCO President shall be responsible for authorizing the issue of site documents.

Managers/Supervisors

- Maintaining all current site documents.
- Reviewing issued site documents for applicability to their organization and ensuring affected personnel are informed and trained as necessary.
- Ensuring personnel within their organization comply with issued site documents.

The User shall be responsible for providing information on the activity to the SME/Technical Writer for document development and validation.

Department reviewers shall be responsible for reviewing site documents in accordance with this procedure.

The Technical Writer

- Writing the document draft and incorporating comment resolutions into document from the information provided by the SME and User.
- Taking the lead role in processing the document through the Site Document System.

The Editor

- Completing a critique of the document draft.
- Completing a final edit of the document prior to approval.

4.0 **RESPONSIBILITIES** (cont.)

DC Tracking

- Assisting SME in filling out the milestone chart.
- Tracking document from request initiation through document distribution.

5.0 **GENERAL**

5.1 Figure 1, FEMP Document Hierarchy shows (a) the flow of site documents and department documents and (b) the types of non-operational documents at the FEMP.

5.2 Each department shall be responsible for establishing and administering a document system that contains the elements in Table 1 to process the documents within their organization.

5.3 A department charter shall be prepared and maintained by each department and processed as a site document per this procedure.

6.0 **PREREQUISITES**

Assigned SMEs and DRCs should complete an orientation class on the Site Document System as scheduled by DC.

7.0 **PROCEDURE** (See Site Document System Flowchart, Figure 2)

7.1 DETERMINING IF A DOCUMENT/REVISION IS REQUIRED

SITE EMPLOYEE OR USER

1. Notify supervisor or manager when a document appears to be incorrect or when a new document is needed.

DEPARTMENT MANAGER (OR DESIGNEE)

2. Determine whether a new document or revision is required based on the criteria provided in Table 2.

3. Assign an SME per SSOP-0014 to conduct research and verify whether the revision or new document is required.

   NOTE: The SME is required to complete an orientation class on the Site Document System as scheduled by DC.

7.1 DETERMINING IF A DOCUMENT/REVISION IS REQUIRED (cont.)

SME

4. Using the Site Document Index and department document indexes, determine whether a document exists for the activity. Contact DC and applicable department document program representatives to ensure a similar document is not in process.

   a. If a site document exists and requires updating, proceed to 7.11 to initiate a revision.

   b. If a department document exists for the activity, notify the department manager and determine whether a site document may be needed.

   c. If a document does not exist for the subject, proceed to 7.2 to initiate a new document.

7.2 INITIATING A NEW DOCUMENT

SME

1. Notify the department manager that a new document is required.

DEPARTMENT MANAGER (OR DESIGNEE)

2. Review the SME's justification for the new document and assign the task to the SME if warranted.

7.3 DEVELOPING A NEW DOCUMENT

SME

1. Prepare a document outline of the proposed activity using the applicable format (see Figures 3 through 7).

   NOTE: The Site Work Plan, Information Manual, Plan, and Safety Analysis Report have no format requirements.

   a. If the document to be written is to provide instruction (an SSOP or SWP), prepare a flowchart detailing each step in the process.

   NOTE: A task team may be required to perform an early analysis for the development of the document.

7.3 DEVELOPING A NEW DOCUMENT (cont.)

SME

2. Determine whether the document required is a site or department document per the definitions provided in 3.0. For assistance, contact DC.

   a. If a department document is needed, proceed per the applicable department procedure for the department document program.

   b. If a site document is needed, proceed to Section 7.3, Step 3.

DC AND SME

3. Determine the specific type of site document required according to the definitions in 3.0 (see FEMP document hierarchy, Figure 1).

DC TRACKING AND SME

4. Select the applicable milestones on the Milestone Chart (see Figure 8) and calculate a document completion date.

   NOTE: The milestone chart will allow DC, along with the SME, to establish a schedule for the document based on document type, size, and typical task/milestone durations.

SME

5. Complete all applicable sections of the Site Document Request (SDR), Form FS-F-3523 (see Figure 9), except for obtaining the department manager's signature. Transmit the SDR form, document outline, and flowchart (as applicable) to DC.

   a. To determine the applicable FEMP reviewers and required approvals, refer to Figures 10 and 11.

      NOTE: DC will assist with the determination of the required reviewers as required.

   b. Add off-site reviews to the SDR review list, as applicable.

   c. Send a copy of a request for a new document to Centralized Training for training analysis.

7.3 DEVELOPING A NEW DOCUMENT (cont.)

DC TRACKING

6. Assign a number and a technical writer (determined by DC Manager) to the SDR and give a copy of the outline to the Editor for review.

7. Throughout the preparation process of the document, record the actual number of work days for the completion of each milestone on the Milestone Chart.

SME AND TECHNICAL WRITER

8. Using the outline, develop the draft with the User and transmit to DC word processing by disk or hard copy.

   NOTE: The SME will arrange for User support.

DC TRACKING

9. When the draft is completed, transmit the SDR with draft to the department manager (who owns the document) for signature.

DEPARTMENT MANAGER (OR DESIGNEE)

10. Read the draft for purpose and site compliance.

11. Sign the SDR for draft acceptability and return to DC.

DC TRACKING

12. When the SDR is signed by the department manager, transmit draft to the Editor.

EDITOR

13. Critique document for user-friendliness and clarity and retun to DC Tracking.

DC TRACKING

14. Record completion of critique from editor and return document to the Technical Writer.

7.3 DEVELOPING A NEW DOCUMENT (cont.)

TECHNICAL WRITER

15. Review editor's critique and resolve comments with SME and the User, if required. Submit marked draft to word processing for revision, as applicable.

7.4 VALIDATION

TECHNICAL WRITER

1. When word processing is complete, schedule validation process with the SME and User. Obtain action memo from DC Tracking for validation process.

SME AND USER

2. Perform a "walk through" or "table top review" of the document for validation with applicable personnel.

   NOTE: The validation process shall include independent verification with users who have not participated in the development of the document.

   a. If the document is valid, sign the action memo and return to DC Tracking.

   b. If the document is not valid, resolve problems/comments and incorporate as necessary into the document. Sign action memo for validation when resolution process is complete.

7.5 REVIEW

NOTE: Each department shall establish and implement the review cycle controls/responsibilities in Table 3.

DC TRACKING

1. Record receipt of action memo for validation and prepare document for review process as follows:

   NOTE: A meeting may be held to expedite the review process.

   a. Verify the departments designated as reviewers are in accordance with the Document Review Matrix (see Figure 10).

7.5 REVIEW (cont.)

DC TRACKING

b. Prepare action memos for review process using review time designated in Figure 10 and deliver to the applicable Document Review Coordinators. Send the document to offsite reviewer(s) (DOE, EPA, and non-WEMCO organizations) if applicable.

DRC

2. Route review copies to applicable personnel within the department as determined by management.

3. Track review copies through review period.

REVIEWER

4. Review the document for specific area of responsibility per Reviewer Guidelines (refer to Table 4).

5. Write comments on the Document Review Comment Sheet (see Figure 12).

6. Mark comments as significant only when based on technical inaccuracies, noncompliance, or inconsistencies with established requirements, laws, regulations, and/or procedures.

7. Return document within the designated review time to the DRC.

DRC

8. Log receipt of reviewed draft document and transmit to DC. If a review is not completed within the review period, notify department manager for corrective action.

DC TRACKING

9. Record receipt of each review and immediately upon receipt of any comments transmit to the SME for resolution.

10. At the review due date, prepare an action memo signifying that the review phase is complete and that comments received require resolution by the SME.

7.5 REVIEW (cont.)

DC TRACKING

a. If a department has not returned their review by the due date, contact the applicable DRC of that department to discuss the delinquent review.

NOTE: Typically review comments received past the review due date will be addressed and incorporated, as applicable, in the next revision of the document.

DRC

11. Log receipt of action memo and transmit to SME.

12. Monitor comment resolution progress. If the action memo is not returned by SME in time to meet DC due date, notify department manager.

7.6 COMMENT RESOLUTION

SME AND TECHNICAL WRITER

1. Resolve comments and record on the comment sheet (Figure 12) how each significant comment was resolved.

2. Ensure comments marked as SRC (Significant Review Comment) are significant per Section 7.5, Step 6. If the comments appear to not be significant, verify through the DC Manager and delete SRC designation, as applicable.

TECHNICAL WRITER

3. Incorporate the comment resolutions on a copy of the document and submit to word processing.

SME

4. For SRCs, discuss comment resolution with appropriate reviewer.

a. If the reviewer agrees that the comments have been resolved satisfactorily, obtain concurrence signature.

NOTE: A signature is not required for comments incorporated verbatim as stated on the comment sheet.

7.6 COMMENT RESOLUTION (cont.)

SME

b. If the reviewer does not concur with resolution, transmit comment and resolution to the reviewer's supervisor and the SME's supervisor for resolution.

5. After SRCs are resolved, contact other reviewers of departments that may be affected by the change to ensure the resolution is acceptable.

   NOTE: SME will determine which department may be affected.

SME AND DC MANAGER

6. If a department does not agree with the resolution to an SRC made by another department, convene a meeting of the departments to negotiate an acceptable solution.

SME

7. Sign the action memo for completing resolution of the comments and obtaining SRC signatures. Return the action memo with completed comment sheets and document to the DRC.

DRC

8. Record receipt of action memo for comment resolution. Ensure all comments have been resolved on the comment sheet and the action memo has been signed by the SME.

9. Return action memo to DC Tracking.

DC TRACKING

10. Record receipt of action memo for comment resolution and maintain action memo on file.

TECHNICAL WRITER

11. When comments have been incorporated by word processing and the signed action memo has been returned for comment resolution, give the document to the Editor via the DC Tracker.

7.6 COMMENT RESOLUTION (cont.)

EDITOR

12. Complete final edit of the document for typographical and grammatical error. Return document to the Technical Writer via the DC Tracker.

TECHNICAL WRITER

13. Incorporate any editorial changes through word processing and give to DC Tracking for approval routing.

7.7 APPROVAL

DC TRACKING

1. Prepare action memos for approval per SDR and deliver to applicable department manager(s).

DEPARTMENT MANAGER (OR DESIGNEE)

2. Ensure document meets site activity requirements.

3. Sign and date approval record signifying the document is still in compliance with site requirements and return to DC.

DC TRACKING

4. Record receipt of each action memo and ensure each approval record has been signed.

   a. If the document is not approved, contact SME and Technical Writer.

SME AND TECHNICAL WRITER

   b. Resolve department manager's comments/concerns and return to applicable department manager for approval (through DC Tracking).

7.8 AUTHORIZATION

DC TRACKING

1. When all the approval signatures have been obtained, add the effective date to the document and deliver document to President for authorization. Include information, as required, to advise President of departments that did not complete the review/approval cycle.

   NOTE: The effective date shall be 10 working days from the date the document is authorized to ensure proper distribution.

PRESIDENT

2. Evaluate impact of document to ensure document meets site activity requirements and can be implemented satisfactorily. Consult cognizant department manager as needed.

3. Sign the document for authorization and return to DC.

   NOTE: A commitment shall be considered closed at the time of document authorization.

   NOTE: Training may be initiated upon authorization per TR-SP-6001.

7.9 DISTRIBUTION

DC

1. After receipt of the authorized document, prepare for distribution.

2. Complete reproduction and controlled distribution of the document prior to the effective date.

7.10 IMPLEMENTATION AND USE

MANAGERS AND SUPERVISORS

NOTE: Every manager/supervisor shall receive and maintain controlled copies of all site documents.

1. Upon receipt of a document, read for awareness of the content and sign the acknowledgement on the distribution sheet (see Figure 13).

7.10 IMPLEMENTATION AND USE (cont.)

MANAGERS AND SUPERVISORS

2. Determine if the content is applicable to your organization.

   a. If the document is applicable to your organization, ensure all personnel are made aware of the document content.

      NOTE: Training shall be initiated as determined by the responsible department per TR-SP-6001.

   b. If applicable, maintain document in the organization's Required Reading File in accordance with Westinghouse Conduct of Operations Manual, dated 7-1-91.

   c. If the document is not applicable to your organization, indicate on the distribution sheet.

3. Return distribution sheet to DC Tracking.

DC TRACKING

4. Retain distribution sheets on file.

MANAGERS AND SUPERVISORS

5. Conduct periodic checks of document users to ensure activities are performed in accordance with issued procedures.

7.11 REVISION

NOTE: An urgent change to a document shall be completed per Section 7.12.

SME

1. Determine whether the revision is major or minor based on the definitions listed in Section 3.0.

   a. If the revision is major, write a summary of the revision, proceed to Section 7.3, Step 1 of this procedure and continue processing of the revision.

   b. If the revision is minor, proceed to Section 7.11, Step 2.

7.11 REVISION (cont.)

SME

2. Mark the changes on a current copy of the document.

3. Complete an SDR form (see Figure 9) and submit to DC.

   NOTE: The department manager's signature is not required for a minor revision.

DC TRACKING

4. Assign a number and a technical writer to the SDR.

TECHNICAL WRITER

5. Review revision, rewrite as necessary, and submit to word processing.

   NOTE: Changes shall be identified by shaded text.

6. When the word processing has been completed, submit revised document pages to DC Tracking to prepare for SME review.

DC TRACKING

7. Verify reviewers on the SDR in accordance with the Site Document Review Matrix (see Figure 10).

8. Prepare action memo to SME, attach revised pages, and deliver to SME.

SME

9. Review minor revision for accuracy.

   a. If the revision is accurate, sign the action memo to route the document for review.

   b. If the revision is not accurate, mark changes on the document copy and return to DC/Technical Writer for correction.

7.11 REVISION (cont.)

DC TRACKING

10. When the revision has been approved by the SME, prepare action memos for document review and deliver to the applicable DRCs.

DRC

11. Proceed to Section 7.5, Step 2 and continue processing of the minor revision through Section 7.10, Step 5.

7.12 URGENT CHANGE

NOTE: A Site Document Change (SDC) form is used to issue an urgent change and may only revise less than 20% of the document text.

NOTE: The SDC, if approved, will normally be processed in one to three days.

SME

1. Mark change on current copy of document and submit to DC to initiate an SDC.

DC TRACKING AND SME

2. Determine reviewers per the Site Document Review Matrix (see Figure 10).

DC TRACKING

3. Assign an SDC number to the change and a technical writer to write the SDC.

TECHNICAL WRITER

4. Develop SDC (see Figure 14) with SME as necessary and obtain SME concurrence to route for review.

   a. If the change will be on-going, mark the "Revise Affected Procedure" box in Item 7 of the SDC form.

   b. If the change is a one-time deviation, indicate as "No Procedure Action" in Item 7 of the SDC form.

7.12 URGENT CHANGE (cont.)

TECHNICAL WRITER

5. Submit SDC to DC Tracking to be routed for review and approval.

DC TRACKING

6. Prepare document with action memos for SDC to be routed for review and approval.

SME OR DC

7. Deliver action memos to applicable department managers. If the department manager is not available, deliver SDC review and approval to DRC.

DEPARTMENT MANAGER (OR DESIGNEE)

8. Review SDC against current document per Reviewer Guidelines (refer to Table 4), record any comments on review comment sheet, and return to DC within one work day. If no comments are made, sign the SDC indicating approval.

DC TRACKING

9. Record receipt of each action memo. If the SDC is returned with comments, notify SME to complete resolution of comments and then obtain approval signature.

10. Upon approval, add the effective date and the expiration date. Complete controlled distribution of the SDC for an effective period of six months.

    NOTE: The SDC shall be issued on blue paper.

11. During the six month period, revise the affected document to incorporate the SDC.

    NOTE: The SDC may be cancelled per this procedure upon request by the SME.

7.13 CANCELLATION

DC

1. For a site document that has been superseded, indicate document cancellation on the filing instruction sheet when the corresponding replacement document is issued.

2. For a department document superseded by a site document, contact the applicable department to initiate cancellation of the document.

SME

3. To cancel a document/SDC due to a cease in activity, complete an SDR form and transmit to DC.

DC

4. Route document for review of the cancellation to IRS&T, EC, and the department manager responsible for the document.

   a. If comments are received, notify SME to resolve comments.

5. After comments are resolved or if no comments are received, prepare cancellation notice and transmit to applicable personnel per controlled distribution.

7.14 DOCUMENT CONTROL AND SYSTEM SUPPORT

DC

1. Set up and maintain site document stations containing all the current site documents. Refer to Table 5 for a list of established and future stations.

2. Conduct quarterly assessments of selected site document volumes in accordance with applicable department procedure to ensure the documents are current.

3. Issue a Site Document Index monthly.

4. Establish and implement a program to annually review site documents for content accuracy.

5. Maintain the review, approval, authorization, and control records of current site documents.

7.14 DOCUMENT CONTROL AND SYSTEM SUPPORT (cont.)

DC

6. Provide non-controlled copies of site documents to FEMP personnel as requested.

7. Establish and maintain a request system for subcontractors who require controlled or non-controlled site/department document copies.

   NOTE: Each department shall control the documents required from their department and transmit to the applicable subcontractor.

8. Maintain cancelled site documents as records.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities"
- RM-0012, "Quality Assurance Program Description"

8.2 REFERENCES

- RM-0012, "Quality Assurance Program Description"
- Westinghouse Conduct of Operations Manual

TABLE 1
DEPARTMENT DOCUMENT PROGRAM ELEMENTS[1]

1. Initiation and development of a new document or revision to an existing document
2. Identification of format for each type of document
3. Review and approval process
4. Identification of documents
5. Process to issue urgent changes
6. Identification of required reviews and approvals
7. Cancellation of documents
8. Issuing authority
9. Document control (including periodic review and controlled distribution)
10. Record maintenance
11. Index of department documents
12. Meets requirements of RM-0012, "QA Program Description"

[1] *This table identifies the basic elements of a department document program. All departments shall ensure their program for processing department procedures contains these elements.*

TABLE 2
CRITERIA FOR INITIATING A DOCUMENT[1]

Repetitive Task
Impact on site operations • Environment, safety, and health • Quality assurance • Monetary • Public relations/legal implication
Requirements of a driver
Result of an audit
Change in activity

[1] A document shall be required based on one or more of the items in Table 2.

TABLE 3
REVIEW CYCLE CONTROLS/RESPONSIBILITIES

Department Manager • Establish a Document Review Coordinator (DRC) to track reviews within the department. • Ensure reviewers are familiar with Section 7.5 of this procedure. • Ensure documents are reviewed in the designated review time.
Documentation Control • Establish and maintain a followup system to monitor late reviews which includes notification to departments of late reviews.

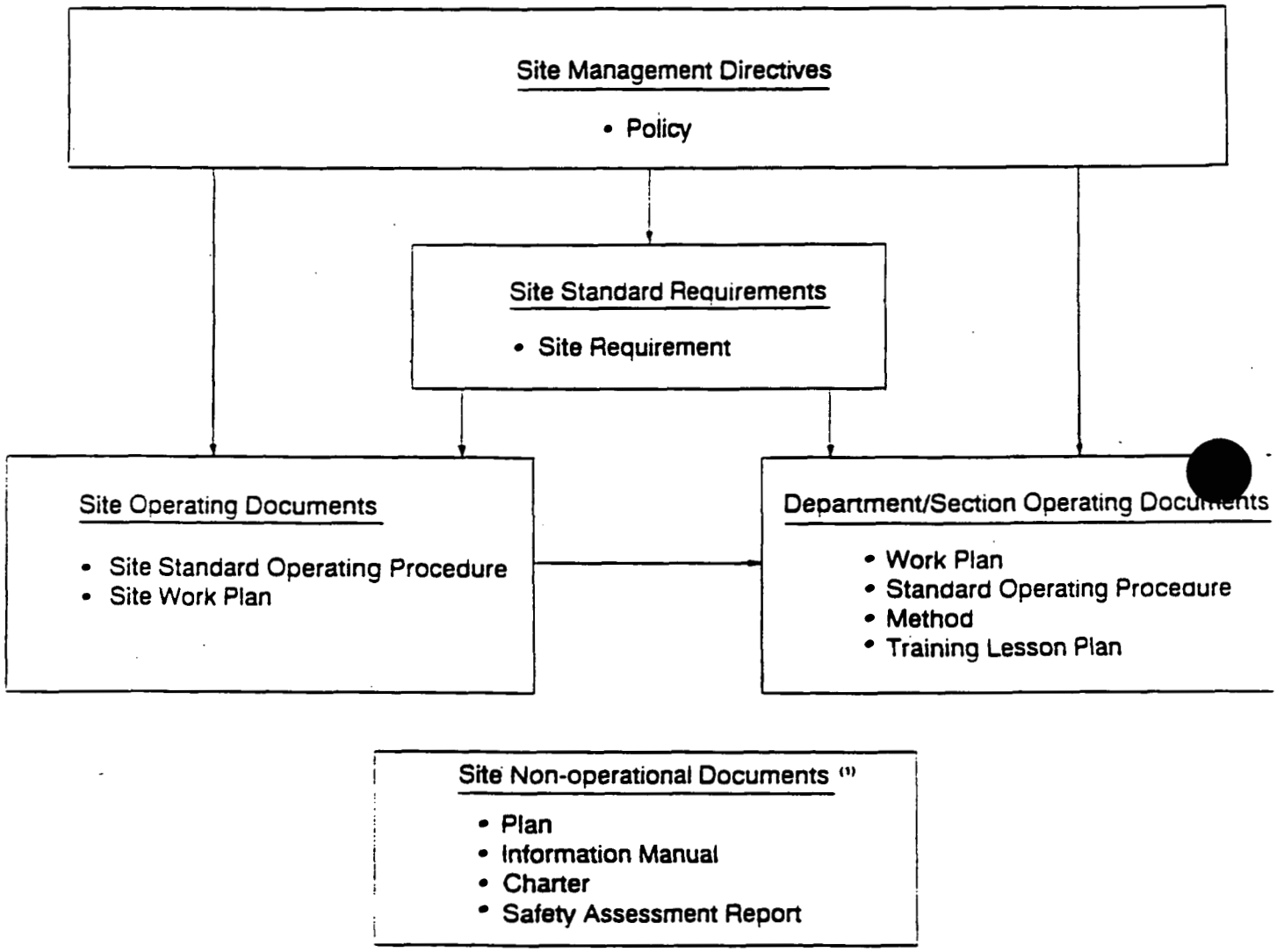
TABLE 4
REVIEWER GUIDELINES

1.	Review for area of responsibility.
2.	Direct comments to the actions within the scope of the procedure. Modification of equipment or new equipment development should not be addressed in the review. Contact the SME and/or the owner of the procedure.
3.	Comment only on the Document Review Comment Sheet. Make a statement. Do not write questions. If necessary to resolve a conflict, call the SME indicated on the document.
4.	Indicate comments as "significant" if the change indicated is required to meet WEMCO policies and/or established regulations applicable to the FEMP operation. A comment which is a suggestion, concern, punctuation, grammar, spelling, organization title, or does not impact one or more of the following areas: safety, DOE requirement, FEMP commitment, quality, compliance, technical content, or scope of procedure shall not be considered significant.
5.	If the technical or administrative accuracy of the document is questionable, compare document to source documents and/or contact the SME.
6.	If material is technically correct, do not change because of personal opinion.
7.	For questions regarding format, contact Documentation Control, X-6545.

TABLE 5
SITE DOCUMENT STATIONS

EXISTING SITE DOCUMENT STATIONS:	SITE STATIONS TO BE ESTABLISHED:
1) N7-0001 - T-24, North 7 Plex	1) T-43, East Trailer
2) S&H-0001 - S&H Bldg. 2nd Floor	2) T-44, West Trailer
	3) T-25, South 7 Plex
	4) Analytical Lab Bldg - North, 2nd Floor
	5) Analytical Lab Building - South
	6) Refinery - Plant 2/3
	7) Metals Plant - Plant 6
	8) Safety & Health - 1st Floor
	9) Safety & Health - Communication Center
	10) Decontamination Bldg (Bldg 69)
	11) T-23, 10 Plex
	12) Administration Bldg. - 1st Floor
	13) Administration Bldg. - 2nd Floor
	14) T-16, East Trailer Area, Conference Room, South end
	15) T-76, Library

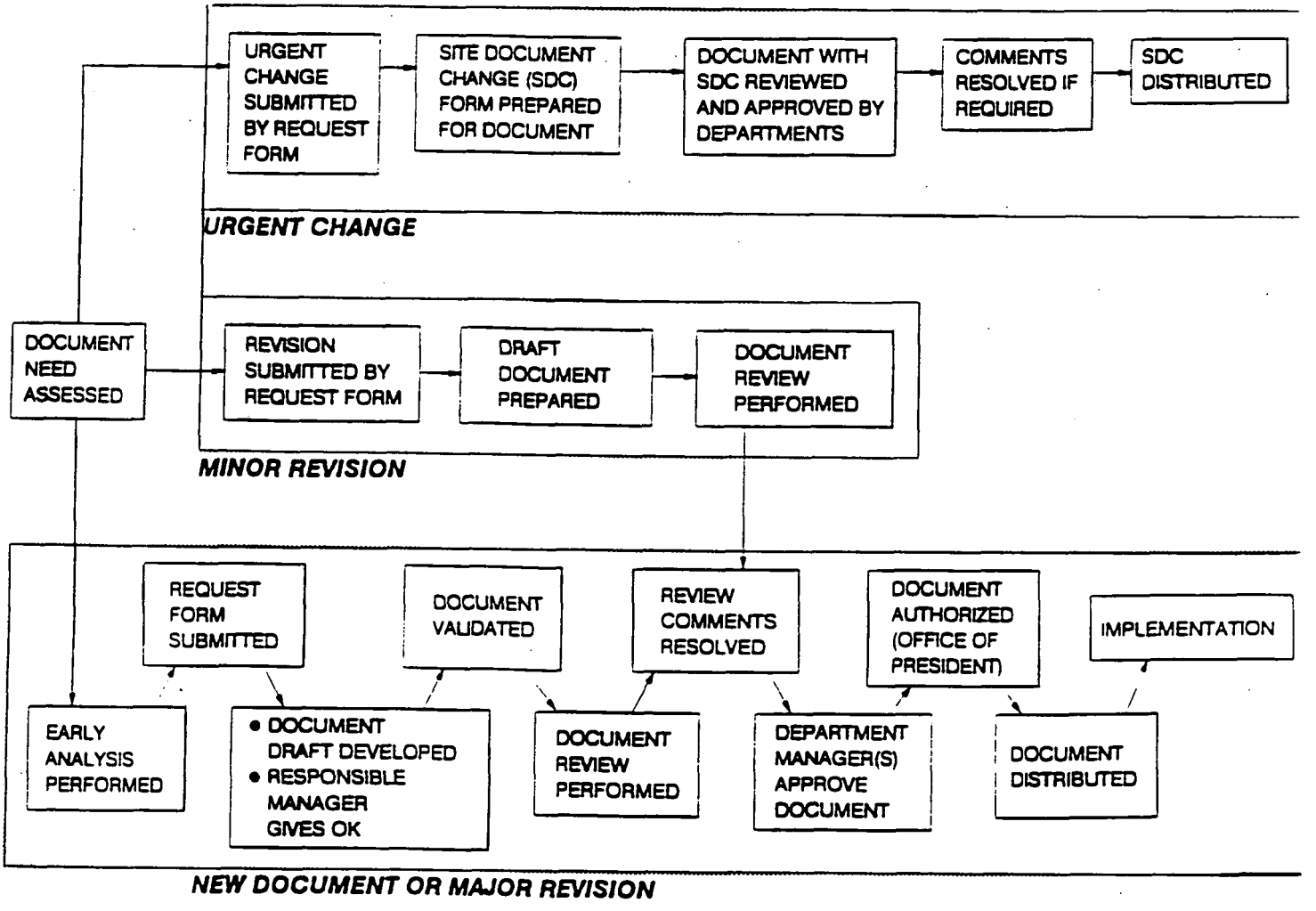
FEMP DOCUMENT HIERARCHY



(1) *Site Non-Operational documents may or may not be developed based on a hierarchial driver. It is possible that there will be a need for one of these documents without being driven by policy, requirement, or other documents.*

Figure 1 - FEMP Document Hierarchy

SITE DOCUMENT PROCESS FLOWCHART



NOTE: A detailed flowchart (Process Map) can be obtained from Document Control

Figure 2 - Process Flow

POLICY FORMAT

1.0 OBJECTIVE

State the general intent of the policy and the corporate directive/ regulation that requires generating this policy (the driver). A summary of the policy.

2.0 SCOPE

Specify all organizations or individuals who will be governed by this policy.

3.0 DEFINITIONS

This section shall include those terms and statements contained in the body of the document which require definition for uniform understanding.

4.0 ELEMENTS

Detail the several components of the policy (as applicable), using subheads to identify each main concept or paragraph.

5.0 IMPLEMENTATION

Specify who is responsible for the implementation of the policy, and the type of document(s) to be written to put the policy into effect.

Figure 3 - Policy Format

SITE REQUIREMENT FORMAT

1.0 INTRODUCTION

State the purpose of the site requirement and the driver that requires the document.

2.0 SCOPE

Specify the activity/function applicable to the site requirement and the affected organizations or personnel.

3.0 DEFINITIONS

This section shall include those terms and statements contained in the body of the document which require definition for uniform understanding.

4.0 STANDARDS

Detail the requirements of the document subject.

5.0 IMPLEMENTATION

Specify how the standards will be implemented at the FEMP, including who is responsible for the implementation of the site requirement and the type of document(s) to be written to place the site requirement into effect.

Figure 4 - Site Requirement Format

DEPARTMENT/ORGANIZATION CHARTER FORMAT

1.0 PURPOSE

Identify the overall function of the organization.

2.0 ORGANIZATION

List subgroups and functions within the organization to describe purpose and goals.

3.0 RESPONSIBILITIES

List specific responsibilities of organization. If responsibilities are shared with other organizations, ensure shared organizations agree with established responsibilities.

4.0 APPLICABLE DOCUMENTS

Include in this section the specific documents that are applicable to the organization. If no documents exist, state "NONE".

4.1 Drivers - Administrative requirements creating need for the charter.

4.2 Reference Documents - Documents required to complete actions or portions of actions identified in the charter. Reference only documents issued through the Site Document System. Department and Library Documents are not acceptable.

Figure 5 - Department/Organization Charter Format

MEMBERSHIP/COMMITTEE CHARTER FORMAT

1.0 PURPOSE

Develop a statement of the purpose for the committee, council, or board.

2.0 MEMBERSHIP

List by title those individuals who serve as members and describe briefly how and by whom members are chosen.

3.0 RESPONSIBILITIES

Include the responsibilities of the committee, council, or board, and, if appropriate, the unique responsibilities of the members. State the authority of the committee, council or board. Do not include responsibilities that are standard for any organization, such as the chairperson "chairs", the committee or the members who participate in the meetings.

4.0 APPLICABLE DOCUMENTS

Include in this section the specific documents that are applicable to the particular committee, council, or board. If no documents exist, state "NONE".

4.1 Drivers - Administrative requirements creating need for the charter.

4.2 Reference Documents - Documents required to complete actions or portions of actions identified in the charter. Reference only documents issued through the Site Document System. Department and Library Documents are not acceptable.

Figure 6 - Membership/Committee Charter Format

SITE STANDARD OPERATING PROCEDURE (SSOP) FORMAT

1.0 PURPOSE

This section shall give a clear, concise statement explaining the intent of the procedure.

2.0 SCOPE

This section should establish the limits of the procedure. The activity/function applicable to the procedure and the affected organizations should be specified.

3.0 DEFINITIONS

This section shall include those terms and statements contained in the body of the document which require definition for uniform understanding.

4.0 RESPONSIBILITIES

This section shall specify the responsibility and authority of the persons and/or organizations involved in the activity for which the procedure is written.

5.0 GENERAL

Include explanatory information that is not specific to the procedure section but is necessary for the clarity and understanding of the document. If there are no general items, indicate by "NONE".

6.0 PREREQUISITES

This section should discuss requirements applicable to the performance of the procedure. These requirements should include Industrial Health & Safety, Personnel, and Tool requirements.

Figure 7 - Site Standard Operating Procedure Format
(Sheet 1 of 2)

SITE STANDARD OPERATING PROCEDURE (SSOP) FORMAT

7.0 PROCEDURE

This section shall contain in detail all steps required to accomplish the activity. Who is to accomplish each step and precise order of steps must be shown. Subsections should show a breakdown of the major activities associated with accomplishing the overall task. The title of the employee or the group responsible for accomplishing accompanying steps will be shown just prior to those steps.

Figures, tables, and guides should be incorporated within the text as close to their reference in the text as possible.

WARNINGS will be used only for conditions that will cause personnel injury. CAUTIONS will be included in the procedure text when a condition will cause equipment/material damage. NOTES will be incorporated in the text of the procedure in order to clearly define a condition or step of a procedure or present information that may be helpful in completing a task.

8.0 APPLICABLE DOCUMENTS

Documents that are "drivers" or "reference" documents should be listed. Drivers are administrative requirements creating a need for the document. References are documents required to complete actions or portions of actions identified in the document. Reference only documents issued through the Site Documentation System.

Figure 7 - Site Standard Operating Procedure Format
(Sheet 2 of 2)

SITE PROCEDURE MILESTONE CHART

PROCESS STEP	RESPONSIBILITY	TOTAL NUMBER OF PAGES								ESTIMATED DATE	COMPLETION DATE
		5	10	15	20	25	30	35	40		
		ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS	ACTUAL DAYS / STD DAYS		
DRAFT DOCUMENT	SME/ TECHNICAL WRITER/ USER										
OBTAIN DEPT MANAGER SIGNATURE	SME										
CRITIQUE DOCUMENT	EDITOR										
CRITIQUE RESOLUTION	TECHNICAL WRITER & SME										
VALIDATION	USER & SME										
REVIEW	DEPARTMENT MANAGERS										
REVIEW COMMENT RESOLUTION	SME/ TECHNICAL WRITER										
EDIT	EDITOR										
APPROVAL	APPLICABLE DEPARTMENT MANAGERS										
AUTHORIZATION	PRESIDENT										
DISTRIBUTE	DOCUMENT CONTROL TRACKING										
	TOTAL ACTUAL DAYS / TOTAL STANDARD DAYS										

Figure 8 - Milestone Chart

FEMP SITE DOCUMENT REQUEST

DOCUMENT BINDING	THIS BLOCK FOR DC USE ONLY			
LOOSE LEAF / BOUND	REQUEST NO.:	REQUEST DATE:	EFFECTIVE DATE:	PRIORITY NUMBER:
DOCUMENT REQUEST TYPE	ASSIGNED TECH WRITER:			EXT:
NEW				
MAJOR REVISION				
SITE DOCUMENT CHANGE (SDC)	DOCUMENT TYPE			
MINOR REVISION (A change consisting of <20% of the document text)	CHARTER (CH)	SITE STANDARD OPERATING PROCEDURE (SSOP)		
CANCELLATION	POLICY (PO)	SITE REQUIREMENT (RO)		
CHARGE NO.:	OTHER:			

NOTE: REQUEST WILL NOT BE PROCESSED WITHOUT DEPARTMENT MANAGER SIGNATURE

SUBJECT MATTER EXPERT (SME):	SME EXT.	SME ORGANIZATION
*DEPARTMENT MANAGER SIGNATURE:	DEPARTMENT MANAGER ORGANIZATION:	DATE:

DOCUMENT NUMBER:	EFFECTIVE DATE:	REVISION NUMBER:
DOCUMENT TITLE:		
SUPERSEDES:	DATE:	REVISION NUMBER:
DRIVER(S):		

REQUIRED DEPARTMENT MANAGER REVIEWS		REQUIRED DEPARTMENT MANAGER APPROVALS

GENERAL COMMENTS/INFORMATION	
COMMITMENT NUMBER:	COMMITMENT DATE:

FS-F-3523 (REV 5/18/92)

Figure 9 - SITE DOCUMENT REQUEST (SDR)
FORM FS-F-3523

SITE DOCUMENT REVIEW MATRIX

DOCUMENT TYPE	REQUIRED REVIEWS	REVIEW TIME			
		New Document/ Major Revision	*Minor Revision*	*SDC*	*Cancellation*
Policy	Responsible Department(s)[1], EC, DC[2]	5 days	3 days	1 day	5 days
Charter	Responsible Departments[1], QA, DC[2]	5 days	3 days	1 day	5 days
Information Manual	Responsible Departments[1], DC[2]	10 days	5 days	3 days	5 days
Plan	Responsible Departments[1], DC[2]	10 days	5 days	3 days	5 days
Safety Assessment Report	Responsible Departments[1], DC[2], IRS&T, EC	10 days	5 days	3 days	5 days
Site Requirement	EC, IRS&T, Responsible Departments[1], DC[2]	10 days	5 days	3 days	5 days
Site Standard Operating Procedure	EC, IRS&T, Responsible Departments[1], DC[2]	10 days	5 days	3 days	5 days
Site Work Plan	EC, IRS&T, Responsible Departments[1], DC[2]	10 days	5 days	3 days	5 days

[1] Responsible Department(s) - The departments which are knowledgeable on the document subject, will contribute to the accuracy of the document content, or are responsible for actions within the document. The SME and DC will determine the responsible departments.

[2] The DC Manager or designee shall ensure the document communicates the activity or subject effectively.

Figure 10 - Site Document Review Matrix

SITE DOCUMENT APPROVAL & AUTHORIZATION MATRIX

DOCUMENT TYPE	*APPROVALS REQUIRED*	*AUTHORIZATION REQUIRED*	*APPROVAL TIME*
Policy	Responsible Department Manager	President	3 days
Charter	Responsible Department Manager	President	3 days
Safety Assessment Report	Responsible Department Manager	President	3 days
Site Requirement	Responsible Department Manager, IRS&T, EC	President	3 days
Site Standard Operating Procedure	Responsible Department Manager, IRS&T, EC	President	3 days
Site Work Plan	Responsible Department Manager, IRS&T, EC	President	3 days
Plan	Responsible Department Manager	President	3 days
Information Manual	Responsible Department Manager	President	3 days

Figure 11 - Site Document Approval and Authorization Matrix

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DOCUMENT REVIEW COMMENT SHEET

SME/OWNER: X-	REVIEWING DEPARTMENT:	DATE:
DOCUMENT NO. AND TITLE		COMMENTS DUE BY:
REQUEST NO.		

ITEM NO.	REVIEWER NAME	PAGE NO./ STEP	COMMENT	SRC ✓	COMMENT RESOLUTION

SIGNIFICANT REVIEW COMMENT RESOLUTION APPROVAL SIGNATURE: _____ DATE: _____

Figure 12 - Document Review Comment Sheet

SITE DOCUMENT SYSTEM **SITE DISTRIBUTION**

Date: September 30, 1992

	DOCUMENT NO.	EFFECTIVE DATE	REVISION NO.
Transmittal of:	PP-0709	09-29-92	0

FILING INSTRUCTIONS

|X| *NEW DOCUMENT* - File the attached document in the applicable section of the Site Document Record Book.

|X| *CANCELLATION* - Remove and discard FMPC-709. (PP-0709 supersedes FMPC-709.)

CONFIRMATION RECEIPT SIGNATURE: _____

DATE: _____

CONTROL NO. _____

Return to: Laura Patrick, Documentation Control (Mail Stop 71-5) by October 16, 1992.

MANAGEMENT ACKNOWLEDGEMENT OF DOCUMENT CONTENT

I have read and am aware of the content of this document.

MANAGER/SUPERVISOR:

Print Name	Signature	Date

Review the attached document for applicability to your organization. If this document applies to personnel in your organization, communicate the document to personnel and maintain document in Reading File, as applicable.

Figure 13 - Distribution Sheet

CONTROL NO.

Page 1 of 1

FEMP
SITE DOCUMENT SYSTEM

SDC No.	SC92-024
Effective Date:	06-10-92
Expiration Date:	12-10-92

SITE DOCUMENT CHANGE

(For Question Contact SME J. Ogg X-6324)

1. AFFECTED DOCUMENT NUMBER SSOP-0060	2. AFFECTED DOCUMENT PAGE NUMBER 16

3. TITLE OR SUBJECT:
Packaging and Loading Radioactive Material for Offsite Shipment

4. ACTIVITY AND AREA AFFECTED:
Packaging and Loading/Site Services

5. APPROVAL SIGNATURE:
S. J. Dechter for STD — Department — Date

6. CHANGE:

1) Step 7.9.29 is revised to read as follows:

7.9.29 Affix placards, provided by Traffic, on both sides and ends of gondola exterior.

7. DOCUMENTATION CONTROL REQUIRED DOCUMENT ACTION

[ ] No Procedure Action

[X] Revise affected procedure/specification per this document.

FILING INSTRUCTIONS: File facing page 16, Document No. SSOP-0060 (Effective Date: 06-01-92, Revision No. 1)

Figure 14 - Example of Site Document Change

REQUIREMENTS MANUAL

CONTROL NO: 4554

RM-0006

Supersedes RM-0006, Rev. 0
Dated 5/22/92

INDUSTRIAL SAFETY

NON-CONTROLLED COPY

Effective Date: 09-04-92

Revision No. 1

AUTHORIZED BY: _____ 9/4/92
H. F. Daugherty Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P.O. Box 398704
Cincinnati, Ohio 45239-8704

074

LIST OF EFFECTIVE PAGES

CHAPTER	PAGE	REV. NO	EFFECTIVE DATE
	i	1	09-04-92
	ii thru vii	1	09-04-92
1	1-1 thru 1-6	0	05-22-92
2	2-1 thru 2-5	0	05-22-92
3	3-1 thru 3-3	0	05-22-92
4	4-1 thru 4-3	0	05-22-92
5	5-1 thru 5-3	0	05-22-92
6	6-1 thru 6-6	0	05-22-92
7	7-1 thru 7-5	1	09-04-92
8	8-1 thru 8-2	0	05-22-92
9	9-1 thru 9-4	0	05-22-92
10	10-1 thru 10-10	0	05-22-92
11	11-1 thru 11-10	1	09-04-92
12	12-1 thru 12-8	0	05-22-92
13	13-1 thru 13-7	0	05-22-92
14	14-1 thru 14-4	1	09-04-92
15	15-1 thru 15-3	0	05-22-92
16	16-1 thru 16-5	0	05-22-92
17	17-1 thru 17-11	0	05-22-92
18	18-1 thru 18-5	0	05-22-92
19	19-1 thru 19-5	0	05-22-92
20	20-1 thru 20-11	0	05-22-92
21	21-1 thru 21-7	1	09-04-92
22	22-1 thru 22-6	1	09-04-92

LIST OF EFFECTIVE PAGES (cont.)

CHAPTER	PAGE	REV. NO	EFFECTIVE DATE
23	23-1 thru 23-6	1	09-04-92
24	24-1 thru 24-10	1	09-04-92
25	25-1 thru 25-7	1	09-04-92
26	26-1 thru 26-5	1	09-04-92
27	27-1 thru 27-7	1	09-04-92
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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
05-22-92	0	Industrial Safety Requirements Manual required per Request No. S92-053, initiated by J. J. Volpe. (Supersedes Interim Manual RM-0006I.1 dated 03-24-92. Chapter 5 has been rewritten for clarification.) **NOTE**: Many of the requirements of this manual were extracted from and supersede the safety requirements of the IH&S Manual.
09-04-92	1	Industrial Safety Requirements Manual revision required per Request No. S92-122, initiated by D. Huebener. Chapters 21 thru 29 added. Chapter 7, and 14 revised for clarity. Chapter 11 revised to more closely meet the latest interpretation of OSHA requirements.

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CHAPTER 1 - GENERAL

1.1 INTRODUCTION

1.1.1 Successful plant operation is dependent upon in-place and current safety procedures, adherence of personnel to safety procedures, and enforcement of safety procedure requirements by supervision and/or management.

1.1.2 Standards stated in this Industrial Safety Requirements Manual are applicable to all FEMP operations. Other applicable codes and standards are outlined in DOE Order 5480.4.

1.2 PURPOSE

1.2.1 The purpose of this manual is to provide the safety standards and requirements for operating the Fernald Environmental Management Project (FEMP).

1.3 SCOPE

1.3.1 The requirements of this manual are applicable to all areas, processes, and personnel at the FEMP, and to FEMP work performed off-site by FEMP employees, contractors and subcontractors.

1.3.1.1 Employers, with personnel not under the immediate supervision of WEMCO, must have their own procedures that meet the intent of the requirements of this manual. These must be approved by WEMCO.

1.4 RESPONSIBILITIES

1.4.1 The Manager, Safety Engineering and Fire Services (SE&FS) shall be responsible for the implementation and enforcement of the requirements contained in this manual.

1.4.2 Responsibilities are contained in the applicable chapters.

1.5 DEFINITIONS

1.5.1 The following terms are generally used words. Specific definitions are listed in the applicable chapters:

1.5.1.1 Accident - An unplanned event that interrupts the completion of an activity. An accident is usually preceded by an unsafe act, unsafe condition, or a combination of the two.

1.5.1.2 Approved - Acceptable to the "authority having jurisdiction"

CHAPTER 1 (cont.)

1.5 DEFINITIONS (cont.)

1.5.1.3 Authority Having Jurisdiction - The organization, office, or individual responsible for "approving" equipment, an installation, or a procedure.

1.5.1.4 Chemical Cover Goggles - A device, meeting the requirements of ANSI Z87.1, for protecting the eyes and eye sockets from liquid or fume penetration.

1.5.1.5 Code - A document containing mandatory provisions which have been adopted into law.

1.5.1.6 Confined Space - An enclosure or space which is not intended for continuous personnel occupancy, has limited openings for entry and exit, or has an unfavorable natural ventilation that contains or can produce dangerous air contamination.

1.5.1.7 Face Shield - A protective device worn in front of the eyes and face to supplement the protection afforded by safety glasses or goggles.

1.5.1.8 Guide - A document which is informative in nature and does not contain requirements.

1.5.1.9 Hard Hat - A device, meeting the requirements of ANSI Z89.1, that is worn to provide protection for the head, or portions thereof, against impact, flying particles, electric shock, or any combination thereof; and that includes a suitable harness.

1.5.1.10 Imminent Danger - The development of a hazardous condition that could reasonably be expected to cause death or serious physical harm to employees (permanent or prolonged impairment of the body or temporary disablement requiring hospitalization), serious property damage, or insult to the environment.

1.5.1.11 Material Safety Data Sheet MSDS - A document describing, the hazards, properties, and methods of safe handling and use of a chemical or hazardous material.

1.5.1.12 Occupational Illness - An abnormal condition or disorder other than an occupational injury, caused by exposure to environmental factors associated with employment.

1.5.1.13 Occupational Injury - An injury which arises out of, or in, the course of employment and occurs in the work environment.

CHAPTER 1 (cont.)

1.5 DEFINITIONS (cont.)

1.5.1.14 Recordable Injury/Illness - (Recordable on OSHA 200 Log) - Work-related illnesses or injury that: (a) results in death, loss of work day(s), loss of consciousness, fracture or, restriction of motion; (b) results in transfer to another job (or termination); (c) requires medical treatment (other than first aid) administered by licensed medical personnel.

1.5.1.15 Safety glasses - A device, meeting the requirements of ANSI Z87.1, patterned after conventional-type spectacle eyewear but having more substantial construction in order to resist shattering in case of impact.

1.5.1.16 Shall - Indicates a mandatory requirement.

1.5.1.17 Should - Indicates a recommendation or that which is advised but not required.

1.5.1.18 Standard - A document containing mandatory provisions.

1.5.1.19 Sub-Contractor/Temporary - Employee of a non-WEMCO organization providing supplies, services, or construction activity in performance of a contractual obligation.

1.5.1.20 Vendor - Employee of a non-WEMCO organization providing supplies or performing a service under contractual obligations resulting from a WEMCO issued purchase order.

1.5.1.21 Visitor - A person other than a WEMCO or DOE employee, subcontractor, or vendor who has been properly authorized and issued temporary or permanent credentials for access to the FEMP.

1.5.1.22 Work Environment - The premises and/or other locations where employees are engaged in job tasks or are present as a condition of employment. The equipment or material used by the employee during work are included.

1.6 ACRONYMS

1.6.1 AEDO - Assistant Emergency Duty Office

1.6.2 ALARA - As Low As Reasonably Achievable

1.6.3 ANSI - American National Standards Institute

1.6.4 ASME - American Society of Mechanical Engineers, Inc

1.6.5 BZ - Breathing Zone

CHAPTER 1 (cont.)

1.6 ACRONYMS (cont.)

1.6.6 CGA - Compressed Gas Association, Inc

1.6.7 CFR - Code of Federal Regulation

1.6.8 DOE - Department of Energy

1.6.9 EC - Emergency Chief

1.6.10 ELSA - Emergency Life Support Apparatus

1.6.11 EOC - Emergency Operations Center

1.6.12 EPA - Environmental Protection Agency

1.6.13 ERT - Emergency Response Team

1.6.14 HEPA - High Efficiency Particulate Air

1.6.15 LPG - Liquified Petroleum Gas

1.6.16 MSHA - Mine Safety and Health Administration

1.6.17 NFC - National Fire Code

1.6.18 NFPA - National Fire Protection Association

1.6.19 NIOSH - National Institute for Occupational Safety and Health

1.6.20 NRC - Nuclear Regulatory Commission

1.6.21 OMB - Office of Management and Budget

1.6.22 ORO - Oak Ridge Operations

1.6.23 OSHA - Occupational Safety and Health Administration

1.6.24 RDA - Radiation Detection Alarm

1.6.25 RPM - Revolutions per Minute

1.6.26 SCBA - Self-contained Breathing Apparatus

1.6.27 SOP - Standard Operating Procedure

1.6.28 TLV - Threshold Limit Value

1.6.29 UL - Underwriters Laboratory, Inc.

1.6.30 WEMCO - Westinghouse Environmental Management Company of Ohio

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CHAPTER 1 (cont.)

1.7 DRIVERS

1.7.1 DOE Order 5480.4, "Environmental Protection, Safety, and Health Protection Standards"

1.7.2 DOE Order 5480.16, "Firearms Safety"

1.7.3 DOE Order 5483.1a, "Occupational Safety and Health Program for DOE Contractors' Employees at Government Owned Contractor Operated Facilities"

1.7.4 DOE Order 5484.1 "Environmental Protection, Safety and Health Protection Information Reporting Requirements"

1.7.5 29 DOE/OSHA 1910.133, "Eye and Face Protection"

1.7.6 29CFR, Part 1910, "Occupational Safety and Health Administration", "General Industry"

1.7.7 29CFR 1910, Subpart O

1.7.8 29CFR 1910, Subpart P

1.7.9 29CFR 1910.179, "Overhead and Gantry Cranes"

1.7.10 29CFR 1926, Subpart P, Excavations, Trenching, and Shoring

1.8 REFERENCES

1.8.1 FMPC-106, "Employment and Indoctrination of New Personnel"

1.8.2 FMPC-302, "Request for Purchase"

1.8.3 FMPC-516 "Control of Permits for Accomplishing Hazardous Work"

1.8.4 PP-FMPC-0719, "Energy Control (Lockout and Tagout)"

1.8.5 RM-FMPC-0001, "FMPC General Design Criteria Manual"

1.8.6 FMPC-2152, "FMPC Respiratory Protection Manual"

1.8.7 PMP-415, "Management of Construction"

1.8.8 DOE Hoist and Rigging Manual

1.8.9 ANSI B7.1 - 1978, "Safety Requirements for the Use, Care, and Protection of Abrasive Wheels"

1.8.10 ANSI Z41.1, "For Personnel Protection - Protection Footwear"

1.8.11 ANSI Z-87.1, "Practice For Occupational and Educational Eye and Face Protection"

CHAPTER 1 (cont.)

1.8 REFERENCES (cont.)

1.8.12 ANSI Z89.1, "Requirements For Protective Headwear For Industrial Workers"

1.8.13 OMBN.1220-0029, "Recordkeeping Guidelines for Occupational Injuries and Illness"

1.9 RESPONSIBILITIES

1.9.1 The responsibilities applicable to Industrial Safety requirements are contained in the specific chapters. Overall responsibilities and those of a more general nature are included.

1.10 APPLICABLE FORMS

1.10.1 DOE F 5480.4, "Contractor Employee Occupational Safety and Health Complaint"

1.10.2 FMPC-ADMS-2414, "Gas, LPG or Diesel Fueled Equipment Operator's Checklist"

1.10.3 FMPC-ADMS-2415, "Electric Truck Operator's Daily Checklist"

1.10.4 FMPC-ES&H-170, "Supervisor's Report of Injury"

1.10.5 FMPC-HR-135, "Notification of Visit to Medical Services and Release For Work"

1.10.6 FMPC-M-528, "Special Health, Safety, and Fire Protection Requirements"

1.10.7 FMPC-IRS&T-389, "Daily Subcontractor/Vendor Inspection"

1.10.8 FMPC-IRS&T-470, "Minutes of Safety Meeting"

1.10.9 FMPC-OS&H-2423, "Record of Daily Hoist Check Sheet"

1.10.10 FMPC-OS&H-21135, "Request For Safety Glasses"

1.10.11 FMPC-PRO-2163, "Hoist Check Sheet"

1.10.12 FMPC-PRO-2445, "Monthly Check Sheet Ropes, Chains, Hooks, and Slings"

1.10.13 FMPC-T-2717, "Construction Environmental Safety and Health Work Survey"

1.10.14 FMPC-IRS&T-2939, "Confined Space Entry Permit"

1.10.15 FMPC-T-2711, "Construction Excavation/Penetration Permit"

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CHAPTER 2 - INDUSTRIAL SAFETY GENERAL POLICIES AND ADMINISTRATION

2.1 INTRODUCTION

2.1.1 This chapter presents the general policies and administration of the WEMCO Industrial Safety program, describes responsibilities that are applicable to WEMCO management, and establishes principle elements by which the WEMCO industrial safety program is implemented.

2.2 RESPONSIBILITIES

2.2.1 **WEMCO Managers/Supervisors** shall be responsible for the following:

2.2.1.1 Maintaining a low risk environment in their area of control.

2.2.1.2 Ensuring that equipment and operations meet the requirements of the Industrial Safety Requirements Manual.

2.2.1.3 Ensuring that Safety Engineering is included in the design review for new facilities and equipment, modifications, or additions to existing facilities.

2.2.1.4 Ensuring that Safety Engineering reviews requests for equipment and materials that are to be purchased (Refer to FMPC-302).

2.2.1.5 Maintaining surveillance of the work environment to identify hazards.

2.2.1.6 Establishing measures to control or eliminate the hazards associated with any operation or equipment.

2.2.1.7 Investigating and determining causes of accidents.

2.2.1.8 Taking appropriate corrective action in accordance with DOE Order 5484.1 when an incident occurs that causes or could cause property damage, injury, or illness to personnel.

2.2.1.9 Instructing and counseling employees in order to develop the attitudes and awareness that will cause employees to take safe and appropriate action when faced with situations not covered by established regulations and practices.

2.2.1.10 Instructing employees to identify and discuss potentially unsafe operations with supervision, understand the potential hazards associated with an operation and the methods for hazard control, are familiar with the approved procedure before performing an operation, and assist others in the area to abide by safety procedures.

2.2.1.11 Assisting the AEDO/Emergency Chief as requested during an emergency.

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2.2 RESPONSIBILITIES (cont.)

2.2.1.12 Using the services of Safety Engineering as needed.

2.2.1.13 Ensuring that employees are informed annually of their rights and responsibilities as outlined in DOE Order 5483.1A.

2.2.1.14 Fostering a "no-fault" attitude so employees do not fear reprisal for reporting unsafe working conditions and practices.

2.2.2 **Employees** shall be responsible for the following:

2.2.2.1 Notifying the supervisor of any behavior or condition which could cause injury or illness to themselves and others or damage to property.

2.2.2.2 Shutting down an operation whenever there is reason to believe that continuing will lead to injury, illness, or damage to property.

2.2.2.3 Learning and following the procedures and standards that are applicable to each job assignment.

2.2.2.4 Wearing or utilizing personnel protective equipment (PPE) as required for each area and/or job assignment.

2.2.2.5 Reporting to supervision and Medical Services Section following an occupational injury/illness or exposure to toxic or radioactive materials.

2.2.3 **Safety Engineering** shall be responsible for the following:

2.2.3.1 Providing WEMCO President with information to formulate safety policy, directives, and standards.

2.2.3.2 Assisting management in the establishment of a low-risk work environment.

2.2.3.3 Monitoring operations to obtain data in order to provide management with information for maintaining a low-risk work environment.

2.2.3.4 Maintaining a staff of specialists that are knowledgeable in all areas of safety.

2.2.3.5 Preparing and maintaining the WEMCO Industrial Safety Manual.

2.2.3.6 Specifying protective equipment for issue to employees.

CHAPTER 2 (cont.)

2.2 RESPONSIBILITIES (cont.)

2.2.3.7 Maintaining current OSHA posters at plant entrances and on safety bulletin boards.

2.2.3.8 Posting OSHA Form 200 annually at main entrances to the site.

2.2.3.9 Maintaining a supply of "Industrial Safety and Health Suggestion/Complaint" forms at the specified locations.

2.2.3.10 Conducting formal safety surveys of all major facilities or operations at least annually (in accordance with DOE Order 5482.1A).

2.2.3.11 Submitting safety reports to management for review.

2.2.3.12 Ensuring that copies of OSHA type complaints submitted for review are posted at site access points and the worksite specified in the complaint.

2.3 Compliance

2.3.1 The Industrial Safety Program shall meet or exceed the following requirements through the implementation of Site and/or Department procedures:
(A) DOE Order 5480.4, "Environmental Protection, Safety, and Health Standards"
(B) DOE Order 5480.9, "Construction Safety and Health Program"
(C) DOE Order 5482.1A, "Environment Protection, Safety, and Health Protection Appraisal Program"
(D) DOE 5483.1A, "Industrial Safety and Health Program For DOE Contractor Employees at Government-Owned Contractor-Operated Facilities"
(E) DOE 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements"
(F) DOE Hoist and Rigging Manual
(G) 29 CFR 1910 Occupational Safety and Health Standards
(H) 29 CFR 1926 Safety and Health Regulations for Construction

2.4 INDUSTRIAL SAFETY PROGRAM

2.4.1 The Industrial Safety and Health program at FEMP is conducted in strict compliance with DOE Order 5483.1A. This Order prescribes mandatory safety and health standards that are compatible with standards set by OSHA and other agencies. Copies of standards that are available for review by employees are available at the Safety and Training Support Section offices.

2.4.2 Posters (DOE Form 5480.4), specifying employee rights and responsibilities, are located at major entrances to the site and on safety bulletin boards in operating plants and office buildings.

CHAPTER 2 (cont.)

2.4 INDUSTRIAL SAFETY AND HEALTH PROGRAM (cont.)

2.4.3 Employees with unresolved safety issues may file a complaint directly to the DOE, using Form 5480.4. Copies of Form 5480.4 are located at the main entrance to the cafeteria.

2.4.4 A tabulation of recordable injuries illnesses (OSHA Form 200) is posted annually at the main entrances to the site.

2.4.5 Employees are informed annually of their rights and responsibilities (relating to a safe working environment) as outlined in DOE Order 5483.1A.

2.5 WEMCO SAFETY STANDARDS

2.5.1 WEMCO Industrial Safety Standards as specified in this manual are applicable to all site operations.

2.5.2 Additional codes and standards that are applicable to WEMCO operations are listed in DOE Order 5480.4, the DOE Hoist and Rigging Manual, and the FMPC Design Criteria Manual. Copies of all applicable standards are maintained at the Safety Engineering & Fire Services Office.

2.6 SAFETY AND HEALTH COMPLAINT/SUGGESTION SYSTEM

2.6.1 Any employee who believes a condition or practice may be hazardous to their safety or health or is in violation of DOE prescribed standards should report as follows:

2.6.1.1 Notify supervision of the unsafe condition/practice and recommend possible corrective action.

2.6.1.2 If no action is taken after reporting the condition to supervision, a formal complaint/suggestion form may be submitted.

2.7 STOP WORK AUTHORITY

2.7.1 Equipment and/or operations under review for actual or suspected unsafe conditions shall be shut down by supervisors and/or managers.

2.7.2 Safety Engineering shall notify management if an unsafe or suspected unsafe condition is discovered.

2.7.3 After notification, Safety Engineering shall request that management take the appropriate action to correct the condition. The operation and/or area may be shut down if Safety Engineering considers the situation to pose imminent danger.

CHAPTER 2 (cont.)

2.7 STOP WORK AUTHORITY (cont.)

2.7.4 In case of disagreement between management and Safety Engineering regarding the necessity for shutdown, Safety Engineering is authorized by the President of WEMCO to shut down the operation. Both parties shall bring the matter to the attention of the Vice President Industrial, Radiological Safety and Training for resolution.

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CHAPTER 3 - ORGANIZATION AND OPERATION OF PLANT SAFETY COMMITTEES AND GROUPS

3.1 INTRODUCTION

3.1.1 The organization and operation of FEMP site safety committees are authorized by management for the purpose of considering safety problems and also to encourage the development of the industrial safety.

3.1.2 This chapter outlines the organization, lists individual duties, and specifies the frequency of site safety committee meetings.

3.2 RESPONSIBILITIES

3.2.1 The **Chairman** shall be responsible for the following:

3.2.1.1 Presiding over the meeting of the safety committee.

3.2.1.2 Calling special committee meetings as may be necessary.

3.2.1.3 Setting the committee meeting agenda.

3.2.1.4 Delegating responsibilities and assigning tasks as necessary to resolve safety concerns.

3.2.1.5 Developing a schedule for completing the tasks necessary to resolve safety concerns.

3.2.2 The **Secretary** shall be responsible for the following:

3.2.2.1 Recording the proceedings of committee meeting.

3.2.2.2 Preparing and issuing meeting minutes to members, Safety Engineering, and appropriate staff management.

3.2.2.3 Sending agenda and meeting notification to committee members.

3.2.3 **Committee Members** shall be responsible for the following:

3.2.3.1 Attending formal committee meetings.

3.2.3.2 Completing assigned tasks on schedule, and giving status reports on pending projects.

3.2.3.3 Reporting action taken at meetings to the appropriate management.

3.2.3.4 Participating in safety review action that may come before the committee.

3.3 GENERAL

3.3.1 A secretary shall be assigned to take minutes of each meeting.

3.3.2 Minutes shall include the time and date of the meeting, general business discussed, and a list of attendees.

3.3.3 A "Minutes of Safety Meeting" form, FMPC-OS&H-470, shall be used to record committee meetings. When completed, a copy of the form shall be forwarded to Safety Engineering.

3.3.4 Meetings are held monthly except for section/groups consisting of salaried employees only. These meetings are held at least quarterly.

3.4 JOINT EXECUTIVE SAFETY AND HEALTH COMMITTEE

3.4.1 Function

3.4.1.1 The Joint Executive Safety and Health Committee is an advisory group that develops recommendations concerning the Occupational Safety and Health Program at the FEMP.

3.4.1.2 After development, the committee submits recommendations to the Manager, IRS&T and/or WEMCO President.

3.4.2 Organization

3.4.2.1 The committee consists of ten members. Five members are from the Atomic Trades and Labor Council and five members represent WEMCO Management.

3.4.2.2 The committee chairmanship alternates between the council and management.

3.5 UNION-MANAGEMENT SAFETY COMMITTEE

3.5.1 Function

3.5.1.1 The Union Management Safety Committee addresses safety issues and other concerns that are brought forth by the union or management.

3.5.1.2 Unresolved issues and concerns or policy decisions may be reviewed by the Joint Executive Safety and Health Committee or be referred to the Manager, IRS&T and/or the President, WEMCO.

3.5.2 Organization

3.5.2.1 The committee is comprised of the Fernald Trades and Labor Council President, Vice-President, appointed union safety representatives, and WEMCO management representatives from each department.

CHAPTER 3 (cont.)

3.6 SECTION/GROUP SAFETY MEETINGS

3.6.1 Function

3.6.1.1 Groups and/or sections shall meet to discuss, and resolve if possible, local safety related problems that are presented at these meetings.

3.6.1.2 The section/group programs should include the following:

(A) review of monthly injury statistics with special emphasis on accident/injuries occurring within the group/section

(B) review of changes in current policies, programs, and other factors, that effect the group/section

(C) periodic instructions regarding the use of protective safety equipment

(D) review of findings from housekeeping, safety, or other inspections/appraisals/audits of the local area or operation

(E) review films, tapes, visual aids, and information from safety data sheets, standards, discussion guides, and other material available from Safety Engineering.

3.6.2 Organization

3.6.2.1 Section/Group meetings are comprised of salary and hourly (if there are hourly employees in the section/group) employees.

3.6.2.2 Meetings are chaired by the group supervisor or section manager.

3.6.2.3 Meetings shall be attended by all members of the section/group who are on-site and are not assigned to vital operations that preclude attendance. Where small groups are involved, meetings may be combined.

3.6.2.4 Employees unable to attend due to absence or job-related requirements shall review meeting material with supervision and sign the "Minutes of Safety Meeting" form.

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CHAPTER 4 - SAFETY REQUIREMENTS FOR PERSONNEL WEARING CLOTHING AND JEWELRY IN CONTROLLED AREAS

4.1 INTRODUCTION

4.1.1 A safe work place shall be maintained for WEMCO employees. As a part of the safety control measures, regulations have been developed to protect personnel against hazards of loose clothing and/or jewelry being worn in proximity to moving machinery.

4.1.2 This chapter presents the basic requirements for employee protection regarding wearing of certain clothing and/or jewelry in controlled areas.

4.2 DEFINITIONS

4.2.1 Jewelry - Bracelets, chains, earrings, necklaces, rings, and/or wrist watches.

4.2.2 Long Sleeves - Portions of coveralls, smocks, sweat shirts, undershirts and jackets that covers the arm of the wearer to, and around, the wrist.

4.2.3 Ornamentation - Key chains, watches, ties (excluding bow ties) and scarfs, and other loose fitting decorative clothing or jewelry item.

4.2.3 Metal Working Machinery - Machinery (such as rotary tables, machine tools, horizontal and vertical milling machines, engine lathes, and/or metal bores) used to cut, bore, shape, or form metal stocks.

4.2.4 Point of Operation - The area on a machine where work is performed on the material being processed.

4.2.5 Power Transmission Apparatus - The power source, associated and intermediate equipment that conveys power, and involved machines up to, but excluding, the point of operation. Apparatus includes revolving, oscillating, reciprocating, or other moving parts (such as actuators, belts, brakes, cams, chains, compressors, counter-weights, couplings, cranks, fly-wheels, gears, lead screws, motors, sheaves, spindles, sprockets, turbines, and winches).

4.2.6 Controlled Area - Zones that require personnel to wear a radiation dosimeter while in the area.

4.2.7 Tight-fitting Long Sleeves - Undergarments (such as tee-shirts and insulated tee-shirts) with sleeves that are 1/4-inch from the arm and cuffs that do not touch the palm of the hand.

4.2.8 Sleeve/Arm Guards - A tube of knit material that slips over the arm of the wearer to ensure that coverall sleeves are tightly fitted.

CHAPTER 4 (cont.)

4.3 RESPONSIBILITIES

4.3.1 Site Services Supervisors shall be responsible for the following:

4.3.1.1 Informing employees of the hazards and safety precautions concerning loose clothing, jewelry, and ornamentation being worn while working near, or operating, machinery.

4.3.1.2 Enforcing safety regulations applicable to the type of clothing, jewelry, and ornamentation prohibited in the work area.

4.3.2 Safety Engineering shall be responsible for the following:

4.3.2.1 Providing assistance in evaluating hazards.

4.3.2.2 Recommending corrective action to prohibit certain clothing, jewelry and ornamentation from being worn by employees working near operating machinery.

4.3.3 Employees shall be responsible for complying with the requirements prohibiting the wearing of certain clothing and/or jewelry while working in Controlled Areas.

4.4 REQUIREMENTS

4.4.1 Employees shall not wear long sleeve clothing, jewelry, or ornamentation under the following conditions:

4.4.1.1 While within one foot of unguarded power transmission apparatus that has not been disconnected, isolated, and tagged.

4.4.1.2 While operating, or working near, metal/wood working machinery and/or machine tools, or other equipment with exposed moving parts. Affected personnel includes toolmakers, machine set-up personnel, tool room machinists, machine tool operators, graphite shop machinists, and maintenance machinists.

4.4.2 Torn or ragged company issued clothing shall be turned in and replaced.

4.4.3 Personnel operating machine tools equipped with rotating chucks are permitted to wear tight-fitting long sleeve garments during cool weather months.

4.4.4 Arm/sleeve guards and tear-away paper jackets with long sleeves are permitted to be worn by personnel operating, or working near, metal working machinery and/or machine tools.

CHAPTER 4 (cont.)

4.4 REQUIREMENTS (cont.)

4.4.5 As a minimum, employees involved in construction activities or outdoor activities shall wear: (a) long pants, covering the legs down to the ankles, and (b) shirts covering the entire torso (no cut-offs) with a minimum sleeve length of 4 inches. (Shoe requirements are covered in another chapter. RCRA requirements may dictate more stringent clothing requirements in some areas).

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CHAPTER 5 - NEW EMPLOYEE SAFETY ORIENTATION

5.1 INTRODUCTION

5.1.1 New employees reporting to work shall be informed of basic safety rules, regulations and equipment used at the FEMP through "New Employee Safety Orientation."

5.1.2 This chapter presents the basic elements of the Safety Orientation Program that is mandatory for new employees reporting to work at the FEMP.

5.2 DEFINITIONS

5.2.1 New Employee Safety Orientation - A program conducted by Safety Engineering for new WEMCO employees reporting to work at the FEMP.

5.2.2 New Employee - First time hire, recalled employee from a reduction in force action, or re-hired former employee.

5.3 RESPONSIBILITIES

5.3.1 **Department Training Coordinators** shall be responsible for contacting Centralized Training on the employee report to work date to schedule new employee safety orientation.

5.3.2 **Safety Engineering** shall be responsible for the following:

5.3.2.1 Conducting the new employee safety orientation program.

5.3.2.2 Determining if new employees are required to receive Energy Control Procedure Orientation.

5.3.2.3 Conducting energy control classes when employees require Orientation.

5.3.3 **Centralized Training** shall be responsible for assisting Safety Engineering to update the new employee safety orientation program annually.

5.3.4 **Human Resources** shall arrange the location for the New Employee Safety Orientation course to be conducted.

5.4 GENERAL

5.4.1 New employees shall be oriented in accordance with FMPC-106.

5.4.2 New employees shall attend the Safety Orientation class in the first week the employee reports to work. If conflicts arise, the class shall be completed within one month of the reporting date.

CHAPTER 5 (cont.)

5.4 GENERAL (cont.)

5.4.3 Centralized Training shall schedule the time and location of the Energy Control Procedure Orientation when the class is required for new employees.

5.5 REQUIREMENTS

5.5.1 Conducting The New Employee Safety Orientation Program

5.5.1.1 The Safety Engineering personnel conducting the program shall explain the presentation.

5.5.1.2 The program shall follow the approved training lesson plan.

5.5.1.3 The program shall be conducted audio/visually using a slide/narration program or a video tape presentation.

5.5.1.4 New employees shall view the video tape "OSHA and You." as a part of the program.

5.5.1.5 New employees shall sign an attendance sheet in order to document participation.

5.5.2 Required Elements of the New Employee Safety Orientation Program

5.5.2.1 The following information shall be included in the curricul for the program:
(A) general methods for communicating WEMCO safety requirements
(B) general familiarization with basic clothing and personal protective equipment used at the FEMP
(C) first aid for contact with chemicals
(D) requirements for reporting occupational injuries and illnesses
(E) requirements of Medical Service Section for conducting non-occupational injury and illness examinations
(F) methods for reporting emergencies
(G) types of emergency alarm systems at the FEMP, alarm recognition, and actions to take in emergency situations
(H) classes of fires and types of fire extinguishers used to extinguish the fires
(I) explanation of work permits
(J) information on the use of safety belts and lifting techniques.
(K) occupational safety and health rights
(L) responsibilities of DOE contractor employees.
(M) types of, and methods for filing, occupational safety and health complaints/suggestions.

5.5.3 Energy Control Procedure Orientation

5.5.3.1 Centralized Training shall notify Departmental Training Coordinators and employees, that require orientation of the date, time, and course location.

5.5.3.2 New employees shall not be involved in work requiring energy control until orientation in the requirements of PP-FMPC-0719 is completed.

5.5.3.3 Classes shall be conducted in accordance with the lesson plan approved by the Centralized Training Section.

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CHAPTER 6 - OCCUPATIONAL EYE AND FACE PROTECTION

6.1 INTRODUCTION

6.1.1 Employees shall be furnished with the necessary occupational eye and face protection and trained in the requirements for using the eye and/or face protection equipment.

6.1.2 This chapter provides information on the types of occupational eye and face protection utilized at the FEMP and the basic requirements for employees and visitors use of eye/face protection.

6.2 DEFINITIONS

6.2.1 Safety Glasses - Corrective (Rx) or plano lens protective eyewear approved for use by Safety Engineering.

6.2.2 Dust Type Cover Goggles - A device that fits the face and surrounds the eye to protect against dust and other airborne hazards.

6.2.3 Filter Lens/Plate - A removable pane that is installed in welding helmets to absorb varying amounts of ultraviolet and visible and infrared rays. Absorption depends on the composition and density of the lens/plate (shades 2.0 through 14.0).

6.2.4 Side Shield - A plastic or metal mesh part that is attached to the sides of safety glasses to prevent the eye from being struck by objects approaching from the side.

6.2.5 Visitor Safety Glasses - Temporary eye protection devices for personnel passing through areas where protection is required.

6.2.6 Full Face Respiratory Protection - NIOSH approved breathing devices that also provide occupational eye and face protection.

6.3 RESPONSIBILITIES

6.3.1 **Management and Supervision** shall be responsible for ensuring that employees and visitors wear the required and/or designated eye/face protection.

6.3.2 **Safety Engineering** shall be responsible for the following:

6.3.2.1 Providing assistance to outline specific occupational eye and face protection requirements.

6.3.2.2 Directing the distribution of company issued safety glasses and visitor safety glasses.

6.3.2.3 Making repairs and/or arrangements for repairs to broken or defective protective eyewear.

CHAPTER 6 (cont.)

6.3 RESPONSIBILITIES (cont.)

6.3.3 If prescription safety glasses are required, Medical Services shall direct new employees to Safety Engineering.

6.3.4 Stores shall be responsible for maintaining and issuing non-prescription occupational eye and face protection equipment.

6.3.5 Employees shall be responsible for complying with the requirements for wearing occupational eye and face protection while performing tasks or working in areas that require eye and/or face protection.

6.4 GENERAL

6.4.1 Employees shall not wear personal eyeglasses in areas requiring company issued safety glasses.

6.4.2 Contact lens are not recommended for wear in the process area, Bioassay Lab, or Analytical Lab. When contacts are worn by personnel regularly assigned to work in these areas, personnel shall notify supervision, Medical Services, and co-workers. (Contact lens wear may also be regulated by FEMP respiratory guidelines.)

6.4.3 Full-time employees, regularly assigned to work in areas where safety glasses are required, shall not wear visitor type safety glasses on a permanent basis. Visitor safety glasses may be worn temporarily (while waiting for company issued safety glasses, etc.). Visitor safety glasses must be worn over personal glasses, unless the personal glasses meet the requirements of this chapter.

6.4.4 Non-prescription eye protection shall be provided by Safety Engineering, Stores, and Laundry.

6.4.5 Stores shall be the primary issue source for all types of occupational eye and face protection equipment other than prescription safety glasses.

6.4.6 Dust type cover goggles shall not be worn when chemical cover goggles are required.

6.4.7 Full face type respirators shall meet all requirements for occupational eye and face protection.

6.5 REQUIREMENTS

6.5.1 Safety Glasses (with side shields)

6.5.1.1 All employees shall wear safety glasses in designated areas areas unless additional eye and face protection is required.

CHAPTER 6 (cont.)

6.5 REQUIREMENTS (cont.)

6.5.1.2 Safety glasses shall be worn by personnel entering the Bioassay and Analytical Laboratories and temporary facilities where wet chemical processing takes place.

6.5.1.3 Safety glasses are required in all areas on the Process side except totally enclosed break areas, motor vehicles, restrooms, or plant offices unless performing work requiring eye protection in those areas.

6.5.1.4 At a minimum, in non-process areas, employees shall wear safety glasses: (a) while operating power tools, (b) while involved with (or near) grinding, hammering, or chipping operations, (c) while pouring concrete, or (d) when instructed.

6.5.2 Chemical Cover Goggles

6.5.2.1 Personnel shall wear chemical cover goggles when entering and while inside areas that are posted "Chemical Cover Goggles Required" and when required by an SOP.

6.5.2.2 Personnel shall wear chemical cover goggles as required by an FEMP work permit and/or a radiation work permit or as directed by supervision or IRS&T.

6.5.3 Dust Type Cover Goggles

6.5.3.1 Personnel shall wear dust type cover goggles when entering and while inside areas that are posted with a requirement for dust type goggles and when required by an SOP.

6.5.3.2 Personnel shall also wear dust type cover goggles when specified by a Maintenance work order or as directed by the supervisor or IRS&T.

6.5.3.3 Personnel operating a jack hammer or mixing concrete shall wear dust type cover goggles.

6.5.4 Full Face Shields

6.5.4.1 Personnel wearing a full face shield shall also wear company issued safety glasses or cover goggles underneath the shield.

6.5.4.2 Personnel shall wear a full face shield when a shield is required by the SOP for the work being performed.

6.5 REQUIREMENTS (cont.)

6.5.4.3 Personnel shall wear a full face shield when required by a work permit and/or a radiation work permit or as directed by the supervisor or IRS&T.

6.5.5 Filter Lens/Plate Eye and Face Protection

6.5.5.1 Personnel engaged in welding operations shall wear a welding hood with the appropriate shade filter installed.

6.5.5.2 Personnel engaged in cutting operations (torch or arc) shall wear cutting goggles with the appropriate shade filter installed.

6.5.5.3 Table 6-1 shows the recommended filter shades for torch and arc welding and cutting operations.

6.5.5.4 Welding operations at ground or floor levels shall be surrounded with a screen to protect adjacent personnel from welding flashes.

6.5.6 Obtaining Company Issued Safety Glasses (Plano)

6.5.6.1 New employees shall be offered company issued safety glasses while attending the New Employee Industrial Safety Training class.

6.5.7 Obtaining Company Issued Prescription Safety Glasses For New Employees

6.5.7.1 Safety Engineering shall inform new employees that a prescription for corrected lens is required from their personal optometrist or ophthalmologist during safety orientation and training. The prescription shall have been completed within the last twenty months.

6.5.7.2 Safety Engineering shall inform new employees of the process for establishing an appointment with the WEMCO optician.

6.5.7.3 New employees normally receive company issued prescription safety glasses within four weeks of their starting date.

CHAPTER 6 (cont.)

6.5 REQUIREMENTS (cont.)

6.5.8 Obtaining Company Issued Prescription Safety Glasses for Current Employees

6.5.8.1 The employee must have a current (completed within the last twenty months) corrective lens prescription from an outside optometrist or ophthalmologist on file in the Safety Engineering Office.

6.5.8.2 The requesting employee shall contact Safety Engineering and arrange an appointment with the company optician.

6.5.8.3 Safety Engineering shall notify the requesting employee of the appointment with the company optician.

6.5.8.4 The employee shall have a supervisor complete a "Request For Safety Glasses" form. The form and a current corrective lens prescription shall be taken to the appointment with the company optician.

6.5.8.5 Employees being fit tested for full face respirators and require prescription glasses shall obtain a frame from Stores. After obtaining the frame, the employees shall make an appointment with the company optician. The frames shall be brought to the fitting session with the WEMCO optician. During the fitting session the company optician shall process the request in the same manner as any other request for prescription glasses.

6.5.9 Obtaining Visitor Safety Glasses

6.5.9.1 Visitors not having safety glasses shall obtain visitor safety glasses from the receptacle located at the access point before entering the controlled area.

6.5.9.2 Upon exiting the process area, the visitor shall leave the safety glasses at the access point.

TABLE 6-1
FILTER LENS SHADE NUMBERS

WELDING OPERATION	SHADE NUMBER
Shielded Metal-Arc Welding - 1/16-, 3/32-, 1/8-, 5/32-, inch electrodes	10
Gas-Shielded Arc Welding (Ferrous) - 1/16-, 3/32-, 1/8-, 5/32-, inch electrodes	12
Gas-Shielded Arc Welding (Non-Ferrous) - 1/16-, 3/32-, 1/8-, 5/32-, inch electrodes	11
Shielded Metal Arc Welding: 3/16-, 7/32-, 1/4-, inch electrodes 5/16-, 3/8-, inch electrodes	 12 14
Atomic Hydrogen Welding	10 - 14
Carbon Arc Welding	14
Soldering	2
Torch Brazing	3 or 4
Light Cutting Up to 1 Inch	3 or 4
Medium Cutting, 1 Inch to 6 Inches	4 or 5
Heavy Cutting, 6 Inches and Over	5 or 6
Gas Welding (Light) up to 1/8 Inch	4 or 5
Gas Welding (Medium) 1/8 Inch to 1/2 Inch	5 or 6
Gas Welding (Heavy) 1/2 Inch and Over	6 or 8

NOTE: The choice of a filter shade may be made on the basis of visual acuity and may therefore vary widely from one individual to another. This is particularly true for different current densities, materials, and welding processes. However, the degree of protection from radiant energy afforded by the filter plate or lens, when chosen to allow for visual acuity, must still remain in excess of the needs for eye protection. Filter plate shades as low as shade 8 have proven suitably radiation-absorbent for protection from arc welding processes. If the worker would want a darker shade than shown in Table 6-1, he/she should be accommodated.

NOTE: In gas welding or oxygen cutting, where the torch produces an intense yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the welding operation.

CHAPTER 7 - OCCUPATIONAL INJURY/ILLNESS REPORTING AND INVESTIGATION

7.1 INTRODUCTION

7.1.1 This chapter provides the requirements for reporting and investigating occupational injuries/illnesses which may occur to WEMCO employees, subcontractors, or visitors to the FEMP and injury/illness recordkeeping requirements.

7.2 DEFINITIONS

7.2.1 Occupational Injury - An injury that occurs during the course of employment or in the work environment.

7.2.2 Occupational Illness - An abnormal condition or disorder, other than occupational injury, that is caused by exposure to environmental factors associated with employment.

7.2.3 Work Environment - The employers premises and other locations where employees are engaged in job tasks or are present as a condition of employment and the equipment or material used by an employee during the course of his or her work.

7.2.4 First Aid Injury - An injury which receives one-time treatment and limited subsequent observation (such as minor scratches, cuts, burns, splinters) and does not ordinarily require professional medical care, a change of work assignment, or loss of time from the job.

7.2.5 Recordable Injury/Illness - (Recordable on OSHA 200 Log) - Work related illness or injury that: (a) results in death, lost work day(s), loss of consciousness, fracture or restriction of motion; (b) results in transfer to another job (or termination); (c) requires medical treatment (other than first aid) administered by licensed medical personnel.

7.2.6 Medical Treatment (OSHA Recordable Injury) - Medical care, other than first aid, administered by a physician or registered professional personnel under the standing orders of a physician. Includes injuries requiring one or more sutures even though only one-time treatment is required.

7.2.7 Restricted Workday Injury/Illness - An occupational injury or illness resulting in the employee being assigned to a temporary job, working less than 1/2 (4 hours) of the scheduled workday, or unable to perform the normal assigned duties.

7.2.8 Lost Workday Injury/Illness - An injury or illness that prevents an employee from working normally scheduled days.

7.2.9 Delayed Report of Injury - An occupational injury/illness reported to Medical Services Section after the employee leaves the site on the day of the occurrence.

CHAPTER 7 (cont.)

7.3 RESPONSIBILITIES

7.3.1 **Supervisors** shall be responsible for the following:

7.3.1.1 Ensuring that employees are aware that all occupational injuries are to be reported immediately to supervision and Medical Services.

7.3.1.2 Conducting a primary investigation of injuries and illnesses, and recording the information on a "Supervisor's Report of Injuries .

7.3.1.3 Taking action to correct unsafe conditions or employee actions.

7.3.1.4 Providing information concerning occupational injuries or illness in their area of responsibility.

7.3.2 **Medical Services Section** shall be responsible for treating injuries and illnesses and maintaining medical data relating to injuries and illnesses.

7.3.3 **Safety Engineering** shall be responsible for the following:

7.3.3.1 Determining recordability, classification and investigation of occupational injuries and illnesses.

7.3.3.2 Maintaining records of occupational injuries and illness data.

7.3.4 **Employees** shall be responsible for reporting personal occupational injuries/illnesses, no matter how slight, or exposure to a fume or chemical release to supervision and Medical Services.

7.4 GENERAL

OMB N.1220-0029 shall be used to classify occupational injury and illness cases.

7.5 REQUIREMENTS

7.5.1 Reporting Injuries/Illness

7.5.1.1 Injured employees or employees exposed to a fume or chemical release shall notify supervision promptly. (immediately, or at least before the end of the shift). The supervisor shall direct the employee to report to the appropriate medical treatment facility.

(a) When the Medical Services Section office is open, on-site employees should be directed there.

CHAPTER 7 (cont.)

7.5 REQUIREMENTS (cont.)

(b) When the Medical Services Section is not open, on-site employees should get medical attention by calling 6511 on the telephone or "Control" on the FEMP radio.

(c) Off-site employees should be directed to the nearest "immediate care" facility.

7.5.1.2 If the supervisor is not available, the employee shall go to the appropriate medical treatment facility. Upon returning to the work area, the employee shall inform the supervisor of the circumstances of the injury or illness.

7.5.1.3 If the injury appears serious or the employee is unable to proceed to the appropriate medical treatment facility with minimal assistance), the supervisor (or another employee) shall summon an ambulance.

(a) On-site - phone 6511 or call "Control" on the FEMP radio, or
(b) Off-site - phone 911.

7.5.1.4 The employee shall report any off-site (job related) treated injury or illness to Medical Services as soon as possible.

7.5.1.5 Whether the injury/illness is treated on-site or off-site, the employee shall report to Medical Services before returning to work.

7.5.2 Delayed Injury Reports

7.5.2.1 When the effects of an occupational injury or exposure become apparent after the employee leaves the site, the employee shall contact Medical Services Section or the Communication Center (738-6511) by telephone, as soon as possible. If the call is taken by the Communication Center, the information shall be telephoned to Medical Services on the following business day morning.

7.5.2.2 The Medical Services Section or the Communication Center shall instruct the employee how to obtain medical attention. The time, employee, nature of problem, and instructions given shall be entered in the Medical Services Section Log of Occupational Injury/Illness.

7.5.2.3 When returning to work, the employee shall report to Medical Services for examination. Then the employee shall inform supervision of the facts or conditions that were responsible for the delayed report of the injury, illness, or exposure.

CHAPTER 7 (cont.)

7.5 REQUIREMENTS (cont.)

7.5.3 Documentation

7.5.3.1 Medical Services shall complete a "Notification of [illegible]it to Medical Services and Release For Work," Form FMPC-[illegible] 135 using information obtained from the employee.

7.5.3.2 Medical Services shall distribute the completed form by giving the pink copy to the employee and forwarding the white copy to the supervisor and the yellow copy to Safety Engineering.

7.5.3.3 The employee shall, on returning to work, give the pink copy to the supervisor and provide additional information that may be required for the investigation of the injury.

7.5.3.4 Delayed reporting of an occupational injury is a [illegible]rety violation. The merits of each case shall be considered, on an individual basis, in accordance with the relevant sections of the "Rules of Conduct."

7.5.4 Investigating Injuries/Illnesses

7.5.4.1 The primary investigation of each incident resulting in an injury/illness shall be conducted by the supervisor of the injured/ill employee.

7.5.4.2 Immediate action shall be taken to correct hazardous conditions and/or reinstruct employees when unsafe work habits are found during the incident investigation.

7.5.4.3 The supervisor shall record the investigatio[illegible] nd action taken/recommended by completing a "S[illegible] Report of Injury," Form FMPC-ES&H-170 prior [illegible]nd of the shift on which the injury was reported.

7.5.4.4 The "Supervisor's Report of Injury" shall be forwarded to the next higher level of supervision for review, signature, and the establishment of direction, responsibili[illegible] and schedule for follow up of recommendations.

7.5.4.5 The signed report shall arrive at Safety Engineering either (1) before the close-of-business of the next business day [for minor injuries or illnesses] or (2) within 24 hours [for a fatality or an incident where five or more employees require hospitalization]. Time starts when the supervisor (acting supervisor) first learned of the injury or event.

7.5.4.6 If a more extensive investigation of the injury/illness is required, Safety Engineering shall conduct the investigati[illegible]

7.5 REQUIREMENTS (cont.)

7.5.4.7 A report of the findings shall be submitted to the Manager, Safety Engineering Section and the department manager of the injured/ill employee.

7.5.4.8 The Manager, Safety Engineering shall inform the Manager, Industrial, Radiological Safety and Training, of injury or illness that involves time lost from work.

7.5.4.9 If the Manager, Industrial, Radiological Safety and Training determines that it is a high consequence injury/illness, then he/she shall appoint a committee to conduct a Class C investigation. (See current site procedure PP-FMPC-5007.)

7.5.4.10 The investigation committee shall be comprised of the following:

(A) not less than three nor more than five members
(B) one of the members shall act as committee chairperson
(C) investigation committee members shall not be directly concerned with the operation or activity involved in the occurrence
(D) at least one boardmember shall be a currently Certified DOE Accident/Incident Investigator
(E) the Certified Accident/Incident Investigator(s) shall not serve as the chairperson

7.5.4.11 A report of the committee findings shall be submitted to the Manager, Industrial, Radiological Safety and Training within 20 working days of the appointment.

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CHAPTER 8 - WORKING ALONE

8.1 INTRODUCTION

8.1.1 This chapter provides instructions in evaluating the safety of tasks requiring one person to perform when task performance could result in the person being injured and unable to obtain help.

8.1.2 This chapter also establishes responsibilities for reviewing tasks where the severity of an accident could be increased due to working alone.

8.2 DEFINITIONS

8.2.1 Working Alone - Performance of a non-routine (not covered by an established procedure) task by an individual who is out of audio and visual range of another person for approximately one hour.

8.2.2 Observer -A safety backup person responsible for keeping watch on, or checking the progress of, a person working alone.

8.2.3 Incapacitating Injury - An injury or illness that renders the victim incapable of evacuating the area or obtaining assistance.

8.3 RESPONSIBILITIES

8.3.1 Supervisors shall be responsible for the following:

8.3.1.1 Performing risk analysis of the task.

8.3.1.2 Ensuring that all known health or physical hazards are removed, to the maximum extent possible, from the work area.

8.3.1.3 Discussing hazards and precautions with the person performing the task.

8.3.1.4 Determining, based on a documented risk analysis, when it is safe for a person to work alone.

8.3.1.5 Taking necessary action to mitigate hazards that exist in the work area.

8.3.2 Employees shall be responsible for the following:

8.3.2.1 Following the applicable safety procedures for the specific task.

8.3.2.2 Discontinuing work if conditions change from those which were originally evaluated by supervision.

8.3.2.3 Notifying the supervisor if changes occur which could adversely affect employee safety.

CHAPTER 8 (cont.)

8.4 REQUIREMENTS

8.4.1 Risk Analysis

8.4.1.1 Each task that involves personnel working alone shall be analyzed to determine associated risks.

8.4.1.2 When there is a doubt or question concerning job safety requirements, the responsible supervisor shall contact Safety Engineering to arrange a joint risk analysis.

8.4.1.3 The risk analysis shall determine the following:
(A) hazards involved
(B) necessary restrictions
(C) need for a written procedure

8.4.1.4 The supervisor shall document the analysis evaluation in a letter. A copy of the letter shall be sent to the Safety Engineering representative (if one was consulted). The original shall be filed and maintained in the section/group office.

8.4.2 Operations Requiring Supervisory Analysis

8.4.2.1 An examination shall be conducted by supervision to determine if a safety observer is required for tasks that involve the following materials, substances, or conditions:
(A) toxic or corrosive gases, liquids, or solids
(B) high pressure systems under test
(C) cryogenic materials
(D) flammable liquids in excess of one gallon
(E) pyrophoric materials
(F) radioactive materials requiring a "Radiation Work Permit
(G) unguarded moving equipment or machinery
(H) electrical systems capable of producing paralyzing shock
(I) towers
(J) any non-routine task or operation that has identifiable safety hazards that increase the probability of an accident occurring

CHAPTER 9 - SAFETY MANAGEMENT OF VENDORS AND SUBCONTRACTORS

9.1 INTRODUCTION

9.1.1 This chapter provides the requirements for safety management of FEMP service vendors, contractors (and their lower tier subcontractors) who are involved in FEMP work either on-site or off-site. These requirements include training requirements, performance monitoring, and communication of requirements to vendors, contractors, etc..

9.1.1.1 Personnel, under the control of the FEMP Construction Contractor, must receive training (meeting current FEMP requirements) provided by the FEMP Construction Contractor.

9.2 DEFINITIONS

9.2.1 Discrepancy - Variations to, or non-compliance with, established safety requirements.

9.2.2 Imminent Danger - An impending condition that could, should it occur, cause death or serious (permanent or prolonged) physical bodily impairment, temporary disablement requiring hospitalization, extensive property damage, and/or insult to the environment.

9.2.3 Service Vendor - Non-WEMCO organizations or personnel who perform a specialized service at the FEMP under a purchase order/subcontract issued by Purchasing.

9.2.4 Subcontractor - Non-WEMCO organization or personnel performing a service under a purchase order/subcontract issued by PM&A.

9.3 RESPONSIBILITIES

9.3.1 Safety Engineering shall be responsible for the following:

9.3.1.1 Management and administration of the requirements of this chapter.

9.3.1.2 Verifying compliance with the requirements of this chapter.

9.3.1.3 Coordinating with requisitioners, project engineers, and vendor/subcontractor personnel to ensure that requirements are followed.

9.3.2 Safety Engineering shall be responsible for monitoring the activities of vendors/subcontractors to ensure compliance with applicable safety requirements.

9.3.3 Safeguards and Security shall be responsible for notifying the on-duty Safety and Fire Inspector when vendor/subcontractor personnel arrive on-site.

CHAPTER 9 (cont.)

9.3 RESPONSIBILITIES (cont.)

9.3.4 Purchasing shall be responsible for forwarding requisition packets (for service vendors/subcontractors) to Safety Engineering for the determination of safety requirements (if the requisitioner does not have the form "Special Health, Safety and Fire Protection Requirements" [WMCO M-528] (to be changed to FS-F-528) attached and signed by Safety Engineering).

9.4 GENERAL

9.4.1 Subcontractor/vendor work shall be in accordance with applicable safety requirements specified in DOE Order 5480.4 and all Site Safety and Health Guidelines.

9.5 REQUIREMENTS

9.5.1 The safety requirements for service vendors/subcontractors shall be determined using one of the following methods.

9.5.2 Service Vendors

9.5.2.1 The requisitioner shall attach a "Special Health, Safety and Fire Protection Requirements" sheet, Form WMCO M-528 (to be changed to FS-F-528) to a prepared requisition packet describing the services to be performed at the FEMP.

9.5.2.2 The requisition packet with attached form shall be forwarded to Safety Engineering for review and completion by the appropriate safety discipline.

9.5.2.3 Applicable sections (depending on the scope of work to be performed) of the special requirements form shall be checked.

9.5.2.4 Special or unusual precautions that the vendor shall observe in order to comply with established safety requirements shall be recorded on the special requirements form.

9.5.2.5 The completed special requirements form shall be returned to the requisitioner for addition to the package going out for bid or purchase.

9.5.3 Subcontractors

9.5.3.1 If the work involves construction, the requisitioner shall attach a "Construction Environmental Safety and Health Work Survey" form (FMPC-T-2717) to the packet, describing the scope of work or services to be performed.

CHAPTER 9 (cont.)

9.5 REQUIREMENTS (cont.)

9.5.3.2 The packet and form shall be forwarded to Safety Engineering for completion by the appropriate safety discipline.

9.5.3.3 Applicable sections (depending on the scope of the work to be performed) of the construction survey form shall be checked.

9.5.3.4 Special or unusual precautions that the vendor shall observe in order to comply with established safety requirements shall be recorded on the back of the construction survey form.

9.5.3.5 The completed construction survey form shall be returned to the requestor for addition to the package going out for bid.

9.5.4 Initial Entry to the Site

9.5.4.1 When vendor/subcontractor personnel arrive at the site, the Safeguards & Security Section shall inform the on-duty Safety and Fire Inspector.

9.5.4.2 The inspector shall check the tools and equipment that the vendor/subcontractor intends to bring onsite. Additional tools and equipment shall be checked by the Inspector when the tools and/or equipment are brought to a site access point.

9.5.4.3 Tools and equipment not in compliance with safety standards shall not be permitted onsite.

9.5.4.4 Prior to starting work, vendor/subcontractor personnel shall attend a safety orientation and briefing to inform vendor/subcontractor of the applicable safety requirements.

9.5.4.5 The requisitioner shall contact Safety Engineering to schedule the required safety orientation and briefing.

9.5.4.6 Attendance at the safety orientation and briefing shall be recorded on a "Minutes of a Safety Meeting" sheet, Form FMPC-OS&H-470 (which is to be changed to FMPC-IRS&T-470). Records shall maintained in the Safety Engineering files.

9.5.5 Safety Monitoring of Vendor/Subcontractor Work Sites

9.5.5.1 Safety Engineering shall inspect work site locations.

9.5.5.2 Inspections shall be recorded on a "Daily Subcontractor/ Vendor Inspection" sheet, Form FMPC-IRS&T-389.

CHAPTER 9 (cont.)

9.5 REQUIREMENTS (cont.)

9.5.5.3 If routine inspections indicate that work is being performed using unsafe practices, the WEMCO representative in charge of the Service Vendor/Subcontractor shall be informed as soon as possible.

9.5.5.4 The representative shall inform the vendor/subcontractor of the unsafe condition and coordinate with the vendor or subcontractor to ensure that the situation is corrected.

9.5.5.5 If routine inspections indicate that unsafe work is being performed and involves an "Imminent Danger" situation, work shall be halted until the discrepancy is corrected.

9.5.5.6 The WEMCO Representative in charge of the Vendor or Subcontractor shall be informed of the situation and action taken.

9.5.6 Safety Monitoring of Vendor/Subcontractor Work Sites

9.5.6.1 If Vendor/Subcontractor non-compliance with sitewide safety requirements persists, the Safety Engineer and/or Manager, Safety Engineering shall coordinate with Project Management and Acquisition/requisitioner to determine what measures shall be taken to ensure that the vendor/subcontractor adheres to the safety program. Measures may include removal of the Vendor/Subcontractor from the site.

9.6 EXHIBITS

9.6.1 Figure 9-1 - Form M-528 (to be changed to FS-F-528) "FEMP Health, Safety & Fire Protection Requirements"

CHAPTER 10 - CRANE AND HOIST OPERATION AND RIGGING PRACTICES

10.1 INTRODUCTION

10.1.1 This chapter presents the basic safety practices that shall be observed while rigging and operating cranes, hoists, and mobile cranes (Refer to OSHA 1910.179 and the DOE Hoisting and Rigging Manual).

10.2 DEFINITIONS

10.2.1 Crane/hoist - A machine for raising, shifting (sometimes), and lowering heavy objects by means of a projecting arm, or with the hoisting apparatus supported by an overhead track.

10.2.2 Mobile Crane - A mechanism that can hoist and swing loads at various radii.

10.2.3 Rigging Devices - The equipment (such as slings, shackles, and eyebolts) associated with the operation of cranes.

10.3 RESPONSIBILITIES

10.3.1 **Crane Operators** shall be responsible for complying with the safety requirements for rigging and operating cranes.

10.3.2 **Supervisors** shall be responsible for ensuring that crane operators are trained in hoist/crane safety requirements.

10.3.3 **Maintenance** shall be responsible for inspecting crane condition and maintaining cranes in a safe operating condition.

10.3.4 **Facility Owners/Designees** shall be responsible for the following:

10.3.4.1 Ensuring that cranes are operated in a safe manner.

10.3.4.2 Ceasing operations when a crane has a deficiency that could jeopardize personnel or equipment.

10.3.5 **Safety Engineering** shall be responsible for performing quarterly surveillance of mobile crane operations.

10.4 GENERAL

10.4.1 Cranes and rigging device shall only be used for the operation that the crane/rigging was designed for.

10.4.2 Crane operators shall observe applicable plant procedures in order to maintain control of the crane and load being lifted.

10.4.3 If a crane is involved in an accident or property damage, the incident shall be reported immediately to the Assistant Emergency Duty Officer (AEDO).

CHAPTER 10 (cont.)

10.4 GENERAL (cont.)

10.4.4 A crane or rigging that is not in a safe operating condition shall be removed from service immediately.

10.4.5 Only authorized personnel shall make repairs to cranes or rigging equipment.

10.4.6 Only trained and authorized personnel shall operate cranes.

10.4.7 Preventive and repair maintenance shall be in accordance with manufacturer recommendations and requirements.

10.5 REQUIREMENTS

10.5.1 Inspections of Cranes, Mobile Cranes and Rigging Devices

10.5.1.1 Cranes, mobile cranes, and rigging devices shall be inspected at the beginning of each shift of use or prior to the first use on each shift.

10.5.1.2 Crane and mobile crane inspection shall be completed and documented on an "Record of Daily Hoist Check," Form FMPC-OS&H-2423.

10.5.1.3 Crane running ropes shall be visually inspected at least monthly and documented on an "Monthly Check Sheet, Ropes, Chains, Hooks, and Slings," Form FMPC-PRO-2445.

10.5.1.4 Preventive maintenance (PM) inspections of cranes/mobile cranes shall be performed semi-annually or annually (as determined by service use) and documented on a "Hoist Check Sheet."

10.5.1.5 If the scheduled PM inspection has not been completed within 30 days of the due date, the crane or hoist shall be downrated to 75% of its rated capacity.

10.5.1.6 If the PM inspection has not been completed within 60 days of the due date, the crane or hoist shall be downrated to 50% of its rated capacity.

10.5.1.7 If the PM inspection has not been completed within 90 days of the due date, the crane or hoist shall be removed from service until such time that the PM is completed and the unit found to be operational or repairs are completed.

10.5.1.8 Mobile cranes shall be inspected annually by a public or private agency recognized by the U.S. Department of Labor.

CHAPTER 10 (cont.)

10.5 REQUIREMENTS (cont.)

10.5.1.9 Rigging devices shall be visually inspected by the crane operator, before their first use during the shift. The devices shall be immediately removed from service if any of the following conditions are present:
(a) Ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay,
(b) Wear or scraping of one-third the original diameter of outside individual wires,
(c) Kinking, crushing or any other damage resulting in the distortion of the rope structure,
(d) Evidence of heat damage,
(e) End attachments that are cracked, deformed, or worn,
(f) Hooks that have been opened more than 15% of the normal throat opening (measured at the narrowest part), or twisted more than 10 degrees (from the plane of the unbent hook),
(g) Corrosion of the rope or end attachments,
(h) Broken, cut, or damaged parts.

10.5.1.10 Rigging devices shall be manufacturer certified, or certified by a Professional Engineer.

10.5.2 Fixed Crane Operation

10.5.2.1 Loads exceeding the rated capacity of the crane or hoist being used shall not be lifted, except for required rated load tests.

10.5.2.2 Loads shall not be handled if chains or ropes are kinked or twisted or show other signs of deformity.

10.5.2.3 Only rigging devices or below the hook lifting devices shall be used to attach loads to the hook.

10.5.2.4 Loads shall be secured and balanced before the load is handled and/or moved.

10.5.2.5 The crane hook shall be centered over the load before attachment to prevent excessive swinging.

10.5.2.6 Moving loads shall not be subjected to sudden or rapid acceleration or deceleration of the crane.

10.5.2.7 The load path of travel shall be clear of obstruction to prevent contact with obstacles.

10.5.2.8 The cranes shall be centered over the load before the load is raised.

10.5 REQUIREMENTS (cont.)

10.5.2.9 Cranes shall not be used for side pulling.

10.5.2.10 Cranes shall not carry or move personnel.

10.5.2.11 Loads shall not be lifted, carried, or suspended over personnel.

10.5.2.12 The upper limit switch shall not be used as an operating control.

10.5.2.13 Suspended loads shall not be left unattended.

10.5.2.14 Personnel shall be kept clear of loads during lifting and while loads are suspended.

10.5.3 Mobile Crane Operations

10.5.3.1 A legible load rating chart shall be posted in a location that is clearly visible from the operating position

10.5.3.2 Loads shall not be handled that exceed the rated capacity except when authorized (in writing) by the manufacturer.

10.5.3.3 Running ropes shall not be wrapped around the load.

10.5.3.4 Running ropes shall not be kinked or twisted when handling loads.

10.5.3.5 Only standard (manufacturer or engineer certified) rigging devices or below-the-hook lifting devices shall be used to attach loads to the crane.

10.5.3.6 The crane shall be level and outriggers in place (when necessary) before a load is handled.

10.5.3.7 Loads shall be secured and balanced before being handled.

10.5.3.8 The crane lifting point shall be centered over the load before lifting, to prevent excessive swinging.

10.5.3.9 Moving loads shall not be subjected to sudden or rapid deceleration or acceleration.

10.5.3.10 The load path of travel shall be clear of obstruction to prevent contact with obstacles.

10.5.3.11 Cranes snall be centered over the load before the load is raised.

CHAPTER 10 (cont.)

10.5 REQUIREMENTS (cont.)

10.5.3.12 Cranes shall not be used for side pulling.

10.5.3.13 Loads shall not be lifted, carried, or suspended over personnel.

10.5.3.14 Suspended loads shall not be left unattended unless the load is cribbed, blocked, or substantially supported by another method approved by supervision.

10.5.3.15 Side loading of boom shall be limited to freely suspended loads.

10.5.3.16 A manbasket may be used to carry personnel if written evaluation, signed by the Department Manager and the Manager IRS&T, determines that the manbasket provides a greater level of protection than other options. (Refer to 29 CFR 1926.550(g) for further information on hoisting personnel.)

10.5.3.17 The area around the counterweight swing radius shall be barricaded.

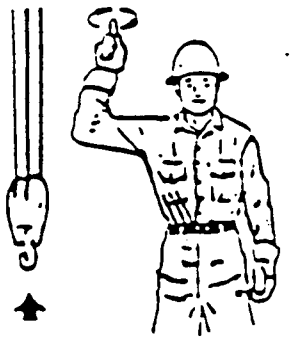
10.5.3.18 Outriggers shall be used in accordance with the crane manufacturer's guidelines.

NOTE: Wood blocks used to support outriggers shall be of sufficient width and length to prevent shifting or toppling under load, strong enough to prevent crushing, and free from defects.

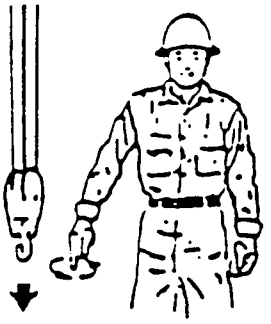
10.5.3.19 Overhead electrical distribution and transmission lines shall be considered energized unless the Utility Engineer certifies power is deenergized and lines are clearly grounded.

10.5.3.20 The following minimum safe working distance shall be maintained between any part of the crane or loads and energized ungrounded distribution/transmission lines:
(A) 50kV or less - 10 feet
(B) 51 to 200kV - 15 feet
(C) 201 to 350kV - 20 feet
(D) 351 to 500kV - 25 feet
(E) 501 to 750kV - 35 feet

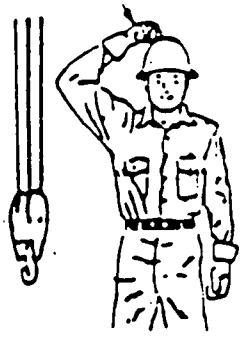
10.5.3.21 Cranes in transit with no load and boom lowered, shall remain a minimum of four feet from energized electrical lines for voltages less than 50kV, ten feet for voltage 51kV to 345kV, and 16 feet for voltages 346kV to 750kV.



HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circles.

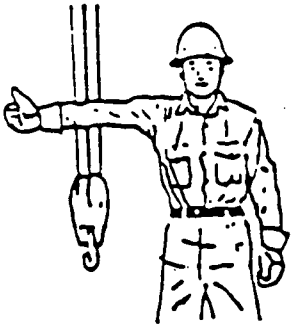


LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circles.

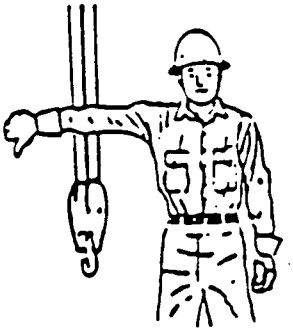


USE MAIN HOIST. Tap fist on head; then use regular signals.

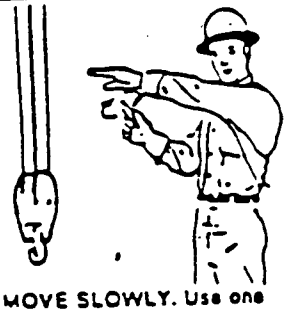
USE WHIPLINE (Auxiliary Hoist). Tap elbow with one hand, then use regular signals.



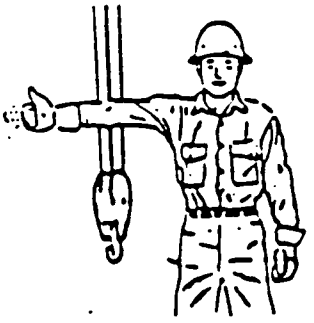
RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.



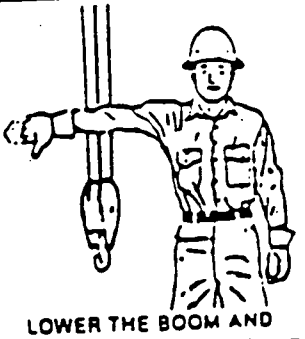
LOWER BOOM. Arm extended fingers closed, thumb pointing downward.



MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)

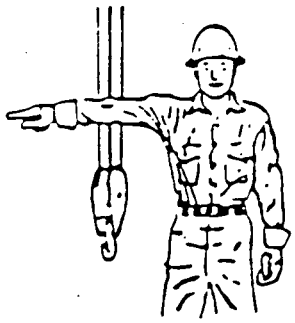


RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

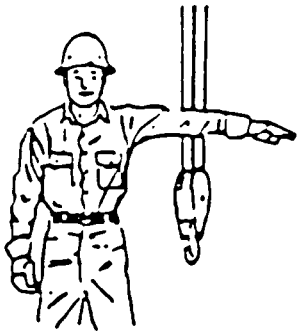


LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

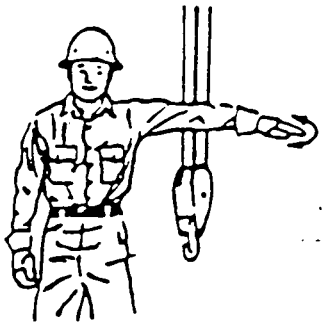
HAND SIGNALS
Figure 10-1 (Sheet 1 of 3)



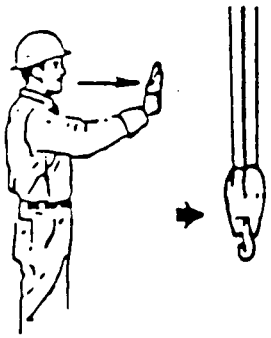
SWING. Arm extended point with finger in direction of swing of boom.



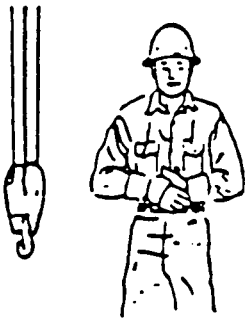
STOP. Arm extended, palm down, hold position rigidly.



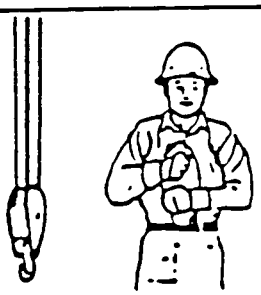
EMERGENCY STOP. Arm extended, palm down, move hand rapidly right and left.



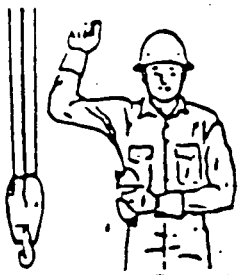
TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.



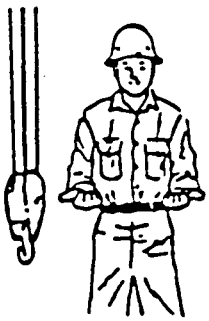
DOG EVERYTHING. Clasp hands in front of body.



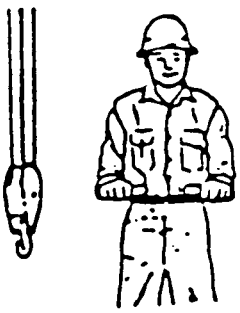
TRAVEL (Both Tracks). Use both fists in front of body, making a circular motion about each other, indicating direction of travel; forward or backward. (For land cranes only.)



TRAVEL (One Track). Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For land cranes only).

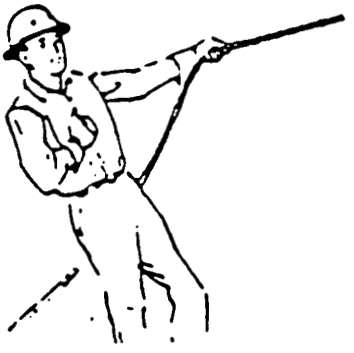


EXTEND BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing outward.



RETRACT BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing toward each other.

HAND SIGNALS
Figure 10-1 (Sheet 2 of 3)



EXTEND BOOM (Telescoping Boom). One Hand Signal. One fist in front of chest with thumb tapping chest.

RETRACT BOOM (Telescoping Boom). One Hand Signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.

HAND SIGNALS
Figure 10-1 (Sheet 3 of 3)

CHAPTER 10 (cont.)

10.5 REQUIREMENTS (cont.)

10.5.3.22 A watchperson shall be designated to observe the crane transit and warn the operator if crane/electrical source clearance approaches the specified minimum.

10.5.3.23 When a crane is in transit, the boom shall be as low as possible and carried in line with the direction of travel, the superstructure shall be secured against rotation except when making turns to avoid obstructions, and the hook shall be secured.

10.5.3.24 Two blocking the crane is prohibited.

10.5.3.25 Personnel shall be kept clear of loads during lifting and while loads are suspended.

10.5.4 Rigging Practices

10.5.4.1 ANSI standard hand signals shall be used to direct mobile crane operations (Refer to Figure 10-1).

10.5.4.2 Rigging devices shall not be used to handle a load that exceeds the rated capacity or specified lift angle.

10.5.4.3 Rigging devices shall not be spliced together.

10.5.4.4 Unattended, suspended loads shall be blocked, cribbed, or otherwise supported.

10.5.4.5 Loads attached with rigging devices shall be raised and lowered slowly to remove slack, determine the stability of the load, and prevent stress to crane ropes and slings.

10.5.4.6 Rigging devices shall be labeled with the rated load capacity.

10.5.4.7 Knotted rigging devices shall not be used.

10.5.4.8 The ends of rigging devices shall be firmly secured to prevent the device from slipping through the hook.

10.5.4.9 Rigging devices shall be protected against weather, incompatible chemicals, high temperatures, sharp objects, and corners.

10.5.4.10 Rigging devices shall be stored properly in designated areas.

10.5 REQUIREMENTS (cont.)

10.5.4.11 Damaged/deteriorated rigging devices shall be removed from service and discarded.

10.5.4.12 Hands, fingers, and other body parts shall be kept from between rigging devices and the load.

10.5.4.13 Rigging device characteristics shall be compatible with the environment the device is being used in.

CHAPTER 11 - EXCAVATION SAFETY

11.1 INTRODUCTION

11.1.1 This chapter provides the requirements for establishing and maintaining safe excavation operations for excavations less than twenty feet deep.

11.1.1.1 Excavations greater than 20 feet deep must be designed by a Registered Professional Engineer.

11.2 DEFINITIONS

11.2.1 Competent Persons - Personnel who have had training in the OSHA "Excavation" standard and who are capable of identifying and eliminating existing and/or potential area work hazards, unsanitary or hazardous work conditions, deficiencies in soil types, and sloping or shoring requirements.

11.2.2 Construction Manager - The organization under a subcontract to WEMCO to provide construction management services.

11.2.3 Excavation - Any manmade cavity or depression in the surface of the earth which was formed by soil or rock removal.

11.2.4 Protective System - Methods (including shoring, sloping, and supporting) of protecting workers from cave-ins, material falling/sliding/rolling from the surface face into the excavation, and collapse of adjacent structures.

11.2.5 Shoring (Shoring System) - A structure (metal, hydraulic, mechanical, or timbers) for supporting the sides of an excavation.

11.2.6 Sloping (Sloping System) - Cutting the sides of an excavation at an angle inclined away from the excavation.

11.2.7 Support System - Structures (such as underpinning, bracing, and shoring) that provide reinforcement for adjacent structures, underground installations, or sides of the excavation.

11.2.8 Trench - A narrow excavation (fifteen feet or less in width) that is deeper than it is wide.

11.2.9 Wales - Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

11.3 RESPONSIBILITIES

11.3.1 Engineering shall be responsible for the following:

11.3.1.1 Complying with this chapter through the administration of appropriate contract language.

11.3 RESPONSIBILITIES (cont.)

11.3.1.2 Administering and enforcing the requirements of this chapter with subcontractors.

11.3.2 **Maintenance** shall be responsible for administering and enforcing the applicable requirements of this chapter.

11.3.3 **Supervisors** shall be responsible for the following:

11.3.3.1 Determining whether underground installations or structures will be encountered and the location of the installation or structure.

11.3.3.2 Taking measures to comply with the requirements of this chapter.

11.3.4 **Safety Engineering** shall be responsible for monitoring and auditing excavation operations to ensure compliance with the standards and provisions of this chapter.

11.3.5 **Competent Person** shall: (1) inspect excavations before personnel enter them, (2) be constantly available while personnel are in or near an excavation, and (3) perform and record both visual and manual soil inspections, unless the excavation is to be protected by sloping at 34°.

11.4 GENERAL

11.4.1 Except as modified in this chapter, excavation, trenching, and shoring activities shall be performed in accordance with OSHA 29 CFR 1926, Subpart P.

11.4.2 Excavations for new construction shall be authorized by an approved and signed "Construction Excavation/Penetration Permit," Form FMPC-T-2711 (Refer to PMP-415).

11.4.3 When personnel are likely to work in an excavation near the face (closer to the face than the depth of the excavation plus the depth of the spoil pile), the worker shall be protected by sloping or shoring the excavation, unless (1) the excavation is less than 5 feet deep, and (2) a competent person determines from both visual and manual soil tests that it is safe.

11.4.4 Unless approved by a competent person, benching excavation faces is not a permitted form of sloping. However, a sloped face may have small steps if the maximum vertical step is 2 feet and work will not require the worker to lay in the excavation, near a step. (See Figure 11-1)

CHAPTER 11 (cont.)

11.4 GENERAL (cont.)

11.4.5 Excavations that are adjacent to structures or improvements or subject to vibration or ground water and are more than 20 feet deep shall have a support system that is planned and designed by a qualified structural/geotechnical engineer.

11.4.6 Materials and/or equipment used for protective systems shall be free from damage or defects that could cause the system to malfunction.

11.4.7 Damaged protective material and/or equipment shall be inspected by a competent person to determine whether or not the material or equipment is suitable for continued use.

11.4.8 Support systems shall be installed and removed in a manner that protects personnel from cave-ins, structural collapse, and being struck by parts of the system.

11.4.9 When personnel are likely to enter an excavation, the competent person shall inspect the excavation: (1) before each shift, (2) after any rain, and (3) after any other event which may affect the stability of the excavation.

11.4.10 Classification of soil type, for other than "C", must be performed by the competent person and must include both a visual and a manual test. These tests must be recorded.

11.4.11 Barricade requirements are covered in Chapter 26.

11.4.12 Occupational clothing, foot, and head protection requirements are covered in Chapters 4, 14 and 15.

11.5 REQUIREMENTS

11.5.1 Preparations for Excavating

11.5.1.1 The responsible supervisor shall determine the existence and location of underground installations or structures.

11.5.1.2 Energized electrical and mechanical installations shall be de-energized and secured in accordance with PP-FMPC-0719.

11.5.1.3 If electrical/mechanical systems cannot be de-energized, excavation within a three foot radius of the system shall be accomplished manually.

11.5 REQUIREMENTS (cont.)

11.5.2 Opening an Excavation

11.5.2.1 When excavating near the location of an underground installation, the exact position shall be located, exposed, and supports constructed for the installation.

11.5.2.2 Excavated material shall be stored and retained far enough from the edge of the excavation to prevent excessive loading of the face of the excavation. This distance shall not be less than two feet.

11.5.2.3 When the side of an excavation is undercut, supports shall be installed to prevent the overhang from collapsing.

11.5.2.4 When personnel are to enter a trench four feet or more in depth, stairs, ladders, or ramps shall be placed so less than 25 feet of lateral travel is necessary to reach the means of egress.

11.5.3 Sloping

11.5.3.1 Sloped faces shall be excavated to a maximum angle of 34 degrees from horizontal (See Figure 11-1), unless a competent person determines that the maximum slope is 45 degrees (Class B soil) or 63 degrees (Class A soil).

11.5.4 Protection of Excavations

11.5.4.1 Excavated material shall be stored and retained far enough from the edge of the excavation to prevent excessive loading of the face of the excavation but not less than two feet.

11.5.4.2 Walkways/bridges with guardrails shall be erected where people an/or equipment cross over the excavation.

11.5.4.3 Safeguards (guardrails, fences, covers, barricades and warning lights, or illumination equipment) shall be placed adjacent to paths, walkways, sidewalks, driveways, and pedestrian or vehicle thoroughfares.

11.5.4.4 Warning lights and/or illumination equipment shall be turned on from sunset to sunrise.

11.5.4.5 If mobile equipment is permitted near the excavation, stop logs or barricades shall be installed far enough from the excavation wall to prevent slides or cave-ins.

CHAPTER 11 (cont.)

11.5 REQUIREMENTS (cont.)

11.5.4.6 When heavy equipment (such as power shovels, derricks, or trucks) is to be operated near an excavation and/or heavy materials or objects placed above and near an excavation, the side adjacent to the load shall be sheet piled, shored, or braced to resist additional pressure.

11.5.5 Confined Spaces

11.5.5.1 When personnel are to enter an oxygen deficient area or an area where gaseous conditions are known to or reasonably expected to exist, a "Confined Space Entry Permit," Form FMPC-OS&H-2939 (which will soon be FMPC-IRS&T-2939) shall be issued in accordance with the site Work Permit procedure (currently FMPC-516) prior to entry of personnel.

NOTE: A Confined Space Entry Permit is not a requirement for an excavation in open ground and away from process or utility piping systems.

11.5.6 Shoring

11.5.6.1 Bracing or shoring of trenches shall be in accordance with the minimum size and spacing of timbers specified in Table 11-1.

11.5.6.2 Trenches shall be braced or shored along the entire length of the trench (Refer to Figures 11-2, 11-3, and Table 11-2).

11.5.6.3 Trench boxes or shields (if used) shall be designed, constructed, and maintained in order to provide protection that is equal to, or greater than, shoring required for the trench.

NOTE: Portable trench boxes or sliding trench shields may be used for personnel protection instead of shoring or sloping.

11.5.7 Backfilling

11.5.7.1 The trench shall be backfilled and trench supports removed simultaneously from the bottom of a trench or excavation.

11.5.7.2 After completing core sampling operations (or similar activities), temporary excavations shall be backfilled immediately.

11.5.7.3 Excavation backfilling shall be in accordance with RM-0001.

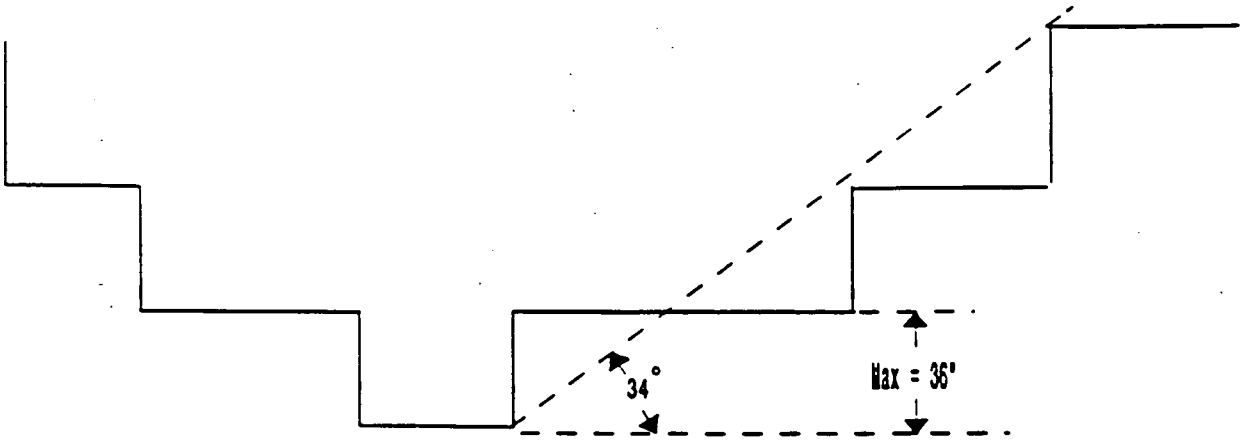
TABLE 11-1
MINIMUM REQUIREMENTS FOR TIMBER TRENCH SHORING

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS[1]													
	CROSS BRACES							WALES		UPRIGHTS				
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE				
5 TO 10	UP TO 6	6 X 6	6 X 6	6 X 6	6 X 6	8 X 8	5	8 X 8	5	3 X 6				
	UP TO 8	6 X 6	6 X 6	6 X 6	8 X 8	8 X 8	5	10 X 10	5	3 X 6				
	UP TO 10	6 X 6	6 X 6	8 X 8	8 X 8	8 X 8	5	10 X 12	5	3 X 6				
	(2)													
10 TO 15	UP TO 6	6 X 8	6 X 8	6 X 8	8 X 8	8 X 8	5	10 X 10	5	4 X 6				
	UP TO 8	8 X 8	8 X 8	8 X 8	8 X 8	8 X 8	5	12 X 12	5	4 X 6				
	(2)													
	(2)													
15 TO 20	UP TO 6	8 X 8	8 X 8	8 X 8	8 X 10	8 X 10	5	10 X 12	5	4 X 6				
	(2)													
	(2)													
	(2)													
OVER 20	(2)													

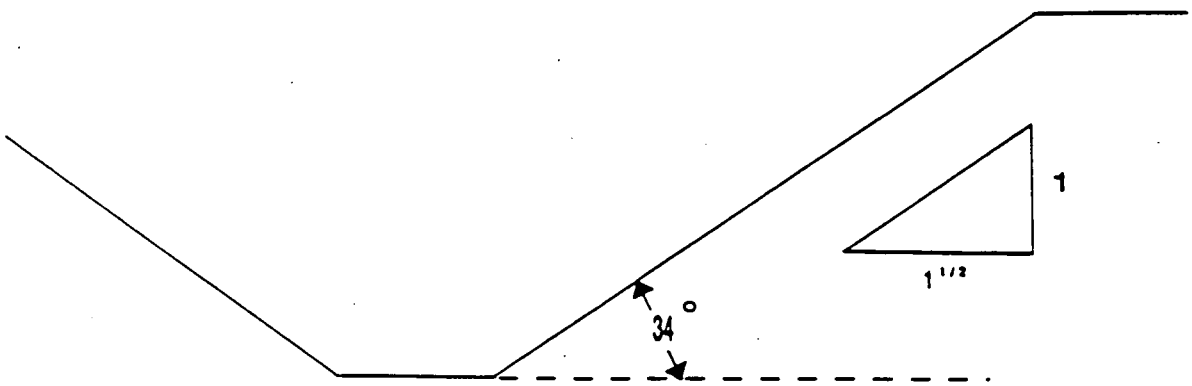
(1) Manufactured members of equivalent strength may be substituted for wood.
(2) Douglas fir or equivalent with a bending strength not less than 1500 psi.

TABLE 11-2
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS FOR SOIL TYPE C

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS		
	VERTICAL SPACING (FEET)	SECTION MODULUS (IN^3)	WIDTH OF TRENCH (FEET)						MAX. HORIZ. SPACING (ON CENTER)		
			UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO 15		SOLID SHEET	2 FT.	3 FT.
			HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER			
OVER 5 UP TO 10		3.5	6.0	2 IN	6.0	2 IN	6.0	3 IN	3X12	—	—
		7.0	6.5	2 IN	6.5	2 IN	6.5	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
OVER 10 UP TO 15	4	3.5	4.0	2 IN	4.0	2 IN	4.0	3 IN	3X12	—	—
		7.0	5.5	3 IN	5.5	3 IN	5.5	3 IN			
		14.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
OVER 15 UP TO 20	4	3.5	3.5	2 IN	3.5	2 IN	3.5	3 IN	3X12	—	—
		7.0	5.0	3 IN	5.0	3 IN	5.0	3 IN			
		14.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
OVER 20											



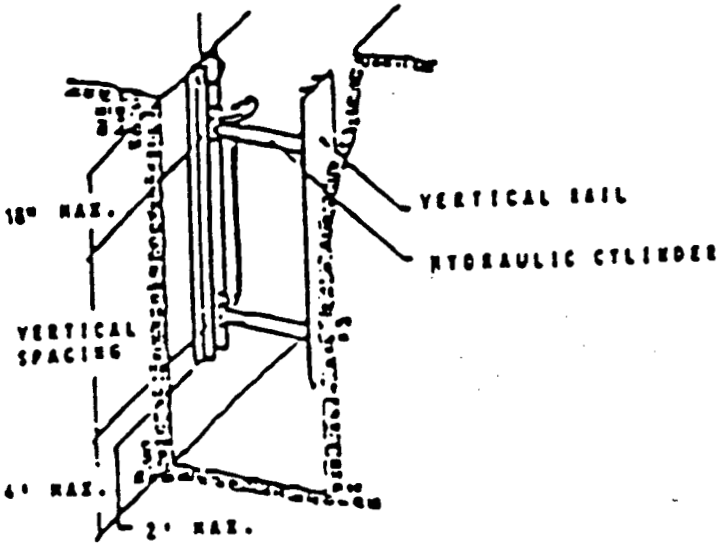
MULTIPLE STEPPED EXCAVATION



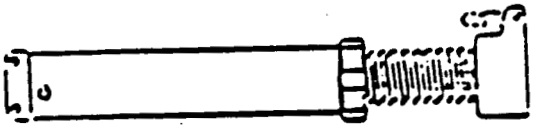
SIMPLE SLOPE

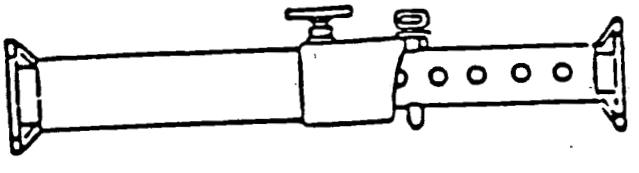
SLOPING AND STEPPING SIDES OF EXCAVATIONS
Figure 11-1

Aluminum Hydraulic Shoring

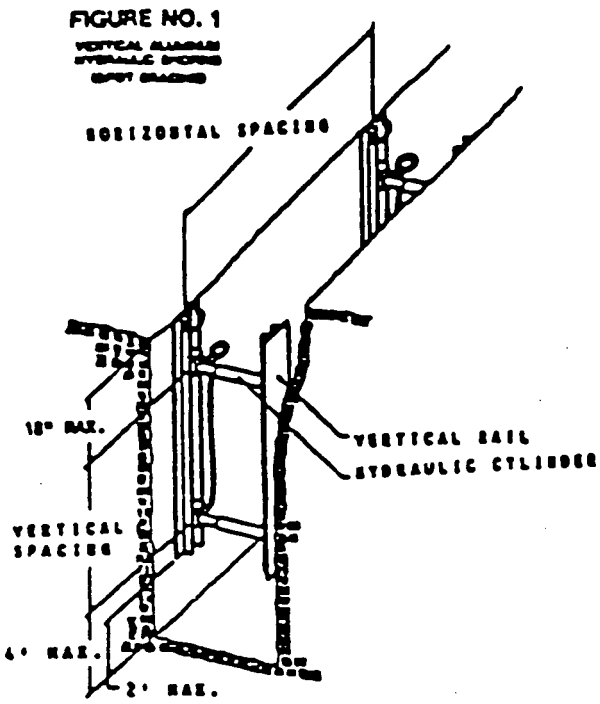


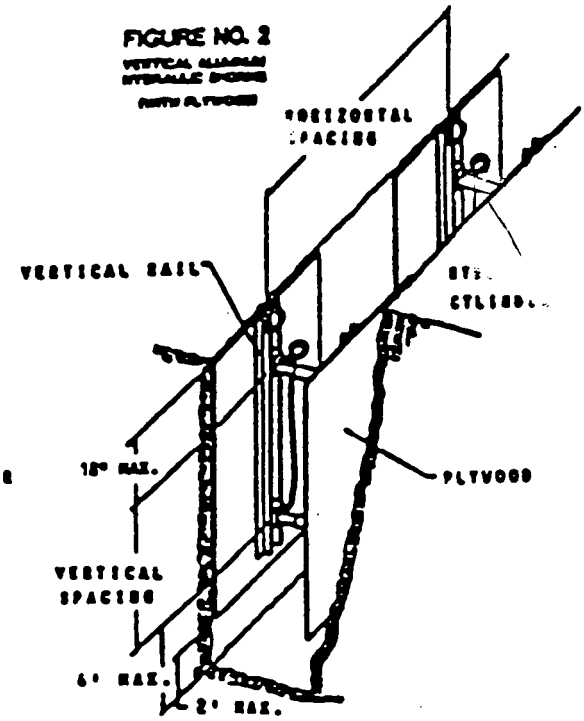
Pneumatic/hydraulic Shoring

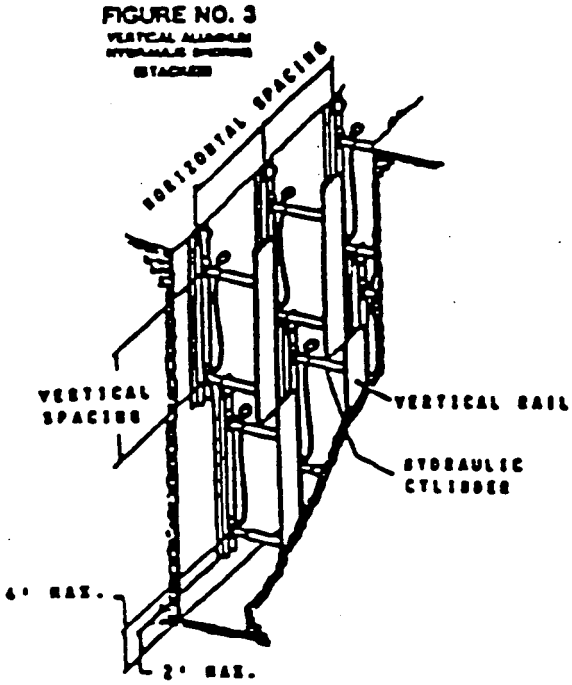


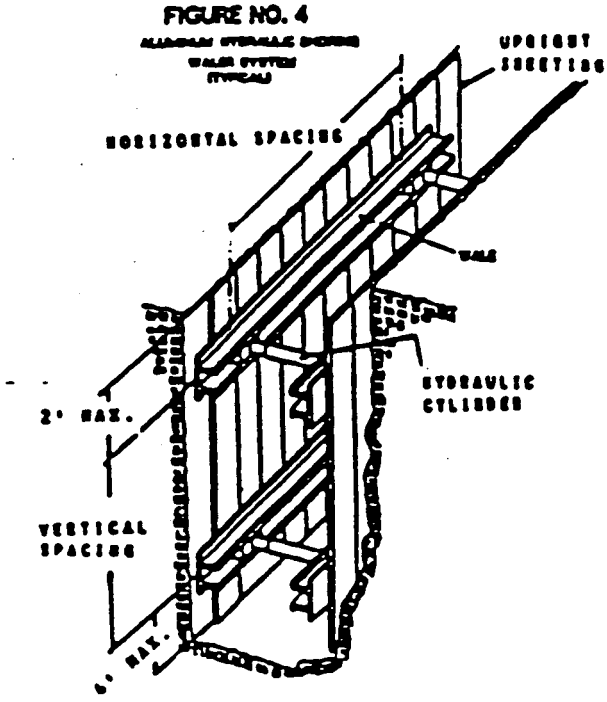


ALUMINUM/PNEUMATIC SHORING
Figure 11-2









ALUMINUM HYDRAULIC SHORING
Figure 11-3

CHAPTER 12 - SAFETY REQUIREMENTS FOR THE USE, CARE, AND PROTECTION OF ABRASIVE WHEELS

12.1 INTRODUCTION

12.1.1 This chapter provides the requirements for storing, handling, mounting, and safe use of abrasive grinding wheels and specifications for safety guards and flanges.

12.2 DEFINITIONS

12.2.1 Competent Persons - Personnel with the experience, training, and ability to recognize conditions that are contrary to established parameters and the corrective actions to be taken.

12.2.2 Dressing - Altering the cutting action or shape of a wheel.

12.2.3 Flange - Collars, discs, or plates with wheels mounted in between.

12.2.4 Grinding Surface or Face - The area of an abrasive wheel where grinding is performed.

12.2.5 Safety Guard - An enclosure for restraining pieces of an abrasive wheel in the event the wheel is broken in operation.

12.2.6 Truing - Correcting out-of-round or imbalance of a wheel.

12.3 RESPONSIBILITIES

12.3.1 Supervisors shall be responsible for ensuring that this chapter is implemented, and for ensuring that personnel are competent to use abrasive wheels.

12.3.2 Safety Engineering shall be responsible for monitoring usage of abrasive wheels to ensure that the wheels are properly used and that the work environment is safe.

12.3.3 Operators shall be responsible for being familiar with, and complying, with this chapter.

12.4 GENERAL

12.4.1 Abrasive wheel utilization issues not addressed by this chapter shall be in accordance with ANSI B7.1.

12.4.2 Leather-palm gloves shall be worn while handling wheels.

12.4.3 Eye and face protection, and clothing requirements are covered in other chapters of this manual.

12.5 REQUIREMENTS

12.5.1 Handling

12.5.1.1 Wheels shall not be dropped or bumped.

12.5.1.2 Wheels shall not be rolled. Trucks, dollies, or other mechanical conveyances shall be used to transport wheels that cannot be carried by hand.

12.5.2 Storage

12.5.2.1 Wheels shall be carefully stored on a shelf or rack or in bins, boxes, or drawers.

12.5.2.2 Wheel storage areas shall be designed, constructed, and located to fit the needs of the work area (Refer to Figure 1).

12.5.2.3 Abrasive wheels shall be stored in a dry area that is protected from extreme temperature changes.

12.5.2.4 Storage areas shall be located as near as practical to the work locations.

12.5.2.5 Storage areas shall not be located where there is a potential for damage from trucks, crane handling, or excessive vibration.

12.5.2.6 Storage areas shall be arranged to allow wheels to be removed without disturbing or damaging other wheels.

12.5.2.7 Storage and inventory control systems shall be established to rotate wheel use and eliminate long term storage of wheels.

12.5.3 Inspection

12.5.3.1 Abrasive wheels shall be inspected prior to mounting and after use.

12.5.3.2 Ensure that the wheels have not been damaged.

12.5.3.3 Wheels shall be dry and free of accumulated dusts.

12.5.3.4 The spindle speed of the grinding machine shall be checked before mounting of the wheel to ensure that the grinder does not exceed the maximum operating speed marked on the wheel.

CHAPTER 12 (cont.)

12.5 REQUIREMENTS (cont.)

12.5.4 Ring Test

NOTE: Since organic bonded wheels do not emit the same clear metallic ring as do vitrified and silicate wheels, a "Ring" test is not recommended.

12.5.4.1 Light wheels shall be suspended from the hole during the inspection, using a pin or finger. Heavier wheels shall be placed in a vertical position on a hard, clean floor.

12.5.4.2 A light non-metallic implement shall be used to tap the wheel approximately 45 degrees each side of the vertical centerline and approximately one to two inches from the periphery (Refer to Figure 12-2).

NOTE: An undamaged wheel will emit a distinct clear metallic tone. A damaged wheel will sound dull.

12.5.4.3 The wheel shall be rotated 45 degrees and the test repeated.

12.5.5 Safety Guards

12.5.5.1 Abrasive wheels shall be used on machines that are equipped with safety guards in accordance with this chapter and ANSI B7.1.

12.5.5.2 The angular exposure of the grinding wheel, periphery and sides, installed on bench and floor grinders shall not exceed 90 degrees or one-fourth of the periphery.

NOTE: Exposure shall begin at a point not more than 65 degrees above the horizontal plane of the wheel spindle.

12.5.5.3 Guards shall be constructed so that the peripheral-protecting-member can be adjusted to the constantly decreasing diameter of the wheel (Refer to Figure 12-3).

NOTE: The distance between the wheel periphery and the adjustable tongue or the end of the peripheral guard at the top shall not exceed 1/4-inch.

12.5.5.4 Safety guards shall cover the spindle end, nut, and flange projections.

12.5.5.5 Guards shall be mounted to maintain alignment with the wheel.

12.5 REQUIREMENTS (cont.)

12.5.5.6 Safety guards on right angle head or vertical portable grinders shall be located between the operator and the wheel during use and adjusted so that pieces of a broken wheel will be deflected away from the operator.

12.5.6 Flanges

12.5.6.1 Abrasive wheels shall be mounted between flanges t: are not less than one-third the diameter of the wheel.

NOTE: Specific definitive exemptions specified by ANSI B7.1 are permitted.

12.5.6.2 Flanges shall be identically paired for a given wheel and constructed in accordance with ANSI B7.1.

12.5.6.3 Flanges shall be checked periodically for flatness, burrs, and wear.

12.5.7 Wheel Truing and Dressing

12.5.7.1 Truing of wheels shall be performed by a competent person.

12.5.7.2 Out-of-balance wheels that can not be corrected by truing or dressing shall be removed from service.

12.5.8 Side Grinding

12.5.8.1 Side grinding wheels (such as abrasive discs) shall be mounted with one flat side against a suitable steel machine plate in order to withstand the side pressure.

12.5.8.2 Peripheral grinding wheels shall not be used for side grinding.

12.5.9 Work Rests

12.5.9.1 Off-hand grinding machines shall be equipped with work rests to support the work.

12.5.9.2 Rests shall adjust to compensate for wheel wear.

12.5.9.3 Rests shall allow a maximum opening of 1/8 inch to prevent the work piece from being jammed between the wheel and the rest.

12.5.9.4 Work rest adjustments shall not be made while the wheel is in motion.

CHAPTER 12 (cont.)

12.5 REQUIREMENTS (cont.)

12.5.10 Work Lights

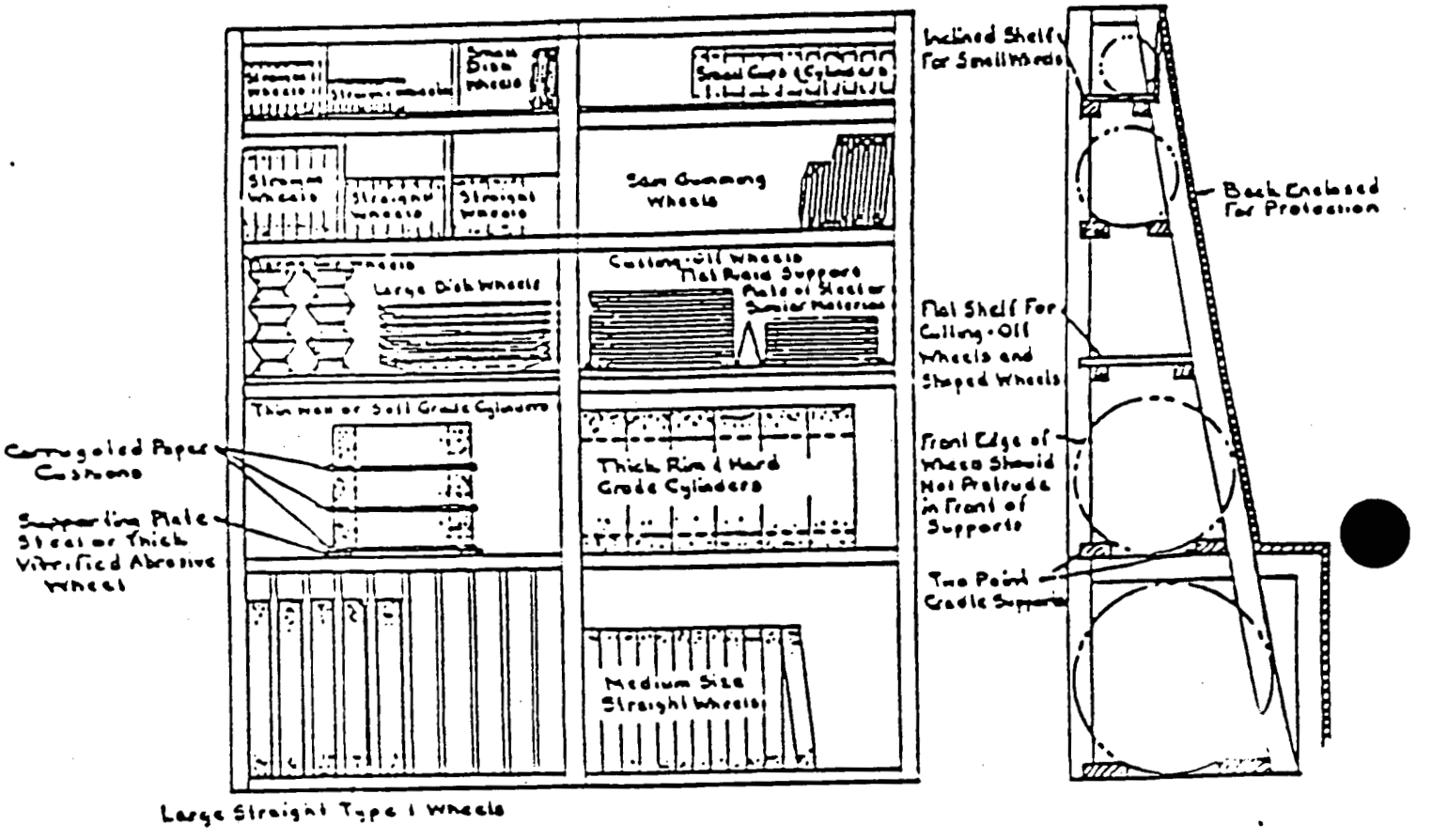
12.5.10.1 When the grinding machine is equipped with work lights, the lights shall be fully functional.

12.5.11 Electrical Disconnect

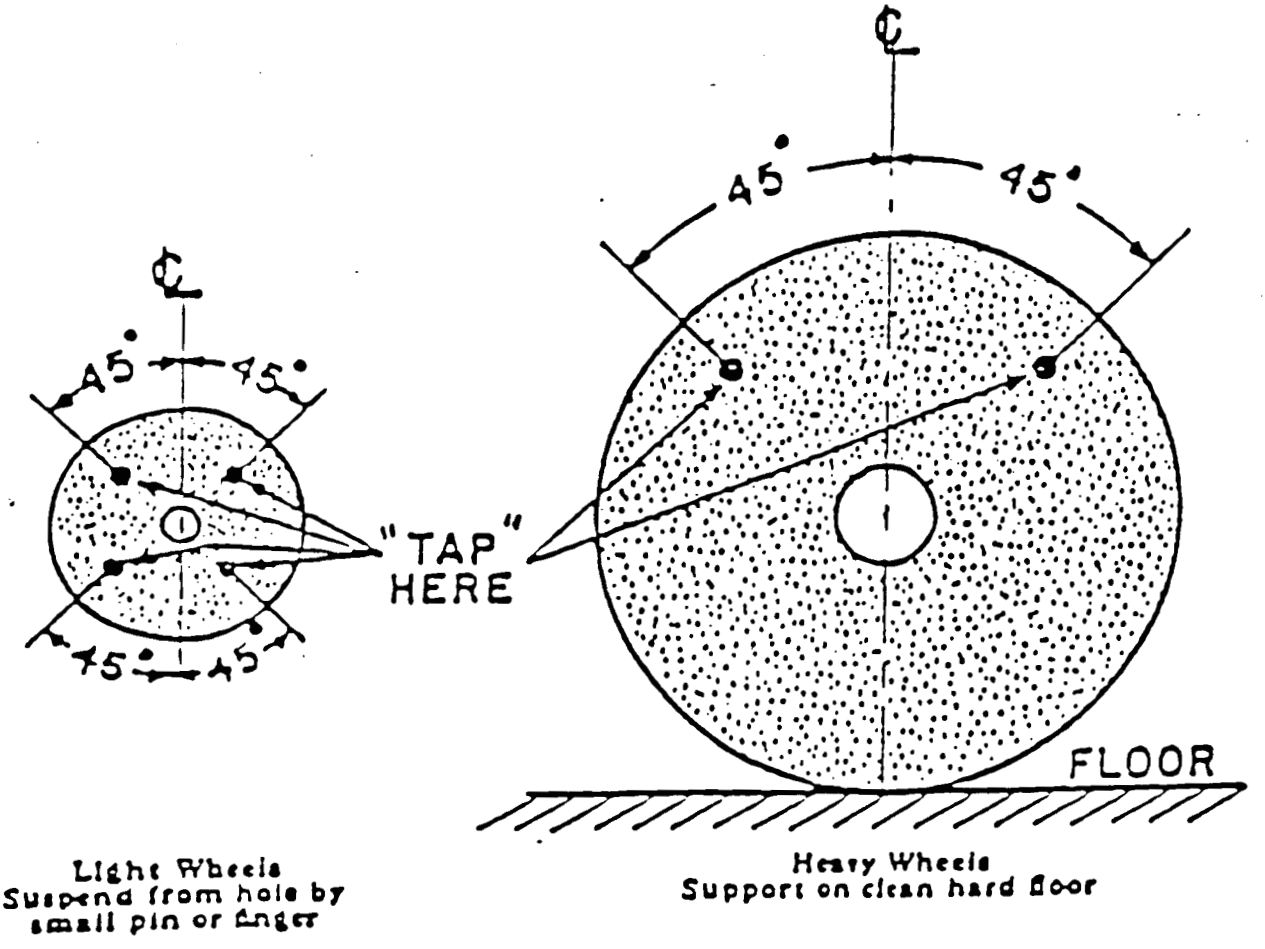
12.5.11.1 Permanently installed equipment shall have a conspicuously identified emergency electrical disconnect switch within arms reach of the operator.

12.5.12 Mounting

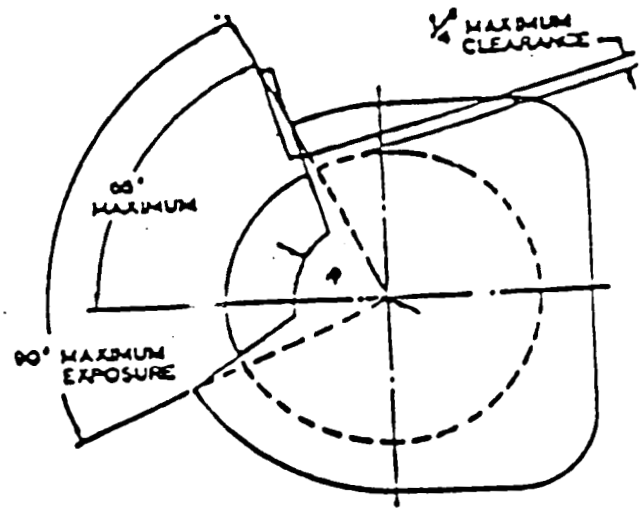
12.5.12.1 Machines that are designed for a fixed location shall be securely anchored to prevent the machine from walking or displacement.



ABRASIVE WHEEL STORAGE RACK DESIGN
Figure 12-1



"RING" TEST TAPPING POSITIONS
Figure 12-2



Wheel guard with adjustable tongue for angular protection to all sizes of wheels.

ADJUSTABLE WHEEL GUARD
Figure 12-3

0 5151

CHAPTER 13 - SAFETY REQUIREMENTS FOR WORKING AT ELEVATED LOCATIONS

13.1 INTRODUCTION

13.1.1 This chapter identifies the safety requirements to be followed when performing work activities that require personnel to engage in work that cannot be done safely from the ground or similar base footing (Refer to DOE Order 5480.4).

13.1.2 Except as modified in this chapter, scaffolds, ladders, and elevated work platforms shall conform to the safety and health requirements of OSHA 29 CFR 1910.25-29, OSHA 29 CFR 1926, Subparts L and M, and U.S. Army Corps of Engineers EM 385-1-1, Sections 22, 30 and 31.

13.2 DEFINITIONS

13.2.1 LADDER - Climbing equipment that usually consists of two side rails joined at regular intervals by cross pieces called steps, rungs, or cleats, on which a person may step to ascend or descend.

13.2.2 PLATFORM - An elevated working space (such as a balcony) above the surrounding floor or ground.

13.2.3 SAFETY CHAIN/SELF CLOSING GATE - A device installed at openings to a catwalk or platform that closes to prevent passage.

13.2.4 SCAFFOLD (SCAFFOLD TOWER) - A temporary elevated platform used for supporting workmen and materials.

13.2.5 STANDARD RAILING - A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls.

13.3 RESPONSIBILITIES

13.3.1 **Site Services** shall be responsible for the implementation and administration of this chapter.

13.3.2 **Project Management and Acquisition (PM&A)** shall be responsible for ensuring that construction subcontractors comply with safety requirements for working in elevated locations.

13.3.3 **Safety Engineering** shall be responsible for ensuring compliance with the safety standards and requirements of this chapter.

13.3.4 **Supervisors** shall be responsible for the following:

13.3.4.1 Ensuring that employees erecting or utilizing scaffolds or ladders are familiar with the requirements of this chapter.

13.3 RESPONSIBILITIES (cont.)

13.3.4.2 Inspecting erected scaffolding to ensure the structure was completed in compliance with requirements of this chapter.

13.4 GENERAL

13.4.1 Work on scaffolds or ladders erected outside of building shall not be permitted during periods of freezing rain, high winds (greater than 35 mph) or electrical thunderstorms.

13.5 REQUIREMENTS

13.5.1 Standard Railing

13.5.1.1 A standard railing shall consist of top and intermediate rails, toeboard, and vertical posts.

13.5.1.2 The rail shall have a vertical height of approximately 42 inches from the upper surface of the top rail to the floor, platform, runway, or ramp level.

13.5.1.3 The intermediate rail shall be approximately halfway between the top rail and the walking surface.

13.5.1.4 The toeboard shall have a minimum of inches vertical height from the top edge to the level of the walking surface.

13.5.1.5 Vertical posts shall be located at centers not exceeding eight feet.

13.5.1.6 The entire standard railing shall be constructed so that the completed structure will withstand a minimum load of 200 pounds in any direction at any point on the top rail with a minimum of deflection.

13.5.1.7 If personnel are required to work or walk under scaffolds, a screen guard of No. 18 gauge, 1/2 inch wire mesh or equivalent shall be provided between the toe board and top rail.

13.5.2 Fall Protection

13.5.2.1 Employees working over machinery or employees on elevated surfaces (from which they could fall six or more feet, such as ramps, catwalks, scaffolds, roofs, etc.) shall be protected by a standard railing, catch platform, temporary floor, safety net, or other equivalent protection.

CHAPTER 13 (cont.)

13.5 REQUIREMENTS (cont.)

13.5.2.2 An individual lifeline shall be provided for each employee working on a suspended scaffold or platform. The line shall be secured to a structural member capable of supporting a minimum dead weight of 5400 pounds and be independent of scaffold support lines.

13.5.2.3 Workers using a lifeline shall have the line tied-off at all times.

13.5.2.4 Persons using safety belts shall have the belt lanyard secured above the point of operation wherever possible.

13.5.2.5 Safety belts shall be equipped with a lanyard that is a minimum 1/2 inch nylon (or equivalent) with a length that will permit a maximum fall of six feet.

13.5.2.6 A 20 foot or more fixed ladder or a fixed ladder where the fall distance is 20 feet or more shall be equipped with a ladder climbing safety device.

13.5.2.7 If a ladder climbing safety device is impractical, caging may be used as an alternate provided that caging meets the applicable standards of construction and installation.

13.5.2.8 Employees working on low-pitched roofs with a ground to eave height greater than 16 feet shall be protected from falling by using one of the following:
- (A) motion stopping safety system (MSS system)
- (B) positive tie-off with safety belts and life lines
- (C) standard railing or other suitable perimeter protection
- (D) warning line system erected and maintained in accordance with applicable standards and supplemented by an MSS system or positive tie-off practices.

13.5.2.9 Safety monitoring systems shall not be used as a method of fall protection.

13.5.2.10 Personnel working in an aerial lift platform shall wear a safety belt with the lanyard attached to the platform boom or basket.

13.5.2.11 Inspections of safety belts, harnesses, lanyards, lifelines and droplines shall follow the procedures and time intervals of ANSI A10.14.

13.5 REQUIREMENTS (cont.)

13.5.3 Erecting and Dismantling Scaffolds

13.5.3.1 Scaffolds shall be erected in accordance with OSHA 29 CFR 1926, Subpart L, Section 1926.451.

13.5.3.2 Scaffold feet shall be established on a solid, level base of support.

13.5.3.3 Scaffolds shall be erected so that vertical members are plumb and the platform(s) is/are horizontal.

13.5.3.4 Scaffold planks shall be cleated, wired down, or otherwise secured against displacement.

13.5.3.5 Overlapping of scaffold planks shall be a minimum of 12 inches and secured from movement.

13.5.3.6 Portable ladders used as temporary access to scaffolds shall extend at least three feet past the landing or dismounting platform.

13.5.4 STABILIZATION

13.5.4.1 Stationary scaffolding shall be securely fastened to a building or other fixed structure. Fasteners shall be installed vertically at 26 foot intervals, starting at the base of the scaffold, and horizontally at 30 foot intervals.

13.5.4.2 Rolling or free standing scaffolds and aerial devices shall be secured to prevent displacement or falling when the platform working height exceeds three times the smallest base dimension.

13.5.4.3 The following methods may be used in place of securing scaffolding:
(A) use of outriggers
(B) assembling additional scaffold sections in such a manner that the height does not exceed three times the smallest base dimension

13.5.4.4 Casters used for a rolling scaffold shall be locked except when the scaffold is being moved.

13.5.4.5 Ladders shall be secured by the top, bottom, and/or intermediate rungs with fasteners that will hold the ladder rigidly in place and support the load.

CHAPTER 13 (cont.)

13.5 REQUIREMENTS (cont.)

13.5.5 Safe Work

13.5.5.1 Portable metal ladders shall not be used for electrical work or where the ladders are in proximity to energized electrical conductors.

13.5.5.2 Personnel shall not remain on a scaffold structure while the structure is being moved.

13.5.5.3 Areas below and around elevated work shall be secured by the posting warning signs and barricades and screened or solid staging when applicable.

13.5.5.4 Personnel climbing to elevated work platforms shall have both hands empty and free for climbing.

13.5.5.5 Pockets, pouches, and tool belts are to be used to carry necessary work tools.

13.5.5.6 A tool bucket (or similar equipment) shall be used to raise and lower objects to and from platforms.

13.5.5.7 Objects shall not be thrown up to or dropped from elevated platforms, scaffolding, or ladders.

13.5.5.8 Personnel climbing a ladder or structure shall pay attention to each step and hand hold.

NOTE: Most falls occur near the top or bottom of a ladder.

13.5.5.9 After ascending a fixed ladder and attaining firm footing on a catwalk or platform, the safety chain/self-closing gate shall be secured in the closed position.

13.5.5.9.1 The safety chain shall be secured in the closed position except when personnel are entering or leaving.

13.5.6 Monitoring and Enforcement

13.5.6.1 Scaffolding that is damaged, not in compliance with safety standards, or does not meet the requirements of this chapter shall be removed from service and identified with a DANGER tag (See Figure 13-1) by the inspecting/monitoring person.

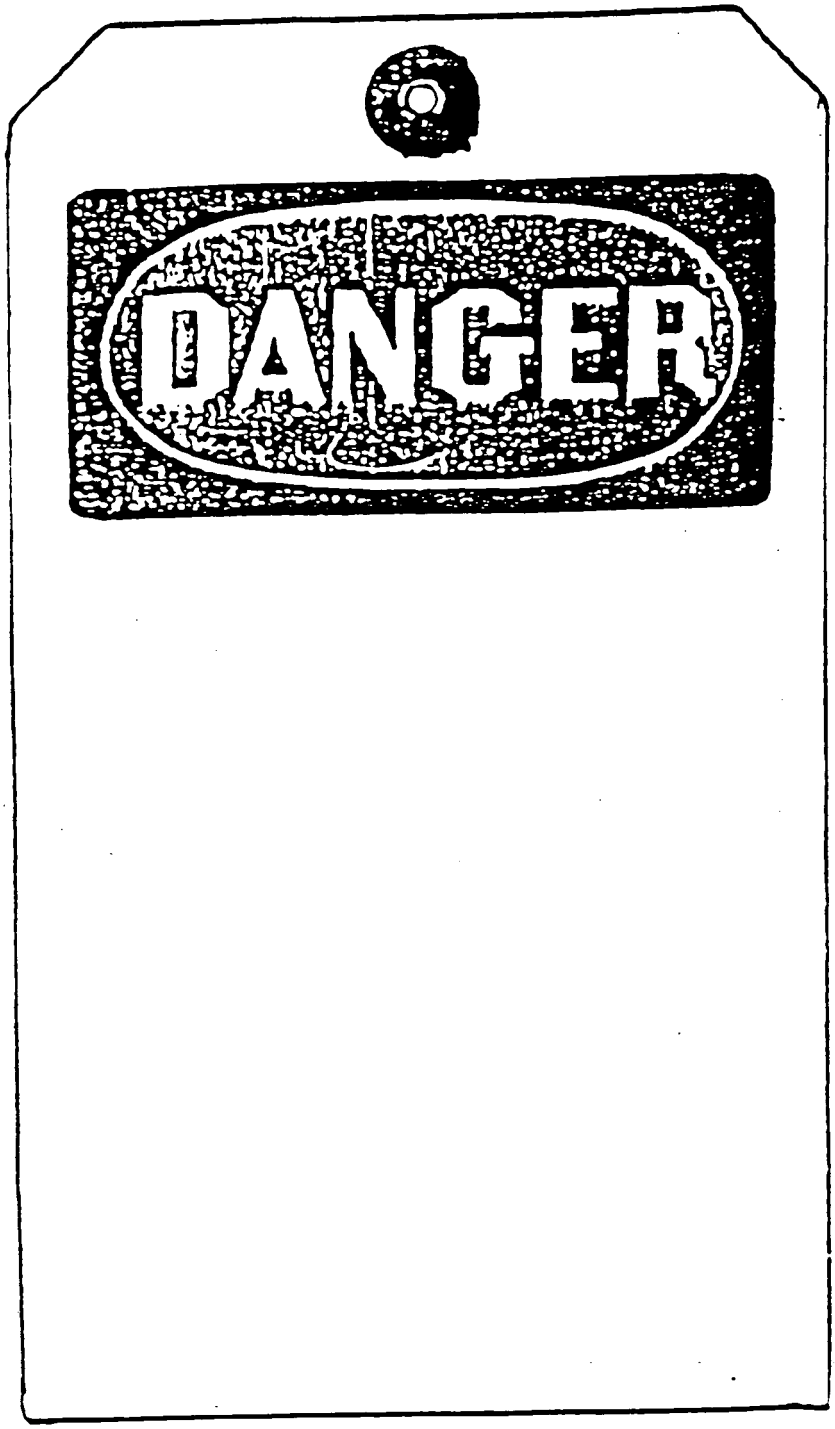
13.5.6.2 Broken or damaged ladders shall be removed from service immediately and identified with a DANGER tag or rendered unusable.

13.5 REQUIREMENTS (cont.)

13.5.7 DANGER Tag

13.5.7.1 When damaged or defective scaffolding, ladders, or other equipment is found, a DANGER tag shall be obtained and the damage/defect, signature, and date written on both sides of the tag.

13.5.7.2 The tag(s) shall be securely affixed to the equipment.



DANGER TAG
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CHAPTER 14 - OCCUPATIONAL FOOT PROTECTION

14.1 INTRODUCTION

14.1.1 This chapter provides the basic requirements for employee foot protection and the specific types of work, locations and personnel who are required to use protective equipment.

NOTE: Occupational foot protection for Emergency Response Team members is excluded.

14.2 DEFINITIONS

14.2.1 Low-Cut Safety Shoes - An oxford type shoe with toe box, leather upper and an oil resistant sole.

14.2.2 Metatarsal Guard - A detachable guard that slips over the foot and protects the wearer between the ankle and the toes.

14.2.3 High-Cut Safety Shoes - A six inch high (minimum) shoe with toe box, leather uppers and an oil resistant sole.

14.2.4 Shoemobile - A vendor-provided, mobile, safety shoe dispensing service that periodically visits the FEMP to provide non-standard types/sizes of safety shoes.

14.3 RESPONSIBILITIES

14.3.1 Employees shall be responsible for complying with the requirements of this chapter.

14.3.2 Managers/Supervisors shall be responsible for the following:

14.3.2.1 Informing employees of the necessity for wearing foot protection.

14.3.2.2 Enforcing the occupational foot protection requirements specified by this chapter.

14.3.3 Industrial, Radiological Safety and Training (IRS&T) shall be responsible for the following

14.3.3.1 Establishing the requirements for foot protection.

14.3.3.2 Specifying use, styles and types of foot protection for various job classifications, work locations, and specific work being performed.

14.3.4 Engineering shall be responsible for purchasing occupational foot protection equipment that has been approved by IRS&T.

CHAPTER 14 (cont.)

14.3 RESPONSIBILITIES (cont.)

14.3.5 **Site Services** shall be responsible for the following:

14.3.5.1 Maintaining an adequate stock of the styles and sizes of approved occupational foot protection.

14.3.5.2 Issuing occupational foot protection to affected employees.

14.4 GENERAL

14.4.1 Wearing non-approved occupational foot wear by personnel requiring such equipment is prohibited.

14.4.2 Torn, ragged, worn, or defective occupational footwear shall be turned in for replacement.

14.4.3 Contamination Control Zone requirements shall be followed by all personnel needing occupational foot protection.

14.4.4 Safety shoes shall meet the requirements of ANSI Z41.1.

14.4.5 Rad protection shoe covers shall not be worn over open-toed or high-heeled shoes.

14.5 REQUIREMENTS

14.5.1 Shoes in the Controlled Areas

14.5.1.1 Hourly personnel (except porters and security inspectors) regularly assigned to a controlled area shall wear high-cut safety shoes.

14.5.1.2 Salaried (exempt and non-exempt) personnel who are regularly assigned to work in the process area (area behind the fence) shall wear either high-cut or low-cut safety shoes while in this area, except, other shoes may be worn in controlled "clean" areas (standard offices, restrooms, and break rooms).

14.5.1.3 Security inspectors and porters shall wear either high-cut or low-cut safety shoes.

14.5.1.4 Visitors and salaried personnel not regularly assigned to work in the process area shall wear shoes that fully enclose the foot [no open-toed shoes, sandals, etc]. Safety shoes shall be worn (1) in areas near manual labor, (2) work locations such as pads, and (3) areas outside of established walkways.

CHAPTER 14 (cont.)

14.3 RESPONSIBILITIES (cont.)

14.5.2 Shoes in Construction and Other Selected Areas

14.5.2.1 Personnel regularly assigned to construction areas shall wear high-cut safety shoes.

14.5.2.2 Personnel incidental (not regularly assigned) to a construction zone shall wear closed-toe, low heel shoes with a substantial (minimum thickness of 1/4 inch) sole.

14.5.2.3 Personnel collecting field samples shall wear closed-toe, low heel shoes with a substantial (minimum thickness of 1/4 inch) sole.

14.5.2.4 Personnel in analytical laboratories (where acids, caustics, and other chemicals are routinely used) shall wear shoes that are leather (or have equivalent resistance to liquid penetration) and fully enclose the foot (no open toed shoes, sandals, etc.).

14.5.3 Shoes in Administrative Areas

14.5.3.1 Hourly personnel (except for cafeteria workers, porters, and security inspectors) assigned to the Administrative Area shall wear high-cut safety shoes.

14.5.3.2 Cafeteria workers, porters, Safety and Fire Inspectors, and security inspectors shall wear either high-cut or low-cut safety shoes.

14.5.4 Metatarsal Guards

14.5.4.1 Personnel operating pneumatic or electrically driven jack hammers shall wear metatarsal guards.

14.5.4.2 Operations, other than jackhammer, requiring metatarsal guards shall be specified by Safety Engineering.

14.5.5 Procedures for Obtaining Safety Shoes and Low-Cut Safety Shoes

14.5.5.1 The supervisor shall be notified of the requirement for safety shoes by the employee.

14.5.5.2 The supervisor shall provide written or verbal authorization for the issuance of new safety shoes.

14.5.5.3 Laundry personnel shall issue safety shoes based on the verbal or written authorization of the supervisor of the requesting employee.

CHAPTER 14 (cont.)

14.5 REQUIREMENTS (cont.)

14.5.5.4 Based on special need, the Laundry Supervisor may arrange for the Shoemobile to visit the FEMP and also provide the employee with written authorization to obtain Safety Shoes.

14.5.6 Obtaining Non-WEMCO issued Safety Shoes and Low-Cut Safety Shoes

14.5.6.1 The requesting employee shall obtain a medical statement from a physician stating that the employee can not wear WEMCO issued safety shoes.

14.5.6.2 The medical statement shall be turned in to Medical Services.

14.5.6.3 Medical Services shall issue a letter to Safety Engineering stating the reason for exception.

14.5.6.4 Safety Engineering shall inform the requesting employee of ANSI Z41.1 requirements and instruct the employee to have shoes inspected and approved.

14.5.6.5 The requesting employee shall submit the bill to Safety Engineering.

14.5.6.6 Safety Engineering shall issue written approval to the Controller for reimbursement to the employee.

14.5.6.7 Managers/supervisors may order specialized safety shoes directly from a vendor provided that the shoes meet the requirements of ANSI Z41.1 and written authorization has been granted by Safety Engineering.

CHAPTER 15 - OCCUPATIONAL HEAD PROTECTION

15.1 INTRODUCTION

15.1.1 This chapter provides the basic safety requirements for head protection and the work locations, and operations where protection is required. Head protection for contamination control purposes or environmental comfort is excluded from this document.

15.2 DEFINITIONS

15.2.1 Hard Hats - Helmets, meeting the requirements of ANSI Z41, that reduce the impact of falling objects and reduce the danger of contact with high voltage conditions.

15.2.2 Bump Caps - Thin-shelled, light-weight plastic caps used in close quarters to protect against bumping fixed objects. No impact resistance is provided.

15.2.3 Flame-Resistant Cap - Fire-resistant head covering that provides protection from sparks or hot metal.

15.2.4 Protective Hair Covering - A head cover that prevents long hair from contacting moving parts of machinery.

15.2.5 Point of Operation - The area of a machine where work is performed.

15.2.6 Power Transmission Apparatus - Energy conveyance devices for driven machines, including associated and immediate equipment up to but excluding the point of operation.

15.3 RESPONSIBILITIES

15.3.1 Employees shall be responsible for complying with this chapter.

15.3.2 **Managers/Supervisors** shall be responsible for ensuring that employees are informed of, and comply with, the requirements of this chapter.

15.3.3 **Safety Engineering** shall be responsible for the following:

15.3.3.1 Establishing the requirements for occupational head protection.

15.3.3.2 Approving the use, styles, and types of head protection for various job classifications, work locations, and specific work being performed.

15.3.4 **Project Management and Acquisition (PM&A)** shall be responsible for maintaining an adequate stock of the styles and sizes of approved occupational head protection.

15.4 GENERAL

15.4.1 Cracked (or otherwise damaged), ragged, worn, or defective occupational head protection shall be discarded.

15.4.2 Bump caps shall not be substituted for hard hats when additional head protection is required.

15.4.3 Hard hats/bump caps shall not be painted. Hats/caps that have been painted shall not be worn.

15.4.4 Stickers or other covering shall not be affixed to hard hats/bump caps to cover cracks.

15.5 REQUIREMENTS

15.5.1 Hard Hats

15.5.1.1 Personnel entering a designated construction area or a zone that is posted "Hard Hats Required" shall wear a hard hat while in the area.

15.5.1.2 Personnel working within the swing radius of a mobile crane or aerial lift shall wear a hard hat.

15.5.1.3 Personnel operating powered mobile lifting platforms shall wear a hard hat.

15.5.1.4 Personnel shall wear a hard hat if the SOP for that task requires impact resistant head protection.

15.5.1.5 Personnel shall wear a hard hat when specified by a "Work Permit" and/or a "Radiation Work Permit," while working below scaffolding, ladders, or other elevated locations, or as directed by Safety Engineering.

15.5.1.6 Personnel working in or near an excavation shall wear hard hats.

15.5.2 Bump Caps

15.5.2.1 Personnel shall wear a bump cap if the SOP for that task requires limited head protection.

15.5.2.2 Personnel shall wear a bump cap when directed by the supervision and/or Safety Engineering.

CHAPTER 15 (cont.)

15.5 REQUIREMENTS (cont.)

15.5.3 Flame Resistant Caps

15.5.3.1 Personnel engaged in overhead cutting or welding shall wear a flame resistant cap.

15.5.3.2 Personnel shall wear a flame resistant cap if the SOP for that task requires fire-proof head protection.

15.5.3.3 Personnel shall wear a flame resistant cap when specified by a "Work Permit" and/or a "Radiation Work Permit" or as directed by Safety Engineering.

15.5.4 Protective Hair Covering

15.5.4.1 Employees with hair that is three inches or longer or touches any part of the shoulder and work within one foot of a point of operation or unguarded power transmission apparatus, shall wear a protective hair covering that completely covers the hair.

15.5.4.2 Hair that can be controlled through grooming techniques to prevent the possibility of hair entanglement with moving parts is an acceptable substitute for protective hair coverings.

15.5.4.3 Hair nets, bandannas, and turbans are not approved hair coverings.

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CHAPTER 16 - OPERATION OF POWERED INDUSTRIAL TRUCKS

16.1 INTRODUCTION

16.1.1 This chapter provides safety requirements for operating fork trucks, powered industrial trucks, intra-plant tractors, and electric carts.

16.2 DEFINITIONS

16.2.1 Fork Truck - Powered industrial equipment that is controlled by a riding operator and is used to lift and move materials.

16.2.2 Walk-Behind or Stand-Up Operated Powered Industrial Truck (Handstacker) - A motorized hand truck that is controlled by a walking operator.

16.2.3 Intra-Plant Tractor - Motorized equipment used to transport trailers in the plant (considered a powered industrial truck).

16.2.4 Electric Carts - A battery powered vehicle used to transport personnel and craft equipment (considered a powered industrial truck).

16.2.5 Towmotor - Powered industrial truck used to tow or push trailers or vehicles.

16.2.6 Unattended Power Industrial Truck - A powered industrial truck that is parked and the operator is more than 25 feet away or the truck is not in view of the operator.

16.3 RESPONSIBILITIES

16.3.1 **Operators** shall responsible for complying with the requirements of this chapter.

16.3.2 **Managers/Supervisors** shall be responsible for ensuring that operators comply with this chapter and that they receive required training.

16.3.3 **Maintenance** shall be responsible for the following:

16.3.3.1 Maintaining powered industrial trucks in a safe operating condition.

16.3.3.2 Providing required operator training and selection.

16.3.4 **Safety Engineering** shall be responsible for performing a annual safety review of powered industrial trucks operation.

16.4 GENERAL

16.4.1 Operators of powered industrial trucks shall observe all traffic and instruction signs and maintain control of trucks.

16.4 GENERAL (cont.)

16.4.2 Powered industrial trucks shall not be used in an operation for which the truck was not designed.

16.4.3 Operators shall yield right-of-way to pedestrian and emergency traffic.

16.4.4 In case of an accident involving a powered industrial truck, the operator shall report immediately to the AEDO.

16.4.5 A powered industrial truck or other vehicle that is not in a safe operating condition shall be removed from service immediately and the Garage Supervisor notified. The truck/vehicle shall be transported as directed by the Garage Supervisor.

16.4.6 Only authorized mechanics shall repair powered industrial trucks.

16.4.7 Operators of powered industrial trucks shall ensure that name plates are in place and legible.

16.4.8 Only qualified personnel shall operate powered industrial trucks.

16.4.9 Fire exits, aisles, and access to emergency equipment shall not be blocked by powered industrial trucks.

16.4.10 Stunt driving and horseplay is strictly prohibited.

16.4.11 Electric carts shall not be operated in a building except when used to transport heavy tools/equipment to a Maintenance work site or to access a battery charging station.

16.5 REQUIREMENTS

16.5.1 Inspection of Powered Industrial Trucks

NOTE: Powered industrial trucks shall be inspected by the operator at the beginning of each shift.

16.5.1.1 Fuel shall be checked and documented on a "Fueled Equipment Operator's Checklist," Form FMPC-ADMS-2414.

16.5.1.2 Electrically powered industrial truck inspection shall be documented on an "Electric Truck Operator's Daily Checklist," Form FMPC-ADMS-2415.

16.5.2 Powered Industrial Truck Operation

16.5.2.1 Powered industrial trucks shall not be driven up to anyone standing in front of a fixed object.

CHAPTER 16 (cont.)

16.5 REQUIREMENTS (cont.)

16.5.2.2 Personnel shall not pass or stand under the elevated portion of a powered industrial truck.

16.5.2.3 Personnel shall not ride on powered industrial trucks unless seating is provided.

16.5.2.4 Operators shall not place arms or legs between uprights of the mast or outside the running lines of the truck.

16.5.2.5 Before a powered industrial truck is left unattended, the controls shall be neutralized, load engaging means fully lowered, power off, brake set, and wheels blocked (if parked on an incline).

16.5.2.6 A safe distance shall be maintained from the edge of ramps or platforms.

16.5.2.7 LPG fueled units shall have the LPG turned off at the tank if the truck will not be used for more than 30 minutes.

16.5.2.8 Operator shall reduce speed and sound the horn when entering or exiting a building, at blind corners, and other locations where visibility is obscured.

16.5.2.9 When a load would obstruct the forward view, the unit shall travel with the load trailing.

16.5.2.10 The operator shall keep a clear view of the path of vehicular travel.

16.5.2.11 When a grade exceeds 10 percent, loaded trucks shall ascend or descend with the load upgrade.

16.5.2.12 When operating on a grade, the load and load engaging means shall be tilted back and raised far enough to clear the road surface.

16.5.2.13 Elevators shall be approached slowly and entered squarely after the elevator car is leveled.

16.5.2.13.1 Truck controls shall be neutralized, power shut off, and brakes set.

16.5.2.14 Fueled trucks shall not be left idling in a building.

16.5.2.15 Personnel shall not be lifted except in approved, secured manbaskets with an operator at the vehicle controls at all times.

16.5 REQUIREMENTS (cont.)

16.5.2.16 Operators of Intra-Plant Tractors shall have a Commercial Driver's License.

16.5.3 General Loading and Unloading Practices

16.5.3.1 Loads shall be centered, stable, and safely arranged.

16.5.3.2 Operators shall exercise caution when handling loads that cannot be centered.

16.5.3.3 Loads shall not exceed the rated capacity of the truck.

16.5.3.4 Empty trucks equipped with attachments shall be operated as partially loaded.

16.5.3.5 The load engaging means shall be placed under the load as far as possible and the mast tilted back to stabilize the load.

16.5.3.6 The mast shall only be tilted back enough to stabilize the load when stacking or tieing.

16.5.3.7 Only approved lift attachments shall be used.

16.5.4 Loading and Unloading Trucks and Railroad Cars

16.5.4.1 The floors of trucks, trailers, and railroad cars shall be inspected for deterioration, weakness, and damage before powered industrial truck is driven into the conveyance being loaded/unloaded.

16.5.4.2 Dockboard and bridgeplates shall be checked for rated capacity, secured, and driven over slowly if the capacity is not exceeded.

16.5.4.3 Brakes of highway and intra-plant tractors being boarded by powered industrial trucks shall be set and the rear wheels chocked to prevent the tractor from rolling.

16.5.4.4 Wheel stops shall be used to prevent railroad cars from moving during loading and unloading.

16.5.4.5 Fixed jacks may be used to prevent uncoupled semi-trailers from upending during loading and unloading.

16.5.5 Changing and Charging Electric Vehicle Batteries

16.5.5.1 Batteries shall be charged in designated areas.

CHAPTER 16 (cont.)

16.5 REQUIREMENTS (cont.)

16.5.5.2 Electric carts shall only be charged at receptacles equipped with a ground fault interrupter circuit (GFCI).

16.5.5.3 Electric carts shall be plugged directly into the receptacle. The use of extension cords is prohibited.

16.5.5.4 Smoking, open flames, and sparks shall be prohibited in battery charging areas.

16.5.5.5 Powered industrial trucks shall be positioned and brakes applied before charging or changing batteries.

16.5.5.6 Batteries being installed shall be positioned and secured in place.

16.5.5.7 A carboy tilter or siphon shall be used for handling electrolyte liquid.

16.5.5.8 Acid shall be poured into water, water shall not be poured into acid.

16.5.6 Gasoline, LPG, and Diesel Engine Fueling

16.5.6.1 Fuel tanks shall not be filled while the vehicle engine is running or left unattended.

16.5.6.2 Oil and/or fuel spills shall be cleaned up immediately.

16.5.6.3 Smoking, open flames, and unguarded heat sources shall be strictly prohibited while refueling.

16.5.6.4 Full LPG cylinders shall be stored in designated areas.

16.5.6.5 Empty LPG cylinders shall be stored upside down in LPG carts.

16.5.6.6 Damaged or defective LPG cylinders shall be removed, the supervisor notified, and the cylinder tagged out of service.

16.5.6.7 Full LPG cylinders shall be handled in the upright position and properly secured when transporting them.

16.5.6.8 LPG cylinders shall be mounted properly and be secured to the vehicle.

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CHAPTER 17 - EXTENSION CORD SETS AND SUPPLY CORDS USE

17.1 INTRODUCTION

17.1.1 This chapter provides the FEMP requirements for extension cord sets and supply cords (including field constructed cords) for voltages less than 600 volts.

17.1.2 This procedure does not apply to temporary power taps (multiple outlet strips) or surge and noise suppressors on flexible cords.

17.2 DEFINITIONS

17.2.1 Adapter - For the purpose of this chapter, an adapter is a device which allows an electrical plug of a certain configuration to be attached to an electric outlet with a different configuration.

17.2.2 Attachment Plug - A device inserted into an electrical outlet (receptacle) to make electrical contact between the source of electricity and the wires of the cord.

17.2.3 Cord Connector - A device on the end of an extension cord set into which an attachment plug is inserted in order to make electrical contact.

17.2.4 Extension Cord Set (General-Use) - An assembly, meeting the requirements of UL-817 for "general-use", consisting of (1) a length of flexible cord, (2) an attachment plug, (3) a cord connector, and (4) an optional cord switch.

17.2.5 Extension Cord Set (Outdoor-Use) - An assembly, meeting the requirements of UL-817 for "outdoor-use", consisting of (1) a length of flexible cord, (2) an attachment plug, and (3) a cord connector.

17.2.6 Ground-Fault Circuit-Interrupter (GFCI) - A device that deenergizes a circuit within an established period of time when a current to ground exceeds a predetermined value (0.005 amps for a Class A GFCI).

17.2.7 Listed (Labeled, Accepted, Certified) - Words meaning the tool was tested and found (1) safe when used as directed, or (2) to meet a nationally recognized standard.

17.2.7.1 Listing shall be by a Nationally Recognized Testing Laboratory such as Underwriters Laboratory Inc. (UL) or Factory Mutual Research Corp. (FM or FMRC).

17.2.8 Locations

17.2.8.1 Conductive Location - Any area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or other source of running water.

CHAPTER 17 (cont.)

17.2 DEFINITIONS (cont.)

17.2.8.2 Damp Location - Any (1) partially sheltered outdoor area (such as a roofed open porch) or (2) interior location subject to moderate degrees of moisture (such as some basements).

17.2.8.3 Dry Location - Any indoor area that temporarily can be, but is not normally subject to dampness or wetness.

17.2.8.4 Hazardous Location - Any area where fire or explosion is possible due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

17.2.8.5 Wet Location - Any area subject to saturation with water, including (1) areas underground like a "manhole", (2) vehicle washing areas, and (3) areas exposed to the weather and unprotected.

17.2.8.5.1 At a given time, a "wet location" might not be wet or conductive.

17.2.9 Short-Term Extension Cord Set Use - The use of an extension cord set is considered short-term if the set is rolled up and put away at the end of the day, or sooner.

17.2.10 Supply Cord (Non-Detachable) - A flexible cord (1) with an attachment plug, (2) with or without a cord switch, and (3) with the load end of the cord not removable from the instrument/appliance.

17.2.11 Supply Cord (Detachable) - A flexible cord (1) with an attachment plug, (2) with or without a cord switch, and (3) with a single outlet appliance connector which plugs into the instrument/appliance.

17.2.12 Temporary Extension Cord Set Use - The use of an extension cord set is considered temporary if it will be in place less than 90 days.

17.2.13 Temporary Power Tap (TPT) - A device, plugged into a receptacle outlet to increase the number of outlets available, consisting of (1) a plug, (2) a flexible cord, and (3) an outlet assembly with three or more outlets and other features such as an on/off switch, pilot light, overcurrent device, surge suppression, etc.

17.2.14 Treadle Pad - a rubber-like device used to (1) protect a flexible cord from damage where it crosses a walkway, and (2) prevent personnel from tripping on the cord.

CHAPTER 17 (cont.)

17.3 RESPONSIBILITIES

17.3.1 Employees shall be responsible for complying with the requirements of this chapter.

17.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

17.3.3 Project Management and Acquisition (PM&A) shall be responsible for ensuring that subcontractors and vendors implement and comply with the requirements of this chapter.

17.3.4 Safety Engineering shall be responsible for providing assistance when additions, corrections and/or engineering determinations are required for this chapter.

17.4 GENERAL

17.4.1 Every factory-assembled and/or field constructed extension cord set and supply cord shall meet or exceed the listing requirements of UL-817.

17.4.2 When not in use, extension cord sets and supply cords shall be coiled and stored where they cannot be damaged.

17.4.3 When in place, extension cord sets and supply cords shall be provided with protection from damage.

17.4.3.1 Pinch points can be avoided in indoor traffic areas by (1) running the cord along the floor in treadle pads, or (2) running cords overhead (ensuring support at appropriate intervals).

17.4.3.2 In outdoor traffic areas, cords can be run overhead or between boards or poles on the ground.

17.4.3.3 Warning cones, along with some other means (if appropriate), may be used to protect a short-term cord and to prevent personnel from tripping over it.

17.4.4 No extension cord set or supply cord shall be run over sharp objects or hot pipes.

17.4.5 No extension cord set or supply cord shall be held in place with metal devices.

17.4.6 Supply cords and extension cord sets shall be arranged to prevent tripping hazards.

17.4.6.1 Taping a short-term cord to the floor as the only measure to prevent tripping is not permitted at the FEMP.

CHAPTER 17 (cont.)

17.4 GENERAL (cont.)

17.4.7 Every extension cord set shall contain an equipment grounding conductor.

17.4.8 Every extension cord set, when moved to a different location, shall be checked for (1) damaged or deformed outer jacket, (2) loose prongs, and (3) cracks or slices in the outer jacket.

17.4.8.1 Defective extension cord sets shall be removed from service and repaired or discarded.

17.4.9 Only extension cord sets with No.12 AWG (or larger) wires in the flexible cord may be repaired.

17.4.9.1 Repaired cords must have the same insulation properties and outer jacket properties, as the original cord.

17.4.10 A supply cord or extension cord set shall not be exposed to damage from feet, chairs, moving equipment, stored equipment, heat or hot pipes.

17.4.11 Every extension cord set shall be rated for hard or extra hard service. (Table 17-1)

17.4.12 Unless otherwise written in this document, a 120-volt extension cord set with a wire size of No.14 AWG or larger may have up to three outlets.

17.4.13 Extension cord sets, for voltages higher than 120 volts, shall have only one outlet.

17.4.14 No extension cord set or supply cord shall go through doors, or holes in walls, floors or ceilings unless all of the following are met: (1) it is short-term, (2) it is protected from physical damage, (3) voltage is less than 150 volts, and (4) it is protected by a suitable size circuit breaker.

17.4.15 Every extension cord set shall have a minimum wire size greater than or equal to the ampere rating marked on the nameplate of the equipment to which it is connected. (Tables 17-1 and 17-2)

17.4.16 If an extension cord set is protected by an integral GFCI, the GFCI shall be tested before each days use.

17.4.17 In unusual or emergency conditions, approval of Safety Engineering shall be obtained before using an extension cord set or supply cord for other than defined uses.

17.4.18 The grounding conductor in a flexible cord shall be tested by qualified personnel when there is some evidence of damage and/or following any repairs.

CHAPTER 17 (cont.)

17.4 GENERAL (cont.)

17.4.19 Every 120-volt extension cord set used in a wet location or an outside damp location shall be GFCI protected by one of the following methods: (1) a GFCI protected outlet, (2) an integral GFCI, (3) a portable GFCI located indoors or (4) an outdoor-use listed portable GFCI which is protected from exposure to moisture.

17.4.20 An adapter shall never be used to connect a grounding type plug to an ungrounded receptacle.

17.5 REQUIREMENTS

17.5.1 Offices (Management and Process Areas)

17.5.1.1 An extension cord set shall not be used on equipment/appliances (such as typewriters, copying machines, fans or space heaters) unless, (1) the equipment is 120-volt, (2) a single outlet extension cord set is used, and (3) one or more of the following apply:

(A) The equipment is not within supply cord length of a permanently wired outlet or a structural surface on which a permanently wired outlet could be located.

(B) The use is short term.

(C) The supply cord is less than 6-feet long.

17.5.1.2 Given extension cord set lengths of 10, 25 and 50 feet, the shortest set which will work shall be used.

(A) These lengths are Stores items.

17.5.1.3 An extension cord set shall not supply a Temporary Power Tap.

17.5.1.4 An extension cord set with a minimum wire size of No.16 AWG may be used if it has only one outlet.

17.5.2 Process and Storage Areas

17.5.2.1 Except during initial setup and testing, extension cord sets shall not be used to supply stationary (non-portable) production equipment.

17.5.2.2 An extension cord set may supply a frequently moved piece of production equipment, such as a drum inspection stand.

CHAPTER 17 (cont.)

17.5 REQUIREMENTS (cont.)

17.5.2.3 An extension cord set may supply portable production equipment when the equipment must be used over a wide undefined area.

17.5.2.4 An extension cord set shall not be used on production support equipment, such as electronic scales, fans, space heaters or similar equipment, unless this equipment is frequently moved (monthly).

17.5.2.5 The outer jacket of extension cord sets used in areas containing chemicals or other destructive agents (including spilled oil) shall (1) be listed for that purpose or (2) be both protected from contact with chemicals or checked at least weekly for deterioration.

17.5.2.6 Extension cord sets used outdoors shall be listed for "outdoor-use". (Table 17-2)

17.5.2.7 Extension cord sets shall have a minimum wire size of No.14 AWG.

17.5.2.8 120-volt extension cord sets that are used in wet, damp or conductive locations shall be protected with a GFCI.

17.5.2.9 Extension cord sets shall be visible, except where protected by treadle pads or similar devices.

17.5.3 Safety and Environmental Test Equipment

17.5.3.1 No extension cord set shall supply power to permanently located (in place for 90 days or longer) test equipment, unless approved by Safety Engineering.

(A) Memo requests for approval of longer term use shall be submitted, in advance, to Safety Engineering.

17.5.3.2 GFCI protection shall be provided for any 120-volt extension cord set supplying power to personnel monitoring equipment (such as friskers) that comes in frequent contact with personnel.

17.5.3.3 An extension cord set may supply power to test equipment if it is to be in place for less than 90 days.

17.5.3.4 If a 120-volt extension cord set (or the equipment it supplies) is in a wet, damp or conductive location, the extension cord set shall be GFCI protected.

CHAPTER 17 (cont.)

17.5 REQUIREMENTS (cont.)

17.5.3.5 Every extension cord set used with test equipment shall be listed for outdoor-use and be equipped with a single outlet cord connector, unless more than one piece of equipment is needed.

(A) If more than one piece of test equipment is needed at the same location, then an extension cord set with three outlets may be used.

17.5.3.6 The individual responsible for removing the test equipment shall remove the extension cord set and return it to storage.

17.5.3.7 Minimum wire size for an extension cord set shall be No.14 AWG.

17.5.4 Maintenance Operations

17.5.4.1 Extension cord sets used by the maintenance department shall meet UL-817 requirements for outdoor use. (Table 17-2)

17.5.4.2 Extension cord sets used with 120 volt, portable, hand-held tools in a wet, damp or conductive location shall be protected by a GFCI.

17.5.4.3 No more than two extension cord sets shall be connected together.

17.5.4.3.1 The connection between the two extension cord sets shall be in an area protected from moisture.

17.5.4.4 The minimum wire size for an extension cord set shall be No.14 AWG.

17.5.4.5 The attachment plug and/or cord connector of every flexible cord shall be protected so that tension on the cord will not be transmitted to the plug and/or connector.

17.5.4.6 Extension cord sets may be used by maintenance personnel to apply power to stationary equipment during repair, testing or calibration.

17.5.5 Construction Sites and Field Activities

17.5.5.1 Extension cord sets (120 volt) used by FEMP personnel, contractors, vendors and/or subcontractors shall be GFCI protected.

CHAPTER 17 (cont.)

17.5 REQUIREMENTS (cont.)

(A) Where temporary wiring supplies power to the extension cord set, the receptacle outlet shall be GFCI protected.

17.5.5.2 Extension cord sets shall have a minimum wire size of No.14 AWG.

17.5.5.3 Extension cord sets shall meet the listing requirements of UL-817 for "outdoor-use". (Table 17-2)

17.5.5.4 No more than two extension cord sets shall be connected together.

(A) The connection shall be in an area protected from moisture.

17.5.5.5 The attachment plug and/or cord connector of every extension cord set and supply cord shall be protected so that tension on the cord will not be transmitted to the plug and/or connector.

17.5.5.6 An extension cord set shall have no more than three outlets.

(A) An "adapter cord set" (an attachment plug, a length of extra-hard-use cord less than 2 ft long and a cord connector with three outlets) may be used on a single outlet extension cord set.

17.5.6 Field Constructed Extension Cord Sets

17.5.6.1 Field constructed extension cord sets shall be made with all UL (or equivalent) listed components (listed for the intended use).

17.5.6.2 Field constructed extension cord sets shall be constructed by qualified persons.

17.5.6.3 Attachment plugs and connector bodies shall be dead-front construction (have no exposed metal parts that could become current carrying).

17.5.6.4 Flexible cord shall have (1) an outer jacket meeting the requirements of this procedure, and (2) have an appropriate voltage rating.

17.5.6.5 The minimum wire size for an extension cord set shall be No.14 AWG.

CHAPTER 17 (cont.)

17.5 REQUIREMENTS (cont.)

17.5.6.6 120 volt extension cord sets (No.14 AWG or larger) may have device boxes with up to three outlets when the device boxes (1) are non-metallic, (2) have an integral cord grip with no exposed metal parts, and (3) are equipped with nonmetallic weatherproof covers.

17.6 APPLICABLE DOCUMENTS

17.6.1 29 CFR 1910 - Occupational Safety and Health Standards (OSHA)

17.6.2 29 CFR 1926 - Safety and Health Regulations for Construction (OSHA)

17.6.3 NFPA 70 - National Electrical Code

17.6.4 NFPA 70E - Electrical Safety Requirements for Employee Workplaces

17.6.5 ANSI/UL 817-1986 - Cord Sets and Power-supply Cords

17.7 FORMS USED

None

17.8 EXHIBITS

17.8.1 Table 17-1 - General-Use Cord Sets and Supply Cords

17.8.2 Table 17-2 - Outdoor-Use Cord Sets and Supply Cords

TABLE 17-1

GENERAL USE CORD SETS AND SUPPLY CORDS
(from ANSI/UL 817, Table 150.2)

CORD TYPE FOR HARD OR EXTRA HARD SERVICE	CONDUCTOR SIZE AWG	NUMBER OF CURRENT CARRYING CONDUCTORS	MAXIMUM CURRENT AT 30°C AMBIENT	
			LENGTH 6-50 ft	LENGTH >50 ft
(600V rating	16	2	13	10
AWG 16 to 2)	16	3	10	7
S, SO, SOO	14	2	18	13
ST, STO,	14	3	15	10
STOO, SE,	12	2	25	18
SEO.	12	3	20	15
	10	2	30	25
(300V rating	10	3	25	20
AWG 16 to 10)	8	2	40	30
SJ, SJO,	8	3	35	25
SJOO, SJT,	6	2	55	40
SJTO, SJTOO,	6	3	45	35
SJE. SJEO.	4	2	70	55
	4	3	60	45
	2	2	95	70
	2	3	80	60

NOTES:
1. See NFPA 70, Art. 400-5 for additional information on cord sets with more current carrying conductors or use at higher ambient temperatures.
2. "O" in the cord type denotes oil resistant outer cord cover.
3. "OO" in the cord type denotes oil resistant outer cord cover and oil resistant insulation on the conductors.

TABLE 17-2

OUTDOOR-USE CORD SETS AND SUPPLY CORDS
(from ANSI/UL 817, Table 25.1)

CORD TYPE FOR HARD OR EXTRA HARD SERVICE	CONDUCTOR SIZE AWG	NUMBER OF CURRENT CARRYING CONDUCTORS	MAXIMUM CURRENT AT 30°C AMBIENT	
			LENGTH 6-50 ft	LENGTH >50 ft
(600V rating	14	2	15	
AWG 16 to 2)	14	3	15	
S, SO, SOO	12	2	20	15
ST, STO,	12	3	20	15
STOO, SE,	10	2	30	20
SEO.	10	3	30	20
	8	2	30*	30
(300V rating	8	3	30*	20
AWG 16 to 10)	6	2	50	30*
SJ, SJO,	6	3	30*	30*
SJOO, SJT,	4	2	60	50
SJTO, SJTOO,	4	3	60	30*
SJE. SJEO.	2	2	60*	60
	2	3	60*	60

* while it may be an oversight in the standard, intermediate values for cord sizes marked with an asterisk are not listed in the table and must be assumed to be approved for the conservative values shown.

NOTES:
1. Outdoor rated cord sets are denoted by "W-A" as a suffix on the cord type.
2. "O" in the cord type denotes oil resistant outer cord cover.
3. "OO" in the cord type denotes oil resistant outer cord cover and oil resistant insulation on the conductors.

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CHAPTER 18 - USE OF ELECTRIC HAND TOOLS

18.1 INTRODUCTION

18.1.1 This chapter provides the requirements for the use of all portable, hand-held, plug connected, 120 volt, electric tools used at FEMP.

18.1.1.1 Examples of electric hand tools include, but are not limited to: (1) drills, (2) saber saws, (3) circular saws, (4) staplers, (5) nail guns, (6) sanders, (7) hand grinders and (8) hedge clippers.

18.2 DEFINITIONS

18.2.1 Adapter - For the purpose of this chapter, an adapter is a device which allows an electrical plug of a certain configuration to be attached to an electric outlet with a different configuration.

18.2.2 Construction Activities - Construction, alteration and/or repair including painting and decorating.

18.2.3 Ground-Fault Circuit-Interrupter (GFCI) - A device that deenergizes a circuit within an established period of time when a current to ground exceeds a predetermined value (0.005 amps for a Class A GFCI).

18.2.4 Listed (Labeled, Accepted, Certified) - Words meaning the tool was tested and found (1) safe when used as directed, or (2) to meet a nationally recognized standard.

18.2.4.1 Listing shall be by a Nationally Recognized Testing Laboratory such as Underwriters Laboratory Inc. (U.L.) or Factory Mutual Research Corp. (FM or FMRC).

18.2.5 Locations

18.2.5.1 Conductive Location - Any area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or other source of running water.

18.2.5.2 Damp Location - Any (1) partially sheltered outdoor area (such as a roofed open porch) or (2) interior location subject to moderate degrees of moisture (such as some basements).

18.2.5.3 Dry Location - Any indoor area that temporarily can be, but is not normally subject to dampness or wetness.

18.2.5.4 Hazardous Location - Any area where fire or explosion is possible due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

CHAPTER 18 (cont.)

18.2 DEFINITIONS (cont.)

18.2.5.5 Wet Location - Any area subject to saturation with water, including (1) areas underground like a "manhole", (2) vehicle washing areas, and (3) areas exposed to the weather and unprotected.

18.2.5.5.1 At a given time, a "wet location" might not be wet or conductive.

18.2.6 Temporary Power Tap (TPT) - A device, plugged into a receptacle outlet to increase the number of outlets available, consisting of (1) a plug, (2) a flexible cord, and (3) an outlet assembly with three or more outlets and other features such as an on/off switch, pilot light, overcurrent device, surge suppression, etc.

18.3 RESPONSIBILITIES

18.3.1 Employees shall be responsible for complying with the requirements of this chapter.

18.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

18.3.3 Project Management and Acquisition (PM&A) shall be responsible for ensuring that subcontractors and vendors implement and comply with the requirements of this chapter.

18.3.4 Safety Engineering shall be responsible for providing assistance when additions, corrections and/or engineering determinations are required for this chapter.

18.4 GENERAL

18.4.1 Every tool shall be used as directed in the manufacturer's owners/safety manual.

18.4.2 When not in use, every tool shall be unplugged and located where it is not subject to physical abuse.

18.4.3 Every tool shall be maintained so the motor and other working parts can get adequate cooling air.

18.4.4 Every tool shall be listed for the location (wet, damp, hazardous, etc.) where it is used.

18. Exposed metal parts of every tool shall be grounded, unless the tool is labeled "double insulated".

18.4.6 Every tool with electrical wires or parts shall have a grillwork or other protection to prevent hazardous electric shocks to personnel

CHAPTER 18 (cont.)

18.4 GENERAL (cont.)

18.4.7 Every tool housing shall be complete, with all covers, guards and other safety items properly attached.

18.4.7.1 No portions of fixed guards shall be removed.

18.4.7.2 No portions of movable guards shall be restrained from movement by tape or dirt or other means.

18.4.8 No tool shall ever be used in a hazardous location, unless it is listed for use in that specific type of location.

18.4.9 Every supply cord shall be arranged so it is not a tripping hazard and is not subject to damage.

18.4.10 Supply cords shall be inspected for cracks, loose or missing pins and/or other damage before each use.

18.4.10.1 Tools with damaged supply cords shall be removed from service.

18.4.11 An extension cord set may be used if it is permitted in the ISRM chapter "FEMP Extension Cord Sets and Supply Cords Use".

18.4.12 A cord-connected temporary power tap may be used if it is permitted in the ISRM chapter "FEMP Use of Temporary Power Taps.

18.4.13 An adapter shall never be used to connect a grounding type plug to an ungrounded receptacle.

18.4.14 Every tool must have the following information marked on its surface by the manufacturer:

18.4.14.1 Tool voltage and amps or watts.

18.4.14.2 Manufacturer's name or logo.

18.4.14.3 Listing Agency.

18.4.15 When both an extension cord and a GFCI are used, the GFCI shall protect the extension cord.

18.4.16 Tools shall not be modified.

18.4.17 Defective or broken tools shall be removed from service.

18.4.18 The tool operating manual shall be readily available.

18.4.19 Safety glasses and/or face shields shall be used when required in OSHA 29 CFR 1926.102.

CHAPTER 18 (cont.)

18.4 GENERAL (cont.)

18.4.20 Hearing protection shall be used when required in OSHA 29 CFR 1926.52.

18.4.21 Respiratory protection shall be used when required by OSHA standards or site procedures.

18.4.22 The maximum current rating of any tool is 80% of the current rating of the branch overcurrent device.

18.5 REQUIREMENTS

18.5.1 Wet, Damp or Conductive Locations

18.5.1.1 GFCI protection shall be used on tools (1) used in wet, or outside-damp locations, or (2) tools used for construction activities.

18.5.1.1.1 GFCI protection is covered in the ISRM chapter "FEMP Use of Ground-Fault Circuit-Interrupters".

18.5.1.2 Tools used outdoors or in other wet locations shall be taken indoors or otherwise protected from rain or moisture when not in use.

18.5.1.3 Tools shall not be used when wet, unless they are listed for wet locations.

18.5.1.4 Tools shall not be plugged in or unplugged if the plug or the users hands are wet.

18.5.2 Specific Tools

18.5.2.1 Circular Saws - No circular saw shall be used with a (1) cracked blade, (2) bent blade, or (3) blade with a lower rpm rating than the rating of the saw.

18.5.2.2 Hand Grinders - No hand grinder shall be used with a (1) cracked wheel, (2) unbalanced wheel, or (3) wheel with a lower rpm rating than the rating of the grinder.

18.6 APPLICABLE DOCUMENTS

18.6.1 29 CFR 1910 subpart S - (OSHA) - Occupational Safety and Health Standards: Electrical

18.6.2 29 CFR 1910.243 - (OSHA) - Occupational Safety and Health Standards: Guarding of Portable Powered Tools

CHAPTER 18 (cont.)

18.6 APPLICABLE DOCUMENTS (cont.)

18.6.3 29 CFR 1926 subpart K - (OSHA) - Safety and Health Regulations for Construction - Electrical

18.6.4 29 CFR 1926 subpart E - Personnel Protective and Life Saving Equipment.

18.6.4 NFPA 70 - National Electrical Code

18.6.5 Industrial Safety Requirements Manual - FEMP Use of Ground-Fault Circuit-Interrupters

18.6.6 Industrial Safety Requirements Manual - FEMP Extension Cord Sets and Supply Cords Use

18.6.7 Industrial Safety Requirements Manual - FEMP Use of Temporary Power Taps

18.7 FORMS USED

None

18.8 EXHIBITS

None

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CHAPTER 19 - USE OF CORD & PLUG-CONNECTED ELECTRIC FANS

19.1 INTRODUCTION

19.1.1 This chapter provides the requirements for the use of all portable, plug-connected, electric fans (air mover, fire service ventilation fan, blower etc.) that are used at FEMP.

19.2 DEFINITIONS

19.2.1 Adapter - For the purpose of this chapter, an adapter is a device which allows an electrical plug of a certain configuration to be attached to an electric outlet with a different configuration.

19.2.2 Constantly Attended - An item is constantly attended if it is in the same part of the room as, or is within view of, a person - except for a short period (15 minutes).

19.2.3 Dedicated Branch Circuit - An overcurrent device (circuit breaker) in an electrical panelboard which is connected to only one receptacle outlet.

19.2.4 Ground-Fault Circuit-Interrupter (GFCI) - A device that deenergizes a circuit within an established period of time when a current to ground exceeds a predetermined value (0.005 amps for a Class A GFCI).

19.2.5 Listed (Labeled, Accepted, Certified) - Words meaning the fan was tested and (1) found safe when used as directed, or (2) met a nationally recognized standard.

19.2.5.1 Listing shall be by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratory Inc. (U.L.) or Factory Mutual Research Corp. (FM or FMRC).

19.2.6 Locations

19.2.6.1 Conductive Location - Any area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or source of running water.

19.2.6.2 Damp Location - Any (1) partially sheltered outdoor area (such as a roofed open porch) or (2) interior location subject to moderate degrees of moisture (such as some basements).

19.2.6.3 Dry Location - Any indoor area that temporarily can be, but is not normally subject to dampness or wetness.

19.2 DEFINITIONS (cont.)

19.2.6.4 Hazardous Location - Any area where fire or explosion is possible due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

19.2.6.5 Wet Location - Any area subject to saturation with water, including (1) areas underground like a "manhole", (2) vehicle washing areas, and (3) areas exposed to the weather and unprotected.

19.2.6.5.1 At a given time, a "wet location" might not be wet or conductive.

19.2.7 Temporary Power Tap (TPT) - A device, plugged into a receptacle outlet to increase the number of outlets available, consisting of (1) a plug, (2) a flexible cord, and (3) an outlet assembly with three or more outlets and other features such as an on/off switch, pilot light, overcurrent device, surge suppression, etc.

19.3 RESPONSIBILITIES

19.3.1 Employees shall be responsible for complying with the requirements of this chapter.

19.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

19.3.3 Project Management and Acquisition (PM&A) shall be responsible for ensuring that subcontractors and vendors, involved in construction or other work, implement and comply with the requirements of this chapter.

19.3.4 Safety Engineering shall be responsible for providing staff assistance when additions, corrections and/or engineering determinations are required for this chapter.

19.3.5 The Facility Owner shall be responsible for permitting or prohibiting the use of certain fans at some or all locations in his/her facility.

19.4 GENERAL

19.4.1 Every fan shall only be used as directed in the manufacturer's owners/safety manual.

19.4.2 Every fan shall be located where it is not subject to physical abuse.

19.4.3 Every fan shall be located so the motor can get adequate cooling air.

CHAPTER 19 (cont.)

19.4 GENERAL (cont.)

19.4.4 Every fan shall be listed for the location (wet, outdoor, indoor, damp etc.) where it is used.

19.4.5 The metal housing and grillwork of every fan shall be grounded unless it is labeled "double insulated".

19.4.6 Every fan with electrical wires or parts shall have a grillwork or other protection to prevent hazardous electric shocks to personnel.

19.4.7 Every fan housing shall be complete, with all covers properly attached.

19.4.8 Every fan, with moving parts less than 7 feet above the floor, must have a grillwork to protect personnel from injury.

19.4.8.1 The grillwork must be such that a hand-held rod which is 0.51 inch diameter and 4 inches long cannot touch any dangerous moving part.

19.4.9 No fan shall ever be used in a hazardous location, unless it is listed for use in that specific type of location.

19.4.10 Every supply cord shall be arranged so it is not a tripping hazard and is not subject to damage.

19.4.11 Supply cords shall not have splices or repairs.

19.4.12 An extension cord may be used if it is permitted in the ISRM chapter "FEMP Extension Cord Sets and Supply Cords Use".

19.4.13 A cord-connected temporary power tap may be used if is permitted in the ISRM chapter "FEMP Use of Temporary Power Taps".

19.4.14 An adapter shall never be used to connect a grounding plug to an ungrounded receptacle.

19.4.15 Every fan must have the following information marked on its surface by the manufacturer:

19.4.15.1 Fan voltage and amps or watts.

19.4.15.2 Manufacturer's name or logo.

19.4.15.3 Listing Agency.

19.4.16 When in use, every fan (used for personnel cooling) shall be "constantly attended".

19.4.17 Whenever both an extension cord and a GFCI are used, the GFCI shall protect the extension cord.

19.4 GENERAL (cont.)

19.4.18 Fans shall not be modified.

19.4.19 Defective or broken fans shall be removed from service.

19.4.20 The operating manual shall be readily available.

19.5 REQUIREMENTS

19.5.1 Conductive, Damp or Wet Locations

19.5.1.1 GFCI protection shall be used on every 120 volt fan used in conductive, damp or wet locations, where personnel are frequently present.

19.5.1.1.1 GFCI protection is covered in another ISRM chapter.

19.5.1.2 No fan shall be plugged in or unplugged if the plug or the users hands are wet.

19.5.2 Branch Circuit Load Limits for Fans

19.5.2.1 The maximum current rating of any fan is 80% of the branch circuit overcurrent device rating.

19.5.2.2 The maximum rating of any 120 volt fan used in offices is 12 amps (1500 watts).

19.6 APPLICABLE DOCUMENTS

19.6.1 29 CFR 1910 subpart S - (OSHA) - Occupational Safety and Health Standards: Electrical

19.6.2 29 CFR 1910.212 - (OSHA) - Occupational Safety and Health Standards: General Requirements for All Machines

19.6.3 29 CFR 1926 subpart K - (OSHA) - Safety and Health Regulations for Construction - Electrical

19.6.4 NFPA 70 - National Electrical Code

19.6.5 Industrial Safety Requirements Manual - FEMP Use of Ground-Fault Circuit-Interrupters

19.6.6 Industrial Safety Requirements Manual - FEMP Extension Cord Sets and Supply Cords Use

19.6.7 Industrial Safety Requirements Manual - FEMP Use of Temporary Power Taps

CHAPTER 19 (cont.)

19.7 FORMS USED

None

19.8 EXHIBITS

None

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CHAPTER 20 - USE OF GROUND-FAULT CIRCUIT-INTERRUPTERS

20.1 INTRODUCTION

20.1.1 This chapter provides the requirements for GFCI protection for all activities and areas at FEMP.

20.2 DEFINITIONS

20.2.1 Constantly Attended - An item is constantly attended if it is in the same part of the room as, or is within view of a person - except for a short period (15 minutes).

20.2.2 Construction Activities - Construction, alteration and/or repair including painting and decorating.

20.2.3 Ground-Fault Circuit-Interrupter (GFCI) - A device that deenergizes a circuit within an established period of time when a current to ground exceeds a predetermined value (0.005 amps for a Class A GFCI).

20.2.3.1 Circuit Breaker GFCI - A GFCI in an electrical panelboard which also works as an overcurrent device.

20.2.3.2 Cord-Connected GFCI - An assembly of: (1) an attachment plug for connection to an electrical outlet, (2) a flexible cord, (3) a GFCI, (4) a neutral relay, and (4) one or more outlets.

20.2.3.3 Portable GFCI - A GFCI that (1) plugs into a receptacle outlet (or extension cord outlet), (2) has a GFCI protected outlet, and (3) has no flexible cord.

20.2.3.4 Receptacle GFCI - A GFCI which is an integral part of a hard-wired receptacle outlet.

20.2.4 Hard-Wired - Part of the permanent building wiring, or at a construction site, part of the temporary wiring that resembles permanent building wiring.

20.2.4.1 A hard-wired device cannot be disconnected by unplugging it.

20.2.5 Listed (Labeled, Accepted, Certified) - Listed means the device was tested and found (1) safe when used as directed, or (2) to meet a nationally recognized standard.

20.2.5.1 Listing shall be by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratory Inc. (U.L.) or Factory Mutual Research Corp. (FM or FMRC).

20.2 DEFINITIONS (cont.)

20.2.6 Locations

20.2.6.1 Conductive Location - Any area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or source of running water.

20.2.6.2 Damp Location - Any (1) partially sheltered outdoor area (such as roofed open porches) or (2) interior location subject to a moderate degree of moisture (such as some basements).

20.2.6.3 Dry Location - Any indoor area that temporarily can be, but is not normally subject to dampness or wetness.

20.2.6.4 Hazardous Location - Any area where fire or explosion is possible due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

20.2.6.5 Wet Location - Any area subject to saturation with water including (1) areas underground like a "manhole", (2) vehicle washing areas, and (3) areas exposed to the weather and unprotected.

20.2.6.5.1 At a given time, a "wet location" may not be wet or conductive.

20.2.7 Rainproof/Weatherproof Device - A device constructed to prevent rain from interfering with its operation.

20.2.8 Receptacle Outlet - For the purpose of this chapter, a receptacle outlet is a hard-wired, 120 volt, 15 or 20 amp electric outlet.

20.3 RESPONSIBILITIES

20.3.1 Employees shall be responsible for complying with the requirements of this chapter.

20.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

20.3.3 Project Management and Acquisition (PM&A) shall be responsible for ensuring that subcontractors and vendors implement and comply with the requirements of this chapter.

CHAPTER 20 (cont.)

20.3 RESPONSIBILITIES (cont.)

20.3.4 Safety Engineering shall be responsible for providing assistance when additions, corrections and/or engineering determinations are required for this chapter.

20.3.5 The Facility Owner shall be responsible for implementing testing and maintaining records on all permanently installed GFCIs in his/her area.

20.4 GENERAL

20.4.1 All GFCI protection shall meet or exceed the requirements of ANSI/UL 943-1985 for a class A GFCI.

20.4.2 Every hard-wired GFCI located outdoors shall be in a rainproof enclosure.

20.4.3 A hard-wired indoor GFCI in a wet location (1) shall be in a rainproof enclosure, or (2) the GFCI/enclosure unit shall be listed for use in a wet location.

20.4.4 Every cord-connected GFCI shall be listed for use in wet locations.

20.4.4.1 The manufacturer's test procedure shall be followed before plugging in the load (tool or equipment), since this is necessary to protect against wiring errors.

20.4.5 The "TEST" button of the GFCI shall be conveniently located to the GFCI user.

20.4.5.1 If a circuit breaker GFCI is used, the electric panelboard shall not be locked.

20.4.6 Every receptacle outlet protected by a circuit breaker GFCI shall have (1) the electrical panelboard number (location) and (2) the circuit breaker number permanently marked on each receptacle cover plate.

20.4.7 Unless specifically stated otherwise, GFCI protection shall be from a hard-wired GFCI.

20.4.8 Every GFCI protected outlet shall be a grounding type outlet.

20.4.9 Egress lighting which is part of the permanent wiring of a building shall never be GFCI protected.

20.4.10 Every GFCI shall be located such that the probability of saturation with water is minimized.

20.4.11 Every 120 volt receptacle outlet located within six feet of a sink shall be GFCI protected.

CHAPTER 20 (cont.)

20.4 GENERAL (cont.)

20.4.12 The same GFCI shall never supply both receptacle outlets and fixture lighting.

20.4.13 Whenever an extension cord is used with a GFCI, the GFCI shall protect the extension cord.

20.4.14 Every GFCI shall be listed for the type of location in which it is used.

20.5 REQUIREMENTS

20.5.1 Rest rooms

20.5.1.. Every 120 volt receptacle outlet in rest rooms shall be GFCI protected.

20.5.2 Photography Labs

20.5.2.1 Every 120 volt receptacle outlet in photo processing labs shall be GFCI protected.

20.5.2.2 Every lighting fixture or lamp which can be adjusted by hand shall be GFCI protected.

20.5.2.3 Every lighting fixture (1) less than 7 feet above the floor, and (2) over the photo processing areas, where water or other liquids are used, shall be GFCI protected.

20.5.2.4 Fixed overhead lighting (1) should not normally be GFCI protected (2) shall not be on the same GFCI as receptacle outlets (3) shall not be GFCI protected if used for egress lighting.

20.5.3 Other Laboratories

20.5.3.1 Every 120 volt receptacle outlet along benches where experiments are performed with water and/or other liquids shall be GFCI protected.

20.5.3.2 Every 120 volt receptacle outlet installed on fume hoods shall be GFCI protected.

20.5.4 Safety and Environmental Activities

20.5.4.1 All 120 volt, safety and environmental monitoring equipment shall be GFCI protected if it is (1) supplied by an extension cord set and (2) in a conductive or wet location.

CHAPTER 20 (cont.)

20.5 REQUIREMENTS (cont.)

20.5.4.2 All 120 volt, safety and environmental monitoring equipment shall be GFCI protected if it is in a wet location.

20.5.4.3 All 120 volt, monitoring equipment that comes in frequent contact with personnel (like hand/foot monitoring equipment) shall be GFCI protected.

20.5.4.4 GFCI protection for equipment which is frequently (monthly) moved may from any type of GFCI.

20.5.5 Electric Scooters with Integral Battery Chargers

20.5.5.1 Every scooter with an integral battery charger shall be GFCI protected when being charged.

(A) Any type of GFCI protection is permitted.

(B) If an integral charger cord GFCI is used, it shall be listed for use in wet locations.

20.5.6 Outdoor Activities

20.5.6.1 Every outdoor 120 volt receptacle outlet shall be GFCI protected unless, the outlet is (1) not readily accessible, (2) sheltered from the rain, and (3) installed for specific equipment (such as a sump pump).

(A) It is recommended that the GFCI be located in a dry or indoor-damp location.

20.5.6.2 GFCI protection for 120 volt power to an outdoor activity can be from any type of GFCI (see 20.4.13).

(A) A portable GFCI may be used outside only if it is protected from exposure to moisture and moved to a dry location if it starts to rain.

20.5.7 Construction Activities

20.5.7.1 Every 120 volt receptacle outlet that is not part of the permanent wiring of a building shall be GFCI protected unless, the receptacle outlet is (1) not readily accessible, (2) sheltered from the rain, and (3) installed for specific equipment (such as a sump pump).

20.5 REQUIREMENTS (cont.)

20.5.7.2 Every 120 volt item used by personnel shall be GFCI protected.

(A) When permanent building wiring is used for construction activities, protection may be from any type of GFCI.

20.5.7.3 Every cord-connected GFCI shall be listed for outdoor use.

20.5.7.4 Every 120 volt outside receptacle outlet shall be protected by a GFCI unless it is (1) not readily accessible, (2) sheltered from the rain, and (3) installed for specific equipment (such as a sump pump).

20.5.7.5 Every 120 volt receptacle outlet installed on a portable or vehicle-mounted generator shall be GFCI protected unless the generator (1) is 2-wire (120 volt only and single-phase), (2) is rated at 5kW or less, and (3) circuit conductors are insulated from the frame.

20.5.8 GFCI Testing

20.5.8.1 Test Intervals

(A) Every receptacle GFCI and/or circuit breaker GFCI shall be tested at intervals not exceeding 30 days.

(B) Test results shall be maintained for every receptacle GFCI and circuit breaker GFCI.

(C) Portable GFCIs and cord-connected GFCIs shall be tested (1) before each days use and (2) each time they are connected to a different outlet.

(D) Every GFCI, listed for use in wet locations, shall be inspected for physical damage (see 20.5.8.5) each time it is tested.

20.5.8.2 Responsibility

(A) The Facility Owner shall implement testing and maintain records of every hard-wired GFCI in his/her area.

CHAPTER 20 (cont.)

20.5 REQUIREMENTS (cont.)

(B) The Construction Manager shall implement testing and maintain records of every hard-wired GFCI on a construction site that is not owned by a Facility Owner.

(C) The Construction Manager shall implement testing of every portable and cord-connected GFCI used on a construction site.

20.5.8.3 Individuals testing GFCIs shall (1) have access to the test instructions from the manufacturer and (2) be familiar GFCI test requirements.

(A) If no manufacturer instructions are available, the Electrical Test and Physical Condition Test of this procedure shall be used.

(B) Testing a GFCI shall be done in cooperation with users since it will cause an interruption of power to equipment being served by the GFCI.

20.5.8.4 Electrical Test

(A) Push the "TEST" button on the front of the GFCI unit. This must interrupt power to all protected receptacles.

(B) Push the "RESET" button to return the GFCI to use.

20.5.8.5 Physical Condition Test - GFCIs listed for use in wet locations shall be inspected for physical damage that would allow the entrance of moisture:

(A) Check the sealing boots (if visible) around the TEST and RESET buttons for cracks and/or other signs of damage.

(B) Check the flex and stress fittings of cord-connected GFCIs for cracks or other signs of damage.

(C) Check the enclosure screws and make sure they are tight.

(D) Check the cover gasket(s) and make sure it is in place.

CHAPTER 20 (cont.)

20.5 REQUIREMENTS (cont.)

20.5.8.6 Test Results - for hard-wired GFCIs.

(A) A record of test results shall be maintained indicating the (1) date, (2) tester's initials, (3) specific location, and (4) test result(s).

(B) Test records shall be maintained by the Facility Owner or Construction Manager in a place where they can be easily accessed by the GFCI user.

(C) The tests shall be recorded on the manufactures's supplied test log sheet or equal (see Figures 20-1 and 20-2).

20.5.8.7 Reporting and Repairing Failures

(A) A GFCI failing a test shall be immediately reported to the Facility Owner or Construction Manager.

(B) The Facility Owner/Construction Manager shall take immediate corrective action.

(C) A GFCI failing a test shall be removed from use until repaired.

(D) The FEMP Energy Control Procedure (FEMP-719) shall be used to remove a failed GFCI from service.

20.6 APPLICABLE DOCUMENTS

20.6.1 29 CFR 1910 subpart S - (OSHA) - Occupational Safety and Health Standards: Electrical

20.6.2 29 CFR 1926 subpart K - (OSHA) - Safety and Health Regulations for Construction - Electrical

20.6.3 NFPA 70 - National Electrical Code

20.6.4 NFPA 70E - Electrical Safety Requirements for Employee Workplaces

20.6.5 ANSI/UL 943-1985 - Ground-Fault Circuit Interrupters

CHAPTER 20 (cont.)

20.7 FORMS USED

20.7.1 Manufacturer Test Log Sheet, Figure 20-1, Figure 20-2 or equal.

20.8 FIGURES

20.8.1 Figure 1 - Receptacle GFCI Test Log

20.8.2 Figure 2 - Circuit Breaker GFCI Test Log

CHAPTER 20 (cont.)

RECEPTACLE GFCI TEST LOG

LOCATION _____ LOCATION _____

DATE MO/DAY/YR	TESTER INIT's	GFCI OK	SEALS OK/NA	DATE MO/DAY/YR	TESTER INIT's	GFCI OK	SEALS OK/NA

RECEPTACLE GFCI TEST LOG
Figure 20-1

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CHAPTER 20 (cont.)

CIRCUIT BREAKER GFCI TEST LOG

ELECTRIC PANELBOARD LOCATION _____

DATE MO/DAY/YR	TESTER'S INITIALS	C B #	GFCI OK	C B #	GFCI OK	C B #	GFCI OK	C B #	GFCI OK

CIRCUIT BREAKER GFCI TEST LOG
Figure 20-2

CHAPTER 21 - USE OF ELECTRICAL EQUIPMENT THAT IS NOT "LISTED"

21.1 INTRODUCTION

21.1.1 The requirements of this chapter shall be followed before the acquisition and/or use of "non-listed" electrical equipment at FEMP.

21.1.1.1 For the purposes of this chapter, "non-listed" means equipment not "listed" by a nationally recognized testing laboratory.

21.2 DEFINITIONS

21.2.1 Ground-Fault Circuit-Interrupter (GFCI) - A device that deenergizes a circuit within an established period of time when a current to ground exceeds a predetermined value (0.005 amps for a Class A GFCI).

21.2.2 Listed (Labeled, Certified, or Accepted) - Listed means the equipment was tested and (1) found to be safe when used as directed, or (2) met a nationally recognized standard.

21.2.2.1 Listing shall be by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratory Inc. (U.L.) or Factory Mutual Research Corp. (FM or FMRC).

21.2.3 Locations

21.2.3.1 Conductive Location - Any area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or other source of running water.

21.2.3.2 Damp Location - Any (1) partially protected outdoor area (such as roofed open porches) or (2) interior location subject to moderate degrees of moisture (such as some basements).

21.2.3.3 Dry Location - Any indoor area that temporarily can be, but normally is not, subject to dampness or wetness.

21.2.3.4 Hazardous Location - Any area where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

21.2.3.5 Wet Location - Any area subject to saturation with water, including (1) areas underground, like a "manhole", (2) vehicle washing areas, and (3) areas exposed to weather and unprotected.

NOTE: At a given time, a "wet location" might not be wet or conductive.

CHAPTER 21 (cont.)

21.2 DEFINITIONS (cont.)

21.2.4 Nationally Recognized Testing Laboratory (NRTL) - A lab, recognized by OSHA, that tests for safety, and lists or labels or accepts equipment for conformance to nationally recognized standards.

21.3 RESPONSIBILITIES

21.3.1 Employees shall be responsible for complying with the requirements of this chapter.

21.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

21.3.3 Engineering shall be responsible for ensuring that subcontractors and vendors implement and comply with the requirements of this chapter.

21.3.4 Safety Engineering shall be responsible for providing assistance when additions, corrections and/or engineering determinations are required for this chapter.

21.3.5 Facility Owners shall be responsible for permitting or prohibiting the use of certain non-listed items at some or all locations in their facilities.

21.4 GENERAL

21.4.1 OSHA Equipment Acceptability Requirements - All electrical equipment used at FEMP shall meet the following requirements:

21.4.1.1 It shall be safe for the purpose (this usually means safe in dry locations). evidenced by listing or labeling.

21.4.1.2 It shall be safe for the location (wet, damp, outdoor etc.) as evidenced by listing or labeling.

21.4.1.3 It shall be marked with the rated voltage and amps or watts.

21.4.1.4 It shall be marked with the listing agency and the manufacturer's name or logo.

21.4.2 Listing Requirements - All equipment shall meet the intent of the OSHA standard:

21.4.2.1 Equipment for which there is a NRTL shall be "listed" or otherwise determined to be safe.

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CHAPTER 21 (cont.)

21.4 GENERAL (cont.)

21.4.2.2 Equipment for which there is no NRTL, shall be acceptable if it is determined to be safe by a Federal, State or local agency responsible for enforcing occupational provisions of the National Electric Code.

21.4.2.3 Custom equipment shall be acceptable if it is determined to be safe by the manufacturer.

21.4.3 Types of Documentation - The following documentation will assist in determining if non-listed equipment meets the National Electric Code and the intent of the OSHA "acceptability" requirements:

21.4.3.1 Manufacturer documentation, such as equipment specifications or a signed letter, stating the conditions necessary for safe use and locations where the instrument may be safely used.

21.4.3.2 Letters from other users stating their experience relevant to the conditions necessary for safe use and locations where the instrument was safely used.

21.4.3.3 Documentation of "listing" (labeling or acceptance) by a regulatory agency (see paragraph 21.4.2.2) outlining the conditions necessary for safe use and locations where the instrument may be safely used.

21.4.3.4 Documented inspection, by a qualified WEMCO electrical or instrumentation group (e.g. the Radiation Instrument Safety Shop), that includes the opinion (signed by the supervisor) on the safety of the equipment and the locations where it may be safely used.

21.4.3.5 Documented testing by a non-regulatory, non-NRTL testing lab (any nationally recognized U.S. test lab or a foreign nationally recognized test lab) stating the conditions necessary for safe use and locations where the instrument may be safely used.

21.4.4 Electrical Precautions for Non-listed Equipment

21.4.4.1 All plug-connected, 120 volt, equipment shall be GFCI protected.

NOTE: See the ISRM Chapter 20 "Use of Ground-Fault Circuit-Interrupters".

CHAPTER 21 (cont.)

21.4 GENERAL (cont.)

21.4.4.2 Personnel using the equipment shall be certain that clearance to all combustible, furnishings, surfaces, or materials is adequate to prevent fires.

(a) Personnel using the equipment shall add a safety factor for anticipated heat from an equipment malfunction.

(b) Whenever feasible, the equipment shall be located on a non-combustible surface.

21.4.4.3 The metal cases of all equipment shall be grounded.

21.4.4.4 Equipment shall not be used in a hazardous location.

21.4.4.5 If an item is powered by a voltage-reducing adapter (with an output less than 50 volts) the adapter is the equipment that shall be determined to be safe.

21.4.5 Administrative Precautions for Non-Listed Equipment

21.4.5.1 A letter (or equal) sent to the manufacturer requesting all of the following:

(a) The signed reply designated in paragraph 21.4.3.1.

(b) A list of customers (names and addresses) using the instrument, who may be contacted.

(c) Information on testing by labs other than a NRTL.

(d) The reason that the equipment is not tested by a NRTL.

21.4.5.2 A letter signed by the supervisor of a qualified WEMCO electrical group. (see paragraph 21.4.3.4)

NOTE: A "loaner" may be requested from the vendor if the equipment has not already been purchased.

21.5 REQUIREMENTS

21.5.1 Determining Safety of Existing Equipment for the Purpose (Dry Locations) - The intent of the acceptability requirements for dry locations will be considered to be met for any of the following sets of conditions:

21.5 REQUIREMENTS (cont.)

21.5.1.1 Documentation by a regulatory lab specified in paragraph 21.4.3.3

21.5.1.2 Documentation by the signed letter from the manufacturer specified in paragraph 21.4.3.1

21.5.1.3 A letter from another user of paragraph 21.4.3.2 and inspection of a WEMCO group of paragraph 21.4.3.4

21.5.1.4 Listing by a lab of paragraph 21.4.3.5 and any of the following:

(a) Inspection of paragraph 21.4.3.4

(b) Listing by another lab of paragraph 21.4.3.5.

(c) A user letter of paragraph 21.4.3.2.

21.5.2 Determining Safety of Existing Equipment for Location Other Than Dry Locations - The intent of the acceptability requirements for other locations will be considered to be met if each location is agreed upon by any of the following sets of conditions listed in paragraphs 21.5.2.1 or 21.5.2.2.

21.5.2.1 Listing by one of the types of labs specified in paragraph 21.4.3.5 and one or more of the following:

(a) Any of the manufacturer documentation specified in paragraph 21.4.3.1.

(b) The inspection of a regulatory lab specified in paragraph 21.4.3.3.

(c) Listing by the other type of lab specified in paragraph 21.4.3.5.

21.5.2.2 Inspection specified in paragraph 21.4.3.4 and one or more of the following:

(a) Any of the manufacturer documentation specified in paragraph 21.4.3.1.

(b) The inspection of a regulatory lab specified in paragraph 21.4.3.3.

(c) Listing by one of the labs in paragraph 21.4.3.5.

CHAPTER 21 (cont.)

21.5 REQUIREMENTS (cont.)

21.5.3 Determining Safety of New Equipment for the Purpose (dry locations)

21.5.3.1 The letter (or equivalent) specified in paragraph 21.4.5.1 shall be sent.

21.5.3.2 The intent of listing requirements for dry locations will be met if either of the following apply:

(a) The requirements of paragraph 21.4.2 are met.

(b) Any of the sets of conditions listed in paragraph 21.5.1 are met.

21.5.4 Determining Safety of New Equipment for Location Other Than Dry Locations

21.5.4.1 The letter (or equivalent) of paragraph 21.4.5.1 shall be sent.

21.5.4.2 The intent of listing requirements for other locations will be met for each location if either of the following apply for each location:

(a) The requirements of paragraph 21.4.2 are met.

(b) Any of the sets of conditions listed in paragraph 21.5.2 are met.

21.5.5 Documentation

21.5.5.1 A close-out letter along with all documents (showing that all requirements were met) shall be kept on file by the user.

21.5.5.2 A copy of the close out letter shall be submitted to Safety Engineering.

NOTE: Safety Engineering will review the letter for completeness.

21.5.6 Determining Rated Current or Watts - If an instrument does not have the rated current or wattage marked on it:

21.5.6.1 Current or watts of a properly functioning item shall be determined by a qualified person.

21.5.6.2 Either current or watts shall be durably marked on the item.

21.6 APPLICABLE DOCUMENTS

21.6.1 29 CFR 1910 subpart S - (OSHA) - Occupational Safety and Health Standards - Electrical

21.6.2 29 CFR 1926 subpart K - (OSHA) - Safety and Health Regulations for Construction - Electrical

21.6.3 NFPA 70 - National Electric Code

21.6.4 Industrial Safety Requirements Manual "Use of Ground-Fault Circuit-Interrupters"

21.7 FORMS USED

None

21.8 EXHIBITS

None

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CHAPTER 22 - USE OF TEMPORARY POWER TAPS AND CURRENT TAPS

22.1 INTRODUCTION

22.1.1 This chapter provides the requirements for use of 120-volt temporary power taps (TPT) and current taps (CT), including those that contain noise and surge suppressors.

22.1.2 This procedure does not cover temporary power taps that are integral to the interior wiring of equipment, machinery or modular furniture.

22.2 DEFINITIONS

22.2.1 Construction Activities - Construction, alteration and/or repair including painting and decorating.

22.2.2 Current Tap (CT) - An electrical "outlet assembly" which is directly mounted on the receptacle outlet.

22.2.3 Listed (Labeled, Accepted, Certified) - Words meaning the device was tested and found (1) safe when used as directed or (2) to meet a nationally recognized standard.

22.2.3.1 Listing shall be by a Nationally Recognized Testing Laboratory such as Underwriters Laboratory Inc. (U.L.) or Factory Mutual Research Corporation (FM or FMRC).

22.2.4 Locations

22.2.4.1 Conductive Location - Any area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or other source of running water.

22.2.4.2 Damp Location - Any (1) partially sheltered outdoor area (such as a roofed open porch) or (2) interior location subject to moderate degrees of moisture (such as some basements).

22.2.4.3 Dry Location - Any indoor area that temporarily can be, but is not normally subject to dampness or wetness.

22.2.4.4 Hazardous Location - Any area where fire or explosion is possible due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

CHAPTER 22 (cont.)

22.2 DEFINITIONS (cont.)

22.2.4.5 Wet Location - Any area subject to saturation with water, including (1) areas underground like a "manhole", (2) vehicle washing areas, and (3) areas exposed to the weather and unprotected.

NOTE: At a given time, a "wet location" might not be wet or conductive.

22.2.5 Outlet Assembly - An assembly of some or all of the following: (1) electric outlets, (2) fuse or circuit breaker, (3) on/off switch(s), (4) pilot light, and (5) other features such as surge/noise suppression.

22.2.6 Receptacle Outlet - A receptacle outlet is: (1) designed for connecting a device to electrical power, (2) hard-wired to the permanent wiring of a building, and (3) designed to accept standard, easily removable plugs. Generally, a 120-volt receptacle outlet has two outlets which are designed to accept standard NEMA 5-15P plugs.

22.2.7 Temporary Power Tap (TPT) - A device, plugged into a receptacle outlet to increase the number of outlets available, consisting of (1) a plug, (2) a flexible cord, and (3) an "outlet assembly".

22.3 RESPONSIBILITIES

22.3.1 Employees shall be responsible for complying with the requirements of this chapter.

22.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

22.3.3 Engineering shall be responsible for ensuring that subcontractors and vendors comply with the requirements of this chapter.

22.3.4 Safety Engineering shall be responsible for providing assistance when additions, corrections, and/or engineering determinations are required for this chapter.

22.4 GENERAL

22.4.1 Every TPT and CT shall be "listed".

22.4.2 Every TPT and CT used in a wet or outdoor damp location shall be "listed" for that type of location.

22.4.3 Every CT shall: (1) be directly mounted and secured to a fixed receptacle outlet, (2) have grounding type outlets, and (3) plug into both the top and bottom of the receptacle outlet.

CHAPTER 22 (cont.)

22.4 GENERAL (cont.)

22.4.4 Every CT with integral surge or noise suppression shall have internal current protection (rated at not more than 15 amps).

22.4.5 No CT shall be located in a receptacle that is less than 6 inches above the floor.

22.4.6 The cord of every TPT shall: (1) be rated for hard or extra hard use (Table 22-1), (2) have a grounding wire, and (3) have a minimum wire size of No.14 AWG.

22.4.7 The outlet assembly of a TPT shall have: (1) a master on/off switch, (2) a master pilot light, (3) all grounding type outlets, and (4) internal overcurrent protection of 20 amps or less.

22.4.8 A TPT or CT may have optional features such as individual on/off switches, individual pilot lights, and surge/noise suppression.

22.4.9 No TPT or CT shall be supplied by an extension cord set or another TPT or CT.

22.4.10 The TPT or CT outlet assembly shall be located where it is visible and readily accessible.

22.4.11 The TPT outlet assembly shall be mounted to a stable surface when it is necessary to (1) comply with paragraph 22.4.10, (2) to protect the plugs and/or supply cords plugged into it from physical abuse or (3) to protect the outlet assembly from accidental water entry.

22.4.11.1 When mounted, the TPT outlet assembly shall be secured in accordance with manufacturer's instructions.

22.4.12 The cord of a TPT shall not be longer than necessary and shall be arranged so it is not a tripping hazard.

22.4.13 Every TPT and CT shall be protected from damage, whether in use or stored.

22.4.14 The plug and cord of every TPT shall be protected from damage.

22.4.15 In unusual or emergency conditions, approval of Safety Engineering shall be obtained before using a TPT or CT for other than a defined use.

22.4.16 The maximum calculated current shall be (1) 12 amps for a CT, (2) 12 amps for a TPT with an integral 15 amp overcurrent device, (3) 12 amps for a TPT with an integral 20 amp overcurrent device that is on a 15 amp branch circuit, or (4) 16 amps for a TPT with an integral 20 amp overcurrent device that is on a 20 amp branch circuit.

CHAPTER 22 (cont.)

22.4 GENERAL (cont.)

22.4.16.1 The calculated current of a TPT or CT is the sum of the current ratings of the items plugged into the TPT or CT (with a minimum of 0.6 amps per outlet) plus 0.6 amps for each empty outlet.

(a) The maximum current of a single item plugged into a 6-outlet, 15 amp, TPT or CT is 9 amps (1125 watts).

(b) The maximum current of a single item plugged into a 6-outlet, 20 amp, TPT is 13 amps (1625 watts).

22.4.17 Stationary appliances (some refrigerators and vending machines) may be supplied by a TPT or CT, but shall not be supplied for more than 90 days.

22.4.18 TPTs and CTs shall not be modified.

22.4.19 Defective or broken TPTs and CTs shall be removed from service.

22.4.20 Heaters shall not be supplied by a TPT or CT.

22.5 REQUIREMENTS

22.5.1 Offices

22.5.1.1 Stationary office equipment (photocopiers etc.) that require surge and noise protection shall be supplied from a receptacle outlet with integral surge and/or noise protection.

22.5.2 Break Areas

22.5.2.1 TPTs located in a break area shall be mounted to a stable surface so the outlets are not facing upward.

22.5.3 Laboratories, Electronic and Maintenance Shops

22.5.3.1 TPTs located on work benches, lab benches and similar surfaces shall be mounted so the outlets are not facing upward.

22.5.4 Telephone Equipment

22.5.4.1 Personal telephone equipment (modems and answering machines) may be supplied by a TPT or CT.

22.5.4.2 Telephone switching equipment shall not be supplied by a TPT.

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CHAPTER 22 (cont.)

22.6 APPLICABLE STANDARDS

22.6.1 29 CFR 1910 subpart S - (OSHA) - Occupational Safety and Health Standards - Electrical

22.6.2 29 CFR 1926 subpart K - (OSHA) - Safety and Health Regulations for Construction - Electrical

22.6.3 NFPA 70 - National Electric Code (1990)

22.6.4 NFPA 70E - Electrical Safety Requirements for Employee Workplaces (1988)

22.6.5 ANSI/UL 817-1986 Cord Sets and Power Supply Cords

22.6.6 UL 1363-1991 - Temporary Power Taps

22.7 FORMS USED

22.7.1 None

22.8 EXHIBITS

22.8.1 Table 22-1 - Cord Types for HARD/EXTRA HARD Service

CHAPTER 22 (cont.)

TABLE 22-1

CORD TYPES FOR HARD/EXTRA HARD SERVICE (from ANSI/UL 817)

600 volt insulation rating	300 volt insulation rating
S, ST, SE	SJ, SJT, SJE

NOTE:
- "O" in the cord type denotes oil resistant outer cord cover.
- "OO" in the cord type denotes oil resistant outer cove- and oil resistant insulation on the conductors.
- "W-A" added as a suffix to the cord type denotes listing for outdoor use.

CHAPTER 23 - USE OF "OTHER" CORD AND PLUG-CONNECTED ELECTRICAL DEVICES

23.1 INTRODUCTION

23.1.1 This chapter provides the FEMP electrical safety requirements for installing and/or using cord and plug-connected, "listed" electrical devices that are not covered by other ISRM chapters or FPRM (Fire Protection Requirements Manual) chapters.

NOTE: Electrical items covered by other chapters include heaters, kitchen-type cooking appliances, hand tools, fans, extension cords, ground-fault circuit-interrupters, and temporary power taps.

23.2 DEFINITIONS

23.2.1 Construction Activities - Construction, alteration and/or repair including painting and decorating.

23.2.2 Dedicated Branch Circuit - An overcurrent device (in an electrical panelboard) that is connected only to one electric receptacle outlet and is intended for use with only one electrical device.

23.2.3 Fixed Device - A device that is hard-wired or is not normally portable because of weight, size or shape.

23.2.4 Ground-Fault Circuit-Interrupter (GFCI) - A device that deenergizes a circuit within an established period of time when a current to ground exceeds a predetermined value (0.005 amps for a Class A GFCI).

23.2.5 Listed (Labeled, Accepted, Certified) - Words meaning the device was tested and found (1) safe when used as directed, or (2) to meet a nationally recognized standard.

23.2.5.1 Listing shall be by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratory Inc. (UL) or Factory Mutual Research Corp. (FM or FMRC).

23.2.6 Locations

23.2.6.1 Conductive Location - An area where personnel are standing directly on or working near (1) concrete, masonry or equivalent in direct contact with ground, (2) ground, (3) large grounded metal objects, (4) water, (5) a wet or damp surface or (6) within six feet of a sink or other source of running water.

23.2.6.2 Damp Location - Any (1) partially sheltered outdoor area (such as a roofed open porch) or (2) interior location subject to moderate degrees of moisture (such as some basements).

CHAPTER 23 (cont.)

23.2 DEFINITIONS (cont.)

23.2.6.3 Dry Location - Any indoor areas that temporarily can be, but is not normally subject to dampness or wetness.

23.2.6.4 Hazardous Location - Any area where fire or explosion is possible due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or particles.

23.2.6.5 Wet Location - Any area subject to saturation with water, including (1) areas underground like a "manhole", (2) vehicle washing areas, and (3) areas exposed to the weather and unprotected.

(a) At a given time, a "wet location" might not be wet or conductive.

23.2.7 Receptacle Outlet - A receptacle outlet is: (1) designed for connecting a device to electrical power, (2) hard-wired to the permanent wiring of a building, and (3) designed to accept standard, easily removable plugs. Generally a 120-volt receptacle outlet has two outlets which are designed to accept standard NEMA 5-15P plugs.

23.2.8 Temporary Power Tap (TPT) - A device, plugged into a receptacle outlet to increase the number of outlets available, consisting of a plug, (2) a flexible cord, and (3) an outlet assembly with three more outlets and other features such as an on/off switch, pilot light, overcurrent device, surge suppression, etc.

23.3 RESPONSIBILITIES

23.3.1 Employees shall be responsible for complying with the requirements of this chapter.

23.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

23.3.3 Engineering shall be responsible for ensuring that subcontractors and vendors, involved in construction or other work, implement and comply with the requirements of this chapter.

23.3.4 Safety Engineering shall be responsible for providing assistance when additions, corrections and/or engineering determinations are required for this chapter.

23.3.5 Facility Owners shall be responsible for permitting or prohibiting the use of certain devices at some or all locations in their facilities.

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CHAPTER 23 (cont.)

23.4 GENERAL

23.4.1 Every device shall be located where it is not subject to physical abuse.

23.4.2 The user shall verify that clearance between the device and combustible furnishings, surfaces or materials is adequate to prevent fires.

23.4.3 Every device shall be "listed" for the location (wet, outdoor, indoor, damp etc.) where it is used.

23.4.3.1 If an item is powered by a voltage reducing adapter, with a "no load" output less than 50 volts, the adapter is the device which shall be "listed".

23.4.4 Devices shall be used as directed in the manufacturer's owners/ safety manual.

23.4.5 120 volt devices used for construction activities shall be GFCI protected.

23.4.6 Whenever both an extension cord and a GFCI are used, the GFCI shall protect the extension cord.

23.4.7 Devices shall have a grillwork or other protection to prevent hazardous electric shocks to personnel.

23.4.7.1 The manufacturer designed openings in devices (whose current-carrying parts are at high temperatures and must be somewhat exposed to work) are permitted.

23.4.8 Devices shall have a grillwork or other protection to prevent injury due to hazardous moving parts.

23.4.9 Every device housing shall be complete, with all covers and/or guards properly attached.

23.4.10 No device shall be used in a hazardous location, unless it is "listed" for use in that type of location.

23.4.11 Supply cords shall (1) be arranged so they are not a tripping hazard, (2) be located so they are not subject to damage, and (3) not have splices or repairs.

23.4.12 Use of the device with extension cord sets, temporary power taps or GFCI are covered in other ISRM chapters.

23.4.13 An adapter plug (designed to connect a grounding type plug to an ungrounded receptacle) shall never be used.

CHAPTER 23 (cont.)

23.4 GENERAL (cont.)

23.4.14 A device shall not be used unless the following information is marked on its surface:

23.4.14.1 Device voltage and amps or watts.

23.4.14.2 Manufacturer's name or logo.

23.4.14.3 Listing agency.

23.4.15 Whenever possible, items used while not attended shall be located (1) on a noncombustible surface, (2) at least 6 inches from any painted noncombustible wall, and (3) 12 inches from any combustible item or wall.

23.4.16 The device shall be located so it has adequate ventilation.

23.4.17 Devices shall not be modified or altered in any manner.

23.4.18 Defective or broken devices shall be removed from service.

23.4.19 The device operating manual shall be readily available.

23.5 REQUIREMENTS

23.5.1 Devices Used in Wet, Damp, or Conductive Locations Readily Accessible to Personnel

23.5.1.1 Exposed conductive parts shall be grounded, unless the device is labelled "double insulated".

23.5.1.2 No item shall be plugged in or unplugged if the plug or the users hands are wet.

23.5.1.3 GFCI protection shall be used on any 120 volt device that is not "listed" for use in these locations.

23.5.1.4 GFCI protection shall be used on 120 volt devices used in indoor-conductive or indoor-damp locations unless the devices are grounded or labelled "double insulated".

23.5.1.5 GFCI protection shall be used on every 120 volt device used in wet or outdoor-damp locations if personnel frequently touch the device.

23.5 REQUIREMENTS (cont.)

23.5.2 Devices Used in Wet, Damp or Conductive Locations Not Readily Accessible to Personnel

23.5.2.1 No item shall be plugged in or unplugged if the plug or the users hands are wet.

23.5.2.2 Exposed conductive parts shall be grounded.

23.5.3 Branch Circuit Load Limits for Devices

23.5.3.1 The maximum rating of any 120 volt, portable device, that is intended for use at locations where the rating of the overcurrent device may not be known, is 12 amps (1500 watts).

23.5.3.2 The maximum rating of any portable device, that will only be connected to outlets where the rating of the overcurrent device, is known is 80% of the rating of the overcurrent device.

23.5.3.3 The maximum current rating of any fixed device is 50% of the branch circuit overcurrent device rating, unless it is connected to a dedicated branch circuit.

23.5.3.4 The maximum current rating of any fixed device operating on a dedicated branch circuit is 80% of the branch circuit overcurrent device rating.

23.6 APPLICABLE DOCUMENTS

23.6.1 29 CFR 1910 subpart S - (OSHA) - Occupational Safety and Health Standards: Electrical

23.6.2 29 CFR 1910.212 - (OSHA) - Occupational Safety and Health Standards: General Requirements for All Machines

23.6.3 29 CFR 1926 subpart K - (OSHA) - Safety and Health Regulations for Construction - Electrical

23.6.4 NFPA 70 - National Electrical Code

23.6.5 Industrial Safety Requirements Manual - Use of Ground-Fault Circuit-Interrupters

23.6.6 Industrial Safety Requirements Manual - Extension Cord Sets and Supply Cords Use

23.6.7 Industrial Safety Requirements Manual - Use of Temporary Power Taps

CHAPTER 23 (cont.)

23.6 APPLICABLE DOCUMENTS (cont.)

23.6.8 Fire Protection Requirements Manual - Use of Kitchen-Type Appliances

23.6.9 Fire Protection Requirements Manual - Use of Cord & Plug-Connected Electric Heaters

23.6.10 Industrial Safety Requirements Manual - Use of Electric Hand Tools

23.6.11 Industrial Safety Requirements Manual - Use of Cord & Plug-Connected Electric Fans

23.7 FORMS USED

None

23.8 EXHIBITS

None

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CHAPTER 24 - USE OF WARNING DEVICES FOR WORK ON OR NEAR ROADS

24.1 INTRODUCTION

24.1.1 This chapter provides the requirements for signs and other warning devices that must be used when work is required on or near public roads and the two main site access roads with (1) speed limits below 66 mph, (2) normal road conditions, and (3) no more than one lane blocked.

24.1.2 This chapter applies to (1) vehicles operated at slow speeds (much slower than the speed limit) on or near roads, (2) vehicles parked on or near roads in areas not designated for parking, and (3) equipment or materials used on or near roads.

24.1.3 A specific traffic control plan and approval by Safety Engineering is required before work commences requiring: (1) road closures, (2) closure of two or more lanes, (3) lane closures over 500 feet, or (4) other road conditions not covered by this chapter.

24.2 DEFINITIONS

24.2.1 Distances

24.2.1.1 Hazard Visibility Distance (HVD) - During normal daylight hours, the line-of-sight distance between the potential hazard and the first point the hazard can be seen (from the center of the traveled lane).

24.2.1.2 Minimum Initial Warning Device Distance (MIWDD) - Distance from the first warning sign to next device, which may be (1) the last warning sign, (2) the first traffic control device, (3) the flagger, or (4) the obstruction.

24.2.1.3 Supplemental Warning Device Distance (SWDD) - Distance between the last warning sign and the (1) the first traffic control device, (2) the flagger, or (3) the obstruction.

24.2.1.4 Taper Distance (TD) - From the point of view of the approaching driver, it is the distance from the first Traffic Control Device [TCD] (located on the edge of the shoulder by the right-of-way) to the last TCD on the same side of the road.

(a) On the same side of the road as the obstruction, the last TCD must be located by the corner of the obstruction nearest to the center of the road.

(b) On the side of the road opposite the obstruction, the last TCD must be located on the shoulder of the road near the flagger.

CHAPTER 24 (cont.)

24.2 DEFINITIONS (cont.)

24.2.2 Flashing Yellow Light - A light which (1) appears yellow, (2) flashes about 50 times per minute, and (3) is visible from any direction at a distance of at least 500 feet under normal conditions (other than dense fog, heavy rain or heavy snow).

24.2.3 Obstruction - Car, equipment, hole (trench) in pavement, or material.

24.2.4 Right-of-Way (R/W) - For the purpose of this chapter, the right-of-way starts on the field side of the shoulder and extends through the area where public utilities may place their poles, pipes or cables.

24.2.4.1 For a two lane road, the edge of the right-of-way (farthest from the road) may be 20 to 50 feet from the center of the road (depending on whether it is a township, county or state road and the right-of-way policy of the township, county, or state when the property last changed hands).

24.2.5 Shoulder

24.2.5.1 For roads with marked edge lines, the shoulder is the area between one foot toward the field side of the edge line to the start of the dirt/grass (where there is no more paving material or gravel).

24.2.5.2 For roads without marked edge lines, the shoulder is the area (sometimes filled with gravel) between the edge of the pavement and the dirt/grass (minimum size is one foot from the edge of the pavement/paving material).

24.2.6 Traffic Control Device (TCD) - A cone or barrel, orange or yellow, hollow, relatively light-weight and pliable, at least 28 inches tall, and which may have a 6-inch-wide white reflectorized stripe at the top.

24.2.7 Traveled Pavement

24.2.7.1 For roads with marked edge lines, the edge of the traveled pavement is one foot toward the field side of the marking.

24.2.7.2 For roads without marked edge lines, the edge of the traveled pavement is the edge of the pavement/paving material.

24.2.8 Vehicle - For the purpose of this chapter, a vehicle is a car, truck, tractor, backhoe, or similar item.

CHAPTER 24 (cont.)

24.2 DEFINITIONS (cont.)

24.2.9 Warning Sign - A yellow or orange sign, at least 2-feet square, with black lettering, mounted so a corner faces up.

24.2.9.1 OLRA (One Lane Road Ahead) - Traffic constricted to one lane.

24.2.9.2 LCA (Lane Closed Ahead) - Traffic constricted by one lane.

24.2.9.3 SWA (Shoulder Work Ahead) - Work is being performed near the road.

24.2.9.4 Distance Sign Addenda (-D) - Additional information (e.g. "200 Feet Ahead") on a smaller sign mounted on or below the warning sign.

24.2.10 Work Time

24.2.10.1 Short - approximately 1/2 hour or less during daylight hours when there is good visibility.

24.2.10.2 Long - longer than 1/2 hour during the daytime when there is good visibility.

24.2.10.3 Low Visibility - conditions of light and/or weather (rain, fog, etc.) resulting in visibility equivalent to nighttime.

24.3 RESPONSIBILITIES

24.3.1 Employees shall be responsible for complying with the requirements of this chapter.

24.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

24.3.3 Engineering shall be responsible for ensuring that subcontractors and vendors, involved in construction or other work, implement and comply with the requirements of this chapter.

24.3.4 Safety Engineering shall be responsible for providing staff assistance when additions, corrections and/or engineering determinations are required for this chapter.

CHAPTER 24 (cont.)

24.4 GENERAL

24.4.1 A plan with a drawing showing the road layout, location of warning devices (signs, cones, flashers, flaggers, etc.) shall be approved by the Manager of Safety Engineering before any (1) long term lane closure, or (2) short term lane closure on a road with a speed limit above 40 mph.

24.4.2 Vehicles shall be equipped with a "flashing yellow light" that are frequently (1) parked on or near roads [in areas not designated for parking], or (2) operated at slow speeds (much slower than the speed limit) on or near roads.

24.4.3 Motorized vehicles and equipment shall use one or more roof mounted "flashing yellow lights" when (1) parked on a road or shoulder (in areas not designated for parking), or (2) operated on a road or shoulder at slow speeds (much slower than the speed limit). Use of the flashing lights not required for vehicles beyond the shoulder of the road.

24.4.4 TCDs used at night or during low visibility conditions shall have a reflectorized white stripe.

24.4.5 The appropriate county or state authorities shall be notified (given the opportunity to review the Plan) before a road is cut - both for construction permits and to learn of any work time limitations.

NOTE: County authorities must be notified for a county road, State authorities must be notified for a state road.

24.4.6 The appropriate county or state authorities shall be notified if a lane must be closed before 8:00 AM or after 3:30 PM.

24.4.7 A TCD (when use is required in this chapter) shall be located (1) in front and back of each obstruction, (2) on the side of the obstruction nearest the center of the road, and (3) no nearer to the center of the road than the obstruction.

24.4.8 TCDs, when required, shall be spaced at roughly equal intervals (normally no more than 20 feet apart) along the TD.

24.4.9 Warning signs shall be located in the right-of-way area (near the shoulder of the road), and

24.4.9.1 For lane obstructions, mounted with the bottom corner of the sign at least 5 feet above the level of the paved surface.

24.4.9.2 For shoulder or right-of-way obstructions, mounted with the bottom corner of the sign above the level of the paved surface.

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24.5 SPECIFIC

24.5.1 Obstructions On the Shoulder or Right-of-Way of Roads with Three (or More) Lanes or Speed Limits Greater than 50 mph

24.5.1.1 For roads with speed limits less than 36 mph, the same warning protocol shall be followed as shown in Tables 24-1 & 24-2 for the appropriate obstruction location and speeds less than 36 mph.

24.5.1.2 For roads with speed limits greater than 36 mph, the warning protocol shown in Tables 24-1 & 24-2 shall be followed for (1) the appropriate obstruction location, and (2) speeds of 36-50 mph.

24.5.2 Short Term Obstruction in One Lane of a Road with Three or More Lanes and a Speed Limit Below 51 mph

24.5.2.1 If there are two or more lanes on the same side of the road as the obstruction, use the appropriate safety precautions shown in Table 24-1 for a Short Lane Obstruction.

24.5.2.2 If there is only one lane on the same side of the road as the obstruction, use the appropriate safety precautions shown in Tables 24-1 & 24-2 for a Short Lane Obstruction.

24.5.3 Obstructions On or Near Two Lane Roads with Speed Limits Below 51 mph - Use Tables 24-1 & 24-2

24.5.3.1 From the viewpoint of the approaching driver, the order of the signs/warning devices is (1) First warning sign [if any], (2) Last warning sign [if any], (3) TCDs [if any] along the TD, (4) flagger [if any] in the TD area, and (5) the hazard.

(a) If only one flagger is used to direct traffic from both directions, the flagger may not be located in the TD area.

24.5.3.2 Total distance from the hazard to the first warning sign seen by the approaching driver is the sum of the MIWDD, SWDD, and TD.

CHAPTER 24 (cont.)

24.5 SPECIFIC (cont.)

24.5.3.3 Tables 24-1 & 24-2 give the warning signs and distances that shall be followed, except for unusual road conditions.

(a) Additional precautions must be approved by Safety Engineering before work commences with unusual conditions such as (1) icy roads, (2) conditions not shown in the Tables, or (4) lane blockages of more than 500 feet.

24.6 APPLICABLE DOCUMENTS

24.6.1 Work Area Protection: Guidelines for Public Utilities - International Right of Way Association

24.6.2 Ohio Manual of Uniform Traffic Control Devices for Streets and Highways - Ohio Department of Transportation

24.7 FORMS USED

24.7.1 None

24.8 EXHIBITS

24.8.1 Table 24-1 - Safety Precautions on the Same Side of Road as the Obstruction

24.8.2 Table 24-2 - Safety Precautions on Side of Road Opposite the Obstruction

24.8.3 Figure 24-1 - Example of traffic control measures for work requiring a lane closure of a road (1) with low traffic volume, (2) with a speed limit of 45 mph, (3) with HVD of 500 feet on the same side of the road as the lane closure, (4) with HVD of 300 feet on the side of the road opposite the lane closure, and (5) for a long time during daylight hours.

24.8.4 Figure 24-2 - Example traffic control measures for parking a car on the shoulder of a road (1) with high traffic volume, (2) with a speed limit of 55 mph, (3) with a HVD of 500 feet on the same side of the road as the parked car, and (4) for a long time during daylight hours.

TABLE 24-1
SAFETY PRECAUTIONS ON SAME SIDE OF ROAD AS OBSTRUCTION

Obstruction Location	Traffic Volume	Speed mph	HVD ft	Work Time	First Sign	MIWDD ft	Last Sign	SWDD ft	Flaggers Required	TD ft	TCDs #	LIGHTS ON TCDs
Lane	High	<36	>200	Short	OLRA	300	----	----	-	250	5	No
				Short	OLRA	300	FA	300	1	50	5	No
				Long	OLRA	300	FA	300	1	50	5	No
				Lo Vis	OLRA	300	FA	300	1	100	5	Yes
			100-200	Short	OLRA	300	FA	300	1	50	5	No
				Long	OLRA	300	FA	300	1	50	5	No
				Lo Vis	OLRA	300	FA	300	1	100	5	Yes
		36-50	>450	Short	OLRA	500	FA	400	1	50	5	No
				Long	OLRA	500	FA	400	1	50	5	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
			200-450	Short	OLRA	500	FA	400	1	50	5	No
				Long	OLRA	500	FA	400	1	50	5	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
	Low	<36	>200	Short	OLRA	300	----	----	-	250	10	No
				Long	OLRA	300	----	----	-	250	10	No
				Lo Vis	OLRA	300	FA	300	1	50	5	Yes
			100-200	Short	OLRA	300	----	----	-	250	10	No
				Long	OLRA	300	----	----	-	250	10	No
				Lo Vis	OLRA	300	FA	300	1	50	5	Yes
		36-50	>450	Short	OLRA	500	----	----	-	600	10	No
				Long	OLRA	500	----	----	-	600	10	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
			200-450	Short	OLRA	500	----	----	-	600	10	No
				Long	OLRA	500	----	----	-	600	10	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
Shoulder	All	<36	>200	Short	----	---	---	---	-	100	5	No
				Long	SWA	300	---	---	-	50	5	No
				Lo Vis	SWA	300	---	---	-	50	5	Yes
			0-200	Short	----	---	---	---	-	50	5	No
				Long	SWA	300	---	---	-	50	5	No
				Lo Vis	SWA	300	---	---	-	50	5	Yes
		36-50	>450	Short	----	---	---	---	-	50	5	No
				Long	SWA	500	---	---	-	50	5	No
				Lo Vis	SWA	500	---	---	-	100	10	Yes
			0-450	Short	----	---	---	---	-	100	10	No
				Long	SWA	500	---	---	-	100	10	No
				Lo Vis	SWA	500	---	---	-	100	10	Yes
Right-of-Way	All	<36	>200	Short	----	---	---	---	-	---	-	No
				Long	SWA	300	---	---	-	---	-	No
				Lo Vis	SWA	300	---	---	-	---	-	No
			0-200	Short	----	---	---	---	-	---	-	No
				Long	SWA	300	---	---	-	---	-	No
				Lo Vis	SWA	300	---	---	-	---	-	No
		36-50	>450	Short	----	---	---	---	-	---	-	No
				Long	SWA	500	---	---	-	---	-	No
				Lo Vis	SWA	500	---	---	-	---	-	No
			0-450	Short	----	---	---	---	-	---	-	No
				Long	SWA	500	---	---	-	---	-	No
				Lo Vis	SWA	500	---	---	-	---	-	No

NOTE: In many situations, a LCA sign is equivalent to a OLRA sign.

CHAPTER 24 (cont.)

TABLE 24-2
SAFETY PRECAUTIONS ON SIDE OF ROAD OPPOSITE THE OBSTRUCTION

Obstruction Location	Traffic Volume	Speed mph	HVD ft	Work Time	First Sign	MIWDD ft	Last Sign	SWDD ft	Flaggers Required	TD ft	TCDs #	LIGHTS ON TCDs
Lane	High	<36	>200	Short	OLRA	300	----	----	-	---	-	No
				Short	OLRA	300	FA	300	-	---	-	No
				Long	OLRA	300	FA	300	1	---	-	No
				Lo Vis	OLRA	300	FA	300	1	100	5	Yes
			100-200	Short	OLRA	300	FA	300	1	---	-	No
				Long	OLRA	300	FA	300	1	---	-	No
				Lo Vis	OLRA	300	FA	300	1	100	5	Yes
		36-50	>450	Short	OLRA	500	FA	400	-	---	-	No
				Long	OLRA	500	FA	400	1	---	-	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
			200-450	Short	OLRA	500	FA	400	1	---	-	No
				Long	OLRA	500	FA	400	1	---	-	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
	Low	<36	>200	Short	OLRA	300	----	----	-	---	-	No
				Long	OLRA	300	----	----	-	---	-	No
				Lo Vis	OLRA	300	FA	300	1	50	5	Yes
			100-200	Short	OLRA	300	----	----	-	---	-	No
				Long	OLRA	300	OLRA-D	300	-	---	-	No
				Lo Vis	OLRA	300	FA	300	1	50	5	Yes
		36-50	>450	Short	OLRA	500	----	----	-	---	-	No
				Long	OLRA	500	----	----	-	---	-	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
			200-450	Short	OLRA	500	----	----	-	---	-	No
				Long	OLRA	500	OLRA-D	400	-	---	-	No
				Lo Vis	OLRA	500	FA	400	1	100	5	Yes
Shoulder	All	All	All	All	----	---	----	---	-	---	-	N/A
Right-of-Way	All	All	All	All	----	---	----	---	-	---	-	N/A

NOTE: In many situations, an LCA sign is equivalent to an OLRA sign.

Side of road with obstruction

(1) First Sign [OLRA]
(2) MIWDD [500 ft]
(3) Last sign [N/A]
(4) SWDD [N/A]
(5) Flagger Required [N/A]
(6) TD [600 ft]
(7) TCDs [10].

Side of road opposite the obstruction

(1) First Sign [OLRA]
(2) MIWDD [500 ft]
(3) Last sign [OLRA-D]
(4) SWDD [400 feet]
(5) Flagger Required [N/A]
(6) TD [N/A]
(7) TCDs [N/A].

SYMBOLS

[OLRA] - Warning Sign (One Lane Road Ahead)
[OLRA-D] - Warning Sign (One Lane Road Ahead - 400 feet)
x - TCD (cone)
OBS - Obstruction

LANE CLOSURE
Figure 24-1

Side of road with obstruction

(1) First Sign [SWA]
(2) MIWDD [500 ft]
(3) Last sign [N/A]
(4) SWDD [N/A]
(5) Flagger Required [N/A]
(6) TD [50 ft]
(7) TCDs [5].

Side of road opposite the obstruction

Nothing required

SYMBOLS

[SWA] - Warning Sign (Shoulder Work Ahead)
x - TCD (cone)
OBS - Parked Car

CAR PARKED ON SHOULDER
Figure 24-2

CHAPTER 25 - FEMP SAFETY AWARDS

25.1 INTRODUCTION

25.1.1 This chapter provides the guidelines for the issuance of safety awards to WEMCO personnel (as authorized by the Department of Energy under Reimbursement Authorization No. 14, Appendix A, of the contract between WEMCO and DOE) and includes (1) eligibility requirements, (2) achievement levels, and (3) method of redemption.

25.1.2 This chapter does not apply to safety awards not covered by this contract (e.g. awards issued in recognition of specific safety/health achievements or other safety activities).

25.2 DEFINITIONS

25.2.1 Department/Section Safety Meeting - A scheduled meeting (1) primarily for consideration of safety or health concerns, (2) where attendance is documented by signing a copy of "Minutes of Safety Meeting", currently Form IRS&T 470. (Figure 25-1).

25.2.2 Lost Workday Case - An occupational injury/illness involving days away from work as determined by WEMCO Manager, Safety Engineering and Fire Services.

25.2.3 OSHA Recordable Injury/Illness (Recordable on OSHA 200 Log) - Work-related illness or injury that: (a) results in death, lost work day(s), loss of consciousness, fracture or restriction of motion; (b) results in transfer to another job (or termination); (c) requires medical treatment (other than first aid) administered by licensed medical personnel.

25.2.4 WEMCO Personnel - For the purposes of this chapter, full-time employees of WEMCO assigned to work at the FEMP or support areas.

25.2.4.1 This chapter shall not apply to subcontractors, temporaries, summer interns or student co-ops.

25.3 RESPONSIBILITIES

25.3.1 The Safety Engineering and Fire Services (SE&FS) Manager shall be responsible for the record keeping, award procurement, and award distribution required by this chapter.

25.3.2 All WEMCO Managers/Supervisors shall be responsible for (1) scheduling and conducting Safety Meetings for personnel in their section/group, and (2) forwarding the copy of the signed form, Minutes of Safety Meeting (Figure 25-1), to the SE&FS Manager for use in determining eligibility for Safety Awards.

25.3.3 All WEMCO Staff Managers shall be responsible for approving the awarding of promotional points as outlined in this chapter.

CHAPTER 25 (cont.)

25.3 RESPONSIBILITIES (cont.)

25.3.4 All WEMCO Personnel shall be responsible for (1) getting redemption certificates from SE&FS, (2) mailing certificates to vendor for home delivery of awards, and (3) reporting any failures in the delivered safety award to the vendor and SE&FS within 2 weeks after the award is received.

25.4 GENERAL

25.4.1 Eligibility for Safety Awards shall be based upon active WEMCO employment.

25.4.1.1 No credit shall be given for (1) personnel who have previously worked at the FEMP as contractors, interns, co-ops and/or for (2) personnel whose status is long term disability.

25.4.2 WEMCO Personnel shall redeem accumulated safety award points (1) only after reaching the level of eligibility for an award, and (2) only in the time period following the reaching of that level.

25.4.3 No individual shall earn more than 48 points in 1 year.

25.4.4 Points may be accumulated for 3 years or until the end of the current program's cycle - whichever occurs first.

25.4.5 Points may be redeemed for a single certificate or multiple certificates (see Figure 25-2). Points may be redeemed (1) all at one time, or (2) partially, with the balance carried forward.

25.4.6 Points shall be redeemed or forfeited at the end of the current program period. The first program period ends 12/92.

25.5 REQUIREMENTS

25.5.1 The level of Safety Award eligibility shall be (1) determined quarterly by SE&FS and (2) based upon the point system required by this chapter.

25.5.2 Assigning of points shall be both monthly and quarterly.

25.5.3 Monthly Assigning of Points

25.5.3.1 For every month there is no WEMCO Lost Workday Case, all eligible WEMCO personnel shall be given 1 point.

(a) All WEMCO personnel working at least one day of that month shall be eligible to receive this 1 point.

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CHAPTER 25 (cont.)

25.5 REQUIREMENTS (cont.)

25.5.3.2 For every month a WEMCO individual does not experience an OSHA Recordable Case, that individual shall be given 1 point.

25.5.3.3 For every month a WEMCO individual attends at least one Department/Section Safety meeting, that individual shall be given 1 point.

(a) Only 1 point for each month shall be given for safety meeting attendance.

(b) Managers/Supervisors shall forward a copy of the Minutes of Safety Meeting (with the list of attendees) to the SE&FS office by the fifth working day after each meeting.

(c) Information not received by this fifth working day shall be included in the following monthly/quarterly record.

25.5.4 Quarterly Assigning of Points

25.5.4.1 For every quarter that a department sponsors promotional safety activities, that department may ask SE&FS to give up to 3 points to each actively participating WEMCO individual.

(a) Departments sponsoring promotional safety activities shall first get an SE&FS written agreement, approved by the Industrial, Radiological Safety and Training (IRS&T) Manager, that states the activities enhance the FEMP safety program.

(b) In order for WEMCO individuals to be eligible for the quarterly points, the written agreement of SE&FS must outline the actions required of these individuals.

25.5.5 Quarterly Compiling of Points

25.5.5.1 The SE&FS Manager shall appoint personnel to prepare a quarterly summary of cumulative points based upon (1) Safety Meeting attendance and (2) participation in promotional safety activities.

(a) Information on attendance and participation is due to SE&FS by the fifth working day of the quarter after the quarter in which the points are earned.

CHAPTER 25 (cont.)

25.5 REQUIREMENTS (cont.)

(b) Information not received when due for summarizing in the proper quarter shall be summarized in the next quarter.

25.5.5.2 The SE&FS Manager shall provide every staff manager with a quarterly summary of cumulative points earned by all WEMCO personnel in their department.

25.5.6 Redemption of Safety Awards

25.5.6.1 Awards shall be redeemed with certificates prior to specific eligibility levels.

(a) Award points may be redeemed for one or more certificates - the total value of the certificates shall not exceed the points earned.

(b) Each certificate shall be for selection of 1 gift.

(c) The certificate shall be valid for any prize in the proper catalog.

(d) The eligibility level shall be determined by the number of points equal to an established award level (Figure 25-2).

25.5.6.2 Certificates shall be issued by SE&FS to personnel requesting them.

25.5.6.3 An individual to whom a certificate is issued shall be solely responsible for that certificate.

(a) Generally, if he/she loses or destroys a certificate, it cannot be replaced.

(b) WEMCO shall be responsible for all expense for getting, but not replacing, certificates.

25.5.6.4 Certificates shall be valid for 6 months from the date they are issued.

(a) If certificates are not redeemed in 6 months, they must be returned to SE&FS by the person(s) to whom they were issued. In this case, a replacement certificate shall be given upon receipt of the previously issued certificate.

CHAPTER 25 (cont.)

25.5 REQUIREMENTS (cont.)

25.5.6.5 Personnel shall complete the redemption certificate and mail it with the postage paid, completed form to the vendor.

(a) A street address shall be given for delivery of the award.

(b) No award shall be delivered to a Post Office Box.

25.5.6.6 A WEMCO individual who does not receive their selected gift within 4 weeks after mailing the completed certificate and form shall (1) notify the vendor by following the steps outlined in the vendor's booklet and (2) send a copy of the notification to SE&FS.

25.6 APPLICABLE DOCUMENTS

None

25.7 FORMS USED

None

25.8 EXHIBITS

25.8.1 Figure 25-1 - Minutes of Safety Meeting

25.8.2 Figure 25-2 - Points Award Schedule

GROUPS ATTENDING: _____

FMPC
OPERATIONS SAFETY & HEALTH - FIRE & SAFETY
MINUTES OF SAFETY MEETING

1. CHECK ONE:
- ☐ SECTION
- ☐ SUB-SECTION
- ☐ DEPARTMENT

SAFETY MEETING WAS HELD:
Date _____
Time _____
Leader _____

2. ATTENDED BY*
NAME | BADGE NO.

3. CHECK VISUAL AIDS USED: (RECORD TITLE AND/OR SUBJECT MATERIAL COVERED)
- ☐ Film ☐ Slides ☐ Videotape ☐ Other _____

Subject _____

4. CHECK ADDITIONAL MATERIAL DISCUSSED OR REVIEWED:
- ☐ (A) Monthly Statistics ☐ (D) OS&H Manual Procedures ☐ (G) Unusual Occurrences/Conditions
- ☐ (B) Accident/Injury Report ☐ (E) Rules & Regulations ☐ (H) Newsletters/Other Media
- ☐ (C) Safety Inspection Report ☐ (F) S.O.P.'s ☐ (I) Other

COMMENTS: (RECORD BRIEFLY THE INFORMATION COVERED IN THE ITEM(S) CHECKED ABOVE. INCLUDE ANY RECOMMENDATIONS OR COMMENTS MADE DURING THE MEETING WHICH MAY IMPROVE OUR SAFETY PROGRAM.

NO.	DISTRIBUTION OF COPIES
1	Fire & Safety (original copy)
2	Section copy
3	Supervisor copy

* RECORD ADDITIONAL ATTENDANCE ON REVERSE SIDE

(CHAIRMAN) _____ (SECTION) _____ (DATE) _____

MINUTES OF SAFETY MEETING
Figure 25-1

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Number of Points	*Number of Awards*	*Award Level*
20	1	A
40	1	D
(one of the following)	2	A
60	1	E
(one of the following)	1 1	D A
	3	A
80	1	F
(one of the following)	1 1	E A
	2	D
	4	A

POINTS AWARD SCHEDULE
Figure 25-2

CHAPTER 26 - REQUIREMENTS FOR ESTABLISHING BARRIERS AND BARRICADES

26.1 INTRODUCTION

26.1.1 This chapter provides the requirements for erecting or maintaining a barrier or barricade. This chapter applies to all FEMP work, whether on-site or off-site.

26.1.2 Barrier requirements governing radiological control zones or asbestos work areas shall take precedence over the requirements of this chapter.

26.2 DEFINITIONS

26.2.1 Affected Personnel - For the purpose of this chapter, individuals required to enter a barricaded area.

26.2.2 Authorized Personnel - Individuals, designated by the Facility Owner or management, who are responsible for erecting or removing barricades.

26.2.3 Barrier/Barricade - Tapes, cones, fences, walls, or similar devices identifying, warning, and limiting access to potentially hazardous areas or dangerous conditions.

26.2.4 Designated Construction Area - An area where WEMCO personnel or non-WEMCO subcontractors (under contract to WEMCO or to Rust Engineering Company) are doing more than routine maintenance work.

26.2.5 Facility Owner/Designee - An individual identified by management as responsible for work done in a designated area.

26.2.6 Information Tag - A blue and white tag (WEMCO Stores item number 5-00208) stating equipment status and special instructions (Figure 26-1).

26.3 RESPONSIBILITIES

26.3.1 The Site Services Manager shall be responsible for implementing, administering, and ensuring compliance with the requirements of this chapter in all WEMCO activities.

26.3.2 The Engineering Manager shall be responsible for implementing, administering, and ensuring compliance with the requirements of this chapter in all subcontractor activities.

26.3.3 The Facility Owner/Designee shall be responsible for ensuring compliance with the requirements of this chapter in their designated area.

26.3.4 The Safety Engineering and Fire Services (SE&FS) Staff shall be responsible for ensuring that barriers or barricades do not create a life safety code violation.

CHAPTER 26 (cont.)

26.3 RESPONSIBILITIES (cont.)

26.3.5 All personnel shall be responsible for remaining out of barricaded areas unless authorized and required to enter them.

26.3.5.1 Personnel shall be responsible for complying with all posted requirements in the area.

26.3.6 Authorized personnel shall be responsible for: (1) erecting barricades in compliance with the requirements of this chapter, (2) posting both requirements for and prohibitions against entrance of barricaded area(s), and (3) advising the facility owner/designee.

26.4 GENERAL

26.4.1 The facility owner/designee shall be informed before barricades are erected in their designated area.

26.4.2 When the facility owner is absent, the Assistant Emergency Duty Officer (AEDO) shall act in their place.

26.4.2.1 The AEDO shall be informed of barricades to be installed, and shall then inform the facility owner before the next scheduled work shift begins.

26.5 REQUIREMENTS

26.5.1 Erecting and Removing Barricades

26.5.1.1 Authorized personnel shall identify to the facility owner/designee (1) the area to be obstructed and (2) the purpose for the obstruction.

26.5.1.2 The facility owner/designee shall inform all "affected personnel" of the presence and purpose of the barricade.

26.5.1.3 The barricade shall be erected with rope, pre-printed tape, plastic fencing, or other proper material.

(a) Yellow/magenta radiation rope/tape or asbestos rope/tape shall not be used to erect a barricade, unless the barricade is to restrict access to a radiation areas or asbestos area.

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CHAPTER 26 (cont.)

26.5 REQUIREMENTS (cont.)

26.5.1.4 All points of entry to a barricaded area shall be posted with a proper and completed standard information tag (Figure 26-1).

(a) The information tag shall give the (1) date the barricade was erected, (2) purpose of the barricade, (3) name(s) of the individual(s) erecting the barricade, (4) name and phone/radio contact for the authorized removal of the barricade, (5) entry requirements, (6) entry prohibitions, and (7) precautions required for permitted entry.

26.5.1.5 Written approval from SE&FS shall be obtained before the erection of barricades that partially or completely obstruct: (1) a means of exit, or (2) movement of emergency equipment (e.g. any road or lane closure).

26.5.1.6 Every excavation left unattended shall be protected and marked by a barricade.

26.5.1.7 Every excavation in or adjacent to roadways or walkways shall be barricaded and posted with warning lights.

26.5.1.8 Floor and wall openings, from which there is a drop of four feet or more, shall be protected by a barricade unless the obstruction interferes with the work being done. See 29 CFR 1910.23 for details.

(a) This requirement applies to walking surface openings measuring 12 or more inches in its least dimension in floors, platforms, pavements or yards.

(b) This requirement applies to wall openings measuring at least 30 inches high and 18 inches wide in walls or partitions.

26.5.1.9 The barricade shall be removed (1) only by authorized personnel and (2) only after the hazard has been removed from the area.

26.5.1.10 Every barricade shall be properly disposed of or stored when it is not in use.

26.5.2 Establishing/Removing Designated Construction Areas

26.5.2.1 Work sites shall be designated as construction areas by the WEMCO Project Engineer.

CHAPTER 26 (cont.)

26.5 REQUIREMENTS (cont.)

26.5.2.2 Every entrance to a construction area shall be posted by the subcontractor with a sign reading "Construction Area - Hard Hats and Safety Glasses Required."

26.5.2.3 Plastic fencing (or equivalent) shall be used to bar entrance by unauthorized individuals to construction areas.

26.5.2.4 Every barricade shall be properly disposed of or stored when it is not in use.

26.6 APPLICABLE DOCUMENTS

26.6.1 29 CFR 1910, OSHA General Industry Standards

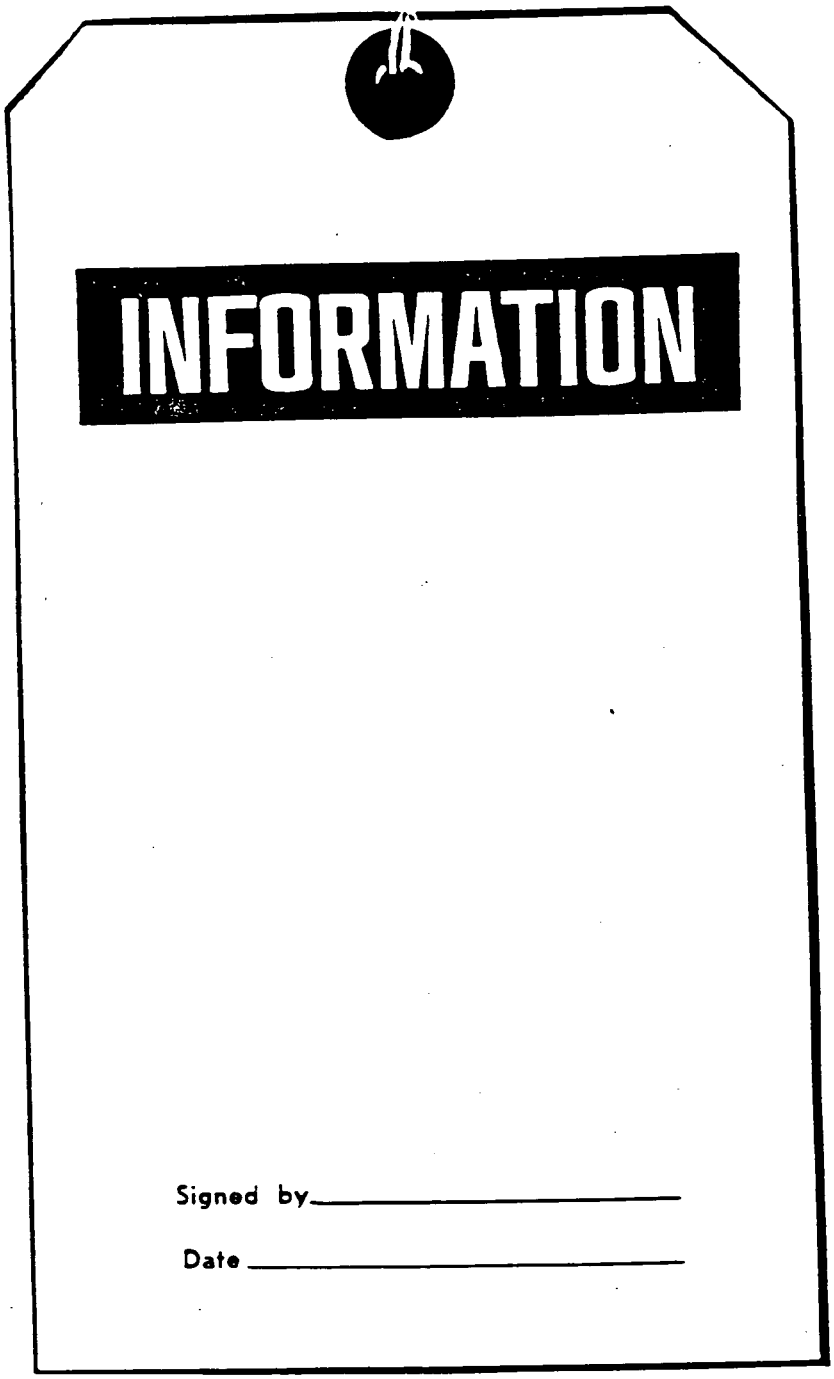
26.6.2 29 CFR 1926, OSHA Construction Industry Standards

26.7 FORMS USED

None

26.8 EXHIBITS

26.8.1 Figure 26-1, FEMP Information Tag



FEMP INFORMATION TAG
Figure 26-1

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CHAPTER 27 - JOB SAFETY ANALYSIS (JSA)

27.1 INTRODUCTION

27.1.1 The purpose of Job Safety Analysis (JSA) is to analyze a job so the probability of injury or occupational illness is reduced. This process requires:

27.1.1.1 Proper selection of jobs to be analyzed,

27.1.1.2 Breaking each job into its component tasks,

27.1.1.3 Analyzing each task to determine the most likely cause(s) of injury (occupational illness),

27.1.1.4 Determining the best way(s) to minimize the probability of injury (occupational illness) during each task, and

27.1.1.5 Communicating Job Safety Analysis fundamentals with the employee.

27.1.2 This chapter provides the FEMP requirements for the JSA Program and guidance for completing the JSA forms.

27.1.3 The results of a JSA can be the basis for establishing or revising Standard Operating Procedures and can also be used as a tool for training.

27.2 DEFINITIONS

27.2.1 Job Safety Analysis (JSA) - A system to reduce the number of injuries by reducing a job to its component tasks, and then determining ways to minimize the probability of injury during each task.

27.2.2 PPE - Personal Protective Equipment such as respirators, safety glasses, hearing protection, and insulated gloves.

27.2.3 Recordable Injury - An occupational injury or illness that: (a) results in a fatality or lost work day(s), (b) requires medical treatment (other than first aid), (c) involves loss of consciousness or restriction of work motion, or (d) is a diagnosed occupational illness even if it causes no lost workdays.

27.2.4 Standard Operating Procedure (SOP) - Step-by-step instructions detailing how to perform a specific job.

27.3 RESPONSIBILITIES

27.3.1 Employees shall be responsible for complying with the requirements of this chapter.

27.3.2 Managers/Supervisors shall be responsible for ensuring that personnel comply with the requirements of this chapter.

CHAPTER 27 (cont.)

27.3 RESPONSIBILITIES (cont.)

27.3.3 Safety Engineering shall be responsible for providing assistance when additions or corrections are required for this chapter, and for review and approval of JSA's.

27.4 GENERAL

27.4.1 Jobs to be Analyzed - Jobs to be analyzed must be:

27.4.1.1 commonly performed jobs, or one-of-a-kind jobs that the supervisor recognizes as being hazardous, and

27.4.1.2 capable of being broken up into distinct tasks.

27.4.2 Selection of Jobs to be Analyzed - When determining the job(s) to be analyzed, the following criteria (27.4.2.1 through 27.4.2.6) must be considered:

27.4.2.1 The supervisor must complete a JSA (review, and revise, as necessary, if an approved JSA exists) for a job in his/her department where there was a recordable injury,

27.4.2.2 The supervisor must complete a JSA (review, and revise, as necessary, if an approved JSA exists) for a job in his/her department where multiple first aid cases occur,

27.4.2.3 A job, in the supervisor's department, where there was an injury requiring only first aid,

27.4.2.4 A job where the supervisor observed a "close call",

27.4.2.5 A job where an employee observed a "close call" and communicated it to the supervisor, and

27.4.2.6 A job that is repetitive, or includes repetitive motions or tasks (even if there have been no reported injuries).

27.4.3 Typical Preventive Measures - Preventive measures that may be relevant include:

27.4.3.1 Listing the types of PPE which are necessary for the job (e.g. proper type of respirator, insulated gloves, ear plugs, safety glasses, fire resistant clothing, [illegible] welding goggles),

27.4.3.2 Equipment that will make the job safer (e.g. use a forklift instead of lifting by hand),

27.4.3.3 Training courses which will raise the employees skill level,

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CHAPTER 27 (cont.)

27.4 GENERAL (cont.)

27.4.3.4 Training courses or group safety meetings, which will make employees more aware of safety concerns (e.g. proper lifting techniques, chemical hazard awareness),

27.4.3.5 Engineering controls (e.g., ventilation, cooling/heating the work area),

27.4.3.6 Substitution (e.g., using a less toxic cleaning solvent),

27.4.3.7 Administrative controls (e.g., minimizing exposure time, restricting access to the work area, warning signs, use of additional personnel), or

27.4.3.8 Change in work practices (e.g., move the box directly from point "A" to point "C" and move the checking procedure normally performed at point "B").

27.5 REQUIREMENTS

27.5.1 Job Analysis (Supervisor's responsibilities) - The following is the sequence of events that should take place for a Job Safety Analysis:

27.5.1.1 Do a preliminary assessment: (a) break the job into several distinct parts or tasks, and (b) determine what items would make the job safer (see paragraph 27.4.3).

27.5.1.2 Get employee input - what the employee(s) believes is: (a) the hazardous part of the job, and (b) a realistic means to minimize the risk.

27.5.1.3 Observe the employee (employees if several perform the same job) while he/she is performing the job.

27.5.1.4 Fill out the JSA form.

27.5.1.5 Forward the JSA form to the JSA reviewer.

27.5.1.6 When the reviewed and approved JSA form is returned,

(a) review the JSA with affected employee(s),

(b) implement the recommendations of the JSA,

(c) file the original JSA in a location accessible to employees (for review and reference).

CHAPTER 27 (cont.)

27.5 REQUIREMENTS (cont.)

27.5.2 Completing the JSA form (Supervisor) - the example in Figure 27-2 will provide additional guidance.

27.5.2.1 Complete the top portion of the form, except:

(a) Leave the "REVIEWED BY" and the APPROVED BY" sections blank.

(b) The PPE section is to be filled out with the PPE items required (recommended) before the JSA was completed.

27.5.2.2 In the "SEQUENCE OF BASIC JOB STEPS" column: (a) Break the job up into as many distinct tasks as is appropriate, (b) enter them in the order they are normally performed, and (c) number them.

27.5.2.3 In the "POTENTIAL ACCIDENTS OR HAZARDS" column: (a) determine the hazard(s) involved with each distinct task, (b) enter each hazard adjacent to the task, and (c) number them to correspond to the number of the task in the first column.

27.5.2.4 In the "RECOMMENDED SAFE JOB PROCEDURE" column: (a) determine the most realistic way(s) to minimize or eliminate the hazards listed in the second column, (b) enter each recommendation adjacent to the hazard, and (c) number them to correspond to the number of the task in the first column.

27.5.3 Reviewing the JSA Form (Reviewer)

27.5.3.1 Review the JSA form for completeness, clarity, and appropriateness of recommendations.

27.5.3.2 Return the form to the Supervisor if revisions are necessary.

27.5.3.3 If no revisions are necessary, sign "Reviewed by" block and forward to Safety Engineering.

CHAPTER 27 (cont.)

27.5 REQUIREMENTS (cont.)

27.5.4 Approving the JSA Form (Manager of Safety Engineering and Fire Services or designee)

27.5.4.1 Review the JSA form for conformance to the requirements of this chapter.

(a) If revisions are necessary, return the JSA to the supervisor.

(b) If the JSA conforms to requirements of this chapter, sign it, retain a copy, and send the original to the supervisor.

27.5.5 Revisions to JSA

27.5.5.1 The JSA must be reviewed and revised as necessary if: (a) the job (or components of the job) are changed, or (b) the implemented recommendations do not prevent injuries or "close calls".

27.5.6 Record Keeping

27.5.6.1 The Original is kept by the supervisor in a location accessible to the employee.

27.5.6.2 A copy is kept by Safety Engineering.

27.6 APPLICABLE DOCUMENTS

27.6.1 DOE 76-45/19, SSDC-19 - Job Safety Analysis

27.7 FORMS USED

27.7.1 JSA Form

27.8 EXHIBITS

27.8.1 Figure 27-1 - JSA Form (blank)

27.8.2 Figure 27-2 - Example of a Completed JSA Form

JOB SAFETY ANALYSIS

JOB:	DATE:

JOB TITLE:	DEPARTMENT:	SECTION/GROUP:

SUPERVISOR:	ANALYSIS BY:	REVIEWED BY:	APPROVED BY:

REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

SEQUENCE OF BASIC JOB STEPS	POTENTIAL ACCIDENTS OR HAZARDS	RECOMMENDED SAFE JOB PROCEDURE

Page ___ of ___

JOB SAFETY ANALYSIS	JOB: Mail Delivery	DATE: 4/2/92
JOB TITLE: Clerk	DEPARTMENT: Communications	SECTION/GROUP: Comm. Services
SUPERVISOR: J. Doe	ANALYSIS BY: J. Doe	REVIEWED BY: / APPROVED BY:
REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT: None		

SEQUENCE OF BASIC JOB STEPS	POTENTIAL ACCIDENTS OR HAZARDS	RECOMMENDED SAFE JOB PROCEDURE
1. Prepare mail for delivery to Post Office	1. Muscle strain (neck and shoulders)	1.
2. Load outgoing mail into boxes for delivery to Post Office	2. Muscle strain	2. Put boxes on lower table to minimize strectching while loaing boxes
3. Load boxes on dolly for transport to car	3. Back injury when lowering boxes to floor level	3a. Use cart instead of dolly so boxes don't have to be lowered to floor level 3b. Attend Back Awareness Training
4. Transport mail to car	4a. Trip while concentrating on balancing the load 4b. Possible injury from running into others	4a. Strap the load in place 4a. Get a Cart with side rails 4b. Use two personnel when load obstructs vision 4b. Install mirrors at corners of the Admin Bldg.
5. Load mail into vehicle trunk	5. Back injury while bending to put boxes in trunk	5. Use two personnel when load is heavy 5. Use station wagon so clerk doesn't have to extend while bending.
6. Transport mail to Post Office	6. Vehicle accident while driving to Post Office	6. Attend Defensive Driving Course

Page ___ of ___

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Figure 27-2

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CHAPTER 28 - FEMP SAFETY SUGGESTION/COMPLAINT SYSTEM

28.1 INTRODUCTION

28.1.1 This chapter provides the basic requirements for the submission, investigation, and resolution of safety or occupational health suggestions and/or complaints by personnel, including: (1) preparation of the necessary written documentation, and (2) the responsibilities of the complainant, their supervisor, section and department managers and the Industrial, Radiological Safety and Training (IRS&T) staff.

28.2 DEFINITIONS

28.2.1 Complainant - An individual using the FEMP "Occupational Safety or Health Suggestion/Complaint" form to submit a safety or occupational health suggestion or complaint (Figure 28-1).

28.2.2 Complaint - A statement explaining the condition or practice that is a violation of an established safety or health standard that can cause an injury or health risk to personnel.

28.2.3 Imminent Danger - A hazardous working situation created by any condition or practice that can cause (1) death or serious physical harm to personnel, (2) serious property damage, or (3) major damage to the environment.

28.2.3.1 Correcting the problem includes removing or minimizing the effects of the condition, and/or removing personnel from the effects of the condition.

28.2.3.2 Serious physical harm to personnel includes permanent or prolonged injury to the body and/or temporary disablement that requires hospitalization.

28.2.4 Safety Suggestion - An idea for improvement of the FEMP Safety and Health Program submitted by an individual.

28.2.4.1 A safety suggestion is not a complaint. It does not involve violations of established codes or standards.

28.2.4.2 A safety suggestion seeks to reduce exposure of personnel to possible hazards or injuries.

28.3 RESPONSIBILITIES

28.3.1 The Safety Engineering and Fire Services (SE&FS) Manager shall be responsible for administering the WEMCO safety and health complaint/suggestion system, including processing and investigating information provided on the FEMP form "Occupational Safety or Health Suggestion/Complaint" (Figure 28-1).

CHAPTER 28 (cont.)

28.3 RESPONSIBILITIES (cont.)

28.3.2 The Manager of IRS&T shall be responsible for investigating the suggestions/complaints and shall, within the time frame of paragraph 28.4.2, provide the SE&FS Manager with written information on code and standard compliance.

28.3.3 Personnel shall be responsible for using the FEMP form "Occupational Safety or Health Suggestion/Complaint" to formally: (1) report violations of safety or other health standards, or (2) present a safety suggestion.

28.3.4 Each Immediate Supervisor and Section/Department Manager of a complainant shall be responsible for (1) investigating the information given on the form, (2) listing corrective actions, (3) adding necessary information where required, (4) signing the form and (5) forwarding the form to the next reviewing individual. All of these actions shall be completed within the time frame of paragraph 28.4.2.

28.4 GENERAL

28.4.1 Safety complaints, especially those involving imminent danger, should be verbally reported to the immediate supervisor, in a timely manner. The FEMP form "Occupational Safety or Health Suggestion/Complaint" (currently IRS&T 2592) is meant to be used f formal safety or occupational health suggestions and for formal resolution of a safety or occupational health complaint.

28.4.1.1 Any individual may submit a written complaint to the DOE using Form 5480.4, "U.S. Department of Energy Contractor Employee Occupational Safety or Health Complaint" (Figure 28-2).

28.4.2 A complainant submitting Form IRS&T 2592 shall receive a written answer within 15 working days of the receipt of the second (blue) copy of the form at the SE&FS Manager's office.

28.4.2.1 The answer shall (1) outline corrective actions taken/planned or (2) explain that additional time is needed for investigating the information given on the form.

28.4.3 SE&FS shall ensure that copies of the "Occupational Safety or Health Suggestion/Com int" form always are available from the yellow boxes labeled "Safet omplaint Forms" and located throughout the various plants.

28.4.3.1 Forms also shall always be available from the SE&FS Manager's office.

CHAPTER 28 (cont.)

28.5 REQUIREMENTS

28.5.1 Complainant Actions - Section 1 of Form 2592

28.5.1.1 The complainant shall complete Sections 1A-1E.

(a) Complete Section 1A by checking the proper block and using the definitions in paragraph 28.2 of these requirements. Use the classification "imminent danger" only for problems truly believed to be so.

(b) Complete Section 1B by describing the exact location of the problem, indicating (1) building number, name, floor, area, and/or (2) the specific piece of equipment involved.

(c) Complete Section 1C by clearly and simply describing the problem, noting the condition or practice and hazard involved. Refer to any DOE or other recognized standard believed to be violated.

(d) Complete Section 1D by describing exactly what can be done to correct the hazard and list any other information that may help in resolving the problem.

(e) Complete Section 1E by signing and dating the form, and putting your badge number in the spaces provided. Print your name after you write it.

28.5.1.2 Hand-carry all 3 copies of the form to the immediate supervisor.

28.5.1.3 Discuss (with the supervisor) the measures that can be taken to remove hazards. (The supervisor then shall acknowledge receipt of the form by initialing and dating it in the space provided in Section 2A.)

28.5.1.4 The complainant then forwards the second (blue) copy of the form to the SE&FS Manager, and keeps the third (yellow) copy.

CHAPTER 28 (cont.)

28.5 REQUIREMENTS (cont.)

28.5.2 Immediate Supervisor - Section 2 of Form 2592)

28.5.2.1 Complete Section 2A by immediately discussing with complainant any problem they have labeled "imminent danger" in Section 1A.

(a) If it is determined that "imminent danger" does exist, contact the SE&FS Manager for any immediate temporary corrective action required. [The SE&FS Manager shall direct a member of the professional or technical staff to conduct immediate investigation of the problem.]

(b) Initial and date the form in the spaces provided. Return copies 2 (blue) and 3 (yellow) to complainant.

28.5.2.2 Complete Section 2B by checking the proper block indicating agreement or disagreement with complainant's evaluation in Section 1C. (Do not use this section to agree/disagree with Section 1D.)

28.5.2.3 Complete Section 2C either (1) by leaving it blank to show agreement with complainant's Section 1C descriptio or (2) by explaining the Section 1C problem as it appea to you, if you disagree with complainant's description.

28.5.2.4 Complete Section 2D by specifically listing any actions taken/pl ned to (1) resolve the problem and (2) prevent recurren of the problem. (Do not simply state that the problem exists d suggest someone else take care of it.)

(a) If assistance from another WEMCO Section or Department has been formally requested, list the actions taken. Also attach copies of applicable work requests, requisitions, purchase orders, memos, etc. to the complaint form.

28.5.2.5 Complete Section 2E only if the corrective action involves issuing a "FEMP Work Request/Order" or procuring supplies through a "Requisition." Give the dates actions were taken, and their completion projected. Attach copies of all documentation involving resolution of the specific problem.

28.5.2.6 Complete Section 2F by signing and dating the original (white) copy on the day it is sent to the Section Manager for review.

CHAPTER 28 (cont.)

28.5 REQUIREMENTS (cont.)

28.5.2.7 All of the actions by the supervisor shall be completed in a timely manner so that the time frame of paragraph 28.4.2 may be met.

28.5.3 Completing Section 3 of Form 2592

28.5.3.1 The complainant's Section Manager shall complete Section 3.

(a) Signing in the space provided shows agreement with the immediate Supervisor's description of the problem and the recommended corrective action.

28.5.3.2 Sign and date the form on the day it is sent to the Department Manager for review.

28.5.4 Completing Section 4 of Form 2592

28.5.4.1 The complainant's Department Manager shall complete Section 4.

(a) Signing in the space provided shows agreement with the immediate Supervisor's description of the problem and recommended corrective action.

28.5.4.2 Sign and date the form on the day it is sent to the SE&FS Manager for review.

28.5.5 Actions By Manager of the SE&FS Section

28.5.5.1 Perform all required investigation, resolution, and documentation involved in resolving safety suggestions and complaints as outlined in the most recent issue of "FEMP Internal Occupational Safety or Health Suggestion/Complaint Forms" (currently SP-P-42-031).

28.5.6 Additional Complaint Reviews

28.5.6.1 If complainant disagrees with the resolution given on the completed form (2592), he/she may request, through the Chairman of the Union Safety Committee, that the suggestion/complaint be discussed at the next Company Union Safety Meeting.

28.5.6.2 A resolution with which a complainant disagrees may be referred to the Joint Executive Safety Committee by complainant's contacting a member of the committee and requesting that the subject be included on the agenda of a future meeting.

CHAPTER 28 (cont.)

28.5 REQUIREMENTS (cont.)

28.5.6.3 Any individual at the FEMP seeking other and/or further problem resolution may submit a written complaint to the DOE as explained in paragraph 28.4.1.1 (Figure 28-2).

28.6 APPLICABLE DOCUMENTS

28.6.1 WEMCO SP-P-42-031 - "FEMP - Internal Occupational Safety or Health Suggestion/Complaint Forms"

28.7 FORMS USED

28.7.1 FEMP Form 2592 - "Occupational Safety or Health Suggestion/ Complaint"

28.7.2 Form F 5480.4, "U.S. Department of Energy Contractor Employee Occupational Safety or Health Complaint"

28.8 EXHIBITS

28.8.1 Figure 28-1 - FEMP Form 2592, "Occupational Safety or Health Suggestion/Complaint"

28.8.2 Figure 28-2 - Form DOE F 5480.4, "U.S. Department of Energy Contractor Employee Occupational Safety or Health Complaint"

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NO. _____

Feed Materials Production Center

OCCUPATIONAL SAFETY OR HEALTH SUGGESTION/COMPLAINT

This form is provided for the assistance of any employe who believes that a violation of DOE safety or health standards exists about which he/she desires to file a complaint or can be utilized to submit a safety or health improvement/suggestion. It is not intended to constitute the exclusive means by which a complaint may be registered with the contractor, the DOE, or the U.S. Department of Labor.

1. *INSTRUCTIONS: This section is to be completed by the employe. After completion of Part 1, employe retains Copy Number 3 (yellow), forwards Copy Number 1 (white) to his/her supervisor and forwards Copy Number 2 (blue) directly to Industrial Hygiene and Safety.*

A. Does the situation deal with a: ☐ SUGGESTION ☐ COMPLAINT ☐ IMMINENT DANGER HAZARD

B. Specify the particular building or workarea where the alleged condition is located:

C. Describe briefly the present condition or practice and explain the basis of this suggestion/complaint *(include any standard you feel is being violated by present condition).*

D. Specify the change you are proposing to improve the present condition.

E.

SIGNATURE _____ BADGE NO. _____ DATE _____

2. This section is to be completed by the employe's immediate supervisor.

A. Supervisory acknowledgement of receipt of suggestion/complaint INITIALS: _____ DATE: _____

B. Do you believe the hazard(s) exist as described in 1C above? ☐ YES ☐ NO

C. If NO is checked, explain your perception of the present condition.

D. Describe briefly any corrective actions taken or planned to mitigate the condition described in 1C.

E. List the date Work Request and/or Purchase Order was/were written that will correct the above situation. *(Attach copies when available.)*

DATE: _____

F.

SUPERVISOR'S SIGNATURE _____ DATE _____

3. SECTION MANAGER:

SIGNATURE _____ DATE _____

4. DEPARTMENT MANAGER:

SIGNATURE _____ DATE _____

NO.	DISTRIBUTION OF COPIES	
1	*White*	Employe gives to supervisor
2	*Blue*	Employe mails to manager of IH&S
3	*Yellow*	Employe retains for his/her records

Give this copy to your supervisor.

FMPC-ESAH-2592 (REV. 9/15/87)

COPY 1

FEMP FORM 2592
Figure 28-1

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DOE F 5480.4
(08-91)
All Other Editions Are Obsolete

U.S. Department of Energy
Contractor Employee
Occupational Safety or Health Complaint

OMB Control No.
1910-0300
OMB Burden
Disclosure Statement
on Reverse

This form is provided for the assistance of any U.S. Department of Energy contractor employee or representative thereof who (1) believes that a violation of a U.S. Department of Energy safety or health standard exists and (2) desires to file a complaint. It is not intended to constitute the exclusive means by which a complaint may be registered with the contractor or with the Department of Energy.

1. THE UNDERSIGNED BELIEVES THAT A VIOLATION OF A DOE OCCUPATIONAL SAFETY OR HEALTH STANDARD EXISTS AT THE PLACES OF EMPLOYMENT INDICATED BELOW, RESULTING IN A JOB SAFETY OR HEALTH HAZARD TO EMPLOYEES.
(Check One)

☐ Employee ☐ Representative of employees ☐ Other (Specify) _____

2. DOES THE HAZARD(S) IMMEDIATELY THREATEN DEATH OR SERIOUS PHYSICAL HARM? ☐ YES ☐ NO

3. CONTRACTOR'S NAME	4. ADDRESS (Street, City, State, Zip Code)	5. TELEPHONE NO.

6. SPECIFY THE PARTICULAR BUILDING OR WORKSITE WHERE THE ALLEGED VIOLATION IS LOCATED, INCLUDING ADDRESS.

7. KIND OF ACTIVITY	8. NAME AND PHONE NUMBER OF CONTRACTOR'S AGENT(S) IN CHARGE

9. DESCRIBE BRIEFLY THE HAZARD WHICH EXISTS INCLUDING THE APPROXIMATE NUMBER OF EMPLOYEES EXPOSED TO OR THREATENED BY SUCH HAZARD. (Continue on another sheet if necessary)

10. LIST BY NUMBER AND/OR NAME THE PARTICULAR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARD(S) PRESCRIBED BY THE DOE WHICH YOU BELIEVE HAS BEEN VIOLATED, IF KNOWN.

11. TO YOUR KNOWLEDGE, HAS THIS VIOLATION BEEN THE SUBJECT OF ANY UNION/MANAGEMENT GRIEVANCE OR HAVE YOU (OR ANYONE YOU KNOW) OTHERWISE CALLED IT TO THE ATTENTION OF, OR DISCUSSED IT WITH, THE EMPLOYER OR ANY REPRESENTATIVE? (Check one) ☐ YES ☐ NO

IF "YES" IS CHECKED ABOVE, PLEASE GIVE THE RESULTS, INCLUDING ANY EFFORTS BY MANAGEMENT TO CORRECT THE VIOLATION.

12. PLEASE CHECK ONE:

☐ I do not wish my name revealed to the employer.

☐ My name may be revealed to the employer.

(Signature)	(Date)	(Typed or printed name)

13. IF YOU ARE A REPRESENTATIVE OF EMPLOYEES, GIVE THE NAME OF YOUR ORGANIZATION.

14. ADDRESS OF ORGANIZATION (Street, City, State, Zip Code)	15. TELEPHONE NO.

PRIVACY ACT STATEMENT ON BACK

FORM DOE F 5480.4
Figure 28-2

CHAPTER 29 - SAFE HANDLING OF COMPRESSED GAS CYLINDERS

29.1 INTRODUCTION

29.1.1 This chapter provides the basic requirements for the use, storage, and handling of compressed gas cylinders (having a maximum water capacity of 1000 pounds [approximately 120 gallons]) that are used for analytical, cutting-welding, fuel-gas, instrumentation, and medical purposes. These requirements shall not apply to larger tanks used for cryogenic purposes.

29.2 DEFINITIONS

29.2.1 Compressed Gas Cylinder - A cylinder containing: (1) any material or mixture of materials having an absolute pressure exceeding 40 P.S.I. at 70 degrees F, or, regardless of the pressure at 70 degrees F, having an absolute pressure exceeding 104 P.S.I. at 130 degrees F, or (2) any liquid flammable material having a vapor pressure exceeding 40 P.S.I. absolute at 100 degrees F.

29.2.2 Flammable Gas Cylinder - A cylinder containing gas such as acetylene, hydrogen and liquified petroleum gas (LPG), or mixture of gases, that easily ignites or explodes at room temperature and vigorously reacts with air to burn.

29.2.3 Inert Gas Cylinder - A cylinder containing gas such as argon, carbon dioxide, helium, and nitrogen that (1) does not react chemically or (2) reacts very slowly, and (3) can displace oxygen.

29.2.4 Oxidizing Gas Cylinder - A cylinder containing gas (e.g. oxygen) that by itself is not explosive but does form explosive mixtures with flammable gases.

29.2.5 Toxic Gas Cylinder - A cylinder containing poisonous gas such as carbon monoxide, chlorine, hydrogen fluoride, and hydrogen sulfide that can cause serious illness or death in short (acute) exposures.

29.2.6 D.O.T. - U.S. Department of Transportation.

29.3 RESPONSIBILITIES

29.3.1 All personnel shall be responsible for complying with all the requirements of this chapter when transporting, using, and/or storing compressed gas cylinders.

29.3.2 All Facility Owners/Designees shall be responsible for complying with all the requirements of this chapter in their own areas when compressed gas cylinders are transported, used, and/or stored.

29.3.3 WEMCO Receiving and Stores shall be responsible for ensuring that (1) all gas cylinders issued to users bear the required identification marking as stated in paragraph 29.4.9 of this chapter, (2) all cylinders received are in a safe condition, and (3) all unsafe cylinders received are returned to vendor(s).

CHAPTER 29 (cont.)

29.3 RESPONSIBILITIES (cont.)

29.3.4 Safety Engineering and Fire Services (SE&FS) shall be responsible for (1) conducting routine and scheduled inspections, and (2) informing proper personnel of any non-compliance with the requirements of this chapter.

29.3.5 Transportation shall be responsible for (1) filling and inspecting LPG cylinders as required by SOP 43-C-803, "Propane Plant," and (2) transporting/delivering all compressed gas cylinders in the manner required by this chapter.

29.3.6 WEMCO Management/Supervision shall be responsible for ensuring that personnel transporting, using and/or storing gas cylinders understand and comply with all of the requirements of this chapter.

29.4 GENERAL

29.4.1 Only DOT approved cylinders shall be used at FEMP.

29.4.2 The valve protective cap of every cylinder shall be on at all times when the cylinder is not in use.

29.4.3 Every cylinder shall be (1) firmly secured or chained and (2) kept in an upright position.

29.4.4 A regulator shall only be used with the type of compressed gas cylinder for which that regulator is made.

29.4.5 Oil and/or grease shall never be used on cylinder valves, regulators, couplings, and/or cylinder head threads or protective caps.

29.4.6 Cylinder valves shall be opened and closed only by hand. Hammers and/or wrenches shall never be used to open cylinder valves. Cylinders with valve problems shall be returned by WEMCO Stores to vendor(s).

29.4.7 Every cylinder shall be tagged either "Empty," "In-Service," or "Full" to show its fill status (Figure 29-1).

29.4.8 No individual shall:

29.4.8.1 tamper with cylinder valves and/or pressure release devices;

29.4.8.2 deface or remove any markings, labels, decals, tags and/or stencil marks used for identifying the contents of a cylinder;

29.4.8.3 try to repair and/or alter cylinder valves;

CHAPTER 29 (cont.)

29.4 GENERAL (cont.)

29.4.8.4 repaint a cylinder unless told to do so by a properly recognized authority.

29.4.9 No cylinder shall be accepted for use if (1) the hydrostatic test due date stamped on it has expired, (2) its valve protective cap is missing, and/or (3) its contents are not identified on it.

29.4.10 No cylinder that is deformed, dented, or has damaged and/or faulty valves shall be used.

29.4.11 No cylinder shall be used as a roller, a support, and/or for any purpose except that for which it was made and its specific contents intended.

29.4.12 No cylinder shall be placed where it could become part of an electric circuit.

29.4.13 Every leaking cylinder shall be immediately brought to the attention of the Assistant Emergency Duty Officer (AEDO).

29.4.14 Only LPG cylinders shall be refilled on site. All other cylinders shall be refilled off site by outside vendor(s).

29.4.15 Empty cylinders shall be stored only in areas designated for this purpose.

29.4.16 No cylinder (other than a breathing air cylinder) shall be taken into a confined space or any other enclosed area.

29.5 REQUIREMENTS

29.5.1 Storing Cylinders

29.5.1.1 All compressed gas cylinders shall be stored in a well ventilated area where temperatures do not exceed 125 degrees F. All cylinders stored outdoors shall be out of direct sunlight and off the ground.

29.5.1.2 The names of all gases being stored in bulk cylinder storage areas shall be prominently posted at the storage site.

29.5.1.3 Assigned storage areas for cylinders shall be so located that the cylinders cannot be knocked over and/or damaged by passing and/or falling objects, and/or tampered with by any individual.

29.5.1.4 All cylinders shall be stored away from ignition sources, combustible materials, and/or other flammable substances such as gasoline or waste. No smoking shall be permitted in these areas.

CHAPTER 29 (cont.)

29.5 REQUIREMENTS (cont.)

29.5.1.5 All cylinders shall be stored in dry areas and away from salt, other corrosive chemicals, and/or fumes.

29.5.1.6 Oxygen cylinders and acetylene cylinders shall be (1) stored at least 20 feet apart or (2) separated by a partition having a one-hour fire resistance rating and standing 5 feet high.

29.5.1.7 No empty cylinders shall be stored with full cylinders. Every empty cylinder shall have its valve closed and its protective cap in place.

29.5.1.8 All cylinders in storage shall be so arranged that the oldest stock is the first released and used.

29.5.1.9 SE&FS shall approve all areas for the storing of six or more cylinders.

29.5.1.10 Every cylinder shall be firmly secured across its upper half, but below its shoulder.

29.5.1.11 Bulk storage cylinders may be "nested" or stored with a chain drawn firmly around their outer perimeter, but every cylinder shall be placed directly next to another cylinder.

29.5.1.12 Every cylinder showing marks of corrosion, pitting, venting, arc burns, and/or other defects shall be taken out of service and returned to WEMCO Stores.

(a) A "Danger Do Not Operate" tag stating its defect shall be put on every damaged cylinder.

29.5.2 Transporting Cylinders

29.5.2.1 A hand truck shall be used to move every cylinder. No cylinder shall be rolled, dragged, and/or dropped at any time and/or for any distance.

29.5.2.2 No cylinder shall be transported in an enclosed vehicle.

29.5.2.3 All cylinders shall be firmly secured to prevent movement and/or falling when transported by any and all vehicles.

29.5.2.4 All cylinders shall be transported in an upright position.

29.5.2.5 The valve protective cap shall be placed on a cylinder before it is moved or transported.

CHAPTER 29 (cont.)

29.5 REQUIREMENTS (cont.)

29.5.2.6 No cylinder shall be lifted by its cap.

29.5.2.7 No cylinder shall be allowed to strike against (1) another cylinder and/or (2) any surface.

29.5.2.7 No cylinder shall be handled by a lifting magnet.

29.5.2.8 No cylinder made without lugs and/or other proper lifting devices shall be handled with slings, ropes, and/or chains.

29.5.2.9 No cylinder shall be handled by cranes without a safe cradle or platform to hold the cylinder.

29.5.3 Using Cylinders

29.5.3.1 Only properly instructed personnel with authorizing documentation by Supervisors shall use compressed gas cylinders.

29.5.3.2 Before any cylinder is handled or used:

(a) Every marking on the cylinder shall be checked. Where any required marking is missing, the cylinder shall be immediately returned to WEMCO Stores.

(b) The cylinder shall be properly supported and secured and its valve protective cap shall be in place when the cylinder is moved.

(c) The cylinder shall be properly secured before its valve protective cap is removed.

29.5.3.3 A cylinder shall be connected only to a properly designed and constructed manifold system.

(a) SE&FS shall inspect every manifold design before the design is used.

29.5.3.4 Every system using compressed gas cylinders shall contain a pressure relief device. Every pressure-regulating device and hose shall be checked for freedom from oil and dirt before a cylinder is used.

(a) Specifically, proper pressure-regulating devices shall be used when gas is admitted to those systems with pressure rating limitations lower than that of the cylinder.

CHAPTER 29 (cont.)

29.5 REQUIREMENTS (cont.)

(b) All connections to piping, regulators and/or other appliances shall be kept tight. Hoses shall be kept in good condition.

29.5.3.5 No regulator hose or other equipment shall be used for any gas other than the one(s) for which it is made.

(a) No connections shall be forced to fit. The threads on a regulator connection and/or other auxiliary equipment shall match the threads on the valve outlet of the cylinder.

(b) The supplier may be contacted for equipment/gas compatibility information.

29.5.3.6 A cylinder valve shall be hand-opened slowly. The valve shall be pointed away from self and other personnel.

(a) Before removing a regulator from a cylinder, (1) the valve of the cylinder shall be closed and (2) all pressure shall be released from the regulator.

(b) Double seated valves should be opened completely to seal properly.

29.5.3.7 Compressed gas without the protection of proper traps and/or check valves shall never be used where the cylinder could be contaminated by the feedback of process materials.

(a) Compressed gas shall never be used to dust off clothing or any other thing.

29.5.4 Oxygen/Acetylene Cylinders

29.5.4.1 Acetylene shall never be used in excess of 15 P.S.I.

29.5.4.2 No Oxygen/Acetylene outfit shall be taken into any confined space without approval of Safety Engineering & Fire Services.

29.5.4.3 Factory Mutual or Underwriter's Laboratory-approved equipment such as torches, regulators and pressure reducing valves only shall be used.

29.5.4.4 Torches shall be lighted only with properly authorized devices.

29.5.4.5 Soap-water, and never a flame, shall be used to check leaks.

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CHAPTER 29 (cont.)

29.5 REQUIREMENTS (cont.)

29.5.4.6 An Oxygen-Acetylene unit shall never be used outside a designated area of a maintenance shop without a flame/welding permit as required by FEMP-516.

29.5.4.7 Every Oxygen/Acetylene outfit shall be equipped with a back-flow device and flame arrester.

29.5.5 LPG Cylinders

29.5.5.1 All LPG cylinders shall be stored in an upright position and properly tagged at the FEMP propane plant (Figure 29-1).

29.5.5.2 All LPG cylinders shall be stored only in those locations and on that equipment designated for this purpose.

29.5.5.3 No LPG cylinder shall be stored or used near flammable solvents, unprotected electrical connections, gas flames, and/or other sources of ignition.

29.5.5.4 When changing LPG cylinders on a vehicle, the ignition of that vehicle shall be off.

29.5.5.5 The cylinder valve shall be closed before removing or installing any/all connections.

29.5.5.6 Gloves preventing freeze burns shall be worn by personnel disconnecting LPG cylinders.

29.5.5.7 All LPG cylinders on vehicles shall be secured by straps mounted to the vehicle. No defective and/or unrepaired strap shall be used.

29.5.5.8 All LPG cylinder valves shall be closed (1) when cylinders are left on any unattended vehicle for more than 15 minutes, and (2) before any repairs, other than that of fuel-related troubleshooting, are made on the equipment and/or vehicles.

29.5.6 Toxic Gas Cylinders

29.5.6.1 Before any employee handles or uses toxic gas cylinders, they shall be instructed in the potential hazards involved (review the MSDS).

29.5.6.2 Emergency Life Support Apparatus (ELSA) and/or Self-Contained Breathing Apparatus (SCBA) where required shall be available for immediate use to all personnel handling or using toxic gas cylinders.

CHAPTER 29 (cont.)

29.5 REQUIREMENTS (cont.)

29.5.6.3 Toxic gas cylinders shall be used only in area(s) with local exhaust ventilation. Emissions involved shall not exceed environmental regulations.

29.5.6.4 No toxic gas cylinder shall be used until it is approved by SE&FS.

29.6 APPLICABLE DOCUMENTS

29.6.1 29 CFR 1910, "Occupational Safety and Health Standards - General Industry."

29.6.2 29 CFR 1926, "Occupational Safety and Health Standards - Construction Industry."

29.6.3 Compressed Gas Association, Standard P-1, Safety Handling of Compressed Gases.

29.6.4 National Fire Codes, National Fire Protection Association.

29.6.5 Standard Operating Procedure 43-C-903, Propane Plants.

29.6.6 FEMP-516, "Control of Potentially Hazardous Work."

29.7 FORMS USED

29.7.1 Cylinder tag with perforated sections stating "Empty," "In-Service," "Full."

29.8 EXHIBITS

29.8.1 Figure 29-1 - Cylinder tag with perforated sections stating "Empty," "In-Service," "Full."

CYLINDER TAG - "EMPTY-IN SERVICE-FULL"
Figure 29-1

CHEMICAL HAZARD COMMUNICATION PROGRAM

RM-2086

NON-CONTROLLED COPY

Effective Date: 07-10-92

REQUIREMENTS MANUAL

AUTHORIZED BY: _____ 7/9/92
H. F. DAUGHERTY, PRESIDENT DATE

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P.O. Box 398704
Cincinnati, Ohio 45239-8704

LIST OF EFFECTIVE PAGES

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2	2-1 thru 2-42	0	07-10-92
3	3-1	0	07-10-92
4	4-1	0	07-10-92
5	5-1	0	07-10-92
6	6-1 thru 6-5	[illegible]	07-10-92
7	7-1	0	07-10-92
8	8-1	0	07-[illegible]-92
9	9-1	0	07-[illegible]-92
10	10-1 thru 10-3	0	07-10-92
11	11-1 thru 11-11	0	07-10-92

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
07-10-92	0	Requirements manual issued per Request No. P91-152, initiated by R. Kruchan. Supersedes Interim IN-6024, dated 10-18-91.

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CHAPTER 1.0 - GENERAL

1.1 INTRODUCTION

The Occupational Safety and Health Administration (OSHA) requires a written hazard communication program be developed and maintained at each facility (per 29 CFR 1910.1200). The program describes the hazardous chemicals in the workplace. If additional information regarding the contents of 29 CFR 1910.1200 is required, contact Industrial Hygiene.

The program also addresses methods for notifying employees of the chemical hazards (both current and new) that may be encountered while performing assigned tasks, description and use of Material Safety Data Sheets, the importance of accurate labeling, and training requirements.

1.2 PURPOSE

The purpose of this manual is to provide information that will increase knowledge of workplace chemical hazards, promote an understanding of the Hazard Communication Program at the Fernald Environmental Management Project (FEMP), and encourage personnel to comply with OSHA requirements.

1.3 SCOPE

This manual is applicable to all work areas (including administrative) at the FEMP, except Analytical Laboratory Employees. Laboratory personnel shall comply with PL-FMPC-3001.

1.4 RESPONSIBILITIES

Responsibilities for implementing and maintaining the Hazard Communication Program at the FEMP are shown in Figures 1-1 thru 1-8.

1.5 DEFINITIONS

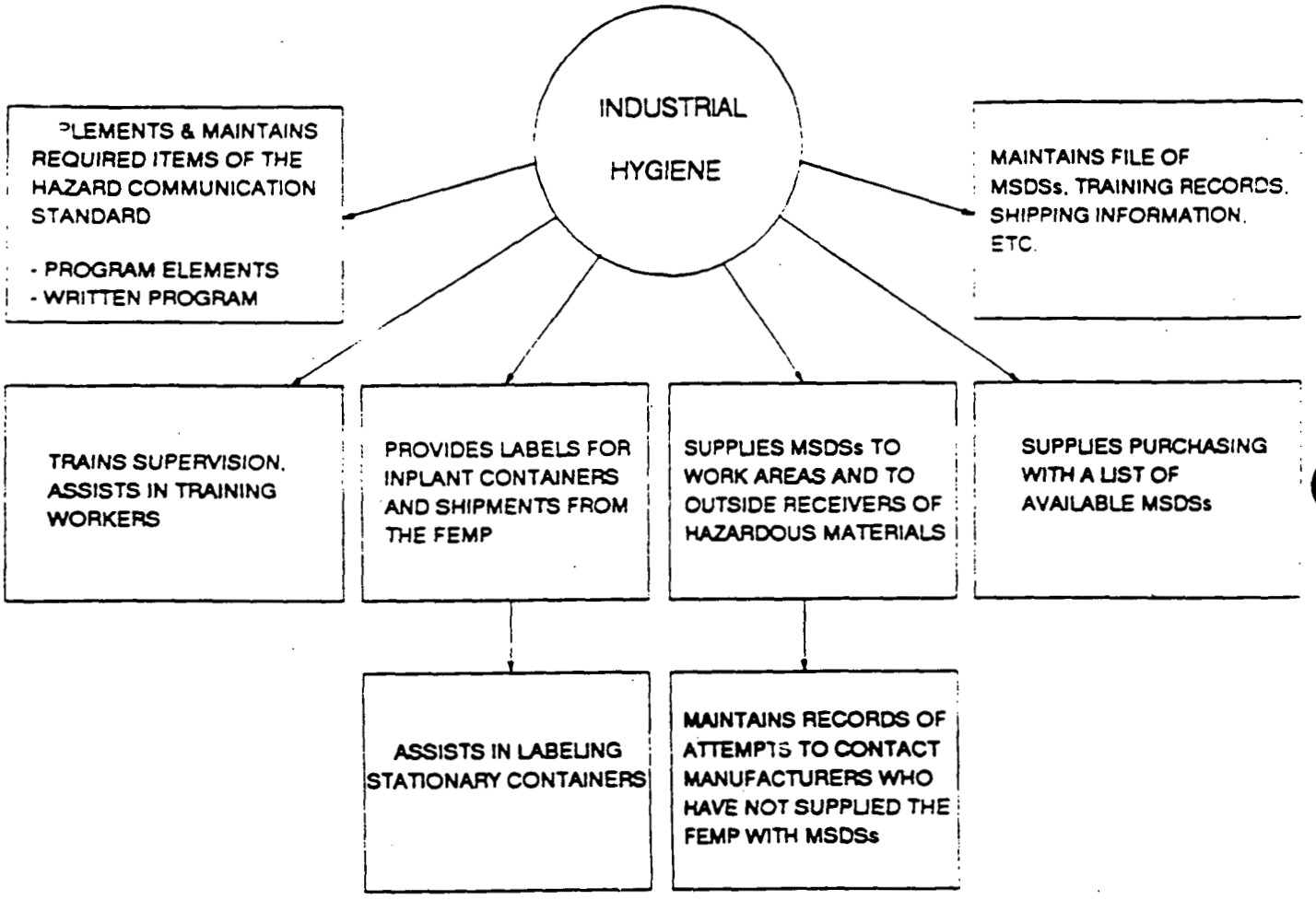
1.5.1 Carcinogen - A chemical substance that causes cancer or is suspected of causing cancer.

1.5.2 Corrosives - Chemical compounds that cause visible destruction of living tissue at the site of contact by chemical action.

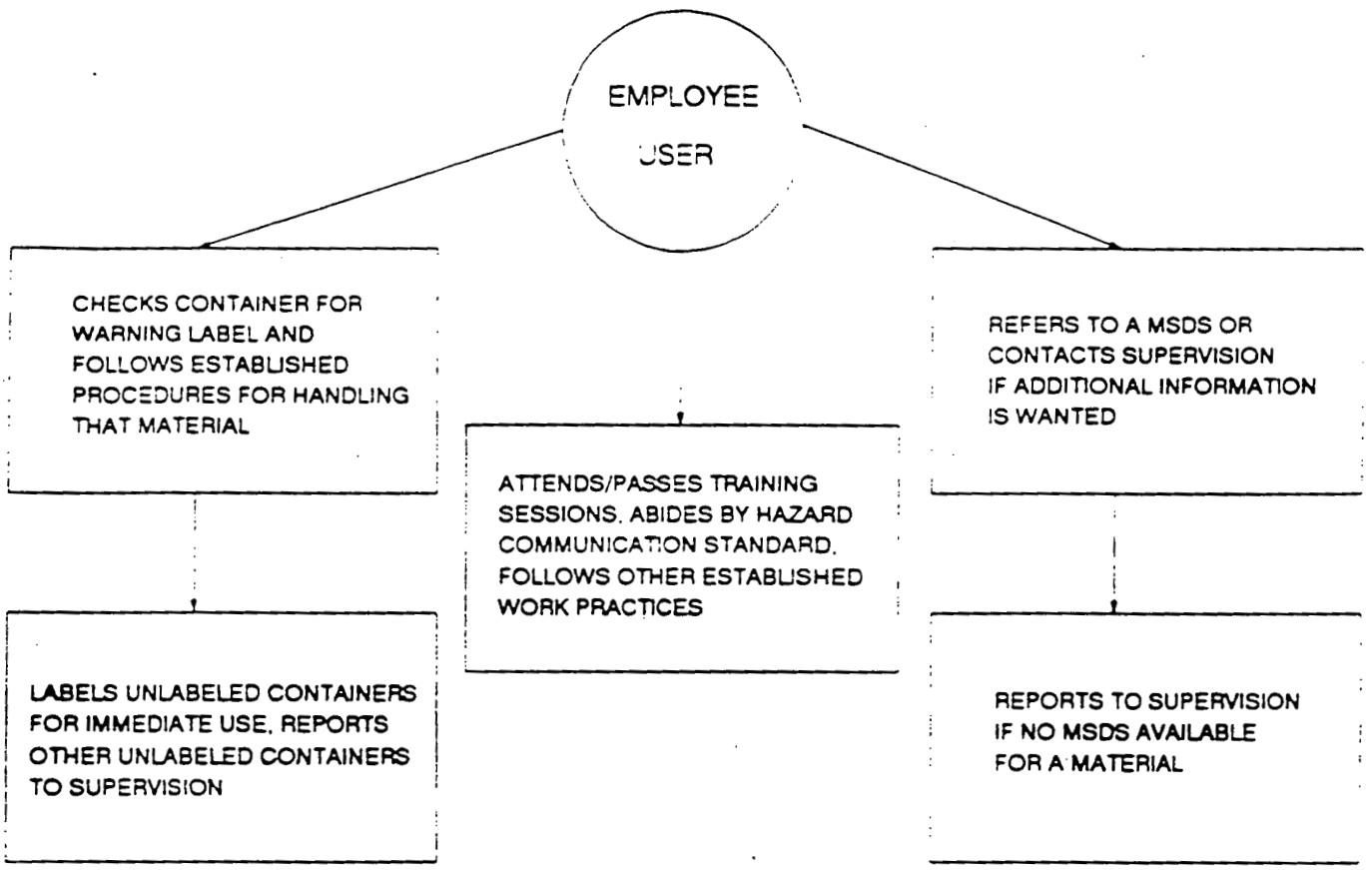
1.5.3 Explosive - A chemical compound or mixture of compounds that can suddenly undergo a rapid chemical transformation with a simultaneous concussion and release of large quantities of heat and gases.

1.5.4 Flammable - A material capable of being set on fire.

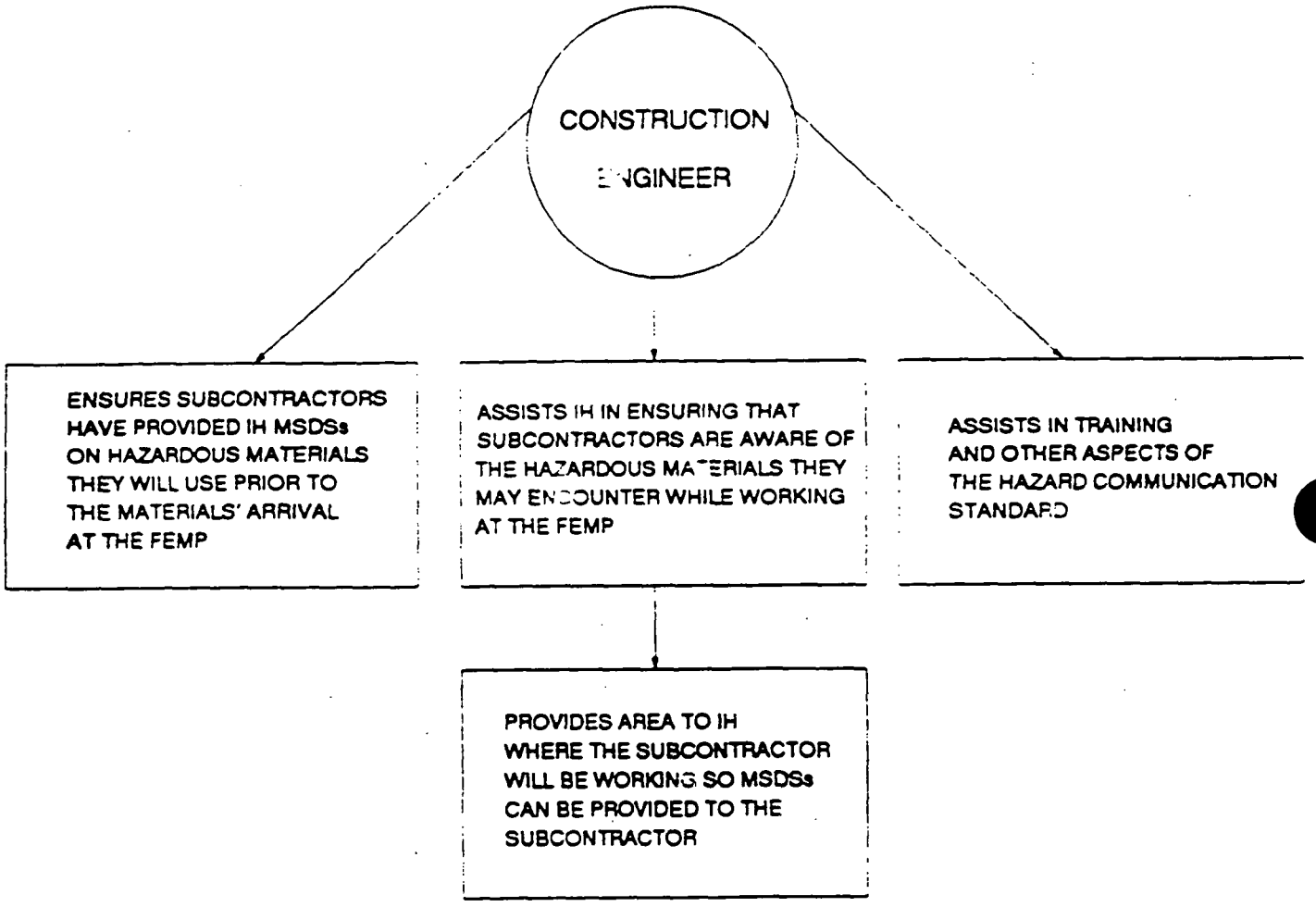
1.5.5 Gas - A vaporous physical state of matter that may be flammable, can produce heat and light, or a poisonous or irritant atmosphere and tends to expand and totally fill the container in which it is confined.



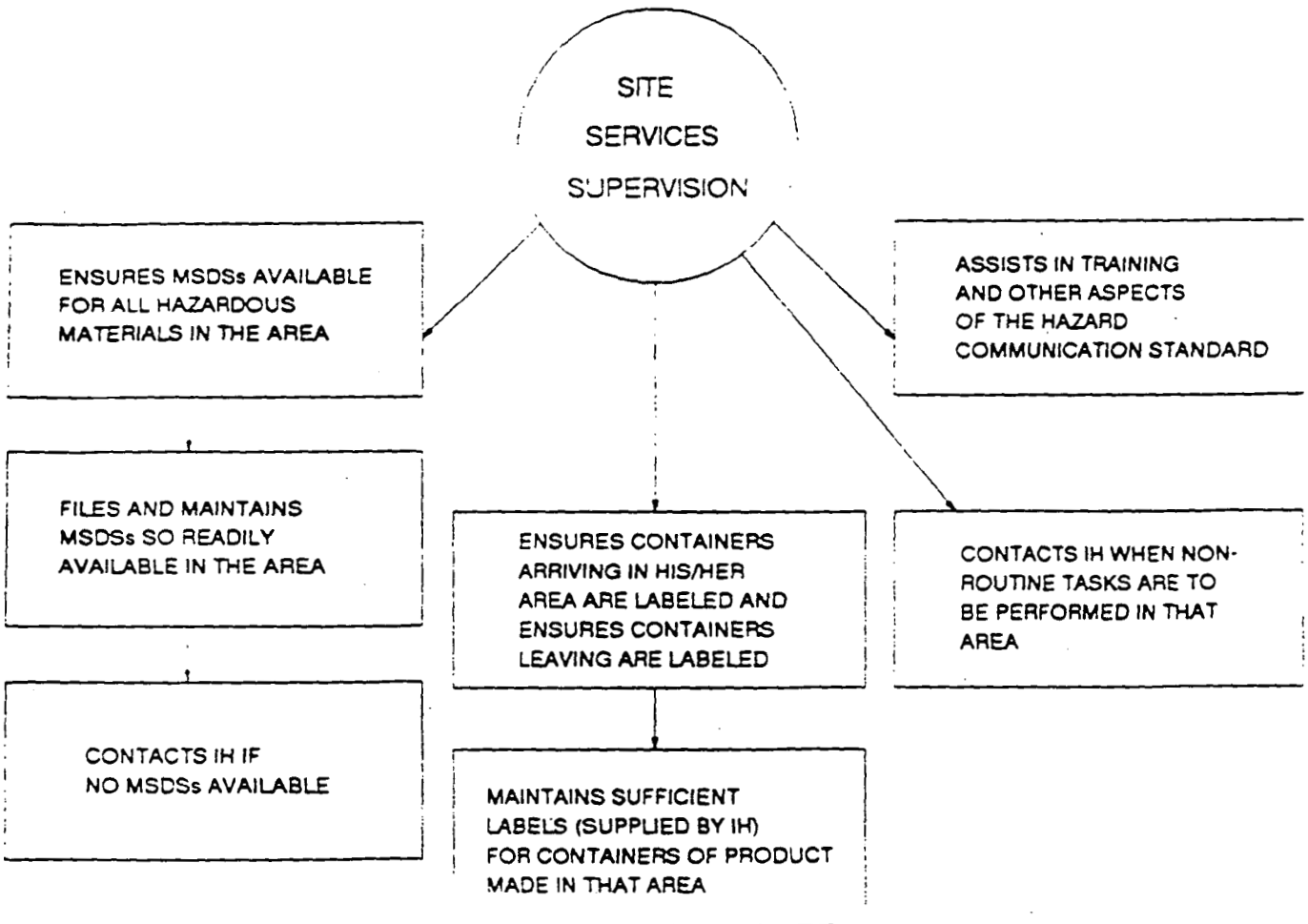
INDUSTRIAL HYGIENE RESPONSIBILITIES
FIGURE 1-1



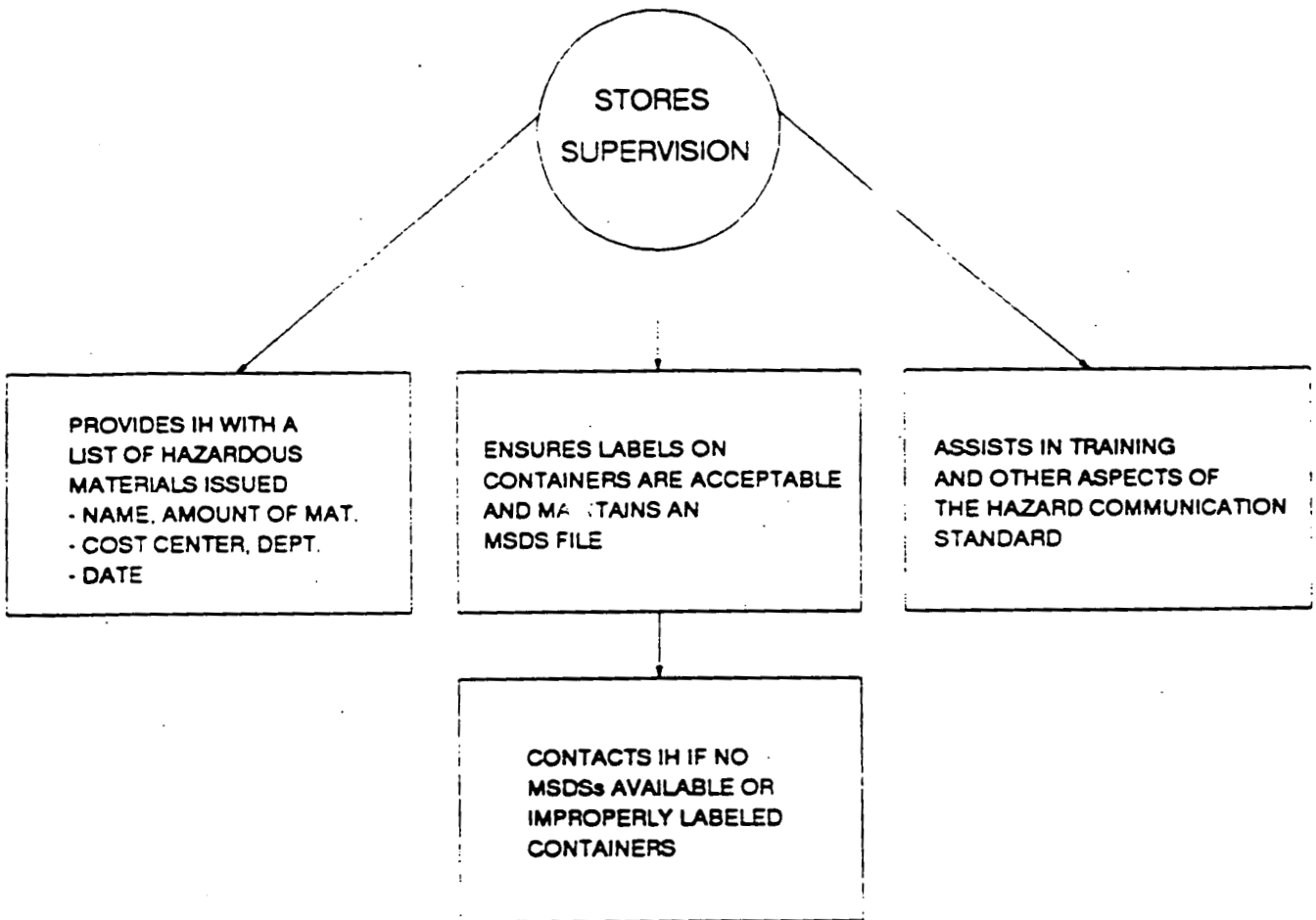
EMPLOYEE RESPONSIBILITIES
FIGURE 1-2



CONSTRUCTION ENGINEER RESPONSIBILITIES
FIGURE 1-3



SITE SERVICES SUPERVISOR RESPONSIBILITIES
FIGURE 1-4



STORES SUPERVISOR RESPONSIBILITIES
FIGURE 1-5

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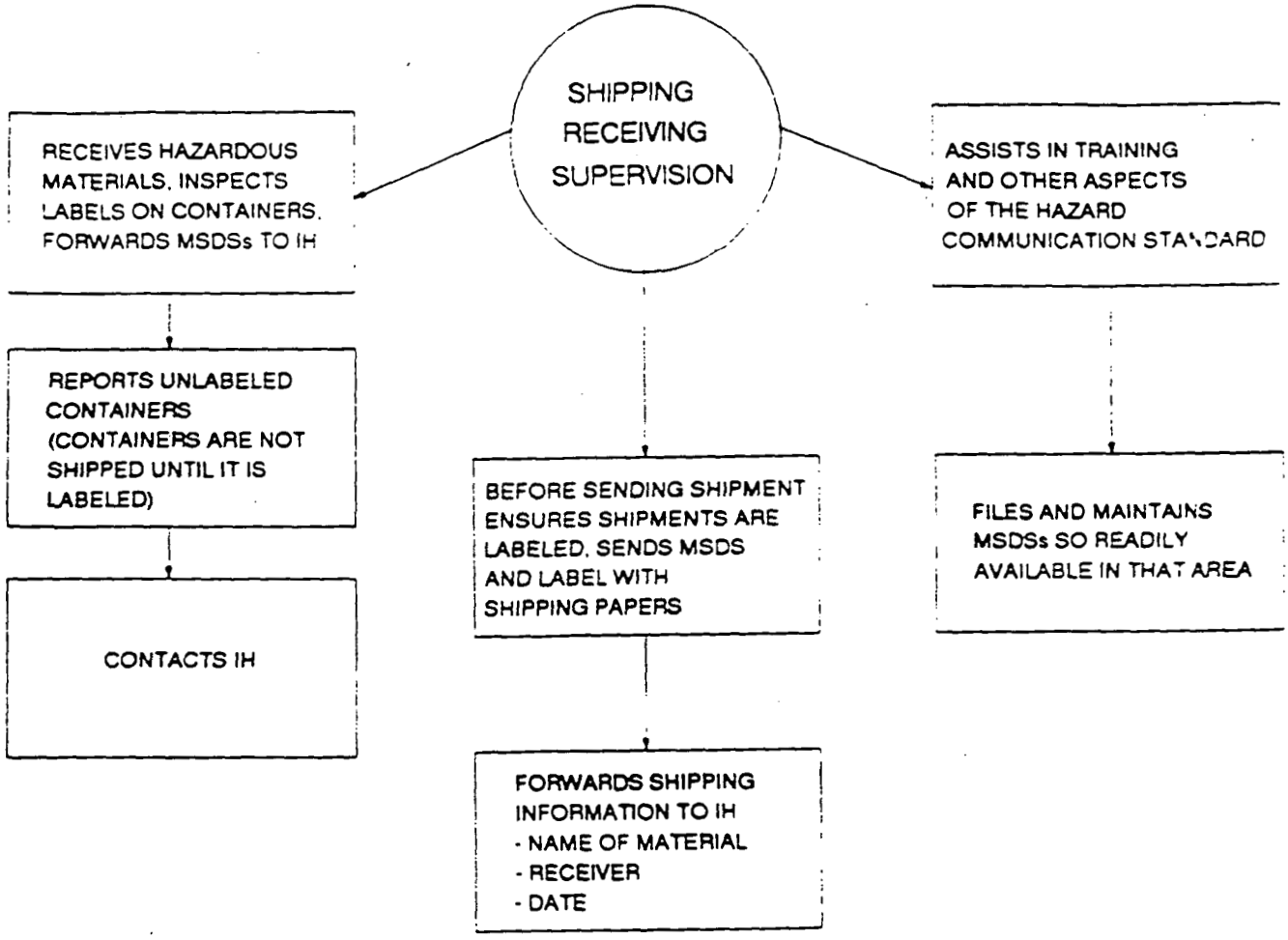
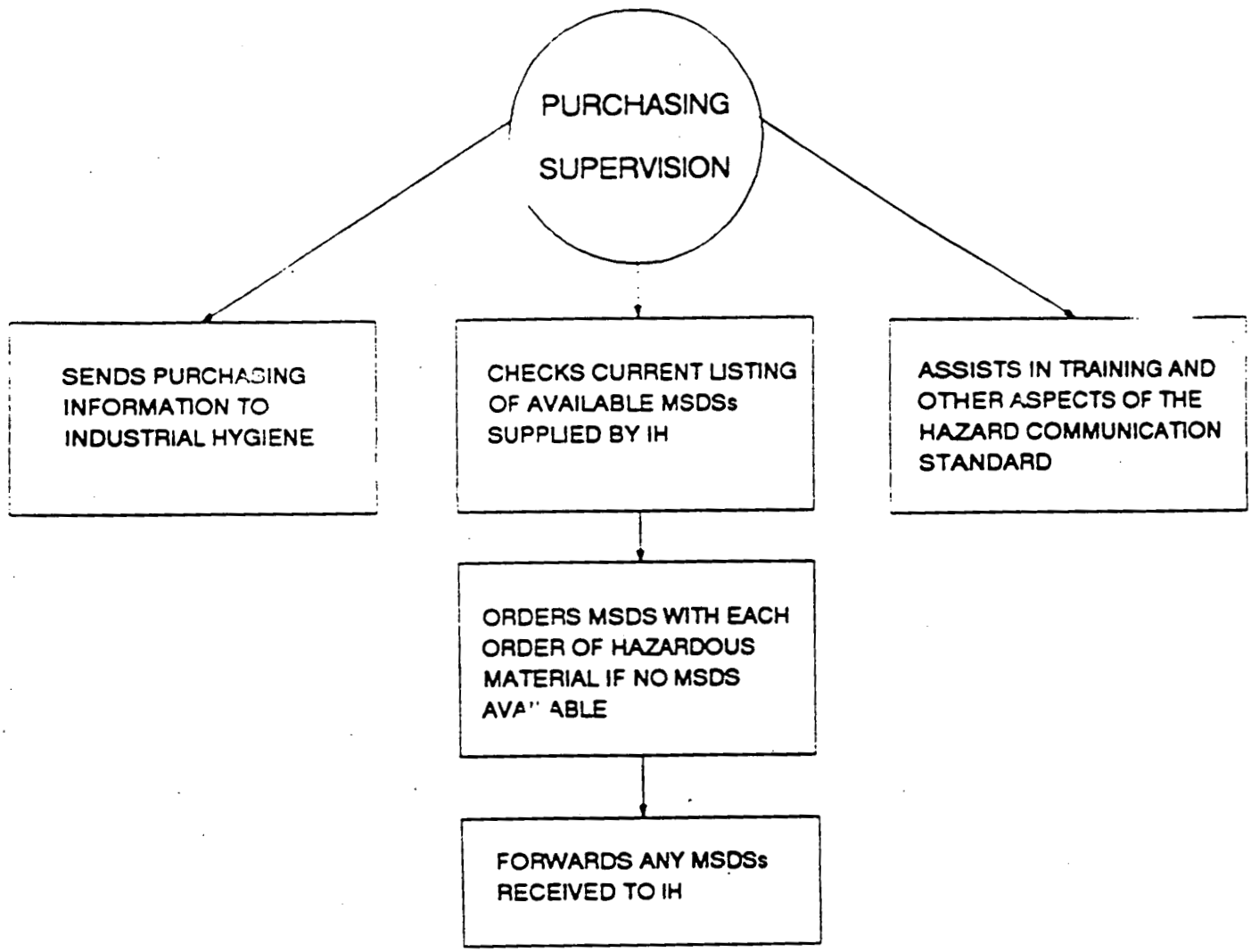
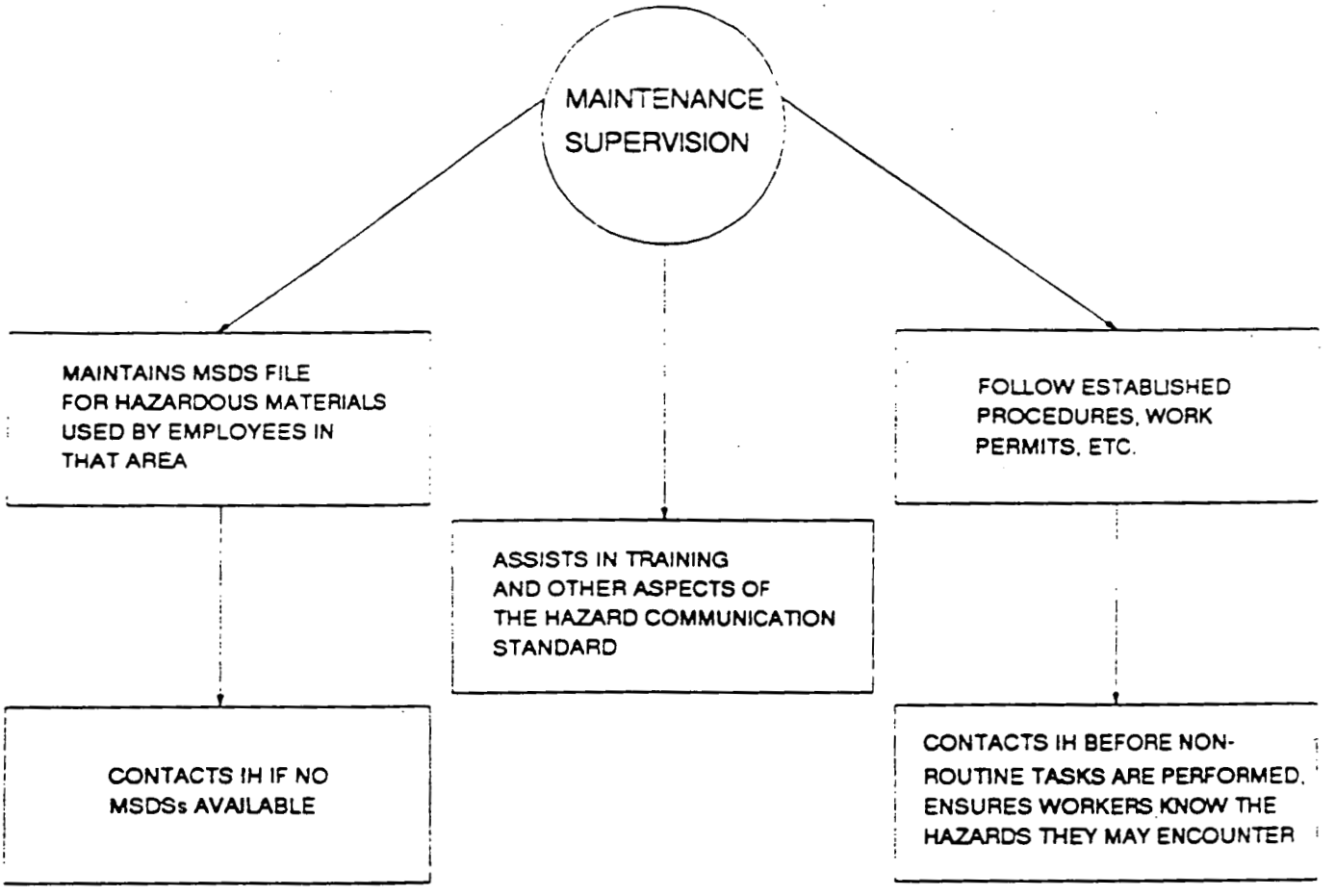


SHIPPING/RECEIVING SUPERVISOR RESPONSIBILITIES
FIGURE 1-6



PURCHASING SUPERVISOR RESPONSIBILITIES
FIGURE 1-7

00 290



MAINTENANCE SUPERVISOR RESPONSIBILITIES
FIGURE 1-8

1.5 DEFINITIONS (cont.)

1.5.6 Hazardous Chemical - A pure chemical, chemical mixture, or product that could cause injury or death if inhaled, ingested, or absorbed by personnel with or near the substance.

1.5.7 Irritant - A material that is not corrosive but which causes a reversible inflammatory effect on living tissue by chemical action.

1.5.8 Lower Explosive Limit (LEL) - The amount of flammable vapors that must build up in the atmosphere before the vapor can ignite or become explosive.

1.5.9 Material Safety Data Sheet (MSDS) - A document supplied by or ordered from the manufacturer or supplier of chemicals that lists the hazards that are associated with the material and suggested precautions.

1.5.10 Non-Routine Tasks - Work (such as construction projects, work permit jobs, new product testing, Plant Test Authorization (PTA) tasks, work which introduces new, potentially hazardous material to the workplace, or work that causes untrained personnel to handle hazardous material) that is not covered by a Standard Operating Procedure or other defined criteria.

1.5.11 Oxidation - The reaction of a material with oxygen (such as combustion and rust formation).

1.5.12 Oxidizers - Substances that release oxygen as they react and provide a self-contained source of energy to fuel the reaction.

1.5.13 Poisons - Toxic substances that may cause death or serious injury if ingested, inhaled, or come into direct contact with skin allowing absorption of the poison into the bloodstream.

1.5.14 Sensitizer - A chemical that causes an allergic reaction in normal tissue after repeated exposures to the chemical.

1.5.15 Solvents - A wide range of fluids (having common characteristics for handling, use, and storage) that are used to dissolve other materials.

1.5.16 Upper Explosion Limit (UEL) - The condition that exists when the atmosphere becomes too fuel-rich with the concentration of explosive vapor that an explosion can not occur.

1.5.17 Volatile - A substance that will evaporate rapidly at ordinary (ambient) temperature.

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1.6 DOCUMENTATION

1.6.1 Drivers

1.6.1.1 OSHA 29 CFR 1910.1200, "Hazard Communication"

1.6.2 References

1.6.2.1 PL-FMPC-3001, "Laboratory Chemical Hygiene Plan"

1.6.2.2 FMPC-0516, "Control of Permits for Accomplishing Hazardous Work"

1.7 HAZARD EVALUATION

All chemicals and mixtures (materials) in use or considered for use at the FEMP shall be evaluated for potential hazards (such as carcinogen, irritant, sensitizer, explosive or flammable substance).

The primary method for hazard evaluation is the data that is supplied by the material producer/manufacturer/vendor.

Studies are also conducted on-site to determine the hazard potential of a material in use or being considered for use.

If a study reveals that a connection exists between the material and a harmful effect to exposed personnel or if data from the supplier indicates that the material is harmful, the material is regarded as a hazard.

1.8 WARNING LABELS

Incoming containers of pure chemicals or mixtures shall be labeled to identify the hazardous chemical and appropriate hazard warning.

Suppliers (producers/manufacturers/vendors) should label each container with a label that specifies the hazards involved with handling/using the material. The label should also include the chemical name of the material and the name and address of the supplier.

When pure chemicals and/or mixtures are transferred from a container, the receiving container shall be identified, by the employee transferring the material, with a label that shows the identity of the material and the same warning data as the source container.

1.9 MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheets (MSD Sheets or MSDS) are furnished to the FEMP by the supplier of the hazardous material. The sheets are supplied to the appropriate areas by Industrial Hygiene.

The MSDS provides employees that work with, or are exposed to hazardous chemicals with information concerning hazards involved in handling, use, and storage of the material, the chemical and physical properties of the material, emergency procedures for spills, leaks, and fires, and the recommended safety precautions.

Area Supervisors ensure that the MSD Sheets are kept in the work area in a permanent file that is easily accessible to employees. A Master MSDS File is maintained by Industrial Hygiene.

1.10 TRAINING

The FEMP shall provide information and training to all workers who are or may be exposed to hazardous chemicals while in the performance of duties where hazardous chemicals are present.

Topics to be covered in training shall include methods for the detection of hazardous chemicals in the workplace, physical and health danger of the hazardous chemicals that may be encountered, and required safety measures to protect the employee from harm while exposed to the material.

CHAPTER 2 - HAZARDOUS CHEMICALS PRESENT IN THE WORKPLACE

2.1 ORIGIN OF INFORMATION

The hazardous chemicals at the FEMP are listed in Tables 2-1 and 2-2. The information was developed by researching purchase orders for material and reviewing the MSDS that accompanied the material.

Additional information was occasionally requested from the manufacturer, vendor, or IRS&T to assist in determining if a material is hazardous.

After completion of research, the database was used as the basis for the list of categories shown in Tables 2-1 and 2-2.

2.2 UPDATING INFORMATION

The completed lists are kept current by periodic updates from an MSDS file maintained by Industrial Hygiene.

MSD Sheets are obtained by the requisitioner of new material and furnished to Industrial Hygiene. If the material is shown to be hazardous, the MSDS is included in the MSDS file.

2.3 USE OF TABLES

The names of all categories of hazardous materials are included in Table 2-1 and are listed alphabetically.

Pure chemicals are listed by code and name in Table 2-2. Unless otherwise noted, all items listed in Tables 2-1 and 2-2 have an accompanying MSDS.

TABLE 2-1
CHEMICAL MIXTURES

CHEMCODE	NAME
13420	#005 OATEY CLEANER
10667	#104 HI-VAC RED FLUID
13403	#5 PASTE FLUX
13520	0.1 mg/ml ETHYLENE BENZENE IN METHANOL
13522	0.1mg/ml 1,4-DICHLOROBENZENE IN METHANOL
13521	0.1mg/ml BENZENE IN METHANOL
13523	0.1mg/ml NITROBENZENE IN METHANOL
13395	3716 DIESEL FLO
13349	3M ALL-AROUND AUTOBODY SEALANT
13265	3M CLEAR AUTO GLASS SEALER PART #08551
13014	3M FAST TACK ADHESIVE
13353	3M IMPERIAL MACHINE GLAZE
13350	3M MULTI PORT FUEL INJECTION CLEANER
13380	3M PLASTIC AND EMBLEM ADHESIVE CLEAR
13352	3M SPRAY DISC ADHESIVE
13332	3M SUPER WEATHERSTRI[P ADHESIVE BLACK##08008
13348	3M TRIM ADHESIVE
[illegible]356	4C ABNORMAL CELL CONTROL
[illegible]687	4C NORMAL CELL CONTROL
13487	52 FLUX
12990	655 SUPER STRENGTH CONCENTRATE
11558	730 SPRAGRIP
13431	743-B HYPALON REPAIR ADHESIVE
11511	A/EPICHLOROHYDRIN RESIN
11804	ABRASIVE WHEEL, PRESSED RUBBER, ALLISON, ECONOMISER
11657	ABRASIVE WHEEL, RESIN BONDED ALUMINUM OXIDE ABRASIVE, A-TYPE WH
11806	ABRASIVE WHEEL, RESIN BOND, ALLISON, CHALLENGER, ECONOMISER
11805	ABRASIVE WHEEL, RUBBER BOND, ALLISON, ECONOMISER
11656	ABRASIVE WHEEL, VITREOUS BONDED ALUMINA ABRASIVE, A-TYPE WHEEL
10451	ACCELERATOR, LECOCEL LECO #763-266 & #763-027
13319	ACETIC ACID 1% FOR LEUCOCYTE COUNT
10925	ADHESIVE, ARMSTRONG 520 ADHESIVE
11207	ADHESIVE, ASPHALT CUT BACK - MASTIC HENRY #232
10458	ADHESIVE, ASPLIT CN SOLUTION
10459	ADHESIVE, ASPLIT CN CARBON POWDER
11057	ADHESIVE, CARBOFIX C
10861	ADHESIVE, CARBOMASTIC 15
10923	ADHESIVE, CELOTEMP 1500 (EXPANDED PERLITE)
120[illegible]	ADHESIVE, CODOBOND 427
1086[illegible]	ADHESIVE, DAP 999 CONSTRUCTION ADHESIVE
12356	ACTIVATED BAUXITE, VAPOILSORB TYPE K-11
10165	ADHESIVE, 3M BRAND STYLE EC 1300
11400	ADHESIVE, 3M SUPER 77 SPRAY ADHESIVE
11506	ADHESIVE, 3M SUPER SPRAY ADHESIVE
10312	ADHESIVE, ALUMINUM BOND
10303	ADHESIVE, DECO-REZ EPOXY CRACK FILLER & ADHESIVE A + B
10920	ADHESIVE, DEVCON SF/HARDENER, A/HARDENER, DEVCON UW
10117	ADHESIVE, DUCO HOUSEHOLD
10663	ADHESIVE, ELMERS GLUE-ALL
12320	ADHESIVE, EPOXY FAST CURE #44583 LOCTITE
12523	ADHESIVE, ERICO JONES GENERAL PURPOSE ADHESIVE 77 (ERICO HI-PERFORMANCE ADHESIVE)
10676	ADHESIVE, F-181 BOLT ANCHOR SULFASET
11693	ADHESIVE, F/G.E. INDUSTRIAL HALOGEN LEAK DET,3M #1099
12256	ADHESIVE, GARLOCK BEARING PRODUCT 201 PART B (VERSAMID 125)
12390	ADHESIVE, GARLOCK BEARING PRODUCT 201 PART A (ARALDITE GY 502
12014	ADHESIVE, GENERAL PURPOSE ADHESIVE 77 AND OR 88 (MJS SUPPLY CO.)
13474	ADHESIVE, GENFLEX PRIMER BUTYL RUBBER ADHESIVE BY GEN CORP
12960	ADHESIVE, GOODRICH ADHESIVE A-178-B

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12177	ADHESIVE, HENRY MULTI-PURPOSE FLOOR COVERING ADHESIVE 356
12989	ADHESIVE, IGI P/N 69-229 PART A
10292	ADHESIVE, INSULATION ADHESIVE
10917	ADHESIVE, LAB-METAL
12135	ADHESIVE, LOCTITE SURFACE INSENSITIVE INSTANT
10547	ADHESIVE, LOCTITE SUPER BONDER 495
10435	ADHESIVE, NORLAND OPTICAL ADHESIVE # 65
10902	ADHESIVE, PENNTROWEL EPOXY PRIMER KIT:CS 7045/7047/7123
10903	ADHESIVE, PENNTROWEL ASPLIT CS RESIN CS 6529
12335	ADHESIVE, PL400 SUB FLOOR ADHESIVE
10207	ADHESIVE, PLIOBOND #20 INDUSTRIAL
10924	ADHESIVE, QUICK COTE
12237	ADHESIVE, R-36 SHIELD-TITE PLASTIC CEMENT
12088	ADHESIVE, RUBBER AND VINYL COVE BASE/ H.B. FULLER
11732	ADHESIVE, SC-1940, FULL GRIP SOLVENT CEMENT
11833	ADHESIVE, SCOTCH-GRIP PLASTIC ADHESIVE 1099
12955	ADHESIVE, SPLICE ADHESIVE SA-1017 AND 106G
11488	ADHESIVE, SPRAY 3M SUPER 77 HIGH COVERAGE
12959	ADHESIVE, SURE SEAL N-100 SPLICING CEMENT
11768	ADHESIVE, THERMOGRIP HOT MELT GLUE #22219
10822	ADHESIVE, TOOLING ADHESIVE, GRADE 514AC
10374	ADHESIVE, TRA-BOND 2101 GENERAL PURPOSE EPOXY
10566	ADHESIVE, TUFF-BOND GENERAL PURPOSE
13407	ADHESIVE, UNIVERSAL CEMENT
11710	ADHESIVE, WEATHERSTRIP AND GASKET
11945	ADHESIVE, WELD-CRETE LARSON PRODUCTS
10404	ADHESIVE, WELDWOOD CONTACT
13162	AF-79
13094	AGAR
11579	AIR FRESHENER, #791 CITRUS AIR FRESHENER
11485	AIR FRESHENER, CAN SCENT DEODORANT MASK, P127 CAN SCENT
11014	AIR FRESHENER, ENCOUNTER
10285	AIR FRESHENER, GOOD SENSE
10286	AIR FRESHENER, GOOD SENSE 7
12185	AIR JET II
12406	ALARA 1146 DECON
11973	ALCOHOL, ISOPROPYL USED IN AFFI-GEL 10,15,501 & AFFI-PREP10
11967	ALCOHOL, MEHTANOL AS USED IN PROTEIN ASSAY KITS I AND II
11968	ALCOHOL, METHANOL, AS USED IN AFFI-GEL PROTEIN A MAPS II
12439	ALCOHOL, REAGENT
13253	ALIZARIN BRILLANT SKY BLUE BLW
12358	ALKALI METALS
13297	ALKALINE IODIDE AZIDE REAGENT
13188	ALKALINE PHOSPHATASE BUFFER
13382	ALL PURPOSE JOINT COMPOUND
13036	ALUMINUM FIBRATED ROOF COATING (NON-ASBESTOS)
12472	AMMONIA
13448	AMMONIA NITROGEN-166MG/L AS NITROGEN
13525	AMMONIUM HEXAFLUORO-STANNATE
13524	AMMONIUM HEXAFLUOROSILICATE,ALPHA-NATURAL CRYPTOHALITE
13284	AMMONIUM SULFATE REFERENCE ELECTROLYTE SOLUTION
13239	ANTIMONY 1%
13032	AQUEOUS INK
13341	ARMOR-TUF STEEL HARDENING COMP.
13503	ASBESTOS BRAKE DRUM SEGMENT-BSI-JU-FF
13506	ASBESTOS BRAKE DRUM LINING
13505	ASBESTOS BRAKE DRUM SEGMENT-BSI9531FG
10015	ASBESTOS CEMENT CORRUGATED BOARD, TRANSITE
13375	ASBESTOS ENCAPSULANT-ACC 2B
11160	ASBESTOS GASKET, SINGLE,DOUBLE JACKETED & SPIRAL WOUND

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11161	ASBESTOS PACKING, ASBESTOS & RUBBER BINDER SHEET & ROLL
13504	ASBSESTO BRAKE DRUM SEGMENT-BSI-DW-FF
13035	ASPHALT ALUMINUM PAINT- ALL COLORS (ALUMINUM COATING NON-FIBERED
12981	ATLASTIC CT-30 HORIZONAL GRADE COMPONET B
13337	AUTOMATIC TRANSMISSION CONDITIONER -311
10633	BA TREAT, MIXTURE OF SULFATE RUST INHIBITOR AND STABIL.AGENT
13536	BAKELITE-VINYL BUTYRAL XYHL
10083	BARIUM CHLORIDE
12548	BELT DRESSING, GRAKO
12308	BELT DRESSING, SPRAYON 006C
12268	BENZALKONIUM CHLORIDE CONC. (ZEPHIRAN)
13119	BETZ 35A CORROSION INHIBITOR
13452	BIA NMMA 2 CYCLE LUBRICANT
12314	BIRD REPELLANT, ROOST NO MORE (LIQUID AND PASTE)
10569	BLACK DRY INK PLUS FOR #1025/1038
12266	BLEACH 142
13563	BLUE ICE (AKA. U-TEK 418, 420, 427, 432, TP10-12, TP10-24, TP10-48)
13296	BOD NUTRIENT BUFFER PILLOWS
13564	BOIL-OUT JR 531
13484	BOLT FLYING INSECT KILLER
12100	BOROSILICATE
13250	BRANSON ULTRASONIC INDUSTRIAL CLEANER
13171	BRIGHT BOWL CLEANER
13113	BRIJ-35, 30% SOLUTION
13008	BRITE ALUM
10085	BROMOCRESOL GREEN
13251	BRONSON ULTRASONIC OXIDE REMOVER
13433	BRONZE PUTTY-RESIN 2 PARTS
12102	BRUSH MIX, AA-22
13476	BRY-AIR BRYSORB 100
13325	BUFFER POWDER PILLOWS Ph 4.50 +0.05
10371	BUFFER SOLUTIONS FISHER
11085	BUFFER, BUFFER SOL'N CONC. SO-B-106, 109, 139, 141, 142
11088	BUFFER, BUFFER SOL'N (PHOSPHATE) SO-P-74, 82, 341
10767	BUFFER, BUFFER SOLUTION - PH 1.00 - 2.00
11086	BUFFER, BUFFER SOLUTION FOR WATER HARDNESS SO-B-119
11244	BUFFER, BUFFER SOLUTION - PH 9.00 - 11.0
10306	BUFFER, BUFFER SOLUTION - PH 6.00 - 8.00, 582823-BECKMAN
11084	BUFFER, BUFFER SOLUTION (ACETATE), SO-B-85, 100, 103
12231	BUFFER, BUFFER SOLUTION (PH 1.00, PH 2.00)
10611	BUFFER, COLOR-KEYED (RED) 4.01PH, 20 LITER
10154	BUFFER, HYDRION
11087	BUFFER, PH 1.00 TO 10.00, SO-B-96,97,98,99,101,102,104...140
12017	BUFFER, PH 10.00 +/-0.02 FISHER SB-116
10592	BUFFER, POWDER FOR PH 4.01, HACH 22269-95
10593	BUFFER, POWDER FOR PH 7.00, HACH 22270-95
10594	BUFFER, POWDER FOR PH 10.00, HACH 22271-95
12415	BUFFER, POWDER PILLOWS PH4.01
10768	BUFFER, SOLUTION CMS BUFFER PH 4.0
13107	BUTVAR AQUEOUS DISPERSION BR
13429	C-14 PRESSURE SENSITIVE ADHESIVE
13428	C-16 VINYL ADHESIVE
13300	CALCIUM CHLORIDE SOLUTION 5.00 +-0.05mg/L #2356
13327	CALVER 2
13340	CARBO FIX C PARTS A & B
12354	CARBO KOREZ LIQUID RESIN
12353	CARBO KOREZ POWDER
13200	CAREFREE RECHARGEABLE BATTERY
12498	CARGILLE REFRACTIVE INDEX LIQUID SERIES A nD=1.460-1.570
12497	CARGILLE REFRACTIVE INDEX LIQUIDS SERIES M RANGE nD=1.705-1.735

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TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12496	CARGILLE REFRACTIVE INDEX LIQUIDS SERIES B RANGE nD=1.657-1.700
12064	CASTABLES, FIRECLAY,HEAVY WEIGHT
12063	CASTABLES, GUN MIXES
12062	CASTABLES, HIGH ALUMINA,HEAVY WEIGHT
10823	CATALYST, AIR CURE CATALYST
12298	CATALYST, PERKINS HF-46 (UREA 46)
10478	CATALYST, RHODIUM 5% ON POWDERED CHARCOAL
10269	CAULK, CAULKING COMPOUND IN CARTRIDGES FOR HANDICALK GUN
12482	CAULK, CORONADO LATEX CAULK 300-1
12522	CAULK, DAP RELY-ON LATEX CAULK
10289	CAULK, DAP WHITE ACRYLIC LATEX
11765	CAULK, EDGE CAULK BY GENCORP POLYMER PRODUCTS
13519	CELATOM MN AND FN GRADES
10128	CEMENT, #301 AIR SETTING
10040	CEMENT, ACIDSILL POWDER
12350	CEMENT, CARTERS RUBBER CEMENT, 08-450, 22-848, 22-842, 22-841, 88-840
11807	CEMENT, DECO-REZ AGGREGATE FOR KIT #722
11992	CEMENT, DECO-REZ POLYMERIC CONCRETE MORTAR
11808	CEMENT, DECO-REZ POLYMER MODIFIED CONCRETE K-700
10143	CEMENT, ELECTRODE JOINT #W-7130
12117	CEMENT, FIBREX SUPER KOTE
11559	CEMENT, FIRECRETE
12209	CEMENT, HY-SPEED 500
10816	CEMENT, MC-3
12519	CEMENT, MULTI-PURPOSE PLASTIC PIPE CEMENT
12524	CEMENT, OATEY HEAVY DUTY CLEAR PVC SOLVENT CEMENT
12037	CEMENT, ONE SHOT ROCK WOOL INSULATING CEMENT
11059	CEMENT, PABCOTE
10914	CEMENT, PLASKON DAP 1610 MOLDING COMPOUND
10136	CEMENT, PORTLAND, MIAMI, RICHMORTAR, RICHCOLOR
11262	CEMENT, QUICK COTE CEMENT, P.K.
10854	CEMENT, RAMCO CEMENTS
11519	CEMENT, SACKRETE MORTAR
10669	CEMENT, SAUEREISEN ELECTRIC RESISTOR NO. 78
10445	CEMENT, SIKATOP 122 REPAIR MORTAR
11378	CEMENT, SIKATOP 144 COATING
12184	CEMENT, SMOOTH-ON NO. 2
10039	CEMENT, TASIL
10916	CEMENT, VITROBOND, (SULFUR MORTAR)
10403	CEMENT, WATERPLUG
10962	CEMENT, WELD-ON 711 FOR PVC PLASTIC PIPE
12980	CEMENT, WELD-ON 714 FOR CPVC PLASTIC PIPE
11027	CEMENT, WET SEAL PLASTIC, HYDRO-TITE PLASTIC, CEMENT
11993	CEMENT, XYPEX MODIFIED CONCENTRATE
13127	CERTANE 2000
13128	CERTANE 3000
13126	CERTANE 77-B
12101	CHEK-STIX
10180	CHEL C D CHELATING AGENT
12170	CHEM PACK, DEVELOPER,FIX,NEUTRALIZER AND WASH
13269	CHEMGRATE POLYESTER RESIN
13266	CHEMGRATE;CHEMTRED;CHEM GRIT-FIBERGLASS REINFORCED POLYESTER
13283	CHEMICAL OXYGEN DEMAND STANDARD SOLUTION-300 mg/L COD
12169	CHICO FIBER
13518	CHROME BRITE ALL PURPOSE ALUMINUM PAINT
11211	CHUCKHOLE PATCH, PRIMER FOR F-230-S
12195	CHUCKHOLE PATCH, RANDUSTRIAL
11153	CHUCKHOLE PATCH, ZOR-X ALL WEATHER PAVEMENT REPAIR MATERIAL
10333	CHUCKHOLE PATCH,RANDUSTRIAL F-230-S(SUMMER)
12348	CHUCKHOLE PATCH,RANDUSTRIAL F-230-W (WINTER
10553	CLEAN LUBE

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10544	CLEANER DYNA SPREX
11777	CLEANER OXYBRITE
11200	CLEANER TWINKLE STAINLESS STEEL OIL BASED
10695	CLEANER, #208 LENS CLEANING FLUID K-LENS-M OR KLEAR GLASS
10081	CLEANER, #21 WINTERGREEN, TEXOPHENE, OR PHILOGREEN DISINFCT
11940	CLEANER, #79 BOWL CLEANER
10384	CLEANER, 1-STROKE VESPHENE
11915	CLEANER, 3M COMPUBLEND BASE E
11914	CLEANER, 3M COMPUBLEND BASE D
11916	CLEANER, 3M COMPUBLEND BASE F
11930	CLEANER, 3M COMPUBLEND CARPET SHAMPOO
11929	CLEANER, 3M COMPUBLEND CARPET SPOTTER / STAIN REMOVER
11920	CLEANER, 3M COMPUBLEND HEAVY DUTY CLEANER
11918	CLEANER, 3M COMPUBLEND WINDOW / GLASS CLEANER
11911	CLEANER, 3M COMPUBLEND BASE A
11913	CLEANER, 3M COMPUBLEND BASE C
11928	CLEANER, 3M COMPUBLEND NON-ACID BOWL CLEANER
11927	CLEANER, 3M COMPUBLEND QUATERNARY DISINFECTANT
11912	CLEANER, 3M COMPUBLEND BASE B
11921	CLEANER, 3M COMPUBLEND DEGREASER
11922	CLEANER, 3M COMPUBLEND AUTO SCRUBBER NEUTRAL CLEANER
11923	CLEANER, 3M COMPUBLEND REGULAR STRENGTH STRIPPER
11931	CLEANER, 3M COMPUBLEND EXTRACTION CLEANER
11919	CLEANER, 3M COMPUBLEND GENERAL PURPOSE CLEANER
11932	CLEANER, 3M COMPUBLEND CARPET PRE-SPRAY / SPRAY CLEANER
11917	CLEANER, 3M COMPUBLEND BASE G
12484	CLEANER, 3M MULTI-PORT FUEL INJECTION CLEANER 08912 (1XD)
11837	CLEANER, 729 SOLVENT CLEANER
11838	CLEANER, 905-XX
12553	CLEANER, ACIDINE
11182	CLEANER, ACTEX
13109	CLEANER, ACTI-CLEAN AK-1, AK-5, OR AK-55
10079	CLEANER, ACTUSAL, NL #40, OR TEXOL #7
1234[illegible]	[illegible]R, AFBC ACID FREE BATHROOM CLEANER
10831	CLEANER, AGAIN
10106	CLEANER, ALCONOX
11715	CLEANER, ALKA-BRITE COIL BRIGHTENER AND CLEANER
11588	CLEANER, AMAC AUTO MACHINE CLEANER
11028	CLEANER, AMMONIATED SPEEDSOPE
10476	CLEANER, ASEPTROL C#331
12116	CLEANER, ASTRO-BRITE
10829	CLEANER, BASIC PLUS ALL PURPOSE CLEANER
12550	CLEANER, BETCO STAINLESS STEEL CLEANER
10541	CLEANER, BLEACH NO. 421PSHC55
11107	CLEANER, BLUE CHIP
11724	CLEANER, BOWL CLEANER
11574	CLEANER, BOWL-SHINE #396
10830	CLEANER, BRAVO EXTRA HEAVY DUTY STRIPPER
11108	CLEANER, BREAK-UP
11029	CLEANER, BRILLO BOWL CLEANER
10487	CLEANER, BUCKEYE BLUE ALL-PURPOSE
11910	CLEANER, BUCKEYE SHOPMASTER CLEANER/DEGREASER
11745	CLEANER, BUFFING COMPOUND REMOVER
12405	CLEANER, BUILDER 300 HIGH ALKALINE LIQUID LAUNDRY BREAK
10013	CLEANER, BUTCHER'S SUNDANCE
11941	CLEANER, BUTCHERS SPEEDBALL POWER CLEANER
12937	CLEANER, CABLE CLEAN #02069
10381	CLEANER, CAL-CLEAN LIQUID DETERGENT
11337	CLEANER, CAR SHAMPOO 0420 PENRAY
12965	CLEANER, CARPET EXTRACTION
10517	CLEANER, CHEM KLEEN LAUNDRY DETERGENT
12020	CLEANER, CHEMERGY
11578	CLEANER, CLEAN-A-BOWL #380
12485	CLEANER, CLEAN-R-CARB 05081

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11749	CLEANER, COILOX CONCENTRATE
13038	CLEANER, COMET CLEANSER
11924	CLEANER, COMPUBLEND HEAVY DUTY STRIPPER
11926	CLEANER, COMPUBLEND SANITIZER
11210	CLEANER, CONTACT RE-NU AEROSOL
12099	CLEANER, COULTER CLENZ
10351	CLEANER, COVERAGE 256
11174	CLEANER, DAY-KLEEN ALL PURPOSE CLEANER
10828	CLEANER, DEEP CRYSTAL
11345	CLEANER, DEGREASING AGENT, MAGNUS 905-XX
11346	CLEANER, DEGREASING AGENT, MAGNU-SPRAY 205
11570	CLEANER, DEODORANT BLOCK-U-BLOCS #104
11586	CLEANER, DIS-SPRAY DISINFECTANT SPRAY
11627	CLEANER, DISINFECTANT TOILET BOWL
11670	CLEANER, DISINFECTANT BOWL CLEANER
10811	CLEANER, DL1810 NIX
11564	CLEANER, DRAINALL #391
10237	CLEANER, DRI-IT DISHWASHING AID
11587	CLEANER, DRY-CLEAN DRY CARPET SHAMPOO
10277	CLEANER, DU PAN POWDERED DETERGENT SOAP
10428	CLEANER, DUBOIS COMBAT DISHWASHING COMPOUND
10485	CLEANER, DUBOIS DUJET
11942	CLEANER, DUBOIS DUMAID
10429	CLEANER, DUBOIS FABRIC SOFTENER
10482	CLEANER, DUBOIS FLOW
11661	CLEANER, DUBOIS LIQUID BR-5515-LAB
12077	CLEANER, DUPAN MANUAL WASHING COMPOUND
12956	CLEANER, DYKEM SPRAY STEEL BLUE SP-1100
12076	CLEANER, DYNA SPREX SOAK CLEANER , ALKALINE
11565	CLEANER, EASY-COT #654
11886	CLEANER, ELITE (LAUNDRY SOFTENER)
12455	CLEANER, EMULSYDE STAINLESS STEEL CLEANER RTU
10228	CLEANER, ENVY INSTANT SPRAY
11884	CLEANER, EPIC LAUNDRY DETERGENT
11290	CLEANER, EQUAL
11839	CLEANER, EUCO-SLIP
11581	CLEANER, EX-TRACT EXT CARPET SHAMPOO
11885	CLEANER, FAST BREAK
11584	CLEANER, FIN-ISH FURN/WOOD POLISH #358
12026	CLEANER, FLOOR WIZARD CLEANER
12097	CLEANER, FLOW CONCENTRATED
11843	CLEANER, FOGPRUF
11842	CLEANER, FOGPRUF P P/N 39474
11596	CLEANER, FORMULA 68-A, STATE
10597	CLEANER, FORTIFY
11778	CLEANER, FRANKLIN SPEEDSOPE STRIPPING DETERGENT
10717	CLEANER, FREEDOM SPEED STRIPPER
11746	CLEANER, FREON TF CLEANER
10567	CLEANER, GLASS CLEANER, SILICLENE OR SSS BLUE
12481	CLEANER, ICE MACHINE CLEANER (GARMAN CO.)
11585	CLEANER, IMAGE SPRAY BUFF #644
11743	CLEANER, INDUSTRIAL STRENGTH CLEANER
12513	CLEANER, INSURE LIQUID
12083	CLEANER, IVERSON X-20 BUTYL CLEANER
10901	CLEANER, JENNY COMPOUND NO. 49
10318	CLEANER, JETTACIN
11388	CLEANER, JOHNNY RINGO GENERAL PURPOSE CLEANER
10718	CLEANER, JOHNSON WAX PRONTO, FAST DRY FINISH
11550	CLEANER, JOHNSON'S SHINE-UP LIQUID
12315	CLEANER, K-LENS-M ANTI-FOGGING LIQUID (#303, #308, #316, #397)
11844	CLEANER, KEMWASH
11748	CLEANER, KLEEN CONCENTRATE CONDENSER CLEANER , NARFOAM
11572	CLEANER, KLEEN-THRU AMMONIA GLASS CLEANER #180
11665	CLEANER, KLOR TECH

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10691	CLEANER, LANO-GUARD POWDERED HAND CLEANER
12486	CLEANER, LECTRA MOTIVE CLEANER 5018
11603	CLEANER, LI'L BROTHER SAM
12401	CLEANER, LIQUI-NOX, LABORATORY GLASSWARE CLEANER BY ALCONOX
11867	CLEANER, LIQUID FLOOR WAX FLOOR FINISH
12479	CLEANER, LIQUID ICE MACHINE CLEANER
11774	CLEANER, LITHOGRAPHIC BLANKET-ROLLER WASH
10017	CLEANE: _PS ELECTRO CONTACT CLEANEF
11183	CLEANER, LYKOPON SF, HI POWER CLEANER
10820	CLE EF M-2 GENERAL PURPOSE CLEANE
10821	CLEANER, M-5 FLASH - BATHROOM CLEANER
12493	CLEANER, MAGNAFLUX SKC-NF-ZC-7B/ SPOTCHECK CLEANER
11841	CLEANER, MAGNUSPRAY 205
13390	CLEANER, MASKLENZE MK-1 DETERGENT FOR GENERAL DYNAMICS RESPIRATOR WASHER
10115	CLEANER, MICRO
11155	CLEANER, MISCO COIL BRITE
12953	CLEANER, MMC-197 DYN-A-MITE II
11869	CLEANER, MMC-38 G.P.C. (GENERAL PURPOSE CLEANER)
10927	CLEANER, MOP MIST
11154	CLEANER, MSA CLEANER-SANITIZER II
11308	CLEANER, MYCOLADE
11507	CLEANER, N.F. CLEANER/DEGREASER
10227	CLEANER, NABC BATHROOM
12019	CLEANER, NAMICO LIQUID LAUNDRY
12500	CLEANER, NAMISOLV
12305	CLEANER, NAR-COIL
11890	CLEANER, NILIUM OR NILODOR SURFACE DEODORIZER
11813	CLEANER, NOZZLE KLEEN #2
12525	CLEANER, OATEY CLEANER
12502	CLEANER, ONE SHOT LIQUID LAUNDRY DETERGENT
11626	CLEANER, ONE STEP
11744	CLEANER, OXIDE REMOVER (2 GALLONS)
10998	CLEANER, PENETRATE
11381	CLEANER, PERJ
11954	CLEANER, PHILLIPS 40% FREEZER CLEANER
11002	CLEANER, PIERCE II
11577	CLEANER, PINE KLEEN #772
10700	CLEANER, PLATE SAV-UR
10937	CLEANER, POWDER BLEACH #448P DRY
11390	CLEANER, POWDER KEY #6394-85
13384	CLEANER, PRONTO
11173	CLEANER, QUAT-KLEEN
11566	CLEANER, QUAT-KLEEN #776
12427	CLEANER, RADCON SURFACE CLEANER
12508	CLEANER, RE-MARK-ABLE QUARTET MARKER BOARD CLEANER #550 (CHEM. PACKG. CORP. CLEANER #404)
11583	CLEANER, RELIABLE FOAMER #767
11569	CLEANER, RELIABLE-T-BLOCKS #204
11307	CLEANER, REMOVER XS
10153	CLEANER, RID - LIME
11925	CLEANER, RINSE-FREE HEAVY DUTY STRIPPER
11547	CLEANER, ROLMARK SOLVENT & CLEANER
10331	CLEANER, RUSTOLEUM SURFA ETCH, 108 ETCHING SOLUTION
10301	CLEANER, SAPONICATE
12480	CLEANER, SAVOGRAN TSP WITH TRISODIUM PHOSPHATE
11571	CLEANER, SEE-THRU GLASS CLEANER #140
11866	CLEANER, SF HEAVY DUTY HAND CLEANER WITH CRUSHABLES
11864	CLEANER, SF HEAVY DUTY HAND CLEANER
11750	CLEANER, SLIME AWAY CONDENSATE PAN TREATMENT
10810	CLEANER, SPARTAN BH-38
10068	CLEANER, SPARTAN DC-13 ALL-PURPOSE
10809	CLEANER, SPARTAN RINSE FREE STRIP
10824	CLEANER, SPRA TEMP, PRESSURIZED CLEANER
11270	CLEANER, SPRAY BUFF - JOHNSON SNAPBACK

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TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10144	CLEANER, SPREX, TEXO AC, OR TROJAN #145 P
12934	CLEANER, SSS BLACK MARK REMOVER #30070
12173	CLEANER, SSS FOAM DISINFECTANT CLEANER
10975	CLEANER, SSS MCU FINISH #40
10647	CLEANER, SSS METAL CLEANER
11015	CLEANER, SSS TILE CLEANER & SCUM REMOVER
10383	CLEANER, ST-21 POLY SPRAY JET
11582	CLEANER, STA-CLEAN STEAM/DRY CARPET SHAMPOO
11602	CLEANER, STATE FIX
11601	CLEANER, STATE FORMULA 236 TERG-O-CIDE
11598	CLEANER, STATE NO-MIX TERG-O-CIDE
11599	CLEANER, STATE SSC
11897	CLEANER, STERA-SHEEN SANITIZER
11955	CLEANER, STIGER-MEDAMIST,CITRUS DISINFECTANT
11811	CLEANER, STIGLER MEDAMIST
11812	CLEANER, STIGLER SPRAY DISINFECTANT AND BOWL CLEANER
11591	CLEANER, STRIP-ALL CONC STRIPPER #164
11592	CLEANER, STRIP-EASE NON AMMONIATED STRIPPER #165
12533	CLEANER, SUPER AGITENE
10361	CLEANER, SUPER DESOIL
11662	CLEANER, SUPER LAUNDRY FABRI SURE
11663	CLEANER, SUPER LAUNDRY LIQUID BREAK
10819	CLEANER, SUPER LIME-SOL
13277	CLEANER, SYSCO LIQUID OVEN CLEANER JR 140
11103	CLEANER, TENNANT 601 INDUSTRIAL GREASE REMOVER
11974	CLEANER, TEXO LP1138 TEXO CORP.
10557	CLEANER, THERMATIC SEWER CLEANER
10896	CLEANER, THRAX
11172	CLEANER, TUF-JOB H/D ALL PURPOSE CLEANER
11576	CLEANER, TUF-JOB H/D ALL PURPOSE CLEANER #115
12490	CLEANER, VARN TOTAL FOUNTAIN SOLUTION
11247	CLEANER, VERSA CLEAN
11389	CLEANER, VESTAL CREME CLEANSER
11391	CLEANER, VESTAL DEFOAMER CONCENTRATE #8265-08
10645	CLEANER, VESTAL DOUBLE BARREL CLEANER
10382	CLEANER, VESTAL LPH GERMICIDAL DETERGENT
11001	CLEANER, VIEW QUICK CLEANER
11269	CLEANER, WATERLESS HAND CLEANER
11725	CLEANER, WAX STRIPPER
11956	CLEANER, WINDSOR IND.,DRI-MATIC COMPOUND
11201	CLEANER,03-301 SURFACE CLEANER
12330	CLEANER,FINISH FABRIC SOFTENER-2276
10942	CLEANER,FRESH
12538	CLEANER/DISINFECTANT, STAPHENE DISINFECTANT SPRAY (AEROSOL)
11109	CLEANER/DISINFECTANT, END-BAC
11759	CLEANER/DISINFECTANT, CLEAN-GEAR 747 SPRAY DISINFECTANT
13432	CLEAR BATH 15540
13091	CLEAR THIN SPREAD ADHESIVE #430
13202	CLOR N OIL PCB SCREENING KIT
13201	CLOR N SOIL PCB SCREENING KIT
11274	COAL,BITUMINOUS COAL
11010	COATING, #151 SILICONE WATER REPELLENT
11011	COATING, #7001 TARSET STANDARD
11009	COATING, #7105 AQUATAR 105, COAL TAR PITCH EMULSION
11110	COATING, 3M BRAND SPRAY UNDERCOATING #8873
12483	COATING, 3M RUBBERIZED UNDERCOATING 8883/8884
11111	COATING, BITUMASTIC SUPER SERVICE BLACK (COAL TAR)
12501	COATING, CHIL-PERM CP-30 LOW ODOR
10878	COATING, ENAMEL METALLICS, 8068 - 8069
10876	COATING, ENAMEL PRIMERS, 8070 - 8072
10877	COATING, ENAMEL SPRAY, 8047 - 8066

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11263	COATING, EZE PEEL (SPRAY BOOTH COATING)
11826	COATING, FLOOR COAT, REZ-SEAL, PLIOCURE, EUCOCURE, ETC.
11817	COATING, H-10 HYPALON COATING - MIST GRAY
12049	COATING, HIGH BUILD EPOXY COATING
11025	COATING, MAGIC FLOOR LIQUID COMPONENT F-161
11302	COATING, MAGNA-MASTIC
11816	COATING, N-111 GRAY NEOPRENE COATING
12303	COATING, PACE WET-JET
10385	COATING, PLASTIC COAT FORMULA PDS16
12423	COATING, R-45 ELASTI-GARD ROOF CEMENT/R-782 ELASTOMER ROOF CEMENT
12424	COATING, R-46 ELASTI-GARD ROOF COATING
10515	COATING, RED AIR DRY PLASTIC (PDS 8815)
10308	COATING, ROTRON FILTER COAT #18440 (RP SUPER FILTER COAT #418)
10724	COATING, RP SUPER FILTER COAT #411, 4313, 414, 420, 421, 422
12192	COATING, RUBBERFLEX X10 ELASTOMERIC COATING
12932	COATING, SSS CLEAR WATER BASED EPOXY PRIMER, PART A HARDENER #30817
12931	COATING, SSS MCU FINISH PLUS POLYURETHANE COATING #30436
12933	COATING, SSS WATER BASED EPOXY PRIMER, PART B RESIN #30821
10995	COATING, TEFLON COATING
10760	COATING, TEXO L.P. 21W
10761	COATING, TEXO L.P. 781
11490	COATING, WORKABLE FIXATIVE KRYLON SPRAY COATING
11947	COATING,J-21 ACRYLIC CURE SEAL AND DUSTPROOFER: 19%
13362	COLORANT, B LAMP BLACK 76 1991
13552	COMBUBLEND II BASE U
13553	COMBUBLEND II BASE V
12166	COMPOUND, #10073/#10075 BAR BELT DRESSING (CLING SURFACE CO.)
12078	COMPOUND, 725 NICKEL ANTI-SEIZE COMPOUND (AEROSOL)
11331	COMPOUND, 900 GOLDEND PASTE
12121	COMPOUND, ABSORB-O-SOX (MINERAL FILLER)
11180	COMPOUND, ADVANTAGE W-1000
10449	COMPOUND, AIR KONTROL FILTER SPRAY
10690	COMPOUND, AQUASET
12444	COMPOUND, ATLASTIC CT-30 HORIZONTAL GRADE COMPONENT A
11620	COMPOUND, BELZONA MOLECULAR E METAL BASE
11646	COMPOUND, BELZONA MOLECULAR CERAMIC EC BARRIER BASE
11652	COMPOUND, BELZONA MOLECULAR GRANOGRIP SOLIDIFIER
11637	COMPOUND, BELZONA MOLECULAR MOULDABLE WOOD POWDER
11640	COMPOUND, BELZONA MOLECULAR D&A ELASTOMER BASE
11651	COMPOUND, BELZONA MOLECULAR GRANOGRIP - BASE - YELLOW
11650	COMPOUND, BELZONA MOLECULAR GRANOGRIP - BASE (RED AND GREY)
11638	COMPOUND, BELZONA MOLECULAR MP ELASTOMER BASE
11630	COMPOUND, BELZONA MOLECULAR MR7 BASE
11632	COMPOUND, BELZONA MOLECULAR FLEXIBLE MEMBRANE
11641	COMPOUND, BELZONA MOLECULAR D&A HI-BUILD ELASTOMER SOLIDIFI.
11622	COMPOUND, BELZONA MOLECULAR CERAMIC R METAL BASE
11648	COMPOUND, BELZONA MOLECULAR CERAMIC CARBIDE BASE
11631	COMPOUND, BELZONA MOLECULAR MR7 SOLIDIFIER
11621	COMPOUND, BELZONA MOLECULAR E METAL SOLIDIFIER
11619	COMPOUND, BELZONA MOLECULAR LAGSEAL
11647	COMPOUND, BELZONA MOLECULAR CERAMIC EC BARRIER SOLIDIFIER

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TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11629	COMPOUND, BELZONA MOLECULAR RELEASE AGENT
11642	COMPOUND, BELZONA MOLECULAR D&A FLUID ELASTOMER SOLIDIFIER
11639	COMPOUND, BELZONA MOLECULAR MP ELASTOMER SOLIDIFIER
11625	COMPOUND, BELZONA MOLECULAR CERAMIC S METAL SOLIDIFIER
11633	COMPOUND, BELZONA MOLECULAR GSC BASE
11624	COMPOUND, BELZONA MOLECULAR CERAMIC S METAL BASE
11649	COMPOUND, BELZONA MOLECULAR CERAMIC CARBIDE SOLIDIFIER
11644	COMPOUND, BELZONA MOLECULAR H.P. ANTI-SEIZE
11623	COMPOUND, BELZONA MOLECULAR CERAMIC R METAL SOLIDIFIER
11635	COMPOUND, BELZONA MOLECULAR PSC SURFACE CONDITIONER
11653	COMPOUND, BELZONA MOLECULAR XL METAL - BASE AND SOLIDIFIER
11655	COMPOUND, BELZONA MOLECULAR SUPER METAL SOLIDIFIER
11654	COMPOUND, BELZONA MOLECULAR SUPER METAL BASE
11634	COMPOUND, BELZONA MOLECULAR GSC SOLIDIFIER
11636	COMPOUND, BELZONA MOLECULAR MOULDABLE WOOD LIQUID
10853	COMPOUND, BRUSH MIX
11520	COMPOUND, CALCIUM CHLORIDE PELLETS 90, ICE MELT
12198	COMPOUND, CEILCRETE 6400 LIQUID
12541	COMPOUND, CHICO A SEALING COMPOUND
11313	COMPOUND, CMP 37
12529	COMPOUND, COLD GALV (AEROSOL)
10625	COMPOUND, CRC 2-26 #02004, 02005, 02005T
11643	COMPOUND, D&A SURFACE CONDITIONER
10050	COMPOUND, DAP 33 GLAZING
12962	COMPOUND, DEPEND 738 ACTIVATOR
12544	COMPOUND, DEPEND ACTIVATOR
10067	COMPOUND, DOW CORNING 11
11686	COMPOUND, DUCT SEAL DC-10, DC-50 (NEER)
10530	COMPOUND, DUXSEAL PUTTY TYPE COMPOUND
11266	COMPOUND, F-102 MARVEL FLOOR
11542	COMPOUND, F-165H FLOOR HARDNER
12028	COMPOUND, F-181 BOLT ANCHOR SULFASET
10653	COMPOUND, FORM-A-JIG
12316	COMPOUND, GEORGIA-PACIFIC READY-MIX JOINT COMPOUND
10913	COMPOUND, GOLD BOND ALL PURPOSE READY MIX JOINT COMPOUND
10743	COMPOUND, GRADE 1 - W-47 HYPREZ - DIAMOND POLISHING COMPOUND
11187	COMPOUND, GREEN LABEL HILITE FOR HILCO OIL RECLAIMER
12491	COMPOUND, HI TEMPCO 1000
10603	COMPOUND, HYPRES F/OS DIAMOND COMPOUND FLUID
11892	COMPOUND, K090, ALUMINUM OXIDE WITH TITANIUM CARBIDE
11792	COMPOUND, KOPR-SHIELD ANTI-CORROSION
12332	COMPOUND, KORKAP VINYL PATCH LD 2989
12509	COMPOUND, LEAK LOCK
11618	COMPOUND, MAGMA CONDITIONER BASE
11617	COMPOUND, MAGMA CONDITIONER SOLIDIFIER
11611	COMPOUND, MAGMA-FILL BASE
11616	COMPOUND, MAGMA-FILL AGGREGATE
11615	COMPOUND, MAGMA-FILL SOLIDIFIER
11612	COMPOUND, MAGMA-QUARTZ SOLIDIFIER
11613	COMPOUND, MAGMA-QUARTZ AGGREGATE
11614	COMPOUND, MAGMA-QUARTZ BASE
12494	COMPOUND, MAGNAFLUX SKL-HF-S SPOTCHECK PENETRANT
11372	COMPOUND, MERIAM #295 FLUID
12136	COMPOUND, MERIAM INSTRUMENTS #1000 GREEN CONCENTRATE
11245	COMPOUND, MICROSCOPE IMMERSION OIL, CARGILLE
12952	COMPOUND, MMC-395 PRIME COTE
12542	COMPOUND, MULE KICK
12403	COMPOUND, NAMICO 630 SOUR C
10609	COMPOUND, NO. 100 'PULL IN' MINERALLAC

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12545	COMPOUND, NOALOX ANTI-OXIDANT JOINT
12161	COMPOUND, NUGLAS PLASTIC REFINISHER
12094	COMPOUND, OAKITE JELCID
12257	COMPOUND, P-242 RANDUSTRIAL ICE MELTER
10697	COMPOUND, PADDING
11706	COMPOUND, PC-B
10163	COMPOUND, PELADOW CALCIUM CHLORIDE 94-97%
12556	COMPOUND, PENNTROWEL EPOXY HARDENER PART B
12957	COMPOUND, PIPE TAPE 9008
12945	COMPOUND, PLS-2 PLASTIC LEAD SEAL
11658	COMPOUND, POZZALIME TYPE I
11935	COMPOUND, PURAFIL MEDIA
12946	COMPOUND, QUIETROLE MARK II
12465	COMPOUND, R-11 SHIELD TITE ROOF PRESERVER
11508	COMPOUND, RELEASE AGENT, BELZONA
11717	COMPOUND, REZKALD 'C' FLOORING COMPOUND HARDENER
11716	COMPOUND, REZKALD 'C' FLOORING COMPOUND POWDER
11718	COMPOUND, REZKLAD 'C' FLOORING COMPOUND RESIN
11720	COMPOUND, REZKLAD CONCRETE PRIMER HARDENER
11719	COMPOUND, REZKLAD CONCRETE PRIMER RESIN
11819	COMPOUND, ROBROY POLYCLAD 936
11541	COMPOUND, RUBARS
11761	COMPOUND, SILICONE INSULATING COMPOUND
12540	COMPOUND, STERNS MIRACLE-GRO
12557	COMPOUND, STONCLAD/STONBLEND/WALCLAD/127A
11105	COMPOUND, STONHARD PRIMER
12044	COMPOUND, SUR-PREP III
11692	COMPOUND, SURE-SEAL SPLICE WASH
12954	COMPOUND, SWISS GLASS
11106	COMPOUND, TRAFFICLAD
12549	COMPOUND, TRIKO TOPPING
11231	COMPOUND, TV TUBE KOTE
10915	COMPOUND, YORK 106 SPAT-R-PRUF COMPOUND
13515	COMPUBLEND II BASE R
13557	COMPUBLEND II BASE S
13551	COMPUBLEND II BASE T
13554	COMPUBLEND II BASE W
13555	COMPUBLEND II BASE X
13556	COMPUBLEND II BASE Y
13164	CONDUCTIVITY STANDARD
12454	CONQ-R-DUST LIQUID
10644	COOLANT, CAMPBELLENE COOL BLUE
11359	COOLANT, DE-FOAMER
11358	COOLANT, EMULSIFIER
11357	COOLANT, HYDROIL
10764	COOLANT, P/N 39118294, FOR INGERSOLL RAND MODEL 1500L WWM5W
11952	COPIER FLUID, 3-M BRAND TYPE 409 TONER (N-P)
10583	COPIER XEROX 2020 MAGNETIC DEVELOPER
10558	COPIER XEROX DRY INK FOR #1040,1045&1055
11177	COPIER, 3M BRAND QUANTIMATIC TONER TYPE 748F
11176	COPIER, 3M BRAND TYPE 852 DEVELOPER PREMIX
11711	COPIER, BI-MODE TONER
12304	COPIER, CANON EP-2 CARTRIDGE
10918	COPIER, COPIER TONER 62-2000
10701	COPIER, DEVELOPER XEROX P/N 5R-148 FOR 1055
12317	COPIER, DISPERSANT FOR SAVIN COPIER MODEL 755
10957	COPIER, KEEPEZE SOLUTION, PART #200-726-2A
11738	COPIER, KODAK RP X-OMAT FIXER WORKING SOLUTION
11739	COPIER, KODAK RP X-OMAT DEVEL. REPL., MX 1275
12506	COPIER, KONICA/ROYAL PHOTOCONDUCTOR DRUM 130/130R, 115/122, 3302MR, 1602MR, 2502MR, 1803ZMR, 2803ZMR, 2203, 2290, 3290
10655	COPIER, LIQUID MASTER DEVELOPER P/N 83-1-101241
12425	COPIER, MINOLTA BIMODAL
12474	COPIER, MITA BLACK DEVELOPER FOR DC-211, 213RE, 313Z, 313ZD, 2105, 4055, 4085

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12475	COPIER, MITA BLACK TONER FOR DC-211, 213RE, 313Z, 313ZD, 114, 1001, 1205, 1255, 2105, 2555, 2585, 3255, 3285, 4055, 4085
11908	COPIER, P/N #5R-167 XEROX DEVELOPER FOR MODEL 1065
10748	COPIER, P/N 5R-130 FOR XEROX MODEL 3450
11013	COPIER, PITNEY BOWES COPIER TONER 502 & CONC.#501
11023	COPIER, REMINGTON DISPERSANT
12515	COPIER, SAVIN-RICOH COPIER TONER 870
10314	COPIER, TONER AND DISPERSANT FOR SAVIN COPIERS
11906	COPIER, TONER FOR SAVIN MODEL 755 COPIER
12131	COPIER, TONER LSP4X-AA TONER KIT FOR LPS40 PRINTER
10526	COPIER, TONER TYPE 748F FOR 3M ENLARGER/PRINTER
10900	COPIER, TYPE 446 3M 9600 ELECTROSTATIC PREMIX TONER
10899	COPIER, TYPE 447 3M 9600 FACSIMILE TONER CONCENTRATE
10898	COPIER, TYPE 448 3M 9600 CLEAR DISPERSANT
10386	COPIER, XEROX #5R12 DEVELOPER
10387	COPIER, XEROX #6R-149 TONER
10568	COPIER, XEROX 1025/1038 BLACK DRY INK PLUS AND BLACK DEVELOPER
12337	COPIER, XEROX 1065 DEVELOPER, 5R-190 5R-518(XCI)5R-90127(RX)
12336	COPIER, XEROX 1065 DEVELOPER, 5R-185
12339	COPIER, XEROX 1065 TONER, 6R285 6R286 (RX)
12338	COPIER, XEROX 1065 TONER, 6R290 6R515(XCI) 6R90145(RX)
10559	COPIER, XEROX 1075 DEVELOPER #5R-302
10585	COPIER, XEROX 1075 DRY INK #6R-301
11815	COPIER, XEROX 1075/1090/4050 PHOTORECEPTOR
11727	COPIER, XEROX 3100 LDC
11814	COPIER, XEROX CARRIER, CLEANER 1075/1090/4050
11483	COPIER, XEROX DEVELOPER P/N 5R-283
11277	COPIER, XEROX DEVELOPER, P/N 5R-111
11783	COPIER, XEROX DRY IMAGER P/N 6R-130
11780	COPIER, XEROX DRY INK PLUS P/N 6R-283
11781	COPIER, XEROX DRY INK PLUS P/N 6R-112
11295	COPIER, XEROX FUSER OIL P/N #8R-79 FOR MODEL 1055
11206	COPIER, XEROX FUSER/LUBRICANT P/N 8R111
12991	COPPER BASED WELDING & BRAZE WIRE &ROD
12055	CORROSION AND HEAT RESISTANT ALLOYS
13104	CP-210 CHIL-ABATE
13129	CP-211 POLYVINYL ACETATE EMULSION
13130	CP-215 POLYVINYL ACETATE EMULSION
13488	CP-240 CHIL LOCK
13027	CRONASOLV F53 FLUX
12997	CRONOSOLV F-51,55,&57 FLUX
11352	CU VER 1 COPPER REAGENT
10471	CUTTING & GRINDING FLUID, TAPMATIC CUTTING #2
12471	CUTTING FLUID, TAP MAGIC
11989	CUTTING TOOLS,BANDSAWS CIR. SAWS & CUTTERS ETC...
11990	CUTTING TOOLS,CLEVLAND TWIST DRILL CO.,FERROUS ALLOYS
13282	CUVER COPPER REAGENT
12058	D/J REF ELCTRODE OUTER FILL SOL'N
12299	DAG 154
13456	DAP WELDWOOD PLASTIC RESIN GLUE
13039	DARK MAHOGANY BLOND IT STAIN LACQUER
13404	DECO-REZ EPOXY MASTIC & CRACK FILLER
13499	DETERGENT 8 -ALCONOX
12402	DETERGENT, CLS (CONCENTRATED LIQUID DETERGENT)
12096	DETERGENT, SUPER LAUNDRY FARI-SURE

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
13046	DEVARDS ALLOY
13010	DEVCON PLASTIC STEEL PUTTY (A) RESIN & (B) HARDNER
13011	DEVCON STAINLESS STEEL PUTTY (ST) RESIN & (ST) HARDNER
11544	DEVELOPER, #51-101-2 DEVELOPER
11950	DEVELOPER, 3-M MICROFILM DEVELOPER (1) IN 3M BRAND FS-6 CHEM
11949	DEVELOPER, 3-M MICROFILM RINSE (4) IN 3M BRAND FS-6 CHEM-PAC
11948	DEVELOPER, 3-M MICROFILM NEUTRALIZER (3) IN 3-M BRAND FS-6
10327	DEVELOPER, 3M CD-5 COLOR KEY
12941	DEVELOPER, 3M IMAGE-N-TRANSFER DEVELOPER
10698	DEVELOPER, 3M R DEVELOPER
12234	DEVELOPER, CAMERA/PROCESSOR DEVELOPER CODE # 26100
12233	DEVELOPER, CAMERA/PROCESSOR FIXER CODE #26101
10912	DEVELOPER, DEVELOPER MIX, AM CAT.# MA-1001
10906	DEVELOPER, FILEMASTER DEVELOPER CONCENTRATE
12942	DEVELOPER, ITEK UNIVERSAL DEVELOPER MP-524E1
11116	DEVELOPER, KODAK BLEACH STARTER, PROCESS E-6
11115	DEVELOPER, KODAK BLEACH REPLENISHER, PROCESS E-6 AR
11114	DEVELOPER, KODAK BLEACH, PROCESS E-6, PARTS A + B
11147	DEVELOPER, KODAK COLOR DEV. REPL., PROCESS E-6, PARTS A & B
11140	DEVELOPER, KODAK COLOR DEV. REPL., PROCESS E-6 AR, PART B
11117	DEVELOPER, KODAK COLOR DEVELOPER, PROCESS E-6, PARTS A & B
11139	DEVELOPER, KODAK COLOR DEVELOPER STARTER, PROCESS E-6
11141	DEVELOPER, KODAK COLOR DEV. REPL.,PROCESS E-6,E-6 AR, PART A
11143	DEVELOPER, KODAK CONDITIONER & REPL., PROCESS E-6 & E-6 AR
11142	DEVELOPER, KODAK CONDITIONER, PROCESS E-6, SOL.# 3775
11144	DEVELOPER, KODAK DEFOAMER, PROCESS E-6
11136	DEVELOPER, KODAK DEKTOL DEVELOPER (SINGLE POWDER)
11146	DEVELOPER, KODAK DEVELOPER D-76 (SINGLE POWDER)
11137	DEVELOPER, KODAK DEVELOPER D-19 (SINGLE POWDER)
11135	DEVELOPER, KODAK DEVELOPER DK-50 PARTS A & B
11133	DEVELOPER, KODAK E-6 RETOUCHING DYE BUFFER
11134	DEVELOPER, KODAK E-6 TRANSPARENCY RETOUCHING DYES
11131	DEVELOPER, KODAK FIRST DEV. REPL., PROCESS E-6 & E-6 AR
11130	DEVELOPER, KODAK FIRST DEVELOPER STARTER, PROCESS E-6
11132	DEVELOPER, KODAK FIRST DEVELOPER, PROCESS E-6
10658	DEVELOPER, KODAK INDUSTREX MANUAL DEVELOPER AND REP.100-3623
11522	DEVELOPER, KODAK INTENSIFYING SCREEN CLNR & ANTISTATIC SOL.
11126	DEVELOPER, KODAK LIQUID X-RAY DEV. & REPL., PARTS A & B
11127	DEVELOPER, KODAK LIQUID X-RAY DEV. & REPL.,PART A,SOL.#3524
11594	DEVELOPER, KODAK MICRODOL-X LIQUID DEVELOPER
11138	DEVELOPER, KODAK OPAQUE (BLACK, RED)
11125	DEVELOPER, KODAK PHOTO-FLO 200 SOLUTION
11145	DEVELOPER, KODAK PRINT FLATTENING SOLUTION
11124	DEVELOPER, KODAK REVERSAL BATH, PROCESS E-6
11123	DEVELOPER, KODAK REVERSAL BATH,REPLENISHER,PROCESS E-6,E-6AR
11121	DEVELOPER, KODAK STABILIZER, PROCESS E-6, SOL.# 3808
11120	DEVELOPER, KODAK STABILIZER AND REPLENISHER, PROCESS E-6

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TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11119	DEVELOPER, KODAK STABILIZER AND REPLENISHER, PROCESS E-6 AR
11122	DEVELOPER, KODAK STABILIZER, PROCESS E-6, SOL.# 3757
10586	DEVELOPER, KODAKLITH LIQUID PART A #157-1900
10587	DEVELOPER, KODALITH LIQUID PART B #157-1918
12002	DEVELOPER, MAGNAFLUX,ZP-5A AQUEOUS WET
11999	DEVELOPER, MAGNAFLUX,ZP-14 ZYGLO
12007	DEVELOPER, MAGNAFLUX ZP-9E ZYGLO
12008	DEVELOPER, MAGNAFLUX, ZP-9C ZYGLO
12010	DEVELOPER, MAGNAFLUX,ZP-4A ZYGLO DRY
12001	DEVELOPER, MAGNAFLUX,ZP-13 ZYGLO
11998	DEVELOPER, MAGNAFLUX, SKD-LT SPOTCHECKER LOW TEMPERATURE
12009	DEVELOPER, MAGNAFLUX,ZP-4B ZYGLO DRYL
12000	DEVELOPER, MAGNAFLUX,ZP-13A ZYGLO
12011	DEVELOPER, MAGNAFLUX, ZP-10 ZYGLO
12012	DEVELOPER, MAGNAFLUX, SKD-HT SPOTCHECK
12005	DEVELOPER, MAGNAFLUX,SKD-5 SPOTCHECK AQUEOUS
12495	DEVELOPER, MAGNAFLUX SKD-NF-DEVELOPER (FORMERLY SKD-NF-ZP-9B)
12003	DEVELOPER, MAGNAFLUX,ZP-5 ZYGLO AQUEOUS
12006	DEVELOPER, MAGNAFLUX,ZP-9F
12013	DEVELOPER, MAGNAFLUX,SKD-5 SPOTCHECK
12004	DEVELOPER, MAGNAFLUX, SKD-W SPOTCHECK AQUEOUS
13454	DEXRON II MERCON AUTOMATIC TRANS FLUID
13222	DEXTRIN
10272	DEXTRON II-AUTO TRANSMISSION FLUID
12021	DIATOMACEOUS EARTH QUARTZ UP TO 2.5%
10072	DIATOMACEOUS EARTH, SPEEDPLUS
10849	DIATOMACEOUS EARTH, TR-20
12217	DICALITE, DIATEMACEOUS EARTH (BP-5)
13465	DIETHYLENETRIAMINEPENTAACETIC ACID PENTASODIUM SALT
12950	DISINFECTANT, GLYBET DISINFECTANT DEODORANT #BP95
12967	DISINFECTANT, SSS DISINFECTANT DEODORANT
11073	DRY INK CARTRIDGE-1012/5012/5014
13399	DUPONT ACRYLIC LACQUER PRIMERS AND SEALERS
13398	DUPONT CLEAR ENAMEL TOPCOATS
13400	DUPONT ENAMEL PRIMERS, CHROMATE PRIMER,VARIPRIME,CORLAR
13396	DUPONT ENAMEL REDUCER # 3812S,8022S,8093S.
12092	DUST SUPPRESANT, FLOW PRO 1320
13485	DYMONIC STANDARD COLORS
13373	DYNA FLOW BRAZING ALLOY
13544	EDF EMULSAFIRE
13492	ELECTRODE FILLING SOLUTION
10479	ELECTROLYTE # 66 SALT SOLUTION
13029	ELMERS EPOXY BARS PART1 RESIN &PART2
13030	ELMERS EPOXY GLUE REGULAR PARTS #1 &2
13028	ELMERS SUPERFAST EPOXY, PART 1 RESIN PART 2 HARDENER
13257	ELVANOL(POLYVINYL ALCOHOL)
13467	EM SCIENCE BUFFER SOLUTION PH-7
13116	EM SCIENCE BUFFER SOLUTION PH-4
13106	EMULSION COATING THERMOTEX B
11878	ENCAPSULANT SURFACTANT, BWE 5000, ASBESTOS REMOVAL
11877	ENCAPSULATING SURFACTANT, BWE 3000, ASBESTOS PENETRANT
12163	EPOXY HARDENER
13268	EPOXY PAINT #101-38A
12296	EPOXY, 5-MINUTE EPOXY RESIN
12349	EPOXY, EASYPOXY K-256 PART A
12098	EPOXY, F-135 RESIN AND F-135H EPOXY RESIN HARDENER
10922	EPOXY, HI-BUILD EPOXOLINE CONVERTER PART B, GRAY PART A
12025	EPOXY, MASTIC
12045	EPOXY, MASTIC 113-111A & B
11267	EPOXY, MT-13 EPOXY RESIN CEMENT

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12206	EPOXY, PC-3 TABLETOP CEMENT PART A
12176	EPOXY, R8 0477 EPOXY A & B OCEAN COATINGS
13215	ERIOCHROME BLACK T
3214	ETHYLENE DINITRILO TETRAACETIC ACID
13339	EXTERIOR OIL WOOD STAIN #43052
11850	EXTINGUISHING AGENT, MET-L-X DRY POWDER
12987	EXTINGUISHING AGENT, ABC DRY CHEMICAL
11852	EXTINGUISHING AGENT, LITH-X DRY POWDER
11849	EXTINGUISHING AGENT, MET-L-KYL DRY CHEMICAL
13507	extra edition pre soak detarnish
13166	EYESALINE
12300	EZE PEEL
13411	FABRE SOFT/SOUR
13408	CURE EPOXY
13047	FERRIC SULFATE
13441	FERROVER IRON REAGENT
13391	FIBERGLASS RESIN
13379	FIBERLOCK LAG KOTE
13561	FILTER DRIER CORES- CATCH ALL
13491	FINAL FINISH
12267	FIREMATE #803
11243	FIXER BUFFER SOLUTIONS-PH3.00 TO 5.00
11951	FIXER, 3-M MICROFILM FIXER (2) IN 3M BRAND FS-6 CHEM-PAC
11500	FIXER 3M 028 FIXING SOLUTION
10897	FIXER 3M BRAND, 3M I.D.#6-9020-0160-7
10580	FIXER 3M H-1
10905	FIXER, FILEMASTER FIXER CONCENTRATE
11128	FIXER, KODAK FIXER & REPLENISHER, PROCESS E-6 & E-6 AP
11129	FIXER, KODAK FIXER, PROCESS E-6
10640	FIXER, KODAK RAPID FIXER, PARTS A & B
11118	FIXER, KODAK X-RAY FIXER
13324	FLINT-FERROCERIUM
10189	FLOCCULANT, AMERFLOC PLUS 5280
10864	FLOCCULANT, POLYMER 1117L
10259	FLOOR DRY-OIL SORBENT(DIATOMACEOUS EARTH)
12341	FLOOR FINISH, ABOVE
11076	FLUID, ALLIED INK REPELLANT
11688	FLUID, ANTI-FREEZE PERMANENT TYPE
11481	FLUID, ASBESTOS WET WETTING SOLUTION
11645	FLUID, BELZONA MOLECULAR NATO FLUID
11846	FLUID, BIRD PROOF LIQUID
12554	FLUID, BRAKE FLUID 1000
11019	FLUID, BRAKE FLUID, PART NO. M44
11851	FLUID, DIELEKTROL III CAPACITOR FLUID
12399	FLUID, DOW 200 FLUID
11563	FLUID, EMULSIFIER E
12487	FLUID, ENGINE STARTING FLUID
11562	FLUID, HYDROIL COUPLING AGENT
12476	FLUID, INDICATING LIQUID NO. 200 BROWN
10519	FLUID, INDICATING VIZZENE B
12478	FLUID, LATEX LIQUID (CAMP CO.)
10598	FLUID, LIQUID PAPER CORRECTION FLUID THINNER
10533	FLUID, LIQUID PAPER CORRECTION FLUID
12546	FLUID, LIQUID PAPER CORRECTION FLUID (WHITE AND COLORS, LPCF-4, LPCF-8, LPCF-9)
11487	FLUID, LIQUID PHOTO MASKOID
11831	FLUID, ORVUS K LIQUID
11026	FLUID, PRE-MIX ALL PURPOSE VK-33
11024	FLUID, RUBBER REJUVENATOR VK-25
11532	FLUID, SAFETAP METALWORKING FLUID
12521	FLUID, SEARCH LEAK DETECTOR
10443	FLUID, SNOOP LEAK DETECTOR
13343	FLUID, ZERO START ENGINE STARTING FLUID
10694	FLUX, ALL-STATE #21 AND #1113 FLUX
13002	FLUX, BURNLEY SOLDERING PASTE FLUX
12208	FLUX, BURNLEY SOLDERING PASTE
11959	FLUX, JOHNSONS SOLDERING PASTE 05-00 FLUX
12516	FLUX, LA-CO ALUMINUM FLUX TU-5

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12528	FLUX, NOKORODE SOLDERING PASTE FLUX
12534	FLUX, P 200 SOLDER PASTE
10455	FLUX, RUBYFLUID SOLDERING FLUX
10388	FLUX, STAY-CLEAN FLUX
10389	FLUX, STAY-SILV BLACK/WHITE FLUX
12396	FOAM, POLYURETHANE PART B (POLYOLS) CROSSPOINT CHEMICALS
12395	FOAM, POLYURETHANE PART A (100% MDI) CROSSPOINT CHEMICALS
12240	FRAGRANCE PAKS-
10880	FREON TF SOLVENT- 1,1,2, TRICHLORE 1,2,2 TRIFLUOROETHANE
10390	FUEL, DIESEL #2
10560	FUSER LUBRICANT-XEROX ASSORTED NUMBERS
13545	GAP SEAL FOR AQUEOUS SOLUTIONS
10966	GAS, 10-30% HYDROGEN IN ARGON
10969	GAS, 25-50% ARGON IN HELIUM
11902	GAS, 30% NITROGEN, 70% HELIUM
10965	GAS, 40% HYDROGEN IN NITROGEN
10970	GAS, 8-25% CARBON DIOXIDE IN ARGON
10756	GAS, AIR, HYDROCARBON FREE, 20-21% O2
11343	GAS, AMMONIA, DISSOCIATED, DA
10406	GAS, ARGON (ZERO GAS)
10964	GAS, CARBON DIOXIDE - OXYGEN USP MIXTURE
10968	GAS, CARBON DIOXIDE AND ARGON IN HELIUM
12178	GAS, CARBON DIOXIDE-OXYGEN USP MIXTURE
13481	GAS, CARBON MONOXIDE IN AIR
13042	GAS, COMPRESSED AIR
10462	GAS, HELIUM
10089	GAS, HYDROGEN 2% IN AIR
10650	GAS, LIQUEFIED PETROLEUM GAS (PROPANE)
10408	GAS, METHANE
10092	GAS, METHANE IN AIR
10967	GAS, OXYGEN AND CARBON DIOXIDE IN ARGON
10016	GAS, P-10 (10% METHANE 90% ARGON)
13512	GAS, SULFIDE IN NITROGEN
10614	GAS, TEST 1%: CO, CO2, CH4, H2, O2 IN N2
10528	GAS, TEST 72% HE2, 5% CO, 5% N2, 4% CH4, 4% H2, 5% O2, 5%CO2
12995	GASKET ELIMINATOR 515 SEALANT
11988	GASKET, FELT AND FELT PRODUCTS
11986	GASKET, PLASTICS PHENOLITE IN FIBERGLASS SHEET TUBE & ROD
11987	GASKET, VARIOUS RUBBER SHEETS AND ROLLS
10391	GASOLINE, PREMIUM UNLEADED
10378	GASOLINE, REGULAR UNLEADED
13161	GENFLEX G-400 SPLICING CEMENT
12301	GILLITE 905-XX
12089	GLUE, ELMERS WATERPROOF GLUE-RESIN PART 1
11069	GREASE GULFCROWN EP 2
10195	GREASE, APEIZON
10552	GREASE, DOW CORNING SILICONE
11340	GREASE, DOW CORNING BR 2 PLUS MULTI PURPOSE E.P. GREASE
12982	GREASE, FALK LONG TERM GREASE
12468	GREASE, GENERAL ELECTRIC G661 POLYSILOXANE GREASE
11509	GREASE, LUBRIPLATE #630-A, #630-AA, #630-AAA, #630-2 GREASE
12093	GREASE, MOBILGREASE MP
11113	GREASE, MOBILGREASE SPECIAL
10008	GREASE, MOBULUBE HD90
10484	GREASE, MPG-2 GREASE
11291	GREASE, POLY-CON PL-2
11555	GREASE, SHELL ALVANIA EP GREASE 2
12964	GREASE, SOVAREX
11333	GREASE, STOPCOCK GREASE, LUBRISEAL
11297	GREASE, TRIBOLUBE 13D - SYNTHETIC GREASE
10664	GRINDING WHEELS
10139	GRIT BLAST, BLACK BEAUTY BB40-16
11285	GRIT BLAST, CHILLED IRON SHOT AND GRIT
12309	GRIT BLAST, EXOLON FASTBLAST (SYNONYM: ALPHA ALUMINA)
10105	GROUT, EMBECO 636
12532	GROUT, SAVOGRAN TILE GROUT READY TO USE
10114	GULF HARMONY-150N OIL
13321	HAIR SPRAY

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
13173	HARDENER BY VARITYPER
13440	HARDNESS STANDARD SOLUTION 20GPG
13510	HEALTH CARE DISINFECTANT
13336	HEAVY DUTY METAL WORKING CONCENTRATE-360
10012	HERBICIDE, BRUSHKILLER 170 (2,4-D)
12949	HERBICIDE, DUPONT KROVAR
12306	HERBICIDE, HYVAR X-L
10634	HERBICIDE, KARMEX DF HERBICIDE
12530	HERBICIDE, OUST
10026	HERBICIDE, PRAMITOL 25E (25% PROMETON)
10054	HERBICIDE, PRINCEP 80W WETTABLE POWDER
11876	HERBICIDE, ROUNDUP
13423	HERBICIDE, TRI POWER
12359	HERBICIDE, WEEDAR (2,4-D BY UNION CARBIDE NOW RHONE-POULENC)
12535	HERCULES PVC PRIMER
12518	HERCULES REAL TUFF
12313	HG ABSORB
13019	HIGH TACK ADHESIVE SEALANT
13018	HIGH TACK SUPER ADHESIVE
10565	HIGH TEMPERATURE #1902 ALUMINUM PAINT
13381	HIGH TEMPERATURE REFRACTORY RETORT & FURNACE CEMENT
13377	HOBART METAL ARC WELDING SOLID WIRE
13033	HONEYWELL INK CARTRIDGES ALL COLORS
13034	HONEYWELL LUBRICATING OIL #71042
13206	HYDRANAL BUFFER
13204	HYDRANAL COMPOSITE
13203	HYDRANAL SOLVENT
13205	HYDRANAL TITRANT 2 NH
10235	HYDRAULIC FLUID, FYREQUEL #150 FIRE RESISTANT
10009	HYDRAULIC FLUID, FYREQUEL #550 FIRE RESISTANT
11870	HYDRAULIC FLUID, FYRQUEL 220
11595	HYDRAULIC FLUID, RT 23 FIRE-RESISTANT HYDRAULIC FLUID, HURST
11672	HYDRO SEAL II HEAVY DUTY COLD PARTS CLEANER
13422	HYDROSEP
13323	HYPAOLON REPAIR ADHESIVE #M-743 PARTS A&B
12060	IGE GARNET, GARLITE
12054	INDUSTRIAL WASH PRIMER, VINYL BUTYRAL-BASIC ZINC CHROMATE
13101	INJECTION SOUR
12059	INK, 3M BRAND TYPE 277 RED
11530	INK, BEROL BOLDLINER F30
10911	INK, BLACK (LITHOGRAPHIC) INK
13374	INK, BLUE TOOLMAKERS INK #6001
11502	INK, BLUE TOOLMAKERS INK 6001, 16001
10549	INK, COLOR BLACK R-BK
11545	INK, COLOR BLUE
11546	INK, COLOR GREEN
11194	INK, COLOR RED
10909	INK, DUPLIMAT PLATEX SOLUTION
10477	INK, ESTERLINE ANGUS RED RECORDING #61101-RM
11669	INK, HIGH INTENSITY-FAST DRY INK
11691	INK, MULTILITH CONVERSION SOLUTION
11690	INK, MULTILITH ELECTROSTATIC
11735	INK, ORANGE
11734	INK, PURPLE
12944	INK, RED 706 RECORDER INK
10910	INK, REPELEX CONCENTRATE
11847	INK, ROLMARK ROLLER STENCIL INK,ALL COLORS
12307	INK, SANFORD'S HI INTENSITY INKS SHARPIE MARKER
11148	INK, VAN SON BLACK #40904 (QUICKSET)
10242	INK, VAN SON BLACK VS-100
10201	INK, VAN SON RUBBER BASE IVY GREEN #VS-338
11149	INK, VAN SON RUBBER BASE PLUS
11150	INK, VAN SON TOUGH TEX
11151	INK, VAN SON VAN GLO INKS, IR-11-18 & 21-23
10468	INSECTICIDE, BUG DUSTER 0.1%PYRETHRIN, 1%PIPERONYL BUTOXIDE
10813	INSECTICIDE, CHLORDANE
11589	INSECTICIDE, CRAW-LESS ANT & ROACH KILLER #785
10512	INSECTICIDE, DERMATOID DR-8270
11854	INSECTICIDE, DURSBAN L.O.

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TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11834	INSECTICIDE, DURSBAN TC
11590	INSECTICIDE, FLY-HI FLYING INSECT KILLER #784
10879	INSECTICIDE, MSA WASP-STOPPER
10276	INSECTICIDE, PHILLIPS HIGH PRESSURE BOMB EPA #7405-52-17004
13424	INSECTICIDE, PROFESSIOINAL TURF INSECTICIDE
11888	INSECTICIDE, PT 250 BAYGON
11853	INSECTICIDE, PT 270 DURSBAN
11887	INSECTICIDE, PT 565 PYRETHRUM
12129	INSECTICIDE, SSS FLYING INSECT KILLER
13100	INSECTICIDE, WASP STOPPER II
10230	INSULATION, BABCOCK & WILCOX KAOWOOL RIGIDIZER
10847	INSULATION, CADABOND #427
12031	INSULATION, CALCIUM SILICATE THERMAL INSULATION
10799	INSULATION, CEASE-FIRE 2000, DEVEL. MIX COMPONENTS A AND B
12038	INSULATION, DELTA LOOSE INSULATION / LOOSE MINERAL WOOL
12039	INSULATION, DELTA MINERAL WOOL BOARD
10773	INSULATION, FBX 1000 BOARD
10774	INSULATION, FBX 1200 BOARD
10772	INSULATION, FBX 1300 BLOCK
10771	INSULATION, FBX 1900 BLOCK
10775	INSULATION, FBX 850 BOARD
10776	INSULATION, FBX MINERAL FIBER BLANKET
10835	INSULATION, FIBERFRAX LDS MOLDABLE
10852	INSULATION, FLEXWHITE PRODUCTS
11756	INSULATION, GLASS WOOL
11975	INSULATION, GORDON VITREOUS SILICA
11979	INSULATION, GORDON,BEO-BERYLLIUN OXIDE
11977	INSULATION, GORDON,CERAMIC FIBER
11978	INSULATION, GORDON,PVC
11976	INSULATION, GORDON/KNAUF FIBERGLASS
10779	INSULATION, HILBLOK
10851	INSULATION, HILBOARD PRODUCTS
12032	INSULATION, INSBLOCK-19 MINERAL WOOL AND CLAY
10848	INSULATION, INSULATING CEMENT
12035	INSULATION, K-GAC 19 BOARD MINERAL FIBER SOUND DEADENING
10800	INSULATION, KAOLITH 90 P.B.V.S.
10802	INSULATION, KAOTAB,KAOCRETE,KAOLITE,KAOGUN,KAOLIN,KAOTUFF...
10781	INSULATION, KAOTEX TEXTILE PRODUCTS
12110	INSULATION, KAOTHERM INSULATING BOARD
10786	INSULATION, KAOWOOL TAMPING MIX
12070	INSULATION, KAOWOOL BLANKET, ALUMINOSILICATE
10790	INSULATION, KAOWOOL STX PRODUCTS, PYRO-BLOC MODULE & FIBER
10785	INSULATION, KAOWOOL CEMENT A AND B
10789	INSULATION, KAOWOOL SAFFIL PRODUCTS, PYRO-BLOC FIBER
12069	INSULATION, KAOWOOL PREFORM , ALUMINOSILICATE
10793	INSULATION, KAOWOOL PRODUCTS
10791	INSULATION, KAOWOOL BOARD PRODUCTS, SLEEVE PRODUCTS
10788	INSULATION, KAOWOOL BOARD, UNIFELT, SLEEVE, 3000 BURNER BLKS
10784	INSULATION, KAOWOOL RIGIDIZER
10787	INSULATION, KAOWOOL PAPER, MILLBOARD, ROLLBOARD, KAOTEX 2000
10792	INSULATION, KAOWOOL BULK FIBER PRODUCTS, MODULE PRODUCTS
10801	INSULATION, KROMALOX, PLASCAST, ULTRACAST
11540	INSULATION, MAGNESIUM OXIDE & ALUMINUM OXIDE
10770	INSULATION, MOLDATHERM
11526	INSULATION, NAD 11, HIGH DENSE BOARD
10783	INSULATION, PYRO-BLOC FIBER AND MODULE PRODUCTS
12036	INSULATION, ROCBLOK PK-19,PK-16
10780	INSULATION, SAFFIL ALUMINA
12108	INSULATION, THERMAL CERAMICS REFRACTORY SHAPES AND FIREBRICK

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12109	INSULATION, THERMAL CERAMICS INSULATING BOARD
10850	INSULATION, TR-19
11827	INSULATION, TRYMER 9501 RIGID FOAM INSULATION
10782	INSULATION, UNIKOTE M AND S
13295	IODATE IODIDE STANDARD SOLUTION .00125N #401
12970	IRONCLAD GALVANIZED METAL PRIMER
13397	ISOCYANATE ACTIVATORS HARDENERS AND ADDITIVES DU PONT #782S,792S,793S
12071	KAOMAT, ALUMINOSI[illegible]CATE
13566	KAVATROL URINE CO[illegible]ROLS
11971	KIT, GOLD ENHANCEMENT KIT (B)
11970	KIT, GOLD ENHANCEMENT KIT
11972	KIT, GOLD ENHANCEMENT KIT (C
11966	KIT, M13 KITS
11965	KIT, SILVER STAIN KIT-DEVELOPER SOLUTION
11963	KIT, SILVER STAIN KIT OXIDIZER SOLUTION
11964	KIT, SILVER STAIN REAGENT CONCENTRATE
12236	KITS, 5501- 5505 SERIES FROM 3M ELECTRICAL DIVISION
13514	KLINGFAST A
12428	KOVATROL URIN CONTROLS
13486	KRESTO
13477	KURE-N-SEAL 30
12996	L-TEC FLUXES FOR GAS WELDING
13023	LA-CO REGULAR FLUX PASTE
13012	LA.-CO. SLIC TITE STIK WITH TEFLON
13439	LABEL REMOVER KIT
12220	LANOXIN
12972	LANTHIUM NITRATE
13102	LATEX TRAFFIC YELLOW PAINT:NON-LEAD
13367	LEAD -ACID STORAGE BATTERY
11880	LIGHTSTICK, CYALUME GREEN CHEMICAL LIGHTSTICK
13509	LIO[illegible]A-X-TRA LIQUID DISHWASHING CP[illegible]
13455	LIQUI-X-TRA CHLORINATED DISHMACHINE DETERGENT
13469	LIQUID ACIDIC DESCALER
13376	LIQUID BUFFER
13419	LIQUID HARDENER
12969	LIQUID HARDENER
12404	LIQUID INSURE - LIQUID HYDROGEN PEROXIDE BLEACH
13425	LIQUID TIME RELEASE NITROGEN FERTILIZER
10041	LIQUID, ACIDSIL SOLUTION
13482	LITH-EASE WHITE LITHIUM LUBRICANT
12142	LITHIUM BROMIDE BRINE
13334	LOCK EASE # LE-4:LE-18
13335	LOCK EASE # LE-5
13394	LOCQUIC (r) PRIMER
10410	LOTION, JERGENS LOTION FOR EXTRA DRY KSKIN
11684	LOTION, SANI-FRESH EXTRA CARE CREAM PROTECTIVE BARRIER CREAM
10696	LOTION, SBS-40 MEDICATED SKIN CREAM
13508	LSR LIQUID DESCALER
11012	LUBRICANT, #995 MULTIFAK EP 2 & #1922 MOLYTEX EP 2, PERMA 12
10855	LUBRICANT, CARBON/GRAPHITE GRADES
10856	LUBRICANT, CARBON/GRAPHITE WITH PARAFFIN WAX
10297	LUBRICANT, CONDUCTO-LUBE
10298	LUBRICANT, COOL AMP POWDER
10578	LUBRICANT, DAG 154 GRAPHITE IN ALCOHOL
12312	LUBRICANT, DOW #316 SILICONE RELEASE SPRAY
10858	LUBRICANT, EASE-ON PIPE LUBRICANT
10483	LUBRICANT, EGO 80/90 GEAR LUBE WITH EP ADDITIVE
12194	LUBRICANT, GREENLEE GREEN 80 WIRE PULLING LUBRICANT
12462	LUBRICANT, HOPPES #9 LUBRICATING OIL
11072	LUBRICANT, HYPREZ OS LUBRICANT
10203	LUBRICANT, KLINGFAST GEAR, SOHITAC, WHITMORE OR TENACE SPRAY
11889	LUBRICANT, LIFEGUARD ENCLOSED GEAR AND DRIVE LUBRICANT
12238	LUBRICANT, LPS 1 GREASELESS LUBRICANT

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10198	LUBRICANT, LPS 3 HEAVY-DUTY RUST INHIBITOR
11898	LUBRICANT, LUBRICANT-SUPER TAYLOR
10325	LUBRICANT, MOBILGEAR 629
11753	LUBRICANT, MOBILGEAR 634
11741	LUBRICANT, MOLY DRY FILM LUBRICANT
12963	LUBRICANT, MULTI-PURPOSE LUBRICANT (DRI-SLIDE) DS CODE 00903
11064	LUBRICANT, MULTI-PURPOSE LUBRICANT (DRI-SLIDE) 215, 889, 250, 251, 321, 325, 3100
10341	LUBRICANT, NEVER-SEEZ ANTI-SEIZE & SEALING COMPOUND
10309	LUBRICANT, POLY-CON PL80-90 GEAR LUBE
10946	LUBRICANT, SILVER GOOP THREAD LUBRICANT ANTISEIZE COMPOUND
10996	LUBRICANT, SPRAGRIP
10140	LUBRICANT, SUN-WAY (WAYLUBE #1180)
10116	LUBRICANT, WD-40
12951	LUBRICANT, WIRE ROPE SPRAY LUBRICANT
12504	LUBRICANT, YELLOW 77 WIRE PULLING LUBRICANT
10997	LUBRICANT,SILICONE LUBRICANT-KITS # 5503&5635
13421	M-1500, LATEX FIRE RETARDANT FLAT PT.
13430	M-743A HYPALON REPAIR ADHESIVE
13446	M-ENDO BROTH CAT.NO. 14623
13447	M-FC BROTH
13333	MACS THERMO AID
12973	MAGNESIUM CARBONATE
12302	MAGNUSPRAY 205
13442	MAN VER 2 HACH CAT. # 928
13326	MAN VER 2 HACH CAT. # 851
13112	MANGANESE SULFATE MONOHYDRATE PWDR
12453	MARKER BOARD CLEANER #202
13436	MATRIX MODIFIER-MAGNESIUM NITRATE
13435	MATRIX MODIFIER-PALLADIUM NITRATE
12052	MEK THINNER, METHYL ETHYL KETONE
12042	METAL ALLOY FROM THERMAL CERAMICS
11996	METAL SHEATHED, MINERAL INSULATED CABLE
11171	METAL, ALUMINUM ALLOYS
10908	METAL, B&W PLASTIC CHROME ORE
11321	METAL, BRASS
11995	METAL, BRASS,923 AND 858 BRAZING ADAPTORS
11318	METAL, BRONZE
11322	METAL, CARBON STEEL, LEADED CARBON
10859	METAL, CAST IRON PIPE AND FITTINGS
11610	METAL, GALVANIZED WIRE
10865	METAL, HARD METAL (OTHERS)
10866	METAL, HARD METAL, K3365, K5860, K6972, ETC.
10867	METAL, IRON CHIPS AND POWDER, A AND B SERIES, K-291, #908
11315	METAL, MOLYBDENUM PRODUCTS
11319	METAL, NICKEL BASED ALLOY STEEL
11170	METAL, STAINLESS STEEL ALLOYS
11169	METAL, STEEL
11317	METAL, THORIATED TUNGSTEN METAL PRODUCTS
11316	METAL, TUNGSTEN PRODUCTS
13303	METHANE IN ARGON 1PPM TO 10%
13111	METHYL RED -NEUTRAL
13565	MICRO-VIEW LEANS CLEANER
13560	MINERALS WASTEWATER
11288	MIXTURE, CARBON ACTIVATED PELLETS
10777	MIXTURE, PROTECTO-COAT 1000, COMPONENTS A AND B
10832	MIXTURE, SUR-PREP NO.II, 93-600
10365	MOLD COATING, CERAMCOTE ZA-BE
10364	MOLD COATING, CERAMCO ZWR-20A
10363	MOLD COATING, CERAMCOTE ZWR
10907	MOLD COATING, TERRAPAINT 6171
10191	MOLD COATING, TERRAPAINT 550
11188	MOLD COATING, TERRAPAINT 559
10726	MSA CLEANER SANITIZER
13493	MSA VENTILATION SMOKE TUBES
13165	MURALO COATINGS ,RESINS, & RELATED PRODUCTS
12221	MYLANTA TABLETS
12463	NAMISOLV

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10236	NESSLER REAGENT
10284	NEUTRACIT-2 CAUSTIC NEUTRALIZER
13001	NEVER -SEEZE PURE NICKLE ANTI-SEEZ CPD
13293	NITRATE ELECTRODE FILLING SOLUTION #44569
13292	NITRATE IONIC STRENGTH ADJUSTER #44563
13291	NITRATE NITROGEN SOLUTION 10.0 +- 0.0mg/L AS N
13289	NITRATE NITROGEN STANDARD SOLUTION 100 +-1mg/L AS N #1947
13290	NITRATE NITROGEN STANDARD SOLUTION 1.0 +-0.01mgLAS N
13445	NITRIFICATION INHIBITOR
13444	NITRIVER 2-NITRITE REAGENT
12227	NITROGLYCERINE TABLET 1/150
3480	NITROGREN DIOXIDE IN NITROGEN(3 PPM)
13124	NO-CHAR 2-2 FIRE RETARDENT
13386	NON AQUEOUS BUFFER
13358	NUMBER 7, TAR AND BUG REMOVER
13263	NUXTRA (R) CALCIUM
12993	OATEY CLEANER
13434	OFF-INSECT REPELLENT
10977	OIL DISPERSANT, SIMPLE GREEN
10411	OIL, 3-IN-1 OIL
10188	OIL, 3'0 SOVAC MOTOR OIL (LUBRITE MOTOR OIL SAE 10)
10815	OIL, 650 T CYLINDER OIL 1000
11261	OIL, AIR TOOL OIL (CLING SURFACE CO.)
11336	OIL, CHESTERTON #390 CUTTING OIL
10513	OIL, CONVOIL-10
10004	OIL, CUTTING OIL, SHELL GARIA H5L7026 BLEND #3
11529	OIL, CVC 60
10150	OIL, DUO SEAL PUMP VACUUM
10481	OIL, DWYER RED GAGE OIL
11937	OIL, ELDORAN UTH J-3-303
11809	OIL, EMULSUN 31
11593	OIL, FLUOROLUBE
10260	OIL, GE SF96-50 SILICONE
12555	OIL, HE 175 VACUUM PUMP OIL (INLAND 19)
10279	OIL, HOOKER OR OXYCHEM FLUOROLUBE MO 10
10205	OIL, HOUGHTON QUENCH K OR BEACON K-9
11281	OIL, IMMERSION, MICRO SLIDE
12022	OIL, INLAND - 19, NEUTRAL PARAFFINIC OIL
11883	OIL, INLAND 19 # 405200
11787	OIL, KROIL PENETRATING OIL
12132	OIL, LPS4X-AC FUSER OIL FOR LPS40
10536	OIL, MERIAM #100 RED UNITY OIL SPEC D-2969
10602	OIL, MOBIL 427 AIR COMPRESSOR OIL
11112	OIL, MOBIL ATF 220
10548	OIL, MOBIL DELVAC, 1110, SAE 10 HIGH DETERGENT
10070	OIL, MOBIL DTE EXTRA HEAVY
10059	OIL, MOBIL DTE OIL 26
10069	OIL, MOBIL DTE-24;25;26;
10380	OIL, MOBIL LUBRITE #130 SAE 30
11156	OIL, MOBIL VELOCITE OIL NO. 10
11501	OIL, MOBILE DELVAC #1130 (LUBRITE SAE 30)
10126	OIL, MOBILGEAR #632 OIL
10447	OIL, MOBILUBE HD90
12345	OIL, ND20
12122	OIL, OIL 15
11018	OIL, PENETECK, MINERAL OIL TECHNICAL
10310	OIL, POLY-CON PL-30 INDUSTRIAL OIL
11197	OIL, RED GAGE OIL
11685	OIL, REXLUBE SOL. LUB. OIL CODE 10,1176 SPINDLE OIL
10164	OIL, RIDGID DARK THREAD CUTTING OIL
11521	OIL, SECO 85
13108	OIL, SHELL DONAX (R) TD FLUID (HYDRAULIC FLUID)
11031	OIL, SHELL RIMULA OIL 10W
11030	OIL, SHELL RIMULA OIL 40
11032	OIL, SHELL RIMULA OIL 20W/20
11033	OIL, SHELL RIMULA OIL 30
10005	OIL, SHELL ROTELLA OIL T MULTI-GRADE SAE 15W/40
11071	OIL, SHELL TURBO OIL 32
10120	OIL, SHELL TURBO OIL #33 (#68)

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11276	OIL, SOLAR CUT SEMI-SYNTHETIC OIL CONCENTRATE
10177	OIL, SUN SECO OIL
10291	OIL, SUN SOLUBLE OIL 31
10393	OIL, SUNISO 3GS REFRIGERATION OIL
10394	OIL, SUNISO 4GS REFRIGERATION OIL
10395	OIL, SUNISO 5GS REFRIGERATION OIL
11561	OIL, SUNLUBE SOLUBLE OIL
11543	OIL, SUNTHENE 410
12489	OIL, TRACTOR HYDRAULIC OIL
11354	OIL, TRANE REFRIGERATION OIL
10412	OIL, VACUUM PUMP FLUID CMP-20
13559	OIL, VULCAN ANTI-WEAR HYDRAULIC OIL -AW LITE 15 &AW 115
10722	OIL,DRYDENE PARADENE AW HYDRAULIC OILS 22AW, 32AW, 46AW, 68AW, 100AW, 150AW, 220AW, 320AW, 460AW
12188	OINTMENT, CORTICPORIN OPTHALMIC
13501	ORANGE 88 DEGREASER
13344	OYLTITE STIK
13176	PABCO SUPER CAL TEMP
12033	PACO 85 CB PLASTIC
12050	PAINT CATALYST, POLYAMIDE EPOXY -CORONADO
10316	PAINT REMOVER, KLEAN-KUTTER CODE 115
10024	PAINT REMOVER, KLEAN-STRIP HEAVY BODIED
10834	PAINT REMOVER, KS-3 PAINT REMOVER
10759	PAINT REMOVER, TEXO 404 THICK
10396	PAINT REMOVER, TURCO STRIPPER
10514	PAINT, #100 CONTINENTAL WEATHERGUARD CEMENT BLOCK WHITE
10599	PAINT, #100-10 PERMA-BOND
11162	PAINT, #101-1A &B EPOXY FINISH COAT
11163	PAINT, #101-250B EPOXY ENAMEL CATALYST, B
10162	PAINT, #1201-A GLYPTOL RED ENAMEL
11164	PAINT, #139-1-1 INDUSTRIAL ENAMEL
10350	PAINT, #168 QUICK DRY IND. RUST INHIBITIVE PRIMER
10022	PAINT, #1900 PERMITE HOT SEAL HIGH HEAT ALUMINUM
11006	PAINT, #299 ALKYD ZINC DUST COATING GRAY
11020	PAINT, #3202 ACRYLIC UNDERCOAT, (GALVINOLEUM)
10601	PAINT, #393-10 MOISURE CURED POLYURETHANE
10248	PAINT, #409 PORTER YELLOW TRAFFIC
10053	PAINT, #4302 MCR EPOXY BLACK: 4302-PT.A AND 4346-PT.B
10046	PAINT, #4306 GRAY EPOXY: #4340-PART A AND #4346N-PART B
11004	PAINT, #4361 HIGH BUILD WHITE
10096	PAINT, #4372 RED EPOXY: 4372-PT.A AND 4346-PT.B
10007	PAINT, #4374 MCR GLOSS POLUMIDE YELLOW: 4374-PT.A + 4347-P.B
11075	PAINT, #45831 PREMIX
10430	PAINT, #49 WHITE SEMI-GLOSS ENAMEL
10509	PAINT, #502 A + B FUTURA BOND
10051	PAINT, #504 NLO LATEX LIGHT GREEN SEMI-GLOSS
11008	PAINT, #5131 SPRAYING THINNER
10510	PAINT, #522 A+B FUTURA FLEX
10511	PAINT, #524 A + B FUTURA FLEX
10881	PAINT, #576 CORLAR THINNER
11021	PAINT, #633 THINNER
11005	PAINT, #6510 PART A & #6546 PART B EPOXY WHITE PAINT
11567	PAINT, #680 ULTIMATE ACRYLIC FINISH
11003	PAINT, #864 PREPARE-IT
10994	PAINT, #906 SILVER GRAY HIGH GLOSS ENAMEL
10648	PAINT, #925-147 HARDIG QUICK DRY RUST INDUST. INHIB. PRIMER
10337	PAINT, #99 HARDIG'S WHITE RUBBER BASE CEMENT PAINT
12940	PAINT, 895-211 GRAY, QUICK DRY METAL PRIMER
11820	PAINT, ACRYLIC ENAMEL BROWN
11822	PAINT, ACRYLIC ENAMEL WHITE
12024	PAINT, ACRYLIC ENAMEL 80-1

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11821	PAINT, ACRYLIC ENAMEL LT. GREEN
11568	PAINT, ART POSTER PAINT DOLCHEM 3700-3725
10358	PAINT, BIN PRIMER-SEALER STAIN
11539	PAINT, BRITE TOUCH SPRAY PAINT
11046	PAINT, CARBO ZINC 12
11861	PAINT, CARBOLINE #295 WB SURFACER PART A & B
11275	PAINT, CARBOLINE 190 FD-COLOR GRAY C-703
11855	PAINT, CARBOLINE 191 FINISH PART A & PART B
11860	PAINT, CARBOLINE 191 PRIMER PART A
11050	PAINT, CARBOLINE 193 PRIMER
11051	PAINT, CARBOLINE 193 FINISH
11049	PAINT, CARBOLINE 3300
11859	PAINT, CARBOLINE THINNER 76
11055	PAINT, CARBOLINE THINNER #15
11052	PAINT, CARBOLINE THINNER #73
11858	PAINT, CARBOLINE THINNER 2
11053	PAINT, CARBOLINE THINNER #21
11047	PAINT, CARBOMASTIC 15
11048	PAINT, CARBOMASTIC THINNER
13378	PAINT, CENTARI ACRYLIC PAINT (DUPONT PAINT)
11708	PAINT, CHLORINATED RUBBER METAL PRIMER # 227-11
11723	PAINT, CLEAR POLYURETHANE
10882	PAINT, CORLAR CHEMICAL RESISTAN. EPOXY ENAMEL
11709	PAINT, CORONADO CHLORINATED RUBBER FINISH COAT # 227-1
13278	PAINT, CORONADO BEIGE- #23717 URETHANE
13279	PAINT, CORONADO BROWN #20117
12407	PAINT, CORONADO INDUSTRIAL ENAMEL 139-145 ALUMINUM
11707	PAINT, CORONADO SUR-PREP III RUST REMOVER
11489	PAINT, CRYSTAL CLEAR KRYLON ACRYLIC SPRAY
10185	PAINT, DRUM BLACK ENAMEL CVC CODE #34884
10413	PAINT, DRUM CLEAR LINER
10045	PAINT, DRUM RED ENAMEL
10442	PAINT, DRUM WHITE ENAMEL
11068	PAINT, EPON RESIN 828
13267	PAINT, EPOXY-#101-36A
12552	PAINT, FLOETROL
10520	PAINT, FOY GLAZE WASH PRIMER PART A + B
11058	PAINT, FOY-GLAZE POLYURETHANE COATING FOR METAL (GRAY)
10875	PAINT, GLASS FROSTING SPRAY
13402	PAINT, GLIDDEN-INTERIOR EXTERIOR ACRYLIC ENAMELS
12968	PAINT, GLIDDEN METAL AIR DRY ENAMEL 1201
10420	PAINT, HARDIGS TUF-N-HARD POLYURETHANESINGLE PACKAGE ENAMEL, S-977, S-945, S-943, S-965, S-940, S-128
11007	PAINT, HYTHANE DEEP BASE
11810	PAINT, INDUSTRIAL ACRYLIC EPOXY, 138-1 A & B WHITE
12051	PAINT, INDUSTRIAL EPOXY ENAMEL
11221	PAINT, INTERIOR ACRYLIC SEMI GLOSS LATEX, ENAMEL (BEIGE)
11836	PAINT, IRONCLAD RETARDO RUST INHIBITIVE PAINT
12526	PAINT, KRYLON CAR COLOR SPRAY PAINT
10805	PAINT, LOOK VINYL ACRYLIC FLAT, 72-1 WHITE
10993	PAINT, LUSTRE INTERMED TB
13031	PAINT, MCR-43 HI-BUILD SEMI-GLOSS
13024	PAINT, MCR-43 HIGH BUILD PRIMER
10804	PAINT, NR. 411 URETHANE ENAMEL - PIGMENTED
13280	PAINT, OSHA YELLOW
11383	PAINT, PEEL FILMITE
12551	PAINT, PENETROL/ MARINE PENETROL
10600	PAINT, PERMA-BOND THINNER
10807	PAINT, PERMITE HIGH TEMPERATURE ALUMINUM, PCS 1100
11045	PAINT, PHENOLINE 300 ORANGE
11043	PAINT, PHENOLINE 305 PRIMER
11044	PAINT, PHENOLINE 305 FINISH
11054	PAINT, PHENOLINE THINNER
13184	PAINT, POLYAMIDE EPOXY PAINT PRIMER #101-253B
13183	PAINT, POLYAMIDE EPOXY PAINT PRIMER #101-147A

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11513	PAINT, PORTER MCR-43 RED PRIMER 4300A & B
10652	PAINT, PORTER PAINT 408 WHITE TRAFFIC PAINT
12961	PAINT, PORTER T-1 THINNER
10052	PAINT, PORTER U-PRIMER PRIMER 282 WHITE
11946	PAINT, PORTER,ALKYD ENAMEL,IA-24 GLOSS FINISH
11960	PAINT, PORTER,ALKYD FAST DRY PRIMER
12016	PAINT, PORTER,ALKYD,IA-24 SPRAYING DRY FOG,EGGSHELL WHITE
12015	PAINT, PORTER,ALKYD,GALVANIZED METAL PRIMER
11074	PAINT, QUELSPRAY - BLACK (PVC SPRAY)
11713	PAINT, RED VINYL TOUCHUP COATING
12118	PAINT, ROBROY PVC VINYL #5736
11041	PAINT, ROOF-FLEX 156, URETHANE ALUMINUM
11042	PAINT, ROOF-FLEX PRIMER #1
12207	PAINT, RUSTOLEUM HYDROCARBON RESIN-ALUMINUM PIGMENT
12325	PAINT, SCOTCHLITE REFLECTIVE #7211 YELLOW
12531	PAINT, SPICED WALNUT BLOND IT
10992	PAINT, SPRED WOOD UNDERCOAT
11696	PAINT, SSS PRIMER NEUTRALIZER #1687
10223	PAINT, T-13 THINNER TARSET
10095	PAINT, T-3 THINNER
10090	PAINT, T-5 THINNER
11181	PAINT, TERRAPAINT 559
11503	PAINT, TRAFFIC PAINT YELLOW
10249	PAINT, TUF-N-HARD M50 PRIMER, S969
11857	PAINT, TYPE YZ THINNER
12086	PAINT, UCAR LATEX 100 - MODIFIED ACRYLIC LATEX
10991	PAINT, ULTRA-HIDE EGGSHELL
11230	PAINT, URETHANE LT. GRAY
11067	PAINT, VERSAMID 140, 141
11740	PAINT, WESTINGHOUSE LIGHT GRAY PAINT
11828	PAINT, WHITE TRAFFIC PAINT
10518	PAINT, WOOD PRESERVATIVE AVENARIUS CARBOLINEUM
12391	PAINT, XYLOL KLEAN STRIP THINNER
10360	PAINT, YTTRIUM OXIDE
13562	PAINT,ALKYD GLYPTEX EGGSHELL
13540	PAINT,CORONADO PURPLE-MAGENTA(31-37-36
10125	PAINT,MCR-43 GLOSS EPOXY-4303,4305,4306,4308,4346,4310,4758,4759,4760,
13549	PAINT,OIL BS ZONE MKT.PT. YELLOW-81-17
13550	PAINT,OSHA SAFETY YELLOW
10250	PAINT,RUST SCAT-URETHANE GL EN 31-2
10082	PAINT,WEEKEND SPRAY PAINT BY ILLINOIS PAINT CO (ALL COLORS)
13363	PAINTSTIK-ALL COLORS
13235	PALLADIUM-500 PPM
13037	PARKER-O-LUBE
12477	PASTE, INTERIOR/EXTERIOR SPACKLING PASTE
13413	PC-3 FORMULATED EPOXY RESIN PART A
12282	PCB - AROCLOR 1242
12281	PCB - AROCLOR 1260
10665	PENWALT FLOOR SURFACER POWDER
10280	PERLITE, SIL-FLO FILTER AID GRADE 443
13017	PERMATEX-SEALANT WITH TEFLON
12041	PETROLEUM HYDROCARBON
13443	PHOS VER 3 -PHOSPHATE REAGENT
13286	PHOSPHATE STANDARD SOLUTION 3.00 mgL #20597
13287	PHOSPHATE STANDARD SOLUTION 1.0mg/L-#2569
13285	PHOSPHATE STANDARD SOLUTION 10.0 mgL-#14204
10475	PHOSPHOR, ZINC SULFIDE SILVER ACTIVATED
11969	PHOSPHORIC ACID,USED IN PROTEIN ASSAY KITS I & II
11936	PHOTO AIDS, BROMO P-DAP 5G
13546	PIG REPAIR PUTTY
13167	PLANISOL M
13110	PLASTIC K-N
10860	PLASTIC WOOD, DAP WOOD DOUGH (ALL COLORS)
12066	PLASTICS, FIRECLAY AND BAUXITE BASE

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11944	PLATINIZING SOLUTION, PLANTIC CHLORIDE, LEAD ACETATE, WATER
13511	PLP-70-PP PIPE (POLYPROPYLENE LINER)
13181	POLYESTER RESIN- CHEMGRATE CORP.
64	PONTAMINE BRILLANT YELLOW 5GA LIQUID
11514	PORTER MCR-43 HIGH BUILD #4361A,4548A,4549A,4550A,4361B,(EPOXY POLYAMIDE)
13490	POTASSIUM CHLORIDE ACS REAGENT
11962	POWDER, ACTIVATED CARBON TYPE,RE
11300	POWDER, ASCARITE (NOT LESS THAN 20-30 MESH) ASBESTOS POWDER
12503	POWDER, CADWELD ELECTRICAL WELDING MATERIAL
11060	POWDER, CHROMTECH 10680
10197	POWDER, DC FILTROL DRY CLEANING
11991	POWDER, DECO-REZ,PCM CATALYZING
11070	POWDER, GAMLENITE #12
12492	POWDER, IRON POWDER AND PIGMENTS
12196	POWDER, LATEX LIQUID FLOOR POWDER
10921	POWDER, LIQUID HEAT 980
11061	POWDER, TUNGTEC 10112
10315	POWDER, VISOLITE GREEN FLUORESCEIN P/N 03500483
13175	POWDER, WHETLERIZED CHARCOAL FOUND IN MSA GMHF-C RESPIRATOR CANISTERS
11226	PRESSURE SENSITIVE TAPE
12443	PRIMER, ATLASTIC CT PRIMER
12520	PRIMER, HERCULES PVC & CPVC PRIMER
10762	PRIMER, RANDUSTRIAL F-165 FLOOR PRIMER
13483	PRIMER, STONHARD TRAFFIC-CLAD PRIMER P/N 01310
12947	PRIMER, WELD-ON P-70 PRIMER FOR PVC PLASTIC PIPE
12039	PROTECTO COAT 1000 - COAL TAR/AMINE ADDUCT(BLEND)
12984	PURGEABLE A 1ml.
12985	PURGEABLE B 1ml
12986	PURGEABLE C 1ml.
12983	PURGEABLES INTERNAL STD.MIX-CLP
13345	PURGEABLES SURROGATE STANDARD MIX CLP
13502	PUROLITE A-600 ANION EXCHANGE RESIN
13457	PUTTY HARDENER 0200
12272	PUTTY, LA-CO PLUMBSET PUTTY
11784	PUTTY, PLASTI PUTTI
13020	PVC CEMENT CLEAR
12992	PVC PLASTIC PIPE CEMENT
13021	PVC PRIMER
11524	PVC, TYGON R-3603
13013	PVC-CEMENT GRAY
12499	R.P. CARGILLE LABORATORIES, INC.
13414	R/G ALL PURP SAT VAR
13416	R/G CHRM FIN H.R. ALUM
13415	R/G PLY SAT VAR
13401	RADIACWASH 005-100 DETERGENT
11786	RAFFINATE
13357	RAIN DANCE TAR AND BUG REMOVER
13356	RAIN DANCE TAR AND BUG REMOVER-AEROSOL
12065	RAMMING MIXES
13149	RAPID TAC-APPLICATION FLUID
12998	RB DEGREASER
13360	READY MIX JOINT CPD
11791	REAGENT 4C PLUS HIGH/NORMAL/LOW/CELL CONTROL
11035	REAGENT, ALKALINE PHOSPHATASE SPIN CHEM REAGENT
10545	REAGENT, AMINO ACID 804-99
10750	REAGENT, AMMONIA ELECTRODE FILLING SOLUTION, #13-641-928
[illegible]50	REAGENT, AST (GOT) REAGENT
1[illegible]507	REAGENT, BARIUM CUSTOM PLASMA STANDARD
11036	REAGENT, BUN CONCENTRATE
13191	REAGENT, BUN REAGENT
11537	REAGENT, CALCIUM INDICATOR
11881	REAGENT, CARGILLE REFRACTIVE INDEX LIQUIDS SERIES B, RANGE nD=1.642-1.656
11882	REAGENT, CARGILLE REFRACTIVE INDEX LIQUID SERIES E
11943	REAGENT CHLORIDE STANDA[illegible] .1ML=1MG CL
11037	REAGE[illegible] CHOLESTEROL-ES REAGENT
11531	REAGENT, CMS CONTRAD 70
13224	REAGENT, COPPER OXIDE
11856	REAGENT, COULTER S-CAL CALIBRATION KIT

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12466	REAGENT, CYANIVER 3 CYANIDE REAGENT
13168	REAGENT, CYANIVER 4 CYANIDE REAGENT
13169	REAGENT, CYANIVER 5 CYANIDE REAGENT
10953	REAGENT, DPD FREE CHLORINE REAGENT POWDER PILLOWS
11038	REAGENT, ELECTRODE FILLING SOLUTION, P/N 566467,4787,8262
11301	REAGENT, EQUITRANSFERENT S.J. REF. FILL SOLUTION
13196	REAGENT, GLUCOSE REAGENT
12467	REAGENT, HACH ONE REFERENCE ELECTROLYTE SOLUTION
13192	REAGENT, HDL CHOLESTERAL REAGENT
11272	REAGENT, HEMA-QUICK STAIN SOLUTION
11528	REAGENT, HEMOCCULT DEVELOPER SOLUTION
11185	REAGENT, HF ELECTROLYTE
10754	REAGENT, HYDRANAL COMPOSITE/5, CAT. NO. CC 34805-1
11536	REAGENT, ISOTERGE II
11273	REAGENT, ISOTON II
10131	REAGENT, KARL FISCHER
11039	REAGENT, LITHIUM CONCENTRATE, P/N 663229
11535	REAGENT, LYSE S II
10496	REAGENT, MOLYBDATE BETZ CODE 236
11863	REAGENT, POTASSIUM CHLORIDE SOLUTION FOR ELECTRODES
10747	REAGENT, SCHUTZE REAGENT, CAT. NO. 761-747
10109	REAGENT, SILVER CHLORIDE - LITHIUM FLUORIDE CARRIER
11040	REAGENT, SODIUM POTASSIUM KIT, P/N 668302
10508	REAGENT, SODIUM THIOCARBAMATE 0.01% BETZ CODE 337
10904	REAGENT, STANNOUS REAGENT, CODE 239
10472	REAGENT, SULFAVER 4 SULFATE REAGENT
11538	REAGENT, SULFITE INDICATOR
12261	REAGENT, URIC ACID
10930	REAGENT, VERSENE FE-3
11731	REAGENT-WHOLE BLOOD REFERENCE CONTROL COULTER DIAGNOSTICS & R D SYSTEMS
12056	REFRACTORY, BANNER SUPER DUTY FIRECLAY BRICK ALUMINA SILICAT
12103	REFRACTORY, BRICK, JAY BEE
12079	REFRACTORY, BRICKS OR SHPES
10796	REFRACTORY, CEE BEE MORTAR
10794	REFRACTORY, CEROX PRODUCTS, PRESSURE POURING TUBE PRODUCTS
12067	REFRACTORY, CONCRETE
12034	REFRACTORY, DIABLO-D REFRACTORY BRICK SHAPE ALUMINA SILICA
11168	REFRACTORY, DIDIER TAYLOR X-11466
10797	REFRACTORY, DRY AND WET MORTAR PRODUCTS
10837	REFRACTORY, FIRECLAY BRICK, FRANCE NON SPALL
10842	REFRACTORY, FIRECLAY PLASTICS, FRANCO SUPER
11668	REFRACTORY, FIRECRETE AND FIRELITE
10836	REFRACTORY, HIGH ALUMINA BRICK, TITAN 50
10798	REFRACTORY, INSULATING FIREBRICK PRODUCTS, K-20 IFB,INSALCOR
12073	REFRACTORY, KAO-PLAS REFRACTORY CONCRETE
12104	REFRACTORY, KRITAB MORTAR
12072	REFRACTORY, KROMALOX P, PHOSPATE BONDED REFRACTORY
10838	REFRACTORY, LFB-60 FIRE BRICK SHAPES
10840	REFRACTORY, LFB-HD FIRE BRICK SHAPES
10839	REFRACTORY, LFB-SD FIRE BRICK SHAPES
10841	REFRACTORY, LOUISVILLE FIRE BRICK
12105	REFRACTORY, MAXBOND PLASTIC REFRACTORY PRODUCT
12106	REFRACTORY, MOREX REFRACTORY BRICK
10973	REFRACTORY, MULLFRAX CEMENT AND FRAXCAST ES
10795	REFRACTORY, NOZZLE CEMENT

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10846	REFRACTORY, PACO 80 RAM (PLASTIC)
10844	REFRACTORY, PACO PLASTIC (RAM OR BLOCK)
10845	REFRACTORY, PACO SUPER PLASTIC (RAM OR BLOCK)
10778	REFRACTORY, PLASTIC K-KN
10843	REFRACTORY, PLASTICS, HIGH ALUMINA, SPARTAN 80
11339	REFRACTORY, PTB THERMO LITH BATCH CHROME
10808	REFRACTORY, REFRACTORY SHEET PRODUCTS, ZIRCAR
11757	REFRACTORY, SANDVIK COROMANT CEMENTED TUNGSTEN CARBIDE
12107	REFRACTORY, SUPER TROWLEZE REFRACTORY MORTAR
12074	REFRACTORY, VARIOUS NAMED MORTARS, REFRACTORY MORTAR
11184	REFRACTORY, X-11466
10078	REFRACTORY, ZIRCONIUM OXIDE POWDER
12426	REGULAR AGITENE
10579	REGULAR DRY CHEMICAL EXTINGUISHING AGENT
12948	REPELLANT, BOLT AIRBORNE FOR FLYING INSECTS
12536	REPELLANT, HALT
12939	REPELLENT, EATONS BIRD REPELLENT
12938	REPELLENT, EATONS BIRD REPELLENT-LIQUID
10377	RESIN, AG50W-X8 CATION EXCHANGE RESIN
12457	RESIN, AMBERLITE IR-12[illegible] PLUS DOMESTIC RESIN
12458	RESIN, AMBERLITE IRA-410 RESIN
11891	RESIN, AMBERLITE IRA-[illegible]2 RESIN
12431	RESIN, AMBERLITE RESIN POLYMERIC ADSORBENT
11102	RESIN, AMBORANE -345 REDUCTIVE RESIN
10683	RESIN, ANION EXCHANGE RESIN AG1-X8, CAT.# 9991111-NI
11673	RESIN, ANION EXCHANGE RESIN AG1-XI ANALYTICAL GRADE
12378	RESIN, DOWEX MONOSHPERE 650A H CATION EXCHANGE RESIN
12377	RESIN, DOWEX MONOSPHERE 550A OH ANION EXCHANGE RESIN
12966	RESIN, MARINE RESIN 552, 553, 554
11733	RESIN, PA-0681, FULLER SYNTHETIC RESIN
11527	RESIN, SCOTCHCAST BRAND RESIN XR-5133
13156	RESIN, SIGMA-CHELATING RESIN
11983	RIBBONS, XEROX SINGLE STRIKE CORRECTABLE TYPEWRITER BLUE AND BLACK DYE
11985	RIBBONS, XEROX,LIFT-OFF CORRECTABLE TAPE
11984	RIBBONS, XEROX,SINGLE STRIKE BLACK CORRECTABLE TYPEWRITER
11982	RIBBONS, XEROX,SINGLE STRIKE CORRECTABLE TYPEWRITER,YEL&RED
11981	RIBBONS, XEROX,SINGLE STRIKE CORRECTABLE TYPEWRITER,BROWN DYE
11980	RIBBONS, XEROX,SINGLE STRIKE CORRECTABLE TYPEWRITER,RED DYE
13409	RM-S SOLVENT CLEANER
10725	ROCHELLE SALT PVA REAGENT
12040	ROCK WOOL METAL MESH BLANKET, DELTA METAL MESH BLANKET
11773	RODENTICIDE, RAT BAIT (POISON)
11760	RODENTICIDE, STATE RMK-308 RODENTICIDE
12346	ROOF, POLYESTER SINGLE PLY ROOF FABIC
12347	ROOF, R-9 SINGLE PLY ROOF COMPOUND
12331	ROOFING CEMENT, R-82 SHIELD TITE ROOF CEMENT
12085	ROSCO FOG FLUID
13160	ROYAL ADHESIVE-M6396
13179	RS URETHANE GL EN 31-151
13180	RS URETHANE GL EN 31-1
13177	RS URETHANE GL EN 31-142
13478	RS URETHANE GL-EN 31-34 PANTONE BLUE
13016	RTV SILICONE(CLEAR SILICONE-RUBBER ADHESIVE SEALANT)
12091	RUPARS - RUBBER PROCESSING AID
11737	RUST PREVENTATIVE, RUST VETO 76-HF

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10414	RUST PREVENTATIVE, TECTYL 127CG
10415	RUST PREVENTATIVE, TECTYL 506
10398	RUST REMOVER, TURCO ALKALINE
13040	SALEM MAPLE BLOND IT STAIN LACQUER
10006	SALT, NU-SAL HEAT TREATING (SODIUM CHL. + POTASS.CHLORIDE)
10888	SALT, SALT-AWAY
11401	SANI TUFF SUPER DUTY CLEANSER WITH GRIT
13328	SCINTILLATION FLUID, PACKARD ULTIMA GOLD
13393	SCINTILLATION SURFACTANT
13006	SCORE PASTE FLUX
13005	SCOTTS TURF BUILDER PLUS 2
11066	SEALANT, #578.2 PERMAGUM SEALANT
11309	SEALANT, AQUATRAZ
11022	SEALANT, BTR 234 SEALANT (FORMERLY CALLED ROCKWELL 234 SEALANT)
11961	SEALANT, CHEM-CHALK 250 POLYSULFIDE SEALANT
12440	SEALANT, DOE 888 HIGHWAY JOINT
12539	SEALANT, DOW CORNING 111 VALVE LUB. AND SEALANT
11534	SEALANT, DOW CORNING 112 HIGH CONSIST VALVE SEALANT
11204	SEALANT, DOW CORNING 732 MULTI-PURPOSE SEALANT-CLEAR
12271	SEALANT, DOW CORNING 795 SILICONE BLDG SEALANT
12201	SEALANT, GORE-TEX JOINT
10142	SEALANT, JOINT, SEAL TIGHT RUBBER
10524	SEALANT, LOCQUIC ACTIVATOR (707)
11062	SEALANT, LOCQUIC PRIMER N
10416	SEALANT, LOCTITE RED A
12203	SEALANT, LOCTITE REFRIGERANT SEAL 554
10582	SEALANT, PERMATEX FORM A GASKET #1 FAST DRYING
11065	SEALANT, PERMATEX FORM-A-GASKET #3
11063	SEALANT, PERMATEX FORM-A-GASKET #2
10704	SEALANT, PERMATEX SPRAY A GASKET
11871	SEALANT, POLYROOF AF (ROOFING SEALER)
11311	SEALANT, PORFIL
11573	SEALANT, PREPARE SEALER #658
12943	SEALANT, PRO LOCK PIPE SEALANT WITH TEFLON P/N 51462, 51464
10646	SEALANT, RECTORSEAL #5 PIPE SEALANT
10239	SEALANT, RTV102 SILICONE RUBBER SEALANT
11516	SEALANT, SILICONE RUBBER SEALANT (SILICAP)
11600	SEALANT, STATE CON-SEAL
12958	SEALANT, SURE SEAL LAP SEALANT
11310	SEALANT, TRAZSEAL
11832	SEALANT, TUFF-LOC PIPE THREAD SEALANT WITH TEFLON
13427	SEAM CLEANER 77
13426	SEAM SEALER 54
12027	SERIPIFLEX SHIELD (AEROSOL)
12543	SHAVING CREAM, BARBASOL REGULAR
12179	SHELL LITHIUM GREASE
10021	SHELLAC, WHITE
13385	SHINE-UP (PRESSURIZED)
13387	SMOKE TUBES-AIR CURRENT TUBES
12318	SMOKE, ROSCO LIQUID SMOKE
12311	SMOKE, SMOKE DETECTOR TESTER BY AEROSOL SERVICES CO.
12319	SMOKE, STANDARD FUSEE GAS & SMOKE GENERATOR (CANDLE)
10919	SMOKE, SUPERIOR SIGNAL GRENADES
11178	SMOKE, VARIOUS SMOKE GRENADES FROM FED. LAB.
11824	SMOKE, VARIOUS SMOKE GRENADE PRODUCTS FROM REGIN (FUMAX)
12111	SNOWITE(AUTO BODY FILLER)
10399	SOAP, ALOE VESTA BODY WASH
12199	SOAP, BORO-GUARD
12510	SOAP, BUILDER 300 B300
11868	SOAP, DERMAPRO SPA BATH (BODY SOAP)
11865	SOAP, DERMATECH BODY BATH/HAIR SHAMPOO
12511	SOAP, DETERGENT CLS
10869	SOAP, ENHANCE LOTIONIZED SOAP
11017	SOAP, EUROBATH, AMMONIUM LAURYL SULFATE
11553	SOAP, EXTRA FOAMING POWERED SOAP #02030
12512	SOAP, FABRIC SOFTNER 2276

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10827	SOAP, GREEN LOTION LIQUID JARDIN HAND SOAP
11580	SOAP, HAND & BODY CLEANER #590
11575	SOAP, HANDS OFF COCONUT HAND SOAP #553
12514	SOAP, INJECTION SOUR
10454	SOAP, KUTOL COMPLYING WITH NLO SPEC.1147 WATERLESS HAND CLNR
10290	SOAP, NLO SPEC #1134 STIGLER'S LIQUID HAND SOAP
10516	SOAP, NLO SPEC 1134 CHEMICAL WAYS-46 LIQUID HAND SOAP
10659	SOAP, RUBARS DUBOIS BAR SOAP
11016	SOAP, SANI-FRESH BODY SHAMPOO
11628	SOAP, SBS-71 LOTION DEODORANT SKIN CLEANSER
10352	SOAP, SEPTI-SOFT CONCENTRATE
12473	SOAP, SEPTISOL SOLUTION WITH IRGASAN
11159	SOAP, SOFTCARE HAIR & BODY SHAMPOO
11597	SOAP, STATE HANDS ON LOTIONIZED SKIN CLEANER
11158	SOAP, STIGLER'S SWASH PROTEIN BODY SHAMPOO, T-261
11699	SOAP,SANITUFF BODY SHAMPOO
10148	SODIUM CARBONATE STANDARD SOL.0.020N
13412	SODIUM HYPOCHLORITE
13288	SODIUM THIOSULFATE SOLUTION,STABILIZED 0.025N#24093
11664	SOFTENER, DUBOIS SUPER LAUNDRY SOFT/SOUR
12167	SOFTENER, NAMICO 682 LIQUID SOUR/SOFTNER
12075	SOFTENER, POWDERED FABRIC
13318	SOFTGUARD HAND CREAM
11078	SOLDER BRAZE, SAFETY-SILV 1435
11549	SOLDER, #34C CERTANIUM ALLOY SOLDER
11796	SOLDER, 50/50 ROSIN CORE WIRE SOLDER
10716	SOLDER, 50/50 WIRE SOLDER , SOLID CORE
10296	SOLDER, 60/40 TIN/LEAD ROSIN CORE
12517	SOLDER, ALUMINUM SOLDER #55
13371	SOLDER, J.W.HARRIS STAY SAFE 50, STAY SAFE BRIDGIT, AND 95/5 TIN-ANTIMONY, AND NICK BRAND SOLDERS
10134	SOLDER, SILVER,CADMIUM FREE-BRAZING ALLOY
11387	SOLDER, STAY BRITE, ALSOLDER 500,95/5,50/50,60/40,40/60,63/37 ,30/70
12527	SOLDER, STAY BRITE, STAY BRITE #8, ALSOLDER 500, 95/5, 50/50, 60/40, 40/60, 63/37, 30/70 SOLDERS
13125	SOLDER, VARIOUS ALLOYS SOFT SOLDER FROM THE AVRIL COMPANY,
13172	SOLID WASTE REFERENCE STANDARD-Q.C. CHECK SAMPLES AND PROF
13226	SOLUTION, 49136 GERMICIDE ORTHO-BENZYL PARA-CHLOROPHENOL ISOPROPANOL SOLUTION
13170	SOLUTION, CYANIDE STOCK SOLUTION 1000 MG/L
11298	SOLVENT, ALL PURPOSE DEGREASER FORMULA III P/N C-2466
10400	SOLVENT, AMSCO SOLV 1106
11396	SOLVENT, BESTINE RUBBER CEMENT THINNER
10204	SOLVENT, BROOKS VERSALENE 650
12935	SOLVENT, BRULIN SOLVENT DEGREASER (AEROSOL)
12936	SOLVENT, BRULIN SOLVENT DEGREASER BULK
10980	SOLVENT, CARBOLINE 190 FD
10979	SOLVENT, CARBOLINE THINNER #15
11659	SOLVENT, CS-50,BU-60,CS-85,BU-85,TP-25 FREON AND ALCOHOL
11667	SOLVENT, DASOL
12488	SOLVENT, DUPONT LACQUER THINNERS AND CLEANING SOLVENTS
12461	SOLVENT, FAST WASH VSP-21
11997	SOLVENT, GORDON,XACTSEAL
10926	SOLVENT, HOPPES #9 NITRO POWDER SOLVENT (FAMOUS #9 SOLVENT)
10418	SOLVENT, MAC'S COLD DIP PARTS CLEANER

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
11215	SOLVENT, MS-190 FLUX REMOVER (FREON TMC SOLVENT)
10200	SOLVENT, MULTILITH DEGLAZING P/N 83-7-788001
11818	SOLVENT, N-450-13 THINNER
12023	SOLVENT, NO SAND
11166	SOLVENT, PERCLENE D
10304	SOLVENT, PERMATEX GASKET REMOVER 81110
10401	SOLVENT, POLYCHEM USD-401
11697	SOLVENT, SSS HEAVY DUTY CONCRETE DEGREASER #30114
10063	SOLVENT, STODDARD (MINERAL SPIRITS)
12310	SOLVENT, TEXO LP 1138
10199	SOLVENT, VARN FAST WASH VK-21
13301	SONNEBORN SONOGUARD RECOAT PRIMER
13026	SPATTER GUARD
13022	SPECIAL PLUMBERS IDEAL DRAIN CLEANER
13041	SPICED WALNUT STAIN
13541	SPIL-X-A
11312	SPILL CLEANUP, HAZORB-PILLOW
10282	SPILL CLEANUP, LABORATORY SPILL CONTROL CENTER
10283	SPILL CLEANUP, SOLUSORB
11157	SPILL CLEANUP, SORBEAD R
11840	SPILL CLEANUP, TYPE K-11 VAPOILSORB
10281	SPILL CLEANUP,NEUTRASORB ACID NEUTRALIZER
13542	SPILL-X-C
13543	SPILL-X-S
12326	SPORICIDIN COLD STERILIZING SOLUTION
13365	SSS CHALKBOARD CLEANER
13320	SST SERUM SEPARATION TUBES VARIETY NUMBERS
13530	STANDARD, 1000 ppm THALLIUN IN NITRIC ACID
10672	STANDARD, ALKALINITY STANDARD SOLUTIONS, NO. 14278-10
12150	STANDARD, ALUMINUM PLASMA SOLUTION
12130	STANDARD, ARSENIC ATOMIC ABSORPTION
10219	STANDARD, BOD CAT #14865-10
12410	STANDARD, CADMIUM PLASMA SOLUTION
12138	STANDARD, CALCIUM AA STANDARD
12409	STANDARD, CALCIUM PLASMA SOLUTION
10675	STANDARD, CHLORIDE STANDARD SOLUTION
10218	STANDARD, CHLORINE TOTAL 50 MG/L CL2 CAT #14268-10
12414	STANDARD, CHROMIUM - HEXAVALENT STANDARD SOLUTION
12139	STANDARD, CHROMIUM AA STANDARD
12413	STANDARD, CHROMIUM PLASMA SOLUTION
10492	STANDARD, COPPER 100 PPM BETZ
10214	STANDARD, COPPER 12.5 MG/L CU+2 CAT #21126-10
12412	STANDARD, COPPER PLASMA SOLUTION
12211	STANDARD, FLUORIDE 1000 PPM
11894	STANDARD, GL. CAP. SPB-5
10542	STANDARD, GOLD ATOMIC ABSORPTION G4137
13531	STANDARD, INITIAL CALIBRATION VERIF. STANDARD
12140	STANDARD, IRON AA STANDARD
12151	STANDARD, IRON PLASMA SOLUTION
12143	STANDARD, MAGNESIUM AA STANDARD
10674	STANDARD, NITROGEN,NITRATE STANDARD SOL. 1000MG/L 12792-11
11896	STANDARD, PCB KIT 3
11533	STANDARD, PCB KIT, PCB-A-21
11895	STANDARD, PCB LOCATOR MIXTURE
11801	STANDARD, PCB-B-20 KIT (AROCLOR 1262)
11800	STANDARD, PCB-B-20 KIT (AROCLOR 1248)
11799	STANDARD, PCB-B-20 KIT (AROCLOR 1242)
11803	STANDARD, PCB-B-20 KIT (AROCLOR 1254)
11802	STANDARD, PCB-B-20 KIT (AROCLOR 1260)
11798	STANDARD, PCB-B-20 KIT (AROCLOR 1232)
10500	STANDARD, PHOSPHATE 45 PPM BETZ CODE 264

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
12400	STANDARD, PLASMA-PURE STANDARD SOLUTION NITRIC ACID SOL'N
11933	STANDARD, POTASSIUM HYDROGEN PHTHALATE
10711	STANDARD, REFERENCE STANDARD SOLUTION FOR NICKEL
10738	STANDARD, REFERENCE STANDARD SOLUTION FOR SILVER
10740	STANDARD, REFERENCE STANDARD SOLUTION FOR TIN
10737	STANDARD, REFERENCE STANDARD SOLUTION FOR SILICON
10708	STANDARD, REFERENCE STANDARD SOLUTION FOR COPPER
10220	STANDARD, REFERENCE STANDARD SOLUTION FOR SULFATE
10706	STANDARD, REFERENCE STANDARD SOLUTION FOR CHROMIUM
10730	STANDARD, REFERENCE STANDARD SOLUTION FOR BARIUM
10731	STANDARD, REFERENCE STANDARD SOLUTION FOR BISMUTH
10741	STANDARD, REFERENCE STANDARD SOLUTION FOR VANADIUM
11609	STANDARD, REFERENCE STANDARD SOLUTION FOR BERYLLIUM
10638	STANDARD, REFERENCE STANDARD SOLUTION FOR LEAD
11607	STANDARD, REFERENCE STANDARD SOLUTION FOR IRON
10710	STANDARD, REFERENCE STANDARD SOLUTION FOR MAGNESIUM
11608	STANDARD, REFERENCE STANDARD SOLUTION FOR BORON
10712	STANDARD, REFERENCE STANDARD SOLUTION FOR POTASSIUM
10707	STANDARD, REFERENCE STANDARD SOLUTION FOR COBALT
10736	STANDARD, REFERENCE STANDARD SOLUTION FOR SELENIUM
10728	STANDARD, REFERENCE STANDARD SOLUTION FOR ANTIMONY
10735	STANDARD, REFERENCE STANDARD SOLUTION FOR MOLYBDENUM
10742	STANDARD, REFERENCE STANDARD SOLUTION FOR TITANIUM
10705	STANDARD, REFERENCE STANDARD SOLUTION FOR CALCIUM
10729	STANDARD, REFERENCE STANDARD SOLUTION FOR ARSENIC
10739	STANDARD, REFERENCE STANDARD SOLUTION FOR STRONTIUM
10714	STANDARD, REFERENCE STANDARD SOLUTION FOR ZINC
10733	STANDARD, REFERENCE STANDARD SOLUTION FOR MANGANESE
11192	STANDARD, REFERENCE STANDARD SOLUTION FOR NITRATE
10732	STANDARD, REFERENCE STANDARD SOLUTION FOR CADMIUM
10709	STANDARD, REFERENCE STANDARD SOLUTION FOR LITHIUM
11606	STANDARD, REFERENCE STANDARD SOLUTION FOR TUNGSTEN
10713	STANDARD, REFERENCE STANDARD SOLUTION FOR SODIUM
11862	STANDARD, REFERENCE STANDARD SOLUTION FOR RUTHENIUM
10734	STANDARD, REFERENCE STANDARD SOLUTION FOR MERCURY
10715	STANDARD, REFERENCE STANDARD SOLUTION FOR ALUMINUM
12385	STANDARD, SELENIUM DIOXIDE 1000 PPM
12411	STANDARD, SILVER PLASMA SOLUTION
12229	STANDARD, STRONTIUM YTTRIUM 90 7.21 NANO CURIES
12228	STANDARD, STRONTIUM YTTRIUM 90 1.2 NANO CURIES
12230	STANDARD, THORIUM 230 1.44 NANO CURIES
10543	STANDARD, ZIRCONIUM ATOMIC ABSORPTION Z2875
13547	STANDARD,INTERFERENCE CHECK STANDARD
13548	STANDARD,INTERFERENTS A STANDARD
13259	STARCH
13473	STATE WHITE N-BLEACH
13342	STEEL INK AEROSOL
13489	STEP SAVER
13258	SUCROSE
13450	SULFATE STANDARD SOLUTION 2500 MG/L AS SO4
13351	SUPER DUTY RUBBING COMPOUND
12241	SUPER GREFITE-HIGH ALUMINA GRAPHITIC PLASTIC

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TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
13453	SUPER HPO MOTOR OIL SAE 20W
12095	SUPER LAUNDRY LIQUID BREAK
13355	SUPER STRIPE ATHLETIC PAINT
12994	SUPERBONDER THERMAL CYCLING RESISTANT ADHESIVE #49850
13338	SUPERCHARGE II -202
13000	SUPERIOR #12 bRONZE POWDER FLUX
13007	SUPERKOTE COMMERCIAL LATEX BLOCK FILL
12048	SUPERTHANE, HARDENER, ALIPHATIC ISOCYANATE
12046	SUPERTHANE, SUPERTHANE II ACRYLIC/ALIPHATIC POLYURETHANE
12053	SUPERTHANE, THINNER, N-BUTYL ACETATE
12047	SUPERTHANE, URETHANE-ACRYLIC COPOLYMER
13174	SUR PREP RUST CONVERTER,93-900
12392	SURFACER, PENNTROWEL EPOXY FLOOR SURFACER RESIN
10208	SURFACTANT, DETER MICROBOND #1010A
10929	SURFACTANT, NATIONAL HIGH EXPANSION LIQUID
12340	SURFACTANT, SILWET L-7002
10928	SURFACTANT, UNIVERSAL (FLUORINATED SURFACTANT)
11175	SWEEPING COMPOUND, DUST-BAN 7977 DUST CONTROL
10806	SWEEPING COMPOUND, D-DUST
13516	SWEEPING COMPOUND,SANDED OIL BASE
12460	SYLON-CT PINT
13369	SYNCHRON AS CO2 KIT
13368	SYNCHRON AS CALIBRATING KIT
13370	SYNCHRON AS CHLORIDE REAGENT KIT
13346	SYNCHRON AS SODIUM AND POTASSIUM CONDITIONER AND BUFFER
13347	SYNCHRON AS WASH CONCENTRATE
13405	SYNTHETIC HYDROCARBON WITH PERFORMANCE ADDITIVES
13004	T GRADE PIGMENT TYPE MARKING PEN INK
13468	TABLEWARE PRESOAK & TARNISH REMOVER
13103	TAC SPRAY ADHESIVE
13475	TAPECOAT --REPAIR TAPE
13500	TC COLDPRIME
13237	TELLURIUM 1%
13388	TEX AC
13354	THERMO AID
13329	THORIUM CONTAINING CUSTOM PLASMA STANDARD
12225	TINACTIN SOLUTION 1 %
12977	TITANIUM OXIDE
12259	TOTAL BILIRUBIN II REAGENT
13197	TOTAL PROTEIN REAGENT
13304	TOUCH N TONE SPRAY PAINT-RED,GREEN,YELLOW,ALUMINUM, WHITE,BLACK BROWN,BLUE
10402	TRAP, CALGON THERMO-TRAP (BENTONITE CLAY)
13366	TRELLBORG HARDENER 7869
10470	TRIPLE E/ TAPMATIC CUTTING FLUID
13364	TRU-CLEAR
13438	TUFCHEM SILICATE SOLUTION
12978	TUNGSTIC ACID
13015	TURBO (414)
12355	TURBO-FOG SMOKE-AGENT WHITE
13117	UNI-T-PAK DILUENT,LYTIC REAGENT CLEANING REAGENT
13115	URANINE WATER DYE
13437	URAPLEX, URANIUM COMPLEXANT
13517	VACUTRAINER BRAND WHOLE BLOOD TUBES
11491	VARNISH, KAMAR VARNISH KRYLON
13383	VERMICULITE
13494	VERSATEC CLEAR DISPERSANT- XEROX
11196	VIRONOX-9[ANTIMICROBAL LIQUID SOAP]
12351	VITREX II LIQUID
12352	VITREX II POWDER
13009	VPI #300 WALLBASE ADHESIVE
13302	W/R ACRYLIC URETHANE VARNISH-AQUA PLASTIC
13359	WAKEFIELD-W 120
10491	WATER TREATMENT, BETZ 2040 CORROSION INHIBITOR / DEPOSIT CONTROL AGENT
10721	WATER TREATMENT, BETZ POLYMER 1117L
11353	WATER TREATMENT, BETZ 1110 POLY-FLOC
10493	WATER TREATMENT, BETZ CORROGEN
10499	WATER TREATMENT, BETZ PERMACOL

TABLE 2-1 (cont.)
CHEMICAL MIXTURES

CHEMCODE	NAME
10581	WATER TREATMENT, BETZ NEUTRAMEEN NA-9
10504	WATER TREATMENT, BETZ POLYNODIC 600 SERIES
10503	WATER TREATMENT, BETZ POLYMER 1125 L
10502	WATER TREATMENT, BETZ POLY-FLOC 3
10488	WATER TREATMENT, BETZ KI-2
10497	WATER TREATMENT, BETZ NEUTRAFILM 463
10489	WATER TREATMENT, BETZ 45
10495	WATER TREATMENT, BETZ ORGANIC K-GEL
10494	WATER TREATMENT, BETZ DIANODIC
11604	WATER TREATMENT, BETZ 35A
10506	WATER TREATMENT, BETZ SLIMICIDE 242
10505	WATER TREATMENT, BETZ POLYSPERSE 100
10490	WATER TREATMENT, BETZ 2020
10507	WATER TREATMENT, BETZ SLIMICIDE 508
11379	WATER TREATMENT, D-TAC
11382	WATER TREATMENT, DEPRESS 14
10826	WATER TREATMENT, DICATON
11380	WATER TREATMENT, DUCIDE 20
10874	WATER TREATMENT, FERROSPERSE
10825	WATER TREATMENT, FLC-45
10873	WATER TREATMENT, FLOWPRO 1345
10871	WATER TREATMENT, FLOWPRO 1340
10872	WATER TREATMENT, FLOWPRO 1340C
10870	WATER TREATMENT, FLOWPRO 1335
11793	WATER TREATMENT, GAMELENITE #12
10976	WATER TREATMENT, GCO-30
10498	WATER TREATMENT, NEUTRAMEEN NA-5
10273	WEATHERPROOFING, VICRYL CP-10/11
10521	WELD ROD, #2233 XUPER EUTECTIC
10940	WELD ROD, #316 S.S. WELDING ROD
11368	WELD ROD, #317 ELC S.S. WELD ROD
10654	WELD ROD, #7018 LINCOLN COATED WELDING ROD
11366	WELD ROD, 307, 308, 309, 310, 312, 316, 317, 318, 320, 321, 330, 347, 410, 420, 430, 502, 505, 630, 26, 16
11179	WELD ROD, CERTANIUM 707-SP
10757	WELD ROD, EUTECTIC CASTOLIN, #680 COATED
10323	WELD ROD, EUTECTIC CHAMFERTRODE
11830	WELD ROD, FLEETWELD 5P
10758	WELD ROD, FLEETWELD #180 MILD STEEL (LINCOLN)
11330	WELD ROD, HASTELLOY C ELECTRODE
10181	WELD ROD, LINCOLN ELECTRIC FLEETWELD 35
10222	WELD ROD, OXWELD 25M,31T,25MFC
11364	WELD ROD, STAINLESS STEEL AWS-316-16 TITANIA COATED
10326	WELD ROD, STAINLESS STEEL AWS-308-16 ELC TITANIA COATED
10270	WELD ROD, STAINLESS STEEL AWS-T-347-16 TITANIUM COATED
10589	WELD ROD, STAINLESS STEEL 316
10660	WELD ROD,INCONEL,NICKEL,INCONEL,MONEL ,INCO,INCO-WELD
11712	WELD ROD,NICKEL FILLER,MONEL,INCONEL,INCOLOY.NI-ROD,INCO
13361	WELDFAST CL-200
13105	WINDSHIELD WASHER SOLVENT
13451	WIRE ROPE LUBRICANT
12470	WOOD DUST- LUMBER INCLUDING TREATED WOOD
13025	WOOD FINISH-GOLDEN OAK
13281	X-6 EPOXY RESIN AND ACTIVATOR-E (2 PARTS)
13410	XB-19126 CONTAINS ETHYLENE GLYCOL
13496	XEROX CE MAGNETA TONER PREMIX
13498	XEROX CE PROCESS BLACK TYPE H TONER CONCENTRATE OR PREMIX
13495	XEROX CE YELLOW TONER PREMIX
11907	XEROX COPIER DRY INK FOR MODEL 1065,5046,5065-SEVERAL PART#
12215	XEROX DRY INK AND DEVELOPER FOR #1020,1035,2830
11782	XEROX TONER FOR#1055
13497	XEROX-CE CYAN TONER PREMIX
12189	XYLOCAINE VISCOUS 2%
13479	ZINC CARBON BATTERY-DRY CELL BATTERY
10252	ZIRCONIUM IN NITRIC ACID

TABLE 2-2
PURE CHEMCIALS

CHEMCODE	NAME
12119	1,1,1 TRICHLOROETHANE
13216	1,5-DIPHENYLCARBOHYDRAZIDE
13459	2,2,BIQUINOLINE
13217	2,7-DICHLOROFLUORESCEIN
13043	2-BUTOXYETHANOL (ETHYLENE GLYCOL MONOBUTYL ETHER)
13082	2-ETHOXYETHANOL (AKA: ETHYL CELLOSOLVE OR ETHYLENE GLYCOL MONOETHYL ETHER)
13084	2-METHOXYETHANOL (AKA: METHYL CELLOSOLVE OR ETHYLENE GLYCOL MONOMETHYL ETHER)
13462	2-METHYL-8-QUINOLINOL
13249	4,5, DIHYDROXY-M-BENZENEDISULFONIC ACID DISODIUM SALT (OCTADECYLAMINE)
13231	4-P-NITROPHENYL AZO-1-NAPHTOL
13050	ACETAMIDE
10540	ACETIC ACID, (1,2-CYCLOHEXYLENEDINITRILO) TETRA- (AKA:CDTA)
10206	ACETIC ACID, GLACIAL 99.5%
10029	ACETONE
10575	ACETONITRILE, HPLC GRADE
12382	ACETOTHIOAMIDE (THIOACETAMIDE)
13182	ACRYLAMIDE
12988	AEROSOL OT (DIOCTYL SODIUM SULFOSUCCINATE)
13187	ALBUMIN REAGENT
13254	ALCOHOL, AMYL (AKA: 1-PENTANOL)
11034	ALCOHOL, CETYL (AKA: ADOL 52 NF)
11835	ALCOHOL, ETHYL (DENATURED)
12456	ALCOHOL, ISOAMYL ALCOHOL (AKA: 3-METHYL-1-BUTANOL)
10084	ALCOHOL, ISOPROPYL (AKA: 2-PROPANOL)
10076	ALCOHOL, METHYL ABSOLUTE (AKA: METHANOL)
12365	ALCOHOL, N-BUTYL (1-BUTANOL)
10986	ALCOHOL, N-PROPYL (AKA: 1-PROPANOL)
13241	ALIZARIN RED S
13189	ALKALINE PHOSPHATSE SUBSTRATE
13535	ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE
13372	ALPHA-FURILDIOXIME MONO;
11242	ALUMINA SILICA
10362	ALUMINA, ACTIVATED
10129	ALUMINA, HYDRATED
12068	ALUMINOSILICATE
11666	ALUMINUM HYDROXIDE
10590	ALUMINUM METAL
10003	ALUMINUM NITRATE REAGENT GRADE
12080	ALUMINUM NITRIDE
13246	ALUMINUM OXIDE
13145	ALUMINUM POWDER
10058	ALUMINUM SULFATE N-HYDRATE (ALUM)
10011	AMMONIA, ANHYDROUS
11080	AMMONIUM ACETATE
13255	AMMONIUM BROMIDE PHOTO
13051	AMMONIUM CARBONATE
11227	AMMONIUM CHLORIDE
11081	AMMONIUM CHLORIDE (AKA: SAL AMMONIA)
10074	AMMONIUM CITRATE
12416	AMMONIUM DIHYDROGEN PHOSPHATE, 98% A.C.S. REAGENT
11056	AMMONIUM HYDROXIDE
10232	AMMONIUM HYDROXIDE 58% NH4OH
10343	AMMONIUM IODIDE CRYSTAL
12419	AMMONIUM IRON(III) SULFATE DODECAHYDRATE, 99%, A.C.S. REAGENT
11082	AMMONIUM MOLYBDATE
11703	AMMONIUM NITRATE
10194	AMMONIUM OXALATE
13052	AMMONIUM PERSULFATE
10886	AMMONIUM PHOSPHATE DIBASIC PURIFIED GRANULAR, DAP
10617	AMMONIUM PYRROLIDINE DITHIOCARBONATE
10168	AMMONIUM SULFATE
11079	AMPYRONE (AKA: 4-AMINOANTIPYRINE)
11083	AMYL ACETATE
12361	ANILINE (AMINOBENZENE)
11260	ANTIMONY
13146	ANTIMONY TRIOXIDE
13135	ANTIMONY(III) OXIDE 99.999%
13275	APIEZON
13240	ARSENAZO III
12362	ARSENIC
13096	ARSENIC TRIOXODE
10974	ASBESTOS FIBER

TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME
10321	ASCORBIC ACID
11186	BARIUM CARBONATE, TECHNICAL GRADE
11167	BARIUM DIPHENYLAMINE SULFONATE
13136	BARIUM FLUORIDE 99.99%
13044	BARIUM HYDROXIDE,8-HYDRATE
11232	BARIUM NITRATE
11825	BENZENE
13147	BENZOIC ACID
13417	BENZOYL PEROXIDE (CREAM HARDENER)
12363	BENZO[A]PYRENE
12364	BERYLLIUM
13527	BERYLLIUM BASIC ACETATE
13137	BERYLLIUM OXIDE
13532	BISMUTH
12344	BISMUTH NITRATE PENTAHYDRATE REAGENT
13526	BISMUTH OXIDE
10094	BORIC ACID
13470	BORIC ANHYDRIDE
13460	BRILLIANT YELLOW
11233	BROMINE
13053	BROMOCRESOL-PURPLE
13238	BRUCINE
11328	BRUCINE SULFATE, ACS REAGENT GRADE
11605	BULK GLASS SLIVER, FIBROUS GLASS
10894	CADMIUM METAL
11893	CALCIUM CARBONATE
10397	CALCIUM CHLORIDE, FLAKE & POWDERED (GENERAL CHEMICAL CORP)
10373	CALCIUM FLUORIDE
10035	CALCIUM HYDROXIDE, HYDRATED LIME
10100	CALCIUM HYPOCHLORITE
12971	CALCIUM NITRATE
13148	CALCIUM NITRATE TETRAHYDRATE
10034	CALCIUM OXIDE, BULK PEBBLE LIME
10256	CALCIUM OXIDE, REAGENT
10161	CALCIUM SULFATE (INDICATING DRIERITE)
11089	CALCIUM SULFIDE
11729	CALCIUM ZIRCONIUM SILICATE (CZS)
10156	CALMAGITE, METALLOCHROMIC INDICATOR
10803	CARBON BLACK
10812	CARBON DISULFIDE
12380	CARBON TETRACHLORIDE (TETRACHLOROMETHANE)
12081	CARBOXY POLYMETHLENE
13054	CELLULOSE ACETATE
12422	CELLULOSE, POWDER, CA. 20 MICRON
10113	CELLULOSE, SODIUM CARBOXYMETHYL ETHER
13458	CERIC SULFATE
13138	CERIUM(IV) OXIDE
13271	CESIUM CARBONATE
11234	CESIUM CHLORIDE
13538	CESIUM NITRATE
13131	CESIUM SULFATE
12190	CHLORINE, LIQUID
12379	CHLOROBENZENE
10032	CHLOROFORM
13193	CHOLESTEROL REAGENT
13466	CHROME AZUROL S
10537	CHROMIC ACID CRYSTAL (AKA: CHROMIUM TRIOXIDE)
11091	CHROMIC CHLORIDE
13155	CHROMIC POTASSIUM SULFATE
13223	CHROMIUM CHLORIDE, 6-HYDRATE
13533	CHROMIUM METAL
13120	CHROMIUM OXIDE
13464	CHROMOTROPIC ACID SODIUM SALT
13472	CHROMOTROPIC ACID,DISODIUM SALT,DIHYDRATE
13095	CINCHONINE
11077	CINNAMIC ACID
10751	CITRIC ACID
12186	CITROCARBONATE
13225	COBALT BRIQUETTES
11090	COBALT CHLORIDE (AKA: COBALTOUS CHLORIDE)
13150	COBALT OXIDE
10028	COBALTIC FLUORIDE (COF3)
13151	COBALTOUS SULFATE-HEPTAHYDRATE
10890	COPPER METAL
13142	COPPER(I) OXIDE
13143	COPPER(II) FLUORIDE
11728	CORN OIL
13195	CREATININE
13194	CREATININE REAGENT
12367	CRESOL (METHYL PHENOL)
11236	CUPFERRON

TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME
10538	CUPRIC SULFATE PENTAHYDRATE CUSO4.5H2O
10146	CYCLOHEXANE
13045	CYCLOHEXANOL
12369	CYCLOHEXANONE (PIMELIC KETONE)
13048	D-TARTARIC ACID
13331	DEUTERIUM
13330	DIAMMONIUM MOLYBDATE,TETRAHYDRATE
13558	DIAMYL(AMYL)PHOSPHATE
10981	DIBUTYLAMINE
10947	DICHLORODIFLUOROMETHANE (DYMEL 12, DUST-OFF 11, FREON-12, R-12)
13055	DIMETHYL GLYOXIME
13078	DIMETHYL OXALATE
12464	DIMETHYLAMINOBENZYLIDENE)RHODANINE,97%, 5-(4-
12235	DIMETHYLPOLYSILOXANE
10678	DIOCTYLPHTHALATE, DOP
13056	DIOXANE
13070	DIPHENYLAMINE SULFONIC ACID
11704	DIPHENYLCARBAZIDE
13207	DIPHENYLTHIOCARBAZONE
13208	DIPYRIDYL
11705	DISODIUM ETHYLENEDIAMINE TETRA ACETATE
10099	DISODIUM PHOSPHATE (AKA: SODIUM PHOSPHATE DIBASIC)
13234	DL-CAMPHOR
13299	DL-GLUTAMIC ACID #23409
10322	DRY ICE (CO2)
13159	DYSPROSIUM OXIDE
11525	EDTA (AKA: ETHYLENEDIAMINE TETRAACETIC ACID)
10014	ETHANE, 1,1,2-TRICHLORO-2,2,1-TRIFLUORO-
13081	ETHANOLAMINE (AKA: 2-AMINO-ETHANOL)
11093	ETHER, BIS(2-METHOXY ETHYL)-
10030	ETHYL ACETATE
12438	ETHYL ETHER
10952	ETHYLAMINE (ANHYDROUS)
10466	ETHYLENE GLYCOL
10576	ETHYLENE OXIDE
13152	ETHYLENEDIAMINE
10190	ETHYLENEDIAMINE TETRAACETIC ACID MAGNESIUM DISODIUM SALT
13272	EUROPIUM
13199	FEEN A MINT GUM (PHENOLPHTHALEIN)
11094	FERRIC AMMONIUM SULFATE
11250	FERRIC CHLORIDE HEXAHYDRATE
10682	FERRIC CHLORIDE, REAGENT GRADE
10539	FERRIC NITRATE FE(NO3)3
13406	FERRIC NITRATE NONAHYDRATE
11095	FERROUS AMMONIUM SULFATE
10608	FERROUS CHLORIDE
11776	FERROUS SULFAMATE, 40% SOLUTION
10320	FERROUS SULFATE CRYSTAL
11721	FERROUS SULFATE, HEPTAHYDRATE
10262	FERROZINE IRON, 3(2-PYRIDYL)-5,6-BIS(4-PHENYLSULFONIC ACID..
11797	FLORISIL
10265	FLUORESCEIN SODIUM SALT (URANINE)
11934	FORMALDEHYDE SOLUTION
10238	FORMIC ACID 88%
12547	FUEL, BERNZOMATIC PROPANE
13273	GADOLINIUM OXIDE
10266	GALLIC ACID POWDER
10409	GAS & LIQUID NITROGEN
10972	GAS, ACETYLENE
12175	GAS, ACETYLENE (UNION CARBIDE)
10405	GAS, CARBON DIOXIDE
11165	GAS, CARBON MONOXIDE
10102	GAS, CHLORINE
12191	GAS, FREON 13 (CHLOROTRIFLUOROMETHANE)
10319	GAS, FREON TYPE 11 (TRICHLOROFLUOROMETHANE)
10247	GAS, FREON TYPE 12, LABCRAFT BRAND AIR-IT (CL2F2C)
10187	GAS, FREON TYPE 22 (MONOCHLORODIFLUOROMETHANE)
10407	GAS, HYDROGEN
12429	GAS, HYDROGEN CHLORIDE
13185	GAS, KRYPTON
10885	GAS, NEON
10971	GAS, PROPYLENE
13276	GAS,ISOBUTYLENE (2-METHYL PROPENE)
13057	GELATIN
13274	GERMANIUM

TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME
13270	GERMANIUM DIOXIDE
11237	GLUCONIC ACID (50% IN WATER)
11758	GLUCONIC ACID SODIUM SALT
13298	GLUCOSE
10959	GLYCERINE
12128	GOLD
10857	GRAPHITE, VARIOUS SHAPES
13083	HEPTANE, N- (AKA: n-HEPTANE)
12469	HEXADECANE (TRADE NAME: N-CETANE)
11096	HEXANE
12370	HYDRAZINE (DIAMINE)
10818	HYDRAZINE (HYDRATE)
13213	HYDRAZINE DIHYDROCHLORIDE
13058	HYDRAZINE SULFATE
13059	HYDRIODIC ACID
13513	HYDROBROMIC ACID 48% OR 49%
10110	HYDROCHLORIC ACID, 20 DEGREES BE
10075	HYDROCHLORIC ACID, SP.G.=1.18
10064	HYDROFLUORIC ACID, 48% SOLUTION
12432	HYDROFLUOROSILICIC ACID
12368	HYDROGEN CYANIDE
10160	HYDROGEN FLUORIDE, ANHYDROUS
10062	HYDROGEN PEROXIDE, 30% REAGENT
10229	HYDROGEN PEROXIDE, 35% TECHNICAL GRADE
12371	HYDROGEN SULFIDE
11097	HYDROQUINONE
10155	HYDROXY NAPTHOL BLUE CALCIUM INDICATOR
10452	HYDROXYLAMINE HYDROCHLORIDE
11098	HYDROXYQUINOLINE, 8- (AKA: OXINE, 8-QUINOLINOL)
13060	HYPOPHOSPHOROUS ACID
11875	IMIDAZOLE
10889	INDIUM METAL
11099	IODINE
11100	IRON
13049	IRON- IRON POWDER
11327	ISOOCTANE, PESTICIDE GRADE
10055	KEROSENE
10057	KETONE, METHYL ETHYL (AKA: 2-BUTANONE)
12388	KETONE, METHYL ISOBUTYL (4-METHYL-2-PENTANONE)
10752	LACTIC ACID
13153	LANTHANUM CHLORIDE
13539	LANTHANUM CHLORIDE
11845	LANTHANUM NITRATE HEXAHYDRATE
13154	LANTHANUM OXIDE
12372	LEAD ACETATE
10324	LEAD ASSORTED
10535	LEAD DIOXIDE (AKA: LEAD PEROXIDE)
12343	LEAD NITRATE
13227	LEAD OXIDE
1046[illegible]	LIQUID ARGON
1017[illegible]	LITHIUM CARBONATE, 98.7 % TECHNICAL GRADE
10424	LITHIUM CHLORIDE
12437	LITHIUM FLUORIDE
10883	LITHIUM HYDROXIDE
13218	LITHIUM META BORATE
13307	LITHIUM OXIDE
13221	M-CRESOL PURPLE
12322	MAGNESIUM CHLORIDE
11303	MAGNESIUM CHLORIDE, HEXAHYDRATE
11304	MAGNESIUM FLUORIDE, (3% URANIUM CONTAMINATION)
11938	MAGNESIUM HYDROXIDE
10002	MAGNESIUM METAL, CHIPPED
10887	MAGNESIUM NITRATE
10132	MAGNESIUM OXIDE
10166	MAGNESIUM PERCHLORATE, ANHYDROUS
10111	MAGNESIUM SULFATE
13294	MAGNESIUM SULFATE #1071
11730	MAGNESIUM ZIRCONIUM SILICATE (MZS)
13139	MAGNESIUM(IV) OXIDE
13132	MAGNESIUM, POWDER
13529	MANGANESE ACETATE
13220	MANGANESE DIOXIDE
13219	MANGANESE OXIDE
10087	MERCAPTOACETIC ACID 80% AQUEOUS SOL'N (THIOGLYCOLIC ACID)
13090	MERCURIC CHLORIDE
13089	MERCURIC NITRATE, MONOHYDRATE
13088	MERCURIC OXIDE
13092	MERCURIOUS CHLORIDE
11953	MERCURY (IC) IODINE
12450	MERCURY IN NITRIC ACID
11392	MERCURY, INSTRUMENT GRADE
12537	METHYL ETHYL KETONE

TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME
13099	METHYL ORANGE
13097	METHYL RED-SODIUM SALT
13098	METHYL VIOLET
10814	METHYLENE BISPHENYL ISOCYANATE, (MDI)
11823	METHYLENE BLUE
10833	METHYLENE CHLORIDE
12394	METHYLTRIOCTYLAMMONIUM CHLORIDE
13133	MOLYBDENUM
12974	MOLYBDENUM TRIOXIDE
10122	MOLYBDIC ACID, 85 % POWDER
11872	N-1-NAPHTHYLETHYLENEDIAMINE DIHYDROCHLORIDE
12387	NAPHTHALENE
12360	NAPTHYLAMINE, ALPHA (1-NAPTHYLAMINE)
13308	NEOCUPPERFORM
11736	NEOCUPROINE
13134	NEODYMIUM CHLORIDE
13140	NEODYMIUM OXIDE
13317	NEODYMIUM POWDER
10355	NICKEL NITRATE, NI(NO3)2.(H2O)6
12975	NICKEL OXIDE
13228	NICKEL STRIP
11879	NICKELOUS CHLORIDE HEXAHYDRATE
12297	NINHYDRIN MONOHYDRATE
10893	NIOBIUM METAL
13229	NIOBIUM OXIDE
10010	NITRIC ACID, 100% BASIS
10176	NITRIC ACID, ANALYTICAL REAGENT GRADE
11958	NITRIC ACID, AQUEOUS NHO3
12374	NITRIC OXIDE (NO)
12373	NITROGEN DIOXIDE (NO2)
13230	NITRON (AKA:1,4-DIPHENYL-3,5-ENDO-ANILINO-4,5-DIHYDRO-1,2,4-TRIAZOLE
10817	NITROUS OXIDE
13085	NONANE, N- (AKA: n-NONANE)
13247	OCTADECYLAMINE-(PRACT)
13086	OCTANE, N- (AKA: n-OCTANE)
11694	OCTANESULFONIC ACID, 1-, SODIUM SALT REAGENT GRADE
13232	OCTYL ALCOHOL
12082	OCTYLPHENOXYPOLYETHOXYETHANOL
10344	OXALIC ACID
10884	OXYGEN BOTH LIQIUD AND GAS- O2
13233	P-TOLUENESULFONIC ACID,MONOHYDRATE
13305	PALLADIUM
12430	PALMITIC ACID
13243	PAN-1-2-PYRIDYLAZO -2-NAPHTOL
13087	PENTANE, N- (AKA: n-PENTANE)
11246	PEPSIN
10043	PERCHLORIC ACID, 70-72% ANALYT. REAGENT
13537	PERFLUOROTRIBUTYLAMINE
10863	PERIODIC ACID HYDRATED
10066	PHENANTHROLINE MONOHYDRATE
10108	PHENANTHROLINE, 1,10-2,9-DIMETHYL (AKA: NEOCUPROINE HCL)
12287	PHENOL
12389	PHENOL, 2,4-DINITRO-(NITROPHENE)
10173	PHENOL, 2-(5-BROMO-2-PYRIDYLAZO)-5-(DIETHYLAMINO)
13463	PHENYLPHTHALEIN DISODIUM SALT
12043	PHOSPHORIC ACID
11324	PHOSPHORIC ACID, META-
10080	PHOSPHORIC ORTHO ACID, 85 % ANALYTICAL REAGENT
13261	PHOSPHOROUS PENTOXIDE
13313	PHOSPHOROUS POWDER-RED
10224	POTASSIUM ACID PHTHALATE
13121	POTASSIUM BIIODATE
12436	POTASSIUM BISULFATE
13066	POTASSIUM BROMIDE
10060	POTASSIUM CARBONATE
10990	POTASSIUM CHLORATE
10423	POTASSIUM CHLORIDE
10989	POTASSIUM CHROMATE
13471	POTASSIUM CITRATE MONOHYDRATE
10988	POTASSIUM CYANIDE
10263	POTASSIUM DICHROMATE CRYSTAL
12084	POTASSIUM FERRICYANIDE
11674	POTASSIUM FERRICYANIDE
11681	POTASSIUM FERROCYANIDE REAGENT GRADE CRYSTAL
10121	POTASSIUM FLOURIDE
11238	POTASSIUM FLUORIDE DIHYDRATE
10018	POTASSIUM HYDROXIDE, 45% AQUEOUS SOLUTION

TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME
13093	POTASSIUM IODATE
10987	POTASSIUM IODIDE
13065	POTASSIUM METABISULFITE
10753	POTASSIUM NITRATE
10112	POTASSIUM OXALATE
12435	POTASSIUM PERMANGANATE
12057	POTASSIUM PERSULFATE
10372	POTASSIUM PHOSPHATE MONOBASIC CRYSTAL
10595	POTASSIUM PYROSULFATE (AKA: POTASSIUM HYDROGEN SULFATE)
13248	POTASSIUM RHODIZONATE
13122	POTASSIUM SODIUM TARTRATE
13123	POTASSIUM SODIUM TARTRATE
12375	PYRIDINE
11939	PYRIDINE SPECTRAR 500 ML.
13245	PYROCATECHOL VIOLET
12386	RESORCINOL
13449	ROSOLIC ACID
13314	RUBIDIUM CARBONATE
13157	RUBIDIUM CHLORIDE
11092	S-DIPHENYL CARBAZIDE
13144	SAMARIUM(III) OXIDE
10441	SILICA GEL
10267	SILICA SAND, CRYSTALLINE SILICA (QUARTZ)
13212	SILICIC ACID N-HYDRATE
10104	SILICON METAL POWDER
11306	SILVER CHLORIDE
11726	SILVER NITRATE
11554	SILVER SULFATE
12127	SILVER, IN METAL FORM OR POWDER OR CHIPS
12357	SODIUM
11957	SODIUM ACETATE
13262	SODIUM AMIDE
12376	SODIUM AZIDE
10985	SODIUM BENZOATE
11000	SODIUM BICARBONATE
12434	SODIUM BISULFATE, MONOHYDRATE
10984	SODIUM BISULFITE
13069	SODIUM BITARTRATE
11240	SODIUM BORATE
10302	SODIUM BOROHYDRIDE 98% NABH4
10983	SODIUM BROMATE
10982	SODIUM BROMIDE
10033	SODIUM CARBONATE-POTASH
10295	SODIUM CHLORIDE
12366	SODIUM CHROMATE
10123	SODIUM CITRATE
10159	SODIUM CYANIDE
13068	SODIUM DICHROMATE DIHYDRATE
11393	SODIUM DICHROMATE REAGENT
10255	SODIUM DIETHYLDITHIOCARBAMATE
13244	SODIUM DIPHENYLAMINESULFONATE
10417	SODIUM FLUORIDE
10077	SODIUM FORMATE
10036	SODIUM HYDROXIDE
10042	SODIUM HYDROXIDE, 50% AQUEOUS SOLUTION
10097	SODIUM HYPOCHLORITE 12.5% AVAILABLE CHLORINE
11873	SODIUM LAURYL SULFATE
10480	SODIUM LEAD ALLOY, HYDRONE
10448	SODIUM NITRATE, PURIFIED GRADE
10118	SODIUM NITRITE, CRYSTAL
13071	SODIUM NITROPRUSSIDE
10425	SODIUM OXALATE
13209	SODIUM PERCHLORATE
10225	SODIUM PEROXIDE, REAGENT GRADE
13073	SODIUM PHOSPHATE TRIBASIC
11239	SODIUM PHOSPHATE, DIBASIC, ANHYDROUS
10307	SODIUM PHOSPHATE, MONOBASIC MONOHYDRATE CRYSTAL
11314	SODIUM SILICATE - LIQUID GRADE 42
13256	SODIUM SILICOFLUORIDE
10465	SODIUM SULFATE
10934	SODIUM SULFHYDRATE (AKA: SODIUM HYDROSULFIDE)
10936	SODIUM SULFIDE
10935	SODIUM SULFITE
11523	SODIUM TARTRATE, DIHYDRATE
11848	SODIUM TETRABORATE, ANHYDROUS
13072	SODIUM THIOCYANATE
10254	SODIUM THIOSULFATE, CRYSTAL
13242	SORBITOL
13236	SPADNS
13074	STANNOUS CHLORIDE
12061	STAUROLITE, FERROUS ALUMINO SILICATE ABRASIVE BLASTING SAND
12418	STEARIC ACID, 95%
10727	STRONTIUM CARBONATE REAGENT POWDER

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TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME
13141	STRONTIUM FLUORIDE
12976	STRONTIUM NITRATE
13080	STYRENE (AKA: VINYL BENZENE)
13418	STYRENE MONOMER (FIBERGLASS RESIN)
10453	SULFAMIC ACID
13075	SULFANAMIDE
11874	SULFANILAMIDE
11676	SULFANILIC ACID
10464	SULFOSALICYLIC ACID
13389	SULFUR DIOXIDE
10098	SULFURIC ACID, 83.2%
10130	SULFURIC ACID, ANALYTICAL REAGENT A.C.S.
10439	SULFURIC ACID, BATTERY ELECTROLYTE SP.GR.=1.250
12999	SULFUROUS ACID
13309	TANTALUM V OXIDE
13316	TANTALUM WIRE
13062	TETRACHLOROETHANE, 1,1,2,2-
10093	TETRACHLOROETHYLENE (AKA: PERCHLOROETHYLENE)
13079	TETRAHYDROFURAN
13158	TETRAHYDROXYQUINONE
13392	TETRAMETHYL AMMONIUM HYDROXIDE SOLUTION
13461	TETRAPHENYLARSONIUM CHLORIDE HYDROCHLORIDE
13312	THALLIUM I SULFATE
12381	THALLIUM III OXIDE (THALLIUM PEROXIDE)
10071	THENOYLTRIFLUOROACETONE (TTA)
13260	THIOACETAMIDE
12383	THIOUREA (THIOCARBAMIDE)
11722	THORIUM
12397	THORIUM METAL (TH-232)
12408	THORIUM NITRATE
12398	THORIUM OXIDE (TH-232)
13310	THULLIUM OXIDE
13076	THYMOL
13211	THYMOL BLUE
11512	THYMOLPHTHALEIN
13311	TIN IV OXIDE
11660	TIN METAL
12421	TIN(II) SULFIDE, TECH.
11320	TITANIUM METAL
11714	TITANIUM(OUS) CHLORIDE SOLUTION 20% STABILIZED
10933	TOLIDINE, O-
10211	TOLUENE
13114	TRANS-1,2-DIMETHYLCYCLOHEXANE
12505	TRIACETIN, 99%
10019	TRIBUTYL PHOSPHATE (TBP)
13061	TRICHLOROETHANE, 1,1,2-
10101	TRICHLOROETHANE, 1,1,1- (AKA METHYL CHLOROFORM) ALSO TAP MATIC CUTTING FLUID
10031	TRICHLOROETHYLENE
10037	TRIETHANOLAMINE
13118	TRIETHYL PHOSPHATE
13198	TRIGLYCERIDE REAGENT
10147	TRIOCTYLPHOSPHINE OXIDE
10932	TRIPHENYLPHOSPHINE
11829	TRIS(HYDROXYMETHYL) AMINOMETHANE
10287	TRISODIUM PHOSPHATE (AKA: SODIUM PHOSPHATE TRIBASIC)
10892	TUNGSTEN METAL
11252	URANIUM COMPOUNDS
11305	URANIUM DICARBIDE
11253	URANIUM DIOXIDE (UO2)
11254	URANIUM HEXAFLUORIDE (UF6)
10999	URANIUM METAL
11255	URANIUM OCTAOXIDE (U3O8)
11256	URANIUM TETRAFLUORIDE (UF4)
11257	URANIUM TRIOXIDE (UO3)
11258	URANYL FLUORIDE (UO2F2)
10174	URANYL NITRATE, CRYSTAL
10141	UREA, FLAKED, SHOTTED, OR PRILLED
12384	VANADIC ACID (AMMONIUM VANADATE)
10931	VANADIUM
12979	VANADIUM PENTOXIDE
10175	VANADIUM SULFATE, DIHYDRATE
13186	XENON
10044	XYLENE (XYLOL)
13063	XYLENE, META (AKA: m-XYLENE OR 1,3-DIMETHYL BENZENE)
13067	XYLENE, ORTHO (AKA: o-XYLENE OR 1,2-DIMETHYL XYLENE)
13064	XYLENE, PARA (AKA: p-XYLENE OR 1,4-DIMETHYL BENZENE)
13210	YTTRIUM NITRATE HEXAHYDRATE
10027	YTTRIUM OXIDE POWDER 99.99% PURE

TABLE 2-2 (cont.)
PURE CHEMCIALS

CHEMCODE	NAME	CHEMCODE	NAME
10354	ZINC ACETATE CRYSTAL		
12433	ZINC NITRATE		
13077	ZINC OXIDE		
12420	ZINC SULFATE HEPTAHYDRATE, 99% A.C.S. REAGENT		
12417	ZINC SULFIDE, 99.99%		
10294	ZINC, HIGH PURITY		
13252	ZIRCON, M&T MILLED		
13528	ZIRCONIUM DICHLORIDE OXIDE		
13534	ZIRCONIUM DIOXIDE		
12459	ZIRCONIUM METAL (CONVERTER TUBE W/RECHARGE 1/8)		
13315	ZIRCONIUM NITRATE		
13306	ZIRCONIUM ROD		

CHAPTER 3 - METHODS FOR NOTIFYING EMPLOYEES OF HAZARDOUS NON-ROUTINE TASKS

3.1 DETERMINATION OF HAZARDS

Performance of non-routine tasks may cause the employee to be exposed to hazardous chemicals. Supervision shall recognize the hazardous chemicals associated with non-routine tasks and determine precautions to be taken. If the required precautions cannot be determined with absolute certainty, IRS&T shall be contacted for assistance.

Large projects, such as those requiring engineering support, are reviewed by Industrial Hygiene as a part of the planning stage. This review assists in the identification of hazardous chemicals that will be encountered.

Projects involving the use of hazardous chemicals during hazardous waste operations shall require a task specific Health & Safety Plan. These plans address chemical hazards to be encountered and safety precautions that employees shall follow. Hazardous waste is not covered under the Federal Regulation 29 CFR 1910.1200 Standard or this written hazard communication program.

Since it is often difficult or impossible to determine in advance what hazardous chemical(s) will be encountered in the performance of a non-routine task, Project Engineers, IRS&T personnel, project supervisors, and the involved employees shall be constantly alert for potential problems and inform Industrial Hygiene when the potential for hazardous chemical exposure exists.

3.2 NOTIFICATION

Prior to performance of the work, the supervisor shall inform the involved employees of chemicals that will be encountered, review hazards associated with the chemicals, and determine the required protective measures that are to be taken. A discussion of any other hazards involved in the performance of the non-routine task would also be appropriate at this time.

In case of a large project, the safety review conducted by Industrial Hygiene as part of the planning stage will determine the training required to notify employees of hazardous material and safety precautions.

If any questions arise during the non-routine task training sessions that are beyond the expertise or knowledge of the supervisor, the supervisor shall contact Industrial Hygiene for assistance.

3.3 DOCUMENTATION

The supervisor shall obtain a Work Permit (per FMPC-0516) from Industrial Hygiene. This permit states the known hazardous material present and specifies the required precautions.

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CHAPTER 4 - METHODS FOR NOTIFYING EMPLOYEES OF HAZARDOUS UN-LABELED PIPES IN THE WORK AREA

4.1 DETERMINATION OF HAZARDS

The supervisor should be aware, through process knowledge, of the content of un-labeled pipes in the work area.

If the content of the pipe(s) is unknown, the supervisor shall contact the Utilities Engineer, other personnel in the plant, the Department/Staff Manager, or the Facility Owner to determine the pipe content.

If the hazard potential of the material/chemical in the pipe is unknown to the supervisor, the supervisor shall request assistance from Industrial Hygiene.

4.2 NOTIFICATION

Before an employee begins work in the area (new hire or transferee), the supervisor shall escort the employee through the area, point out the pipes containing hazardous material, review the applicable MSD Sheets with the employee, and inform the employee of the required safety precautions when working near the pipes.

If questions arise that require additional information on the material or safety precautions, the supervisor shall contact Industrial Hygiene and request assistance.

The training requirements of Chapter 10 are also applicable to personnel working with or near unlabeled pipes of hazardous material.

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CHAPTER 5 - METHODS FOR NOTIFYING SUBCONTRACTORS OF HAZARDOUS CHEMICALS IN THE WORK AREA AND SUGGESTING PROTECTIVE MEASURES

5.1 NOTIFICATION OF HAZARDS BY THE FEMP

Industrial Hygiene shall provide, through the Purchasing Department, the prospective subcontractor(s) with a pre-bid list of hazardous chemicals that may or will be encountered during the construction project.

The subcontractor shall also be provided, by the Project Manager, with a list of hazardous chemicals and the MSD Sheets for each item. The list and MSD Sheets shall be given to the subcontractor at pre-construction meetings or prior to beginning work. Early notification allows the subcontractor time for respirator fit testing, acquire personal protective equipment, and train/inform employees as required.

The Project Manager (PM) shall also provide the subcontractor with the applicable MSDS forms before the start of work.

5.2 DETERMINATION OF HAZARDS

The PM shall contact IRS&T prior to the start of construction and request assistance in determining the hazardous materials/chemicals present in the work area.

IRS&T personnel from Industrial Hygiene and Radiological Safety shall inspect the proposed construction site to determine hazardous material present, estimate the amount of hazardous material, and suggest the safety measures required to protect subcontractor/WEMCO employees.

5.3 NOTIFICATION OF HAZARDS BY THE SUBCONTRACTOR

The subcontractor shall furnish the WEMCO Project Manager (PM) with a list of the hazardous materials that will be used during construction and MSD Sheets for each item. The list and sheets shall be furnished at least one week prior to the arrival of material on site.

NOTE: The requirement for notification by the subcontractor shall be included in the contract.

The PM shall immediately forward the data to Industrial Hygiene to allow time for notification of involved WEMCO employees (such as those working in the area and Emergency Response Team members).

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CHAPTER 6 - METHODS FOR ENSURING THAT HAZARDOUS MATERIAL CONTAINERS ARE LABELED

6.1 INCOMING CONTAINER LABELING

Incoming containers that are marked with identification that meets WEMCO standards do not require relabeling with an in-plant label.

NOTE: To be adequately identified, the container shall be marked with the name of the material, name and address of manufacturer or supplier, and a hazard warning.

Containers that are received with illegible or partially destroyed labels or that are unmarked shall be set aside in a designated safe area until the proper in-plant "Hazard Communications Label" (Refer to Section 6.3 and See Figure 6-1) is applied.

The Receiving Group Supervisor is responsible for ensuring that incoming containers are marked as required and also for notifying Purchasing and Industrial Hygiene of unmarked or improperly marked containers.

NOTE: It is important that Purchasing deals only with vendors who comply with the OSHA Hazard Communication Standard.

6.2 IN-PLANT AND OUTGOING CONTAINER LABELING

When containers are labeled in-plant, the name of the manufacturer or supplier is not required to be on the label. Material identification and hazard warnings are required.

When a hazardous chemical is received into a tank or transferred from one container to another (such as a drum or pail), the container receiving the material shall be labeled with the material identification and hazard warnings that match the source container. Labels shall be applied by the employee transferring the material.

NOTE: A National Fire Protection Association (NFPA) Hazard warning label may be used to identify the hazard potential of the enclosed material.

Unlabeled containers shall be set aside for sampling, characterization, and labeling. The supervisor and Industrial Hygiene shall be informed of unlabeled containers.

Except for empty containers and some other materials (such as hazardous waste regulated by the Environmental Protection Agency) all containers of hazardous material shall be labeled. No label should be removed or defaced without the knowledge and consent of Industrial Hygiene.

When containers are ready for shipment off-site, the Shipping Group Supervisor shall contact Industrial Hygiene to obtain the labels that are to be used.

6.3 TRAINING

All FEMP employees who work with hazardous chemicals shall be informed and aware of the need to have accurate labels and material identification on all containers. Employees shall be responsible for attending training sessions scheduled by supervision or Centralized Training. Training shall include studies of the OSHA "Hazard Communication" document, reading and understanding in-plant labeling system and the labeling system of the suppliers of material, following established procedures for handling and storing hazardous material, and reporting unlabeled containers.

6.4 HAZARD COMMUNICATIONS (NFPA) LABEL

The "Hazard Communications National Fire Protection Association (NFPA) Label" (See Figure 6-1) is diamond shaped, color coded, and has spaces for material identification, hazard rating, and special hazards associated with the material.

The outer diamond contains four inner diamonds. Each of the inner diamonds is color coded and represents a hazard. From the left and clockwise, the represented hazards are Health (See Tables 6-1 and 6-3), Fire (See Table 6-2), Reactivity (See Table 6-3), and Special.

A numerical hazard rating of health, fire, and reactivity provides the user with hazard information. Each hazard is rated 0 to 4 (See Tables 6-1 thru 6-3). Chemicals in category 0 are the least hazardous and category 4 chemicals are the most hazardous.

When an employee is using an NFPA label on a receiving container and the correct numerical rating is unknown, the supervisor shall contact Industrial Hygiene for assistance.

The bottom diamond of the label is used to indicate special hazards that are associated with the chemical (such as a "W" with a slash meaning do not use water, "OXY" for oxidizing material, or a radioactive symbol to indicate a radiation hazard).

The top portion of the label, above the diamond, contains the common identification of the hazardous chemical.

TABLE 6-1
RELATIVE TOXICITY RATINGS FOR HAZARDOUS CHEMICALS

RATING	COMMON TERM	ACUTE EXPOSURE[1]	CHRONIC EXPOSURE[2]	EFFECTIVE DOSE ppm	EFFECTIVE DOSE mg/m[3]
4	Extreme health hazard	Death	Death[3]	<1	<0.25
3	High health hazard	Major temporary or permanent injury. May threaten life.	Major permanent injury. Includes mutagens and teratogens	2-10	0.26-2.5
2	Moderate health hazard	Minor temporary or permanent injury.[4] Includes nonlife threatening substances which sensitize the majority of exposed workers.	Minor temporary or permanent injury. Includes skin carcinogens.	11-250	2.57-5.0
1	Slight health hazard	Minor injury.[4] Readily reversible.	Minor injury. Readily reversible.	251-1000	5.1-10.0
0	No signif-icant health hazard	Materials that produce toxic effects only under the most unusual conditions or by overwhelming dosage.	Same	>1000	>10

[1] Single exposure, immediate or delayed effects.

[2] Repeated exposure.

[3] Includes substances which bear a significant relationship to development of cancer, except for common varieties of skin cancer.

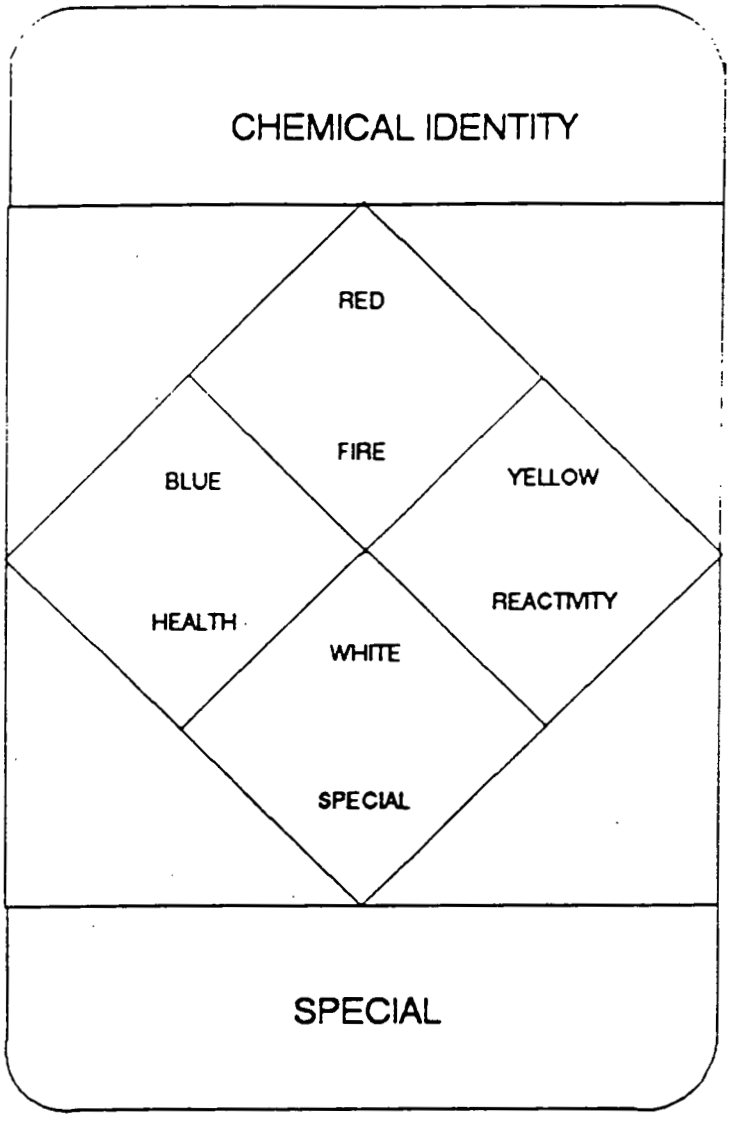
[4] Allergens are rated by sensitizing potential rather than severity of an allergic reaction upon re-exposure to a substance by a sensitized worker.

TABLE 6-2
RELATIVE FLAMMABILITY CRITERIA

RATING	COMMON TERM	FLASH POINT ·C(·F)	BOILING POINT ·C(·F)
4	Extremely flammable	Below 23 (73)	Below 37.8 (100)
3	Highly flammable	23 - 38 (73 - 100)	Above 37.8 (100)
2	Moderately flammable	38 - 93 (101 - 200)	- - -
1	Slightly flammable	Above 93 (200)	- - -
0	Non-flammable	Above 816 (1500)	- - -

TABLE 6-3
HEALTH/REACTIVITY CODES

RATING	HEALTH	REACTIVITY
4	Materials that could cause death or major residual injury (including those that are too dangerous to be approached without special equipment).	Materials which are readily capable of detonation or explosive decomposition or explosive reaction at normal temperature and pressure.
3	Materials that, on short exposure, could cause serious temporary or residual injury (including those requiring protection from bodily contact).	Materials which are capable of detonation or explosive decomposition or of explosive reaction but require a strong initiating source or which must be heated under confinement.
2	Material hazardous to health but area may be entered freely with full face mask, self contained breathing apparatus which provides eye protection.	Normally unstable materials and readily undergo violent chemical change but do not detonate.
1	Materials slightly hazardous to health. Self contained breathing apparatus is recommended but not required.	Normally stable material that may become unstable at elevated temperature or pressure or which may react with water with some release of energy but not violently.
0	Materials which on exposure to fire would offer no hazard beyond ordinary combustible material.	Materials which are normally stable even when exposed to fire and are not reactive with water.



HAZARD COMMUNICATION (NFPA) LABEL
FIGURE 6-1

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CHAPTER 7 - METHODS FOR ENSURING THAT MATERIAL SAFETY DATA SHEETS (MSDS) ARE MAINTAINED

7.1 MSDS RECEIPT

When a hazardous chemical is received on site, the material shall be accompanied by an MSDS. The Receiving Group or Stores Supervisor shall forward the MSDS to Industrial Hygiene.

When a chemical is received without an MSDS, the chemical shall remain in the Receiving Area until an MSDS is obtained for the chemical.

7.2 MSDS DISTRIBUTION

When Industrial Hygiene is in receipt of an MSDS for a hazardous chemical, copies shall be made and distributed to areas of the FEMP that use or store the chemical. Industrial Hygiene shall maintain the original in a master file of data sheets.

Binders and/or file cabinets marked for MSD Sheets shall be established and maintained at designated areas throughout the Site.

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CHAPTER 8 - METHODS FOR EXPLAINING MSDS USE AND CONTAINER LABELING REQUIREMENTS

8.1 TRAINING

Each employee that works with or near hazardous chemicals shall attend training sessions in MSDS use and labeling requirements.

Employee general training sessions will be held to review the categories of hazardous chemicals as described in NFPA, DOT, HMIS, and any other labeling system that may apply.

Prior to starting work, the supervisor shall review the specific MSDS(s) that apply to the particular hazardous chemical(s) that will be encountered during completion of the task.

Supervisors shall hold general training sessions to acquaint employees with MSDSs and MSDS use. Literature and audio visual aids may be used if desired.

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CHAPTER 9 - METHODS FOR NOTIFYING EMPLOYEES OF NEW HAZARDS IN THE WORKPLACE

9.1 NOTIFICATION

When a new product containing hazardous chemicals is introduced into the work environment, the supervisor shall, with assistance from Industrial Hygiene, inform the involved employee of the hazards of the product and safety precautions.

If the new hazard requires engineering or other controls be used to prevent exposure, then the employee shall be provided with additional training (such as reviewing the MSDS).

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CHAPTER 10 - METHODS FOR COMPLETING TRAINING/INFORMING REQUIREMENTS

10.1 GENERAL

The methods for training and/or informing the employee ensure that the employee is aware of the hazards in the work area and trained for the job that is to be performed.

In addition to hazardous chemicals, the DOE requires that personnel working with or near physical and/or biological hazards are aware that the hazard(s) exists, that controls are in place to prevent or limit exposure, and that personnel in the area are familiar with the controls and control use.

This chapter describes areas of responsibility in meeting training requirements, frequency of training, and a guide for training and informing employees of hazards, the effect of hazards, and controls to prevent exposure.

Industrial Hygiene is responsible for implementing and managing the training requirements of OSHA 29 CFR 1910.1200 and assisting supervision with training when requested.

Records of training will be maintained by Centralized Training.

10.2 TRAINING SCHEDULE

Training shall be conducted at orientation (new hires), at the time of initial assignment to a new task, and when a new hazard is introduced to the work area.

Employees shall be informed of all hazardous chemicals currently being used and trained in handling material and exposure avoidance. Retraining shall be conducted when information regarding the material changes.

The general instruction phase consists of classroom courses that use slide/tape presentations or other audiovisual teaching aids.

10.3 DOCUMENTATION

Supervisors are required to hold formal training sessions in the workplace to familiarize employees with additional hazardous material, such as fumes and hazardous pipelines, that the employee will encounter in the immediate work area.

During the formal training sessions, employees are required to sign an attendance record sheet. This attendance sheet is used by the Centralized Training Department to verify training and update employee personnel records.

Supervisors shall fill out a "Specific Job Area Health and Safety Orientation" checksheet (See Figure 10-1) for recently hired employees or employees transferred into their group. The Area Supervisor shall complete the checksheet before the employee begins work in the area.

SPECIFIC JOB AREA HEALTH & SAFETY ORIENTATION

COURSE NUMBER: 00959

The purpose of this orientation is to inform the employee of known Physical and Chemical Hazards of the employee's immediate work area as required by 29 CFR 1910.1200.

Work Location:_____ Date:_____

Supervisor Name:_____ Badge#:_____

Employee Name:_____ Badge#:_____

Employee Job Title:_____

Objective At the end of this orientation the employee will be able to state areas, situations, and chemical materials in the work area that may be hazardous to the employee's health.

Check each item _✓_ as it is completed. Indicate NA if not applicable.

PHYSICAL HAZARDS

1. ____ Use of special tools or the lifting of heavy objects that may cause back injury or other physical harm to the employee.
2. ____ Location of nearest fire extinguisher.
3. ____ Location of the flammable materials storage area.
4. ____ Control of Hazardous Energy (Lock and Tag Requirements).
5. ____ Housekeeping - cleaning work area after each job; cleaning spills.
6. ____ Other issues that are specific to the area (for example, battery charging stations, Satellite Accumulation Area). Please List:

   a. _____

   b. _____

   c. _____

   d. _____

SPECIFIC JOB AREA HEALTH AND SAFETY ORIENTATION
Figure 10-1 (Sheet 1 of 2)

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CHEMICAL HAZARDS

1. ___ Location of the Material Safety Data Sheet (MSDS) Binder.

2. ___ Employees have been informed that they may get copies of any applicable MSDS and that in the event a MSDS is not located in the binder in the work area, or if an employee wishes to see the Written Hazard Communication Program, they may call extension 8922 or 6207 (Industrial Hygiene).

3. ___ Operations in the work area where hazardous chemicals may be released while employees are performing their job.

4. ___ List of materials used in the area that are potential chemical hazards.

Material Name	MSDS Number
A. _____	_____
B. _____	_____
C. _____	_____
D. _____	_____
E. _____	_____

5. ___ Review the physical/health hazards of the chemicals in the work are named in item #4. (The information can be found on the appropriate MSDS sheet).

6. ___ Measures employees can use to protect themselves from chemical hazards.

___ Ventilation (General or Local)	___ Eye Wash/Safety Shower
___ Rubber Gloves	___ Respirator
___ Safety Shoes	___ Face Shields
___ Safety Glasses	___ Other

7. ___ Explain the numbered hazard warning labels used on site (NFPA 704 Labelling System - Diamond labels).

I received this orientation and its entire content as stated above and understand that I am responsible to report any hazards that I may see immediately.

Signature of Employee_____ **Date**_____

I have performed this orientation and have encouraged the employees to work safely and report unsafe conditions immediately.

Signature of Supervisor_____ **Date**_____

SPECIFIC JOB AREA HEALTH AND SAFETY ORIENTATION
Figure 10-1 (Sheet 2 of 2)

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CHAPTER 11 - SPECIFIC CHEMICAL DATA

11.1 OXIDIZERS

11.1.1 Description

Oxidizers release oxygen during a chemical reaction and by so doing they provide energy to fuel the reaction. Oxidizer reactions vary from slight to extreme, depending on the reactant and existing conditions.

When oxidizers combine with combustible material, a fire will result that will burn fiercely. Oxidizers in contact with some materials will result in spontaneous combustion.

In contact with heat, shock, and reactive substances, oxidizers can cause an immediate explosion or combustion. Organic peroxides are a special class of oxidizer that react violently when exposed to fire.

11.1.2 Hazard

Information concerning the health hazards of oxidizers should be found by consulting the MSDS for the particular compound or the hazard label affixed to the container.

Chemical oxidizers that promote oxidation are very important in chemical reactions, but are also hazardous materials that can cause damage if contacted, ingested, or inhaled. Oxidizers have been identified as carcinogens, corrosives, toxins, irritants, sensitizers, and substances that affect target organs.

Oxidizers are also classified as a hazard due to the potential for fire and/or explosion and/or release of toxic vapors either from the compound itself or from a reaction that occurs when the compound contacts other material.

11.1.3 Precautions

Safety while handling and using oxidizers is based on no physical contact with unprotected areas of the body. If there is any possibility of direct contact, an analysis shall be performed by Industrial Hygiene to determine the most likely entry routes to the body (such as inhalation or reaction with mucous membranes).

The analysis shall be used to determine the most appropriate and effective protective equipment to be used during the operation. The personnel involved with the operation shall be informed of the required protective equipment and the supervisor shall ensure that the worker is familiar with the use of the equipment.

11.1 OXIDIZERS (cont.)

11.1.4 Storage

Because oxidizers react violently with most other chemicals, all oxidizers should be stored in an area that is separated from other material.

The storage area and containers shall be inspected frequently for spills and/or leaks.

11.2 POISONS (Toxic Substances)

11.2.1 Hazard

Information regarding the hazards of the particular poison being used may be found in the applicable MSDS and/or on the hazard warning label affixed to the container.

Poisons may enter the system through ingestion, inhalation, or absorption through the skin. The effects can vary from irritation to death. Poisons can interfere with oxygen distribution in the body, paralyze muscles, and prevent nervous system activity.

The hazard degree posed by a poison depends on the physiological reaction of the host body to the substance, the route of attack, the concentration of the substance, and the duration of exposure.

The two major categories for the health hazard of poisons are "highly toxic" and "toxic." Two other categories that are classed as health hazards are irritants and sensitizers.

Irritants are not corrosive but do cause a reversible inflammatory effect on living tissue through chemical action at the site of contact with the body.

Repeated contact with a sensitizer can result in the development of an allergic reaction in normal tissue.

Poisons may give off toxic vapors which can be inhaled, react with the skin, or be absorbed through the skin.

11.2 **POISONS** (cont.)

11.2.2 Precautions

Safe handling of poisons is based on the elimination of human contact with the material.

If there is a probability of contact with the material, Industrial Hygiene shall make an analysis of body entry routes and specify protective equipment.

Supervisors shall contact Industrial Hygiene prior to starting any work that requires personnel to be exposed to poisons. Industrial Hygiene shall provide assistance in determining the safety measures that are required.

The supervisor shall also review the MSDS for the material with the affected employee(s) before starting operations that involve handling poisons.

11.2.3 Storage

Because of the specific harmful effects of poisons, the material shall be contained in accordance with the applicable Standard Operating Procedures (SOPs). The containers shall be labeled with accurate identification and hazard communication (NFPA) warnings.

Containers shall be stored away from any material that could cause degradation of container integrity.

Inspections of containers and the area for leaks and spills shall be scheduled and performed when required by applicable SOPs.

11.3 **CORROSIVES**

11.3.1 Description

Some corrosives dissolve (eat away) metals. Most corrosives can cause injury or death when bodily contact occurs.

The name or chemical structure is not sufficient to identify a substance as corrosive. For example, strong acids are corrosive but not all acids are corrosive. Some acids, like boric acid which is used as an eyewash, are beneficial or harmless.

11.3.2 Hazards

If a material is corrosive, the applicable data will be found in the MSDS for the material and on the hazard warning label affixed to the container.

11.3 CORROSIVES (cont.)

The degree of hazard assigned to a corrosive or the damage that can be caused by skin contact is dependent on the reactivity of the material, the concentration, and duration of exposure.

Some corrosives are extremely dangerous and can cause destruction of the skin in three minutes or less after contact. Medium hazard corrosives cause skin destruction between three and sixty minutes following exposure. Corrosives that cause skin damage after sixty minutes are considered to be minor hazards.

Most corrosives present multiple threats to human health since they are toxic through inhalation and skin absorption as well as burns (corrosive) caused by contact.

Corrosives in contact with other chemicals can react violently and cause an increase in the hazard potential. Some corrosives decompose at high temperature or react with water or moisture in the air and release toxic gases. Other corrosives are also flammable liquids or oxidizing materials.

11.3.3 Precautions

Precautions for the handling and use of corrosives may be found in the MSDS for the material or the warning label affixed to the container.

Safe handling and use is based upon avoiding contact with the corrosive. If there is a possibility of contact, Industrial Hygiene should perform an analysis of the material to determine access routes.

The analysis should include vapor production capacity to determine the inhalation hazard and possible reaction with mucous tissues. The analysis results will be used to determine the required protective equipment and measures while handling/using corrosives.

Supervisors shall contact Industrial Hygiene if assistance is required to inform/train involved personnel in safety procedures that will be used during the operation.

Prior to beginning work, the supervisor shall review the MSDS that is applicable to the corrosive with the affected personnel.

If contact occurs, the area of contact should be flushed with water immediately since the severity of the damage to tissue increases as the contact time increases.

11.3 **CORROSIVES** (cont.)

11.3.4 Storage

Because of the reactive nature of corrosives, containers shall be in good condition and constructed of non-corrosive material.

Containers of corrosive substances shall be accurately identified with the material name and a warning label showing the hazard potential.

Storage areas shall be isolated from materials, such as water, with which the corrosive could react violently.

Containers and the storage areas shall be inspected, in accordance with applicable SOPs, for spills and leaks.

11.4 **SOLVENTS**

11.4.1 Description

Because of the ability to dissolve other materials, solvents are used as cleaning fluids, degreasing agents, and extractors for removing solubles from solid material. Solvents are also used in chemical processing and have a wide variety of uses in industry.

Water is the most common and least harmful solvent, sometimes referred to as the universal solvent. Water dissolves a wide range of substances.

11.4.2 Hazards

The health and/or safety hazards of solvents range from harmless to extremely hazardous. The MSDS and warning labels affixed to containers will designate the hazards involved with handling and use of the solvent.

Volatile solvents that are flammable present a safety hazard due to the vapors that are given off. The vapors form a combustible or explosive atmosphere that can be easily ignited. Also, in a closed space the vapors can displace or combine with oxygen and inhibit the breathing process in living organisms.

Solvents can also present a health hazard since these chemicals may be classified as carcinogens, corrosives, highly toxic substances, irritants, sensitizers, and toxic substances. They may also be compounds with target organ effects.

Most solvents, when inhaled, can have an anesthetic effect that causes wooziness, sleepiness, and can render unprotected personnel unconscious.

11.4 SOLVENTS (cont.)

Physical contact with the skin by most solvents can remove the protective oils from the skin allowing the solvent to be absorbed into the body. Absorption (or inhalation) can result in systemic or target organ damage, particularly the liver and blood-forming organs.

Solvents can also have a toxic effect that causes serious illness or death if ingested.

11.4.3 Precautions

The precautions for handling/using solvents will be found in the MSDS for the material and also on the warning label affixed to the container.

Solvents shall be used in a well ventilated area. If possible, the area should be free of spark producing tools and equipment, open flames, and other heat producing or ignition sources.

Supervisors should contact Industrial Hygiene for assistance if the hazardous properties of a solvent is in doubt or there is any question concerning the required protective equipment.

Prior to the start of work, the supervisor and affected employee shall discuss the hazards that are associated with the solvent, the required protective equipment, and review the applicable MSDS.

11.4.4 Storage

Solvents that are flammable should be stored in non-sparking containers that are in good condition.

Solvents shall be stored away from other chemicals with which the solvent could react, such as oxidizers, in a fireproof area that is designed to control fires.

The storage area shall be well ventilated and free of heat sources that could cause ignition.

Solvent storage areas and containers shall be inspected per the applicable Standard Operating Procedures for leaks and spills.

11.5 GASES

11.5.1 Description

A gas consists of a vaporized and expanded physical state of a solid or liquid material. Most gases are the changed form of a liquid since liquids can be slightly or extremely volatile. Solids that become gaseous usually do so as the result of a fire.

When certain solids or liquids are subject to low pressure or high temperature, the form will be altered, become a gas, expand, and diffuse. Once the state of the material is altered, the gas will tend to expand and fill the container in which it is confined.

The size of the container usually determines the concentration of gaseous vapor. In a small size container such as a drum or a tank, the concentration will be much higher than the concentration in a room or a building.

Many gases are heavier than air so that they displace oxygen and form layers at the lowest level that the gas can reach. The gas concentration in areas such as at floor level or in equipment wells can reach high proportions.

Most gases can be liquified by increasing the atmospheric pressure in the container that confines the gas or by decreasing the temperature of the gas. The ease with which a gas can be liquified depends on the molecular weight and chemical structure of the material.

11.5.2 Hazards

Gases pose the same physical hazards associated with materials that are kept at a high pressure or are highly flammable. The degree of hazard may be found in the MSDS associated with the material and/or on the hazard warning label affixed to the container.

The health hazards properties of gases are identified as toxins, carcinogens, corrosives, irritants, sensitizers, and substances that adversely affect target internal organs.

Suffocation can also be a hazard associated with gases since inert or non-toxic gases, such as nitrogen and carbon dioxide, displace air.

The health hazard of material in a gaseous state is increased due to the high exposure potential from inhalation and eye and skin contact. Some gases are odorless which also increases the exposure potential.

Gases can also present a safety problem since flammable vapors escaping from an open or leaking container can reach explosive proportions. In addition, pressurized containers of some gases, such as liquid oxygen (LOX), can explode if subjected to high enough temperature.

11.5 GASES (cont.)

11.5.3 Precautions

Prior to starting work, the supervisor and the affected employee shall review the MSDS for the material and warning labels on the container and then discuss safety precautions.

The work area where flammable gases are in use shall be posted with signs that warn of the hazard and specify a zone that is free of heat, static, and electrical spark sources.

Non-sparking tools shall be used when working in the protected zone surrounding the containers of flammable gases.

Personnel shal not smoke within or near the protected zone that surrounds the area where flammable gases are stored and/or used.

11.5.4 Storage

Storage areas for flammable gases shall be surrounded by a posted safety zone that warns of the hazard. The storage area and the safety zone shall be well ventilated and free from heat and spark producing sources.

The storage areas for flammable gases shall be established away from combustible material, oxidizers, and explosives.

11.6 EXPLOSIVES

11.6.1 Description

When an explosive chemical compound or mixture explodes, there is usually a concussion with heat, gas, and light production that is followed by shock waves.

Explosive reactions can be initiated by ignition (such as an electrical spark or fire) or physical shock (such as being struck with a heavy object).

The severity of an explosion depends on the specific compound or mixture. An explosive can be a solid, a liquid, or a gas. The severity also depends on the conditions that exist at the time. The tighter the explosive material is compressed, the greater the explosive force.

11.6 **EXPLOSIVES** (cont.)

11.6.2 Hazards

There are a number of safety hazards that are associated with an explosion. The MSDS accompanying chemicals will specify the exact explosive potential of the material. Also, warning labels affixed to containers will indicate the explosive hazard.

The primary hazard posed by an explosion is the physical damage that is caused by detonation. The shock waves resulting from an explosion can cause serious injury and/or death as can the accompanying heat, which is usually intense. The shock waves and heat tend to dissipate with distance so that the further that personnel are from the initial blast, the less the harm that is caused.

There is also a danger to personnel from flying or falling objects that are hurled or dislodged by the initial blast or resulting concussive shock waves.

Another hazard is caused by combustible or explosive conditions forming in the work area. Concentrations of a gas or vapor given off by flammable substances (such as solvents) may build up to a highly explosive level.

The LEL varies from substance to substance. Quite often, but not always, the presence of vapors that approach LEL may be determined by a distinctive odor that is identified with the material.

When a substance reaches the UEL, there is no danger of explosion, however this level may create hazards such as those identified in the paragraphs on gases and solvents.

Although the principle cause of explosion are gases or vapors in the atmosphere or that form in an enclosed container (such as hydrogen), airborne dust particles can form an explosive mixture, equipment used in chemical processes (such as pressure buildup in pumping operations or distillation columns) can create an explosive hazard, and chemical reactions may release heat that could cause an explosion.

Some explosive compounds have health risks in addition to that of detonation (such as nitroglycerin and dinitrophenol which are toxic) that require additional safety measures and equipment.

11.6 EXPLOSIVES (cont.)

11.6.3 Precautions

Two of the most important precautions are to have excellent fire prevention and housekeeping programs in areas where explosives are handled, used, or stored. Personnel shall be thoroughly trained in fire deterrent procedures.

Areas where explosives are handled or where potentially explosive gas or vapor can form shall be posted with signs that warn of the danger in that area. If necessary, an Isolation Zone shall be established to prevent personnel from entering the area.

Areas where explosives are handled or where explosive gas/vapor can form shall be free of heat sources and/or spark producing tools or equipment.

Electrical circuits in the area shall be shielded to prevent short circuits or sparking that could cause ignition.

Before handling and/or using potentially explosive material, the supervisor and involved personnel shall review the MSDS for the material and discuss safety precautions and equipment to be used.

If there is any question concerning the explosive property of the material or safety precautions and equipment, the supervisor shall contact Industrial Hygiene and request additional information and assistance.

11.6.4 Storage

Explosives storage areas shall be segregated from other explosive/flammable material, posted with warning signs and, if necessary, barricades.

Explosive storage areas shall have a comprehensive fire deterrent system in place, be kept clean, free of heat sources and spark producing tools or equipment, and be well ventilated.

Electrical circuitry in the storage area shall be safeguarded to prevent short circuits and sparking. Exposed wiring shall be inspected on a schedule established by IRS&T.

11.7 CARCINOGENS

11.7.1 Description

A chemical compound or substance is considered to be a carcinogen if the material has been evaluated by the International Agency for Research on Cancer and found to be a carcinogen or potential carcinogen, if the material is listed as a carcinogen or potential carcinogen in the "Annual Report on Carcinogens" published by the National Toxicology Program, or if the substance is regulated by OSHA as a carcinogen.

11.7.2 Hazards

Exposure to certain compounds have been found to correlate with cancer development. There is a broad range of effects which are dependent upon the dose level received by the subject, length of exposure, and individual susceptibility. Because some cancers remain dormant for twenty years or more before becoming active, it can be difficult to trace the cause to the effect.

When a material is classified as a carcinogen, that information, target organs affected, and other hazards associated with the material will be shown in the MSDS and on the hazard warning label affixed to the container.

When a carcinogen invades the body, it could cause a body cell to become cancerous. The cancerous cell reproduces out of control resulting in the formation of malignant tumors. Some carcinogens will attack specific target organs. The liver is particularly susceptible to invasion by carcinogens.

11.7.3 Precautions

A mandatory system of controls (such as the establishment of an Isolation Zone for areas where carcinogens are processed, handled or used) has been established for regulated material that is, or suspected to be, a carcinogen. The supervisor shall review MSDS, applicable controls, and required safety measures and equipment with the affected personnel before starting a task that involves carcinogens.

The supervisor shall contact Industrial Hygiene for questions or for additional information on a substance.

11.7.4 Storage

Carcinogens shall be stored away from other material and access to the area shall be strictly controlled. In addition, all other storage requirements for the material are applicable.

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CHAPTER 1.0 - GENERAL

1.1 PURPOSE

This Requirements Manual identifies respiratory requirements and provides practical guidance on the issuance, use, and care of respiratory protection equipment at the FEMP.

1.2 INTRODUCTION

1.2.1 At WEMCO, the prevention and control of potential respiratory hazards is accomplished as far as feasible by accepted engineering control measures (e.g., enclosure or confinement of the operation, general or local ventilation, etc.). Where these controls are not feasible, when they are not sufficient by themselves, or while they are being developed and instituted, respiratory protection equipment furnished by WEMCO shall be used to accomplish the necessary degree of control.

1.2.2 Respiratory equipment shall be used in accordance with this manual and applicable WEMCO procedures which are designed to comply with Occupational Safety and Health Administration (OSHA) and American National Standards Institute (ANSI) Z-88.2 requirements.

1.2.3 These manual requirements take precedence over all other WEMCO documents on respiratory protection. Where conflicts are known to exist, the Respiratory Protection Program Administrator in Industrial Hygiene shall be contacted. The Respiratory Protection Program Administrator shall approve any changes or exceptions to the requirements of this Manual.

1.2.4 Respiratory protection is required for FEMP employees whenever potential respiratory hazards are present at concentrations that could present a health concern or as dictated by good industrial hygiene and health physics practices. The safety and health of FEMP employees is the primary concern. Every effort will be made to protect employees with necessary protective equipment that will ensure maintenance of their good health.

1.2.5 Respiratory protection is required during emergencies such as fires or spills when the employee may be exposed to oxygen deficient atmospheres or to high airborne contaminant levels or to smoke. Respirators are also required during either routine or maintenance where action levels, 8-hour exposure limits, ceiling exposure limits, or 15-minute, short-term exposure limits are expected to be exceeded.

1.2.6 No employee shall use respiratory equipment until the appropriate medical certification, training, and fit testing are completed.

1.2.7 Requirements are specified throughout the manual. The words "shall", "must", "should", and "may" were used to specify the level of compliance required per this manual. The words "shall" and "must" indicate a requirement and compliance is mandatory; "should" indicates a recommendation; and "may" denotes permission.

CHAPTER 1.0 (cont.)

1.3 RESPONSIBILITIES

1.3.1 Employees are required to follow and observe all FEMP Respiratory Protection Program requirements.

1.3.2 The FEMP Respiratory Protection Program Administrator shall be responsible for specifying what respiratory protection equipment will be purchased for use at the FEMP on the basis of the quality of equipment fit on employees, the nature of the work being performed, possible respiratory hazards which might be encountered, past experiences with equipment, employee preferences (i.e. comfort and general acceptance), and the limitations and capabilities of equipment. Only equipment approved by the National Institute for Occupational Safety and Health (NIOSH) shall be specified.

1.3.3 Industrial Hygiene and Radiological Safety personnel shall be responsible for selecting the type of respiratory protection equipment to be used on particular jobs at the FEMP. Respirator selections shall be communicated in writing to respirator issuers.

1.3.4 Supervisors who have attended respirator issuance training shall be responsible for issuing respirators in accordance with written respirator selections.

1.3.5 Supervisors with storage cabinets and recycling receptacles in their areas shall maintain these receptacles in accordance with requirements of this manual.

1.3.6 Maintenance Services personnel shall be responsible for ensuring only clean and fully operational respirators are sent to Inventory Control and Warehousing for reissuance.

1.3.7 The manager of Inventory Control and Warehousing shall order, store, and distribute respirators and parts to all holders of properly completed Stores Requisitions.

1.3.8 A physician in FEMP Occupational Health Services shall certify employees as medically able to use respirators prior to respirator use.

1.3.9 WEMCO personnel in charge of subcontractors, vendors, and/or visitors, who will need to use respirators, are responsible for ensuring that they are properly qualified (Chapter 10).

1.4 DEFINITIONS

1.4.1 Administrative Controls - Methods to decrease employee exposures to contaminants by job-rotations, work assignments, work practices or time periods away from contaminants, training, and warning and/or information sign postings.

CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.2 Administrator - Individual designated by the Industrial Hygiene Manager, responsible for developing and maintaining the FEMP Respiratory Protection Program.

1.4.3 Airline-Only-Eligible - A term designating that an individual cannot use any type of respiratory protection equipment other than airline respirators and ELSA units.

1.4.4 Air-Purifying Respirator - A device which removes contaminants from ambient air by drawing it through either a filter or absorbent media.

1.4.5 Air-Supplying Respirator - A device which provides air from a source other than the surrounding atmosphere, such as an airline hose or a compressed air cylinder.

1.4.6 American National Standards Institute (ANSI) - An organization composed of experts from industry, universities, and safety and health organizations which drafts and publishes consensus standards on safety and health issues, including respiratory protection.

1.4.7 Breathing Air - Respirable air which meets Compressed Gas Association (CGA), G-7.1-1973, Grade D, Type I specifications.

1.4.8 Canister - Large container filled with air-purifying media including sorbents, catalysts, and/or aerosol filters that remove gases, vapors, and/or particulates that are drawn through it.

1.4.9 Cartridge - Small container filled with air-purifying media.

1.4.10 Cascade Breathing System - Respirable air supplied to airline respirators from a series of high pressure cylinders connected to a common manifold. Such systems are useful in providing breathing air at remote locations and allow one or more cylinders to be kept in reserve.

1.4.11 Contaminants - Undesired airborne materials in an individual's potential breathing zone.

1.4.12 Dusts - Solid airborne particles generated by handling, crushing, grinding, rapid impact, detonation, or cracking of materials.

1.4.13 Emergency Life Support Apparatus (ELSA) - An emergency use respirator designed for escaping from a sudden release of air contaminants.

1.4.14 Engineering Controls - Methods to decrease employee exposures by modifying sources or reducing quantities of contaminants released into work environments. Examples of such controls include ventilation systems, shielding, and replacement of toxic materials with less toxic materials.

CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.15 Facepiece - Portion of respirator that covers wearer's nose and mouth (half-mask respirator); or nose, mouth and eyes (full-face respirator).

1.4.16 Fit test - Method used to determine whether a respirator provides a good seal for the wearer.

1.4.17 Fit Test Factor (FTF) - Ratio of a test agent's concentration in the test chamber or fit test area to its concentration inside a user's respirator. Higher FTFs indicate better respirator fits. Percent leakage measured on a facepiece is 100 x FTF^{-1}.

1.4.18 Fumes - Tiny solid airborne particles formed by the condensation of vapors of heated solid materials, such as lead, uranium, and metals being welded, cut, brazed, or soldered.

1.4.19 Gas and Vapor Contaminants - Contaminants which exist in the gaseous state at room temperature and pressure conditions or which result from evaporation of liquids. These contaminants mix molecule by molecule with air molecules.

1.4.20 Immediately Dangerous to Life of Health (IDLH) - An atmosphere so toxic that an exposure of 30 minutes or less can cause irreversible adverse health effects or death or eye watering severe enough to impair the ability to escape.

1.4.21 Medical Certification - Determination made by a medical physician on basis of medical evaluation of potential user's ability to use respiratory protection equipment.

1.4.22 Mists - Suspended liquid airborne droplets generated by condensation from gaseous to liquid state or by breaking up liquid into dispersed state (examples include splashing, foaming, or atomizing).

1.4.23 National Institute for Occupational Safety and Health (NIOSH) - A government research agency which tests and certifies respiratory protection equipment for use in the United States.

1.4.24 Non-eligible - Determined medically unable to use any type of respiratory protection equipment.

1.4.25 Non-SCBA-eligible - Determined medically unable to use a SCBA unit.

1.4.26 Occupational Safety and Health Administration (OSHA) - The U.S. Federal Agency which enforces all legal requirements of the Occupational Safety and Health Act, including those on respiratory protection.

1.4.27 Oxygen Deficient Atmospheres - Any atmosphere with inadequate levels of oxygen to support human respiration and life. At sea level such atmospheres are defined as those with less than 19.5% oxygen by volume.

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CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.28 Permissible Exposure Limit (PEL) - An employee's maximum permitted exposure to airborne contaminant materials listed in Table Z-1, Z-2, or Z-3 of OSHA regulations section 29 CFR 1910.1000 or substance specific standards such as lead in 29 CFR 1910.1025.

1.4.29 Personal Protection Controls - Devices such as earplugs and respirators, used to protect employees from safety and health concerns found or likely to be found in the work place.

1.4.30 Physician - A medical doctor responsible for evaluating whether employees are medically able to use respiratory protective equipment.

1.4.31 Pliable - Easily stretchable; state of usable rubber straps or facepiece material on respirator.

1.4.32 Protection Factor (PF) - Actual protection given to a respirator user against potential respiratory hazards. A PF is usually represented as ratio of a contaminant's concentration in ambient air to the concentration in air inside the respirator facepiece. Higher ratios indicate greater levels of protection.

1.4.33 Respirator - Device worn by employee for protection from inhalation of harmful airborne contaminants.

1.4.34 Respirator-Eligible - Determined medically able to use both air-purifying and airline respirators.

1.4.35 SCBA - Self-contained breathing apparatus.

1.4.36 SCBA-Eligible - Determined medically able to use a SCBA unit.

1.4.37 Subcontractors/Vendors - Employees of non-WEMCO organizations which require access to the FEMP for the purpose of providing supplies (or performing some service or construction activity) at the FEMP in performance of their employers' contractual obligations. On-site employees of other DOE prime contractors are considered subcontractors.

1.4.38 Threshold Limit Value (TLV) - Exposure level under which most people can work for eight hours a day, five days a week, over a working lifetime with no harmful effects. TLV's are established by American Conference of Governmental Industrial Hygienists.

CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.39 Time Weighted Average (TWA) - Average exposure of worker during an eight hour work day as determined by either periodic or continuous sampling.

1.4.40 Visitors - Any person (to include temporary employees and Internal Westinghouse Requisition personnel), other than WEMCO/DOE employees, subcontractor or vendor personnel who has been properly authorized and issued temporary or permanent credentials for access to the FEMP.

1.5 DRIVERS

1.5.1 DOE Order 5480.4, "Environmental Protection, Safety and Health Standards.

CHAPTER 2.0 - TYPES OF EQUIPMENT

2.1 Tables 2-1 through 2-3 list the types of air-purifying respirators, air-supplied respirators, and cartridges and canisters available for use at the FEMP. Only NIOSH-approved equipment shall be chosen for use at the FEMP.

2.2 Typical examples of respiratory protection equipment are shown in Figures 2-1 through 2-5. Consult with the Respiratory Protection Program Administrator for the current lists of available equipment.

2.3 Both air-purifying and air-supplied respirators shall be used in accordance with their limitations and capabilities listed in Chapter 3.0.

2.4 Contact Industrial Hygiene for proper respiratory protection equipment selection for specific jobs or work activities when chemical air contaminants are involved. For radioactive air contaminants, contact Radiological Safety for proper selection.

2.5 Respirator selection for each job shall be communicated in writing.

TABLE 2-1

Air-Purifying Respirators Available at the FEMP

Half-Mask Respirators:

MSA Comfo II Silicone Respirator +
North 7700 Silicone Respirator
MSA Belt-Mounted Comfo II Silicone Respirator +

Full-Face Respirators:

MSA Ultra-Twin Silicone Respirator +
MSA Ultravue Silicone Respirator +

Powered Air-Purifying Respirators:*

MSA Powered Air-Purifying Respirator with Ultravue Silicone Facepiece +

* Only for use in special circumstances as specified by Industrial Hygiene (e.g., some asbestos removal jobs and other unusual situations).

+ MSA Silicone facepieces may be colored yellow or black.

CHAPTER 2.0 (cont.)

TABLE 2-2

Air-Supplied Respirators Available at the FEMP

Airline Respirators:

MSA Comfo Welder's Half Mask Silicone Rubber Airline Respirator +
MSA Full-Face Silicone Full-Face Airline Respirator +
MSA Sandblast II Abrasive Blasting Hooded Airline Respirator
Bullard TIC-20 Hooded Airline Respirator
North 85300 Series Hooded Airline Respirator
*SurvivAir Combination Self Contained Breathing Apparatus (HIP-PAC) and Pressure Demand Airline Respirator**
*MSA Hip-Air Combination Self-Contained Breathing Apparatus and Pressure Demand Airline Respirator**

Self-Contained Breathing Apparatus Units (SCBA):

SurvivAir Mark 2 SCBA 30 Minute HP Series 9840 Unit
SurvivAir Mark 2 SCBA 60 Minute HP Series 9870 Unit

Emergency Life Support Apparatus Units (ELSA):

ISI Emergency Life Support Apparatus

* Only for use in special circumstances as specified by Industrial Hygiene (e.g., some entrances into confined spaces and other unusual situations).

+ MSA Silicone facepieces may be colored yellow or black.

CHAPTER 2.0 (cont.)

TABLE 2-3

Cartridges and Canisters Available at the FEMP

MSA Cartridges:

GMA	*Chemical Cartridge (Black) for Organic Vapors*
GMC	*Chemical Cartridge (Yellow) for Organic Vapors, Chlorine, Hydrogen Chloride, and Sulfur Dioxide*
GMC-H	*Chemical/Filter Combination Cartridge (Magenta and Yellow) for Organic Vapors, Chlorine, Hydrogen Chloride, Sulfur Dioxide, and against Highly Toxic Dusts, Fumes, Mists, and Asbestos and Radionuclide Particulates*
GMD	*Chemical Cartridge (Green) for Ammonia and Methyl Amine*
Type F	*Pre-Filter for Dusts and Mists*
Paint	*Pre-Filter for Mists of Paints, Lacquers, and Enamels*
Type H	*Ultra Filter Cartridge (Magenta) for Highly Toxic Dusts, Fumes, Mists, Asbestos-containing Dusts, Mists, and Radionuclides*
Mersorb	*Indicator Cartridge (Orange) for Metallic Mercury Vapor and Chlorine*
Mersorb-H	*Indicator Cartridge (Orange) for Metallic Mercury Vapor and Chlorine and Ultra Filter (Magenta) for Highly Toxic Dusts, Fumes, Mists, Asbestos-containing Dusts, Mists, and Radionuclides*

North Cartridges:

N7500-1	*Chemical Cartridge (Black) for Organic Vapors*
N7500-3	*Chemical Cartridge (Yellow) for Organic Vapors, Chlorine, Hydrogen, Chloride, and Sulfur Dioxide*
N7500-4	*Chemical Cartridge (Green) for Ammonia and Methyl Amine*
N7500-8	*Filter Cartridge (Magenta) for Highly Toxic Dusts, Fumes, Mists, Asbestos and Radionuclide Particulates*
N7500-10	*Pre-Filter for Mists of Paints, Lacquers, and Enamels*
N7500-23	*Pre-Filter for Pesticides*
N7500-83	*Chemical/Filter Combination Cartridge (Magenta and Yellow) for Organic Vapors, Chlorine, Hydrogen Chloride, Sulfur Dioxide and Highly Toxic Dusts, Fumes, Mists, and Asbestos and Radionuclide Particulates*

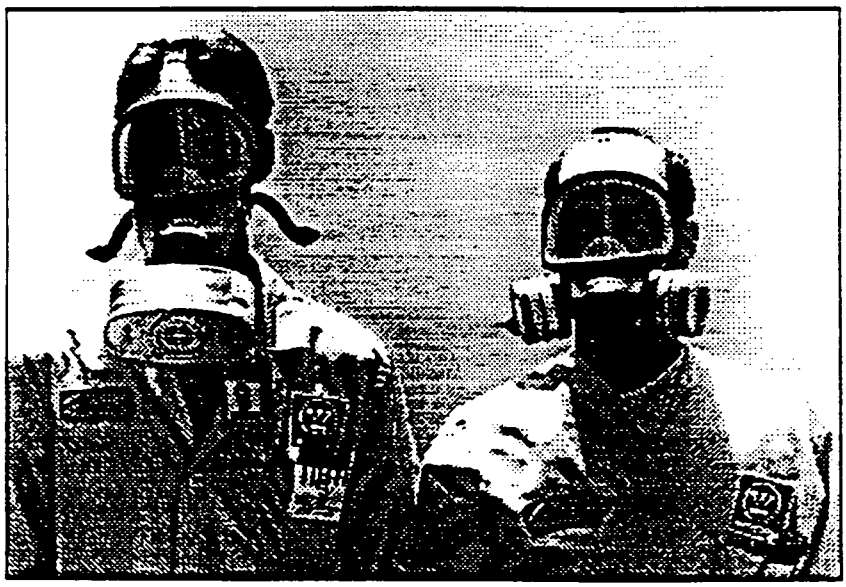
MSA Canisters:

GMD-C	*Chemical Canister (Dark Green with Orange Stripe) for Ammonia, Nonhighly-toxic Dusts and Mists*
GMHF-C	*Chemical Canister (Green with Purple Stripe) for Hydrogen Fluoride and Highly Toxic Dusts, Fumes, Mists and Asbestos and Radionuclide Particulates*
Type H	*Ultra Filter Canister (Magenta) for Highly Toxic Dusts, Fumes, Mists and Asbestos and Radionuclide Particulates*

THREE HALF-MASK RESPIRATORS (FROM LEFT TO RIGHT, A MSA SILICONE RESPIRATOR, A NORTH SILICONE RESPIRATOR, AND A MSA BELT-MOUNTED COMFO II SILICONE RESPIRATOR)

Figure 2-1

CHAPTER 2.0 (cont.)



TWO FULL-FACE RESPIRATORS (FROM LEFT TO RIGHT. A MSA ULTRAVUE SILICONE RESPIRATOR AND A MSA ULTRA-TWIN SILICONE RESPIRATOR)
Figure 2-2

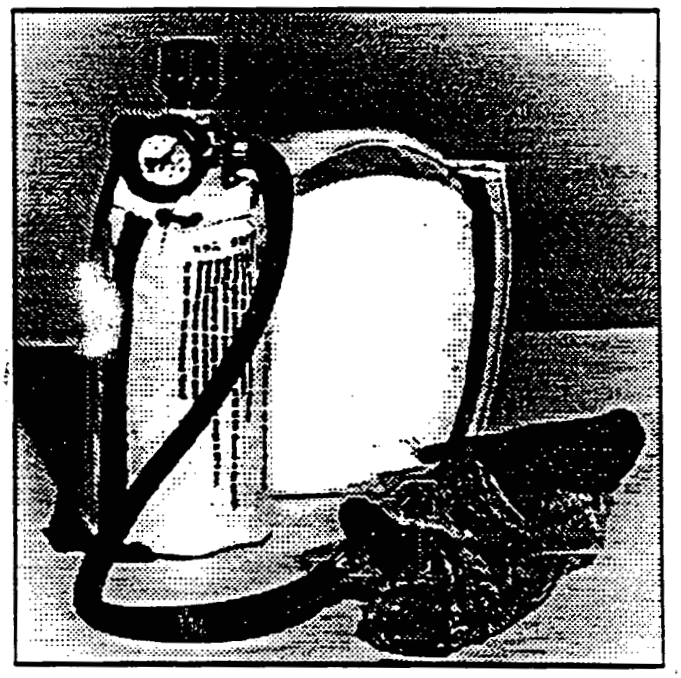
BULLARD TIC-20 HOODED AIRLINE RESPIRATOR AND ANTI-CONTAMINATION PROTECTIVE CLOTHING

Figure 2-3

CHAPTER 2.0 (cont.)

SURVIVAIR MARK 2 SCBA
Figure 2-4

CHAPTER 2.0 (cont.)



ISI EMERGENCY LIFE SUPPORT APPARATUS (ELSA)
Figure 2-5

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CHAPTER 3.0 - EQUIPMENT LIMITATIONS AND CAPABILITIES

3.1 AIR-PURIFYING RESPIRATORS

3.1.1 Air-purifying respirators shall not be worn for any use other than that identified on the type cartridge/canister installed. Contact Industrial Hygiene or Radiological Safety for cartridge/canister selection information.

3.1.2 Mersorb or Mersorb-H indicator cartridges for protection against mercury vapor shall only be used when a Belt-Mounted Comfo II Respirator is worn.

3.1.3 Air-purifying respirators shall not be used for protection against gases or vapors which have poor warning properties. A substance has poor warning properties when the odor, taste, or irritation effects are not detectable or not persistent at concentrations at or below the exposure limit. A substance has no warning properties if it has no odor (e.g., Carbon Monoxide) or causes loss of smell (e.g., Hydrogen Sulfide).

3.1.4 Air-purifying respirators shall not be used as protection against gases which have extremely low occupational exposure limits or for protection against high airborne contaminant concentrations.

3.1.5 Half-mask respirators shall not be used as protection against materials present in concentrations sufficient to cause eye irritation.

3.1.6 Air-purifying respirators shall not be used in atmospheres containing less than 19.5% oxygen or for entry into atmospheres which could quickly and unexpectedly become immediately dangerous to life or health (IDLH).

3.1.7 Air-purifying respirators shall not be used by employees unless they are clean-shaven in all face-sealing areas (see Figures 6-6 and 6-7). Employees with facial hair extending into the area of the exhalation valve shall not be permitted to use air-purifying respirators.

3.1.8 Air-purifying respirators shall not be used for protection against gas or vapor contaminants for which purifying canisters or cartridges have a very short service lifetime.

3.2 AIR-SUPPLIED RESPIRATORS

3.2.1 Air-supplied respirators shall not be used in atmospheres containing less than 19.5% oxygen or for entry into atmospheres which could quickly and unexpectedly become immediately dangerous to life or health. Interruption of airflow to the respirator could be rapidly fatal or very harmful to health.

3.2.2 Airline respirators shall only be used in atmospheres from which a user can escape, if necessary, without the aid of a respirator. If respiratory protection is needed during escape, an airline equipped with a 5 minute escape air cylinder shall be worn.

CHAPTER 3.0 (cont.)

3.2 AIR-SUPPLIED RESPIRATORS (cont.)

3.2.3 The face covering provided by a Hooded Airline Respirator does not provide eye protection as defined by ANSI Z-87.1. Safety glasses or chemical splash goggles shall be worn when using hooded airline or half-mask airline respirators.

3.2.4 Only MSA Hip-Air Combination SCBA and pressure demand airline respirators, SurvivAir Combination (HIP-PAC), and pressure demand airline respirators, or SurvivAir SCBA units shall be used in confined spaces and other atmospheres when Industrial Hygiene or Safety & Fire Services has determined that conditions are or could quickly and unexpectedly become immediately dangerous to life or health (IDLH) and escape can be made within 5 minutes.

3.2.5 Airline respirators and ELSA units shall not be used for fire fighting, rescue activities or entry into Immediately Dangerous to Life or Health (IDLH) atmospheres because of the possibility of airline airflow interruption and the ELSA having only 5 minutes worth of air.

3.2.6 SCBA units shall be used in accordance with applicable Safety and Fire Services Section training, instructions, and requirements.

3.2.7 ELSA units shall only be used to escape from potentially hazardous areas. (ELSA units contain only a five minute supply of compressed breathing air.)

3.2.8 Tightly sealing facepiece air-supplied respirators shall not be used by employees unless they are clean-shaven in all face-sealing areas.

CHAPTER 4.0 - PREREQUISITES FOR RESPIRATOR USE

4.1 MEDICAL CERTIFICATION

4.1.1 An employee must be medically certified by FEMP Occupational Health Services physicians prior to using a respirator. For subcontractor, vendor, and visitor medical requirements, refer to Section 10.2 of this manual.

4.1.2 The employee shall receive a classification for respirator/SCBA use based on the results of a medical review. The respirator/SCBA classifications are listed in Table 4-1.

TABLE 4-1
RESPIRATOR/SCBA CLASSIFICATIONS

CLASSIFICATION	DESCRIPTION
Respirator-eligible	Certified as capable of using both air-purifying and air-supplied (not including SCBAs) respirators.
Airline-only-eligible	Permitted only to use airline respirators, although either tight-fitting (half-mask and full-face) or hooded airline respirators may be used.
Non-eligible	Not permitted to wear any air-purifying or air-supplied respirator.
SCBA-eligible	Certified as capable of using SCBAs.
Non-SCBA-eligible	Not permitted to use SCBAs.

4.1.3 These classifications can impact where employees work and what job assignments they are given. Employees shall not be permitted to use equipment for which they are not medically certified.

4.1.4 Medical respirator certification is valid for one year. However, employees who have a change in their physical status should notify FEMP Occupational Health Services so that their respirator status can be reviewed.

4.2 TRAINING

4.2.1 An employee shall be trained on the proper use and care of the equipment prior to using a respirator.

4.2.2 Training may consist of watching a video cassette or movie, taking interactive computer-programmed courses, listening to a lecture, participating in class discussions, or a combination of learning methods. Class participation with demonstration and hands-on training using respirators available at the FEMP is emphasized in respirator training classes.

4.2.3 Table 4-2 lists the respirator training classes required at the FEMP, their approximate time lengths, the required frequencies, and the classes required for specific groups of employees.

CHAPTER 4.0 (cont.)

4.2 TRAINING (cont.)

TABLE 4-2

RESPIRATOR TRAINING COURSES

Training Course Title	Approximate Course Length (hours)	Frequency	Required Attendees
Basic Principles of Respiratory Protection	*3.0*	*Annually*	*All Respirator Program Participants*
SCBA Training	*3.0*	*Annually*	*Respirator Program Participants as determined by Safety and Fire Services and Supervision*

4.2.4 Supervisors shall be responsible for ensuring their personnel attend required classes. Supervisors shall be given additional instruction covering respirator issuance and other aspects of the respirator program for which they are responsible.

4.2.5 In addition to the required training listed in Table 4-2, the following training methods are also available which supplement information given in the basic principles class:

4.2.5.1 A training video tape titled "Airline Respirator Use and Maintenance" lasting 0.5 hours, designed for airline users.

4.2.5.2 A training class and exercise titled "Emergency Life Support Apparatus (ELSA) Training" lasting 0.5 hours, designed for personnel who may use ELSA.

4.3 FIT TEST REQUIREMENTS

4.3.1 Respirator fit testing, conducted by Industrial Hygiene, is required for all respirator program participants (Refer to Table 4-3). This test is used to determine the size and make of respirator(s) which provides acceptable protection from the inhalation of potential respiratory hazards for each individual.

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CHAPTER 4.0 (cont.)

TABLE 4-3
RESPIRATOR PROGRAM JOB CLASSIFICATIONS

WEMCO PERSONNEL

IRS&T Department

Safety & Fire Services
- Fire Protection Engineer
- Safety Engineer
- Fire & Safety Inspector
- Fire Protection Specialist
- Industrial Hygiene
- Industrial Hygiene Manager
- Industrial Hygiene Technologist
- Industrial Hygiene Technician

Radiological Safety
- RAD Engineer
- Radiological Support Supervisor
- Technicians
- Technical Trainee

Safeguards & Security
- Armorer
- Police Lieutenant
- Security Police Officer

Site Services Department

Operations Quality Control
- Inspector
- Gauge Set-Up Worker

Maintenance Group
- Apprentice
- Carpenter
- Electrician
- Engineer
- Industrial Mechanic
- Instrument Mechanic
- Laborer
- Mason
- Millwright
- Oiler
- Painter
- Pipefitter
- Planner-Estimator
- Supervisor
- Welder

Site Services Department (cont.)

Utilities
- Assist. Pump Operator
- Assist. Water Plant Operator
- Boiler Operator
- Boiler Operator Helper
- Bulldozer Operator
- Power Plant Oiler
- Pump Operator
- Stationary Engineer
- Utility Engineer
- Waste Treatment Operator
- Water Plant Operator

Site Services Operations
- Chemical Operator
- Decontaminator
- Degreaser
- Engineer
- Graphite Machinist
- Industrial Cleaner
- Laborer
- Machine Set Up Operator
- Machine Tool Operator
- Packer
- Site Service Worker
- Supervisor
- Technical Trainee

Support Services
- Laundry Worker
- Laundry & Housekeeping Supervisor

Transportation & Support Services
- Heavy Equipment Operator
- Laborer
- Motor Vehicle Operator
- Transportation Supervisor

Logistics Administration & Inventory Control & Warehousing
- Inventory Control Supervisor
- Storeroom Attendant

CHAPTER 4.0 (cont.)

TABLE 4-3 (cont.)

Project Management & Acquisitions Department

Construction Coordination & Support
Construction Field Coordinator

Other employees as authorized by supervision and Industrial Hygiene

NON-WEMCO PERSONNEL

RUST Engineering

Area Manager
Quality Assurance Inspector
General Foreman
Safety Coordinator
Foremen
Project Engineer
Craftsmen (RUST Employees)

SUBCONTRACTORS, VENDORS AND VISITORS

Subcontractors, Vendors and Visitors as determined by Industrial Hygiene depending on activity/job.

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CHAPTER 4.0 (cont.)

4.3 FIT TEST REQUIREMENTS (cont.)

4.3.2 Respirator fit tests are valid for one year for non-asbestos work or six months for asbestos work.

4.3.3 The respirator user shall be issued a fit test card (Figure 4-4) after the successful completion of the test which identifies respirator(s) approved for use.

4.3.4 During the fit test and before each time a respirator user enters a contaminated atmosphere, the following steps must be performed:

4.3.4.1 Inspect the respirator.

4.3.4.2 If an air purifying type, install specified cartridges.

4.3.4.3 Don and adjust the respirator.

4.3.4.4 Perform a negative and/or positive field fit check as described in Section 4.4 for all tightly sealing facepiece respirators.

4.3.5 Employees shall not be fit tested when wearing glasses or other objects (e.g. skull caps) which enter into or could obstruct the face sealing area.

4.3.6 Employees shall not be fit-tested when facial hair is present in face sealing area (See Section 6.6).

4.4 FIELD OR SELF-FIT CHECK METHODS

4.4.1 Field or self-fit checks and/or quantitative fit tests are conducted at the FEMP to ensure employees receive and maintain good respirator seals for all tightly sealing facepiece respirators.

4.4.2 A field or self fit-check shall be conducted by respirator wearers to check their own face-to-respirator seals with the particular respirator types with which they successfully quantitatively or qualitatively were fit tested.

4.4.3 No special equipment or materials are required. The two types of self-fit checks are the positive pressure test and the negative pressure test. These tests shall be conducted by workers every time they wear a respirator having a tightly sealing facepiece.

4.4.4 The following precautions for performing self-fit checks shall be observed:

4.4.4.1 Self-fit checks must be performed carefully.

4.4.4.2 Do not distort or reposition the respirator while performing these tests.

CHAPTER 4.0 (cont.)

4.4 FIELD OR SELF-FIT CHECK METHODS (cont.)

4.4.4.3 If a respirator face position is accidentally changed/shifted, the wearer must reposition it and then perform the self-fit checks again.

4.4.5 A Positive Pressure Check shall be performed (see Figure 4-1) as applicable in the field before entering the area where respiratory protection is necessary as follows:

4.4.5.1 Place the palm of one hand over exhalation valve cover and exhale gently into facepiece.

4.4.5.2 If a slight positive pressure is built up inside the facepiece without any evidence of outward leakage, the respirator fit is satisfactory.

4.4.5.3 If air is leaking from respirator, refer to Table 4-4 for corrective action.

TABLE 4-4
RESPIRATOR FIT TROUBLESHOOTING GUIDE
(Positive Pressure Test)

RESPIRATOR TYPE	PROBLEM	CONDITION AND/OR CAUSE	CORRECTIVE ACTION
Half-mask	Leakage of air usually around the eyes or neck	Poor fit	Readjust the respirator position on the face and/or tighten the head straps. Perform positive pressure test again.[1]
Full-face	Leakage of air around the temples, forehead, or neck	Poor fit	Readjust the respirator position on the face and/or tighten the head straps. Perform positive pressure test again.
Half-mask	Leakage of air on exhalation at some place besides faceseal	Leakage at inhalation valves or cartridge gaskets	Remove respirator and repeat inspection. Get another respirator if defect is not correctable.
Full-face	Leakage of air on exhalation at some place besides faceseal	Leakage at inhalation valves, cartridge gaskets, inhalation valves; speaking diaphragm, or visor	Remove respirator and repeat inspection. Get another respirator if defect is not correctable.

(1) If the respirator fails again, a second respirator must be tested. If a successful fit cannot be achieved after trying three respirators, Industrial Hygiene shall be contacted for assistance.

POSITIVE PRESSURE TEST DEMONSTRATION
Figure 4-1

CHAPTER 4.0 (cont.)

4.4 FIELD OR SELF-FIT CHECK METHODS (cont.)

4.4.7 A Negative Pressure Check shall be performed (see Figure 4-2) as applicable in the field by workers before entering an area where respiratory protection is necessary as follows:

NOTE: This test can be performed for both tight-fitting air-purifying and air-supplied respirators. Also this test may be required for a respirator having a unique exhalation valve assembly design.

4.4.7.1 On air-purifying respirators place palms of hands over the air inlet areas of the respirator cartridges or canister and inhale gently. On tight-fitting airline respirators close off the inlet at the inlet of the breathing tube and inhale gently. As wearer inhales, respirator facepiece should collapse.

4.4.7.2 If a good respirator-to-face seal is obtained, wearer will be able to hold breath fo: 5 to 10 seconds without facepiece filling with air (i.e., air leaking into the deflated facepiece).

4.4.7.3 If facepiece fills with air during the test, refer to Table 4-5 for corrective action.

TABLE 4-5
RESPIRATOR FIT TROUBLESHOOTING GUIDE
(Negative Pressure Test)

RESPIRATOR TYPE	PROBLEM	CONDITION AND/OR CAUSE	CORRECTIVE ACTION
Half-mask or Full-face	Facepiece fills with air during negative pressure test	Poor fit	Reposition the respirator and/or tighten straps. Perform test again.[1]
Half-mask	Air enters facepiece somewhere other than faceseal	Leakage of exhalation valve or cartridge gaskets	Remove respirator and repeat inspection. Obtain another respirator if defect is incorrectable.
Full-face	Air enters facepiece somewhere other than faceseal	Leakage at exhalation valve, cartridge gaskets, inhalation valve assembly, speaking diaphragm, or visor	Remove respirator and repeat inspection. Obtain another respirator if defect is incorrectable.

[1] If the respirator fails again, a second respirator must be tested. If a successful fit cannot be achieved after trying three respirators, Industrial Hygiene shall be contacted for assistance.

CHAPTER 4.0 (cont.)

NEGATIVE PRESSURE TEST DEMONSTRATION
Figure 4-2

CHAPTER 4.0 (cont.)

4.5 Other Fit Test Methods

4.5.1 A Qualitative Test using "banana oil" is used for a pre-test for an asbestos protective respirator and shall be performed as follows:

4.5.1.1 The tester shall ensure the wearer has a sense of smell which can detect the material.

4.5.1.2 Wearer shall stand in front of fume hood while a weak concentration of "banana oil" is released from a stencil brush and moved slowly along the faceseal.

4.5.1.3 If the wearer has a poor respirator-to-face seal, the banana odor will be detected during one or more of the test exercises.

4.5.1.4 If no odor is detected during any of the test exercises, the wearer is then given a quantitative fit test.

4.5.2 A Quantitative Test is considered the most reliable method for determining which respirator provides the best face-to-mask seal and shall be performed as follows:

NOTE: For a Quantitative Test, the TSI PortaCount instrument and a personal computer are used to measure leakage of ambient particles from room air into the respirator facepiece (See Figure 4-3). The PortaCount has a device known as a condensation nuclei counter, which uses alcohol to increase the size of small dust particles to allow them to be detected by the unit's sensitive optical particle counting system.

4.5.2.1 The tester has the wearer don a respirator and perform both negative and positive pressure tests with the respirator.

NOTE: During these steps, the tester minimizes any coaching of the wearer on how to put on and adjust the respirator.

4.5.2.2 The tester then guides the employee through a series of fit test exercises: normal breathing, deep breathing, turning the head side-to side, raising the head up and down, reading, grimacing, touching the toes, jogging, and normal breathing.

4.5.2.3 A fit test factor (FTF) is calculated after each exercise and an average fit test factor for all exercises is calculated at the end of the test.

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CHAPTER 4.0 (cont.)

TSI PORTA COUNT COMPUTER-CONTROLLED FIT-TEST UNIT
Figure 4-3

CHAPTER 4.0 (cont.)

4.5 Other Fit Test Methods (cont.)

4.5.2.4 Both OSHA and ANSI require that a FTF of 10 be obtained for half-mask and 100 for full-face respirators. At the FEMP, a minimum FTF of 50 for half-mask and 200 for full-face respirators must be obtained, although much higher levels exceeding 1000 of protection are usually achieved. The OSHA asbestos standard requires that a FTF of 100 be obtained for half-masks and 1000 for full-faces if the fit is satisfactory.

4.6 Fit Test Cards

4.6.1 Fit test cards shall be issued following successful fit tests by Industrial Hygiene personnel to FEMP respirator-eligible employees who have been medically certified and have successfully attended the "Basic Principles of Respiratory Protection" training class.

4.6.2 Airline-only-eligible employees shall be issued fit test cards after being medically certified and successfully attending the "Basic Principles of Respiratory Protection" training class.

4.6.3 The fit test card shown in Figure 4-4 shall include the name, badge number, and picture of employee; list of brands, types, styles, and size of respirator the employee can use at the FEMP; the fit test date, the card expiration date, and employee and fit tester signature. Asbestos fit-test cards shall also list the FTF and the respirator's NIOSH approval number.

4.6.4 Airline-only-eligible employee fit test cards shall have "Airline Respirators Only" written on them rather than a specific listing of respirator brands, types, styles, or sizes.

4.6.5 Employees are only allowed to wear the air-purifying respirator brands, types, styles, and sizes listed on their cards. If a card specifies that a North silicone medium half-mask respirator and a MSA silicone medium full-face respirator are to be worn, then only those two respirators can be used by the employee at the FEMP.

CHAPTER 4.0 (cont.)

PHOTO	RESPIRATOR TYPE/SIZE	
	1.	
	2.	
	3.	
	Employee:	Date:
	Fit Tester:	Date:

Employee is permitted to use the above respiratory protection device only.

Name:	Badge:
Expiration Date: (Non-Asbestos Work):	Expiration Date (Asbestos Work):

THIS CARD IS VALID ONLY AT THE FEMP

FS-F-2581 (REV. 2/21/92)

GENERAL WEMCO RESPIRATOR USE RULES

1. Store respirators and cartridges issued to you in bags inside boxes with your name on them. Keep these clean in lockers, toolboxes, vehicles, etc. as directed by supervision.
2. Before each use, always inspect, don, and check the fit of your respirator (by conducting a positive and negative pressure test) in an area where respiratory protection is not necessary.
3. During the workday, keep your respirator clean and uncontaminated between uses or discard after each use in a green and white respirator recycling receptacle as directed by supervision. Do not use the same respirator for more than one shift.
4. Never leave your respirator lying out in the work place.
5. For questions concerning respiratory protection, dial extension 6231.

	NIOSH APPROVAL TC-21C-	FIT TEST FACTOR
1.		
2.		
3.		

THIS CARD IS VALID ONLY AT THE FEMP

FS-F-2581 (REV. 2/21/92)

FEMP FIT TEST CARDS, FRONT (TOP) AND BACK (BOTTOM) DESIGN
Figure 4-4

CHAPTER 4.0 (cont.)

4.6 Fit Test Cards (cont.)

4.6.6 Fit test cards are valid only at the FEMP.

4.6.7 On the back of fit test cards, are general WEMCO rules for respirator use at the FEMP.

4.6.8 Pictures are included on fit test cards to document acceptable facial hair status.

4.6.9 If a fit test card is found and the owner cannot be located, it should be returned to Industrial Hygiene. Industrial Hygiene will return it to the employee.

4.6.10 If a fit test card is lost, Industrial Hygiene should be contacted so that a replacement card can be made.

CHAPTER 5.0 - SELECTION AND ISSUANCE OF RESPIRATORY PROTECTION EQUIPMENT

5.1 Industrial Hygiene personnel shall be responsible for ensuring the proper selection of respiratory protection equipment for all potential hazards from airborne contaminants, other than radioactivity, including dust, mists, fumes, gases, and vapors.

5.2 Radiological Safety personnel shall be responsible for ensuring proper selection of respiratory protection equipment for potential hazards from radioactive airborne contaminants.

5.3 Selections shall be made for each job or work area based upon the type(s) of contaminant(s) present or likely to be present and its (their) expected concentration(s). Factors such as skin, head, and eye protection as well as employee comfort shall also be considered. The Respirator Selection Chart Guide (Figure 5-1) shall be used.

5.4 Respiratory equipment selections are communicated in writing to supervision by the following means:

5.4.1 Specific or general operating procedures

5.4.2 Work Permits or Chemical, Radiological, Asbestos, Flame/welding, or Confined Space Entry Permits

5.4.3 Memoranda

5.4.4 Workplace warnings or signs at equipment or radiological areas

5.4.5 Project/Task Specific Health and Safety Plans

5.4.6 Periodically updated list of routine jobs requiring respiratory protection

5.5 Respirators shall be issued to wearers by supervisors or designees who have attended the class "Respiratory Protection for Supervisors".

<u>NOTE</u>: To assist in this, Industrial Hygiene shall transmit a list of respirator-qualified employees including the type of respirator.

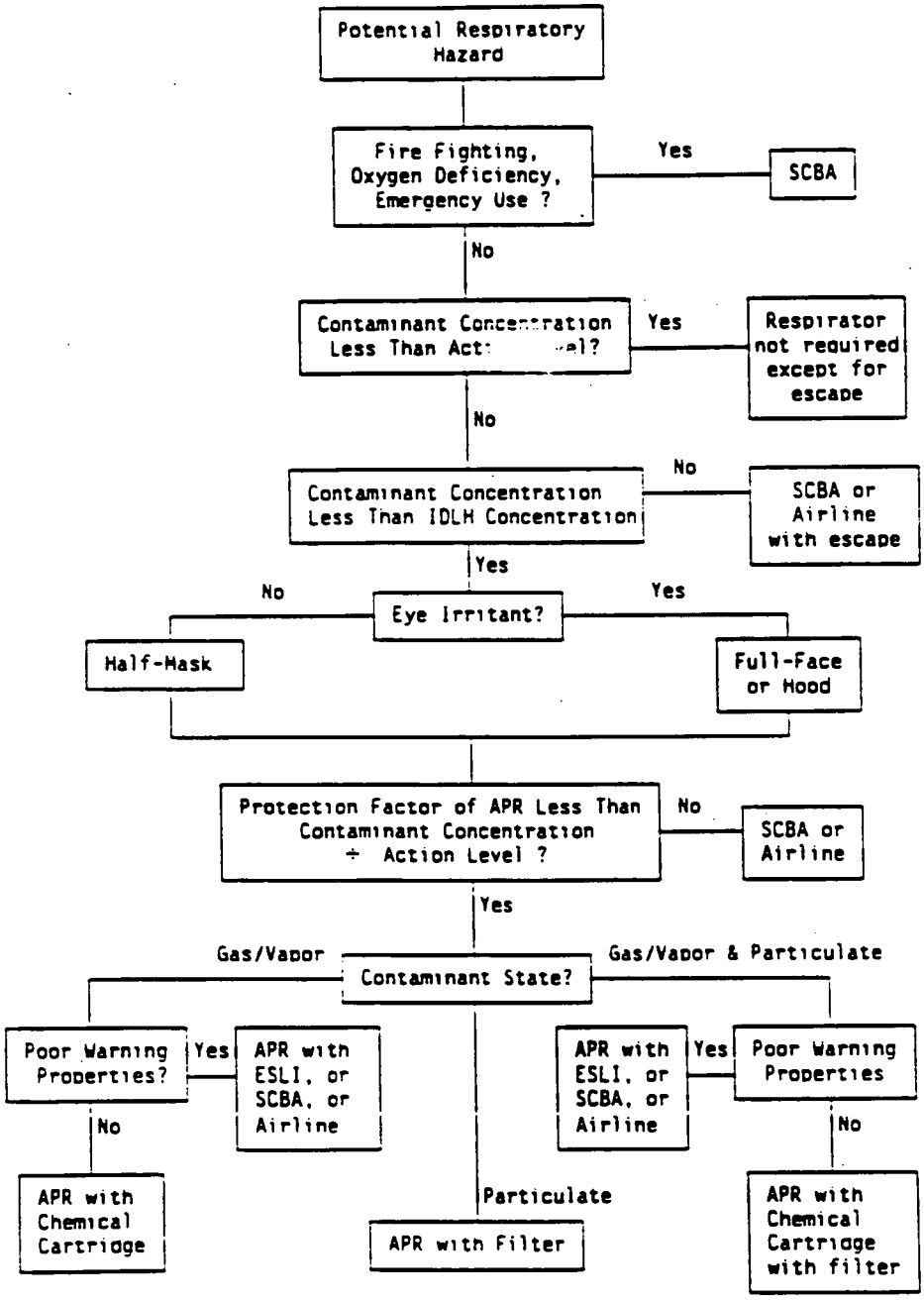
5.5.1 The supervisor (or designee) is responsible for ensuring the following:

5.5.1.1 Wearers use the proper type respirator/cartridges in accordance with requirements as stated in 5.3.

5.5.1.2 Wearers are qualified to use respirators who have been trained and fit-tested in the last 12 months or fit tested in the last 6 months for asbestos or other specific contaminants as required by OSHA.

CHAPTER 5.0 (cont.)

RESPIRATOR SELECTION DECISION LOGIC



Glossary: APR = Air-Purifying Respirator
ESLI = End-of-Service Life Indicator
IDLH = Immediately Dangerous to Life or Health
SCBA = Self-Contained Breathing Apparatus

INDUSTRIAL HYGIENE AND RADIOLOGICAL SAFETY RESPIRATOR SELECTION CHART GUIDE

Figure 5-1

CHAPTER 5.0 (cont.)

5.5.1.3 Wearers have no interfering facial hair.

5.5.1.4 Wearers receive the proper size and brand respirator. Refer to Table 5-1 for a list of available respirators with Stores number.

5.6 Questions regarding proper selection or issuance regarding non-radioactive respiratory protection concerns shall be referred to Industrial Hygiene.

5.7 Questions regarding proper selection or issuance regarding radioactive respiratory protection concerns shall be referred to Radiological Safety.

TABLE 5-1
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
Air-Purifying Respirators & Parts	
North Respirators & Parts	
North Silicone Half-Mask, Small	M-594
North Silicone Half-Mask, Medium	M-593
North Silicone Half-Mask, Large	M-595
North Black Cartridge	M-464
North Green Cartridge	M-473
North Magenta Cartridge	M-466
North Yellow Cartridge	M-465
North Magenta/Yellow Cartridge	M-574
North Paint Spray Prefilter	M-509
North Paint Spray/Pesticide Prefilter Cover	M-510
MSA Respirators & Parts	
MSA Silicone Half-Mask, Small	M-616
MSA Silicone Half-Mask, Medium	M-615
MSA Silicone Half-Mask, Large	M-614
MSA Silicone Half-Mask Belt-Mounted, Small	M-706
MSA Silicone Half-Mask Belt-Mounted, Medium	M-707
MSA Silicone Half-Mask Belt-Mounted, Large	M-708
MSA Silicone UltraTwin Full-Face, Small	M-636
MSA Silicone UltraTwin Full-Face, Medium	M-637
MSA Silicone UltraTwin Full-Face, Large	M-638
MSA Silicone UltraVue Full-Face, Small	M-610
MSA Silicone UltraVue Full-Face, Medium	M-611
MSA Silicone UltraVue Full-Face, Large	M-612
MSA Black Cartridge	M-118
MSA Green Cartridge	M-474
MSA Magenta Cartridge	M-392
MSA Yellow Cartridge	M-081
MSA Magenta/Yellow Cartridge	M-573
MSA UltraTwin Dual Cartridge Adapter for UltraVue	M-852

CHAPTER 5.0 (cont.)

TABLE 5-1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
Air-Purifying Respirators & Parts	
MSA Respirators & Parts (cont.)	
MSA Paint Spray Prefilter	M-118
MSA Paint Spray Prefilter Cover	M-512
MSA Prefilter Dispenser, 20	M-511
MSA Orange Cartridge	M-714
MSA Orange/Magenta Cartridge	M-851
MSA Green Canister	M-703
MSA Magenta Canister	M-701
MSA HF/Magenta Canister	M-626
MSA Spectacle Kit for Full-Face Respirators	M-609
MSA Plastic Cover Lens for F[illegible] Respirators	M-635A
MSA Nose Cup for Full-Face Respirators, Medium	M-813
MSA Nose Cup for Full-Face Respirators, Large	M-814
MSA Welder's Adapter	M-645
MSA Welder's Glass Cover	M-646
MSA Spring Lens Welder Adapter	M-647
MSA Welder's Adapter Filter Plate, Shade 6	M-812
MSA Welder's Adapter Filter Plate, Shade 10	M-648
MSA Welder's Adapter Filter Plate, Shade 12	M-649
Nomex Hood with Shoulder Cowl for MSA Welder's Adaptor	M-644
General Air-Purifying Accessories	
Plastic Bag 10 X 12 inches for half-mask respirator storage	M-849
Cardboard Box 11 X 7 X 5 inches for respirator storage	S-271
Belt-Mounted Carrying Bag for Half-Mask	M-627
Fog-Pruf Tissues	M-756
MSA Cleaner-Sanitizer II	M-699
Plastic Storage Bags for airline and full-face respirators	M-531
Ties for Plastic Storage Bags	S-255
Deficient Respirator Tags	K-728
Reconditioned Respirator Cards	K-778
North & MSA Air-Purifying Respirator Repair Parts	
MSA Half-Mask Respirator Exhalation Valve	M-527
MSA Ultra Vue Full-Face Respirator Canister Adapter	M-758
MSA Thick Plastic Lens for Full-Face Respirators	M-635
North Headbands for North Silicone Half-Mask Respirator	M-815
North Silicone Half-Mask Valve Cover	M-816
MSA UltraTwin Cartridge Receptacle	M-853
MSA Cartridge Receptacle Gasket for Comfo & UltraTwin	M-854
MSA UltraVue Inhalation Valve Spider Gasket	M-865
MSA Respirator Exhalation Valve Cover	M-868

CHAPTER 5.0 (cont.)

TABLE 5-1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
Airline Respirators & Parts	
North Respirators & Parts	
North Hooded Airline Respirator 85300 Series	M-735
North Replacement Hood for 85300 Series	M-734
North 25 Foot Airline Hose	M-784
MSA Respirators & Parts	
MSA Welder's Half-Mask Airline, Small	M-782
MSA Welder's Half-Mask Airline, Medium	M-549
MSA Welder's Half-Mask Airline, Large	M-783
MSA Full-Face Airline, Small	M-764
MSA Full-Face Airline, Medium	M-765
MSA Full-Face Airline, Large	M-766
MSA "DuoFlo" Airline Respirator Valve	M-850
MSA 25 Foot Airline Hose	M-382
MSA 50 Foot Airline Hose	M-390
MSA Web Belt	M-529
Coupling, 3/4" Female to 1/4" Male NPT	M-571
Coupling, 3/4" Male to 1/4" Male NPT	M-396
Breathing Tube for MSA Airline Respirator	M-711
Flow Control Valve with Schraeder fitting	M-855
Plastic Sleeve for MSA airline breathing tubes	M-866
Bullard Respirators & Parts	
Bullard Hooded Airline Respirator	M-619
Bullard Hooded Airline Respirator with Hard Hat	M-810
Bullard Replacement Hood	M-619A
Bullard 25 Foot Starter Airline Hose	M-779
Bullard 25 Foot Airline Hose	M-778
Bullard Climate Control (Vortex) Tube Kit	M-763
Coupling 3/8" Female NPT x 1/4" Male NPT for Bullard Hoses	M-817

CHAPTER 5.0 (cont.)

TABLE 5-1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
Airline Respirators & Parts	
General Airline Station Items	
Compressed Breathing Air, 244 cu. ft cylinder	C-429
MSA Airline Station Filter Assembly Complete	M-393
MSA Airline Station Filter Cartridge	M-498
MSA Airline Station Chemical Cartridge	M-497
MSA Airline Station Pressure Regulator with Gauge	M-811
MSA Airline Station Filter Gasket I	M-651
MSA Airline Station Filter Gasket II	M-652
CO Monitor Replacement Sensor	M-620
Airline Station Outlet Fitting Plug & Chains	M-704
"Airline Station" Signs	S-252
"Airline Respirator Minimum Pressure" Signs	S-257
"Do Not Disconnect - Airline Respirator in Use" Tags	S-260
"Deficient Respirator" Tag	K-728
PVA Plastic Bags for Disposing Asbestos Respirators	S-261
Coupling, 1/4" Female NPT to 1/4" Female Schraeder	M-383
Coupling, 1/4" Female NPT to 1/4" Male Schraeder	M-384
Filter Cartridge Element for Air Systems International Portable Breathing Air Compressor	M-856

CHAPTER 6.0 - RESPIRATOR USE

6.1 RESPIRATOR INSPECTION

6.1.1 Respirator users shall carefully and thoroughly inspect respiratory protection equipment prior to each use of that equipment.

6.1.2 Users must ensure that all equipment parts are present and in proper working order, and that the equipment has an inspection tag placed either in its plastic storage bag, or in its storage carton, that verifies that the equipment has been inspected within one year (12 months) of its intended use.

6.1.3 Equipment not inspected within one year of the intended use shall immediately be placed in a recycling receptacle. Excluded from point of use inspection shall be SCBAs which are inspected monthly by Safety and Fire Services Section.

6.1.4 The following respirator parts shall be inspected for defects during pre-use inspections:

6.1.4.1 Facepieces - Ensure there are no cracks, tears, or deformities in shape.

6.1.4.2 Straps/Harnesses - Ensure that there are no cracks in plastic components, no fraying (loose threads) in cloth/elastic components, that rubber/elastic components are functioning properly and still elastic, and that all necessary buckles, snaps and/or fittings are present and are not rusty.

6.1.4.3 Valves - Verify that inhalation and exhalation valves are loose and flat and not cracked, torn, warped, or deformed. Also verify that the plastic valve seats are clean and not cracked. Ensure exhalation covers are tightly affixed and not cracked. Verify that there are no pieces of foreign material (i.e. paper, plastic, lint, or hairs) between the exhalation valve and the valve seat.

6.1.4.4 Cartridge/Canister Receptacles - Ensure threads are not worn. MSA units have gaskets present and not cracked, and the receptacle is not cracked.

6.1.4.5 Cartridges/Canisters - Check metal cartridges for dents and plastic ones for cracks, chips, damage to threads. Screw cartridges onto receptacles using two hands and putting them on tightly, so they won't loosen and leak when the rubber seal warms up. Care should be taken to avoid cross threading cartridges.

6.1.4.6 Lenses - Observe that full-face and airline hood lenses are not scratched or cracked and visibility is clear and unobstructed. Observe that the full-face visor clamp is tight and there is an even bead of rubber between the clamp and the visor. An optional mylar scratch protector sheet is available to keep the visor clean.

CHAPTER 6.0 (cont.)

6.1 RESPIRATOR INSPECTION (cont.)

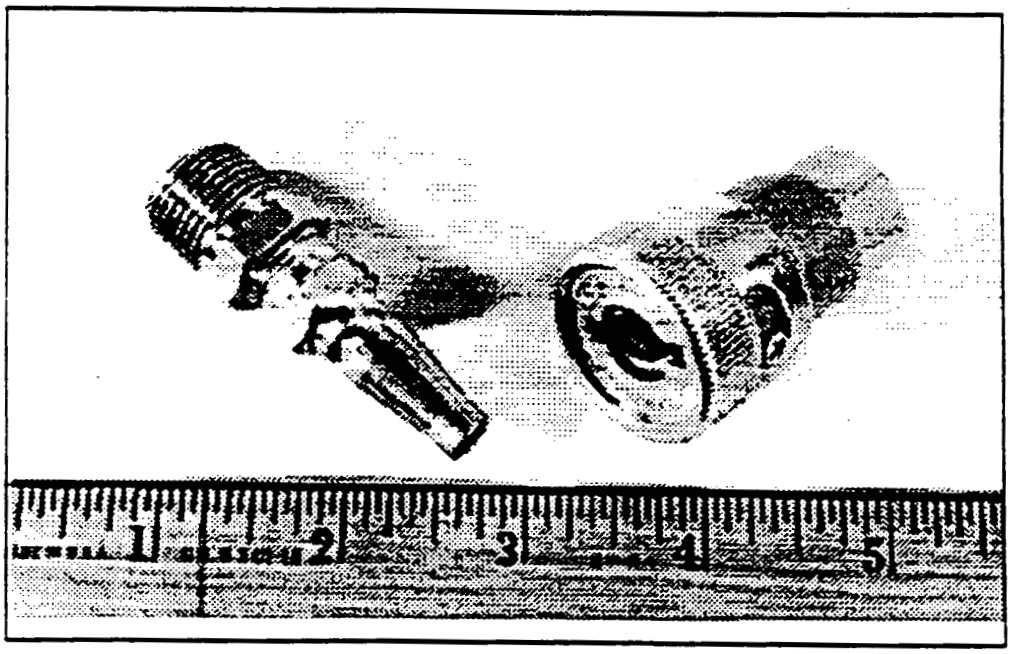
6.1.4.7 Speaking Diaphragm Assembly - Check that the speaking diaphragm is present, the retaining ring is screwed in tightly, and that the speaking diaphragm assembly is securely attached to the facepiece by its metal clamp ring.

6.1.4.8 Hoods - Observe for any tears, cracks, or material defects.

6.1.4.9 Hoses - Make sure there are no cracks, holes, worn areas, kinks, or rusted fittings on hoses, that quick-disconnect fittings are Schraeder (Figure 6-1) and that quick-disconnect fittings are not used to attach airline hoses together. Ensure that corrugated breathing tubes on airline respirators are protected by a plastic sleeve.

6.1.4.10 UltraVue Inhalation Valve - Look up inside the valve and verify that the six-legged spider gasket and flapper valve behind it are both present. Turn the inhalation valve locknut clockwise to ensure that it is tight.

6.1.4.11 Full-face Eyeglasses/Nosecup - If a prescription spectacle kit or nosecup is needed, install it into the facepiece.



SCHRAEDER MALE (LEFT) AND FEMALE (RIGHT) QUICK DISCONNECT AIRLINE RESPIRATOR HOSE FITTINGS

Figure 6-1

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CHAPTER 6.0 (cont.)

DEFICIENT RESPIRATOR

Missing Part: _____

Defective Part: Facepiece

Brief Description of Problem: Deformed in face sealing area

Area Found: Plant 19

NAME	BADGE NO.	DATE
J. Doe	9999	1-3-88

EXAMPLE OF DEFICIENT RESPIRATOR TAG
Figure 6-2

6.1 RESPIRATOR INSPECTION (cont.)

6.1.5 Inspect all parts to ensure that foreign materials (e.g. dust, chemical or radioactive materials, etc.) are not present.

6.1.5.1 If deficiencies are discovered during inspection, a "Deficient Respirator Tag," Form FMPC-ES&H-2946 (See Figure 6-2) should be completed, attached to the deficient respirator, and the respirator placed in a recycling receptacle.

6.1.5.2 Users must not attempt spur-of-the-moment respirator repair because the indiscriminate substitution of parts from different models or manufacturers renders the NIOSH approval of the respirator null and void.

6.1.6 To complete a "Deficient Respirator Tag", the respirator user should write which respirator part is defective or missing.

6.1.6.1 If the part is defective, a brief description of how the part is defective should be written in the "description of defect" space. Then the area where the respirator was found should be listed on the tag, as well as the inspector's name and badge number, and the date.

6.1.7 Completed tags shall be collected by the respirator cleaning and sanitizing facility and forwarded to Industrial Hygiene.

NOTE: These tags will enable Industrial Hygiene to determine if there are any negative patterns developing and, if necessary, thus ensuring that corrective measures are taken. This will ensure that the WEMCO respirator cleaning and sanitizing facility's quality service is maintained.

CHAPTER 6.0 (cont.)

6.1 RESPIRATOR INSPECTION (cont.)

6.1.8 The deficient respirators will be repaired/reconditioned, rewashed, and resanitized or discarded as appropriate.

6.2 GENERAL REQUIREMENTS

6.2.1 Before each use, respirators shall be inspected, donned, and checked for proper fit (by conducting a negative and positive pressure test) by users in an area where respiratory protection is not necessary.

6.2.2 Respirators shall not be removed until the user has entered an area where respiratory protection is not necessary.

6.2.3 For jobs where re-use of respirators is allowed, respirators shall be stored inside clean, sealed plastic bags between uses on one job. Respirators stored in a locker, toolbox, or vehicle shall b stored inside a box. Reconditioned respirators are supplied in plastic bags. Newly purchased respirators are supplied with a plastic bag in their cartons.

6.2.4 At the end of the shift or job, whichever is sooner, respirators shall be separated from their cartridges and the cartridges discarded. When removing potentially contaminated cartridges, the user shall wear gloves. Respirators are to be returned to their storage bags and the bagged respirators shall be placed in a green and white recycling receptacle. The same respirator shall not be used for more than one shift. For some jobs the respirators shall be recycled each time they are removed when leaving controlled areas.

6.2.5 Respirators used for asbestos work shall have their cartridges removed and discarded as labelled asbestos waste. At the asbestos decontamination area, respirator facepieces shall be placed inside a plastic bag with an asbestos fiber warning label, the bag closed, and placed in a recycling receptacle.

6.2.6 Respirators shall not be left lying out in the workplace.

6.2.7 Users may leave a respirator area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other condition that might require such relief. Examples of such conditions might include the need for an employee to get a drink of water because of a dry throat due to using an airline respirator, the need to replace used cartridges or a canister, or the need for an employee to wash and dry his face to prevent sweat from interfering with his face seal.

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CHAPTER 6.0 (cont.)

6.3 AIR-PURIFYING RESPIRATOR USAGE

6.3.1 Half-mask and/or full-face air-purifying respirators shall be used in situations where atmospheric organic vapors, acid gases, radioactive and non-radioactive dusts, and mists are present or are likely to be present in low concentrations that could constitute a potential health hazard.

6.3.2 Full-face respirators shall be used instead of half-mask respirators when there is a danger that harmful contaminants could splash or blow into wearers' eyes, when the chemical gas or vapor is irritating to the eyes, or when additional respiratory protection is required.

6.3.3 The use of air-purifying respirators is subject to the capabilities and limitations listed in Chapter 3.0 of this manual.

6.4 AIRLINE RESPIRATOR USAGE

6.4.1 An airline respirator may be required when confined space or enclosure entry is necessary and it is verified that the atmosphere of the confined space or enclosure is not immediately dangerous to life or health (IDLH).

6.4.2 In situations where atmospheric chemical contaminants and/or dusts and mists could be present in concentrations that exceed acceptable levels for air-purifying equipment, airline respirators may be used.

6.4.3 Half-mask airline respirators shall only be used in non-IDLH atmospheres which do not contain eye or skin irritants.

6.4.4 Hooded airlines may be used in non-IDLH atmospheres in which some possible eye or skin irritants could exist at lower concentrations. These devices shall only be worn for protection against materials which will not react with or penetrate the hoods or other protective clothing worn. Wearers must also wear safety glasses inside these hoods.

6.4.5 MSA Hip-Air or SurvivAir Combination SCBA (HIP-PAC) and Supplied-Air Respirators and similar devices shall be used in non-IDLH atmospheres in which there is an absence of skin irritants, but there may be the possibility that the atmosphere could change from non-IDLH to IDLH, requiring immediate escape of the user. This device shall not be worn in atmospheres that can change from non-IDLH to IDLH suddenly and without clear warning signs (i.e., odor of leak, sound of exploding valve, or sight of escaping gas).

CHAPTER 6.0 (cont.)

AIRLINE CAUTION TAG
Figure 6-3

CHAPTER 6.0 (cont.)

A VORTEX COOLING OR HEATING TUBE TO COOL AIR GOING INTO A BULLARD HOODED AIRLINE RESPIRATOR.

Figure 6-4

CHAPTER 6.0 (cont.)

6.4 AIRLINE RESPIRATOR USAGE (cont.)

6.4.6 Caution tags (which should be stored in respirator storage cabinets near airline respiratory protection equipment) with the words "Do Not Disconnect Airline Respirator in Use" shall be attached at airline stations and between all 25 and 50 foot connected hoses in use. These tags shall be removed only by the user immediately upon the completion of airline respirator use. An example of this tag is shown in Figure 6-3.

6.4.7 Schraeder quick disconnect fittings (Figure 6-1) shall be the only fittings used in conjunction with breathing air equipment. Schraeder fittings shall be used to connect airline hoses to airline station outlets and to the short breathing tubes attached directly to the airline respirator. Airline hoses shall be connected together using their own threaded hose couplings, not by Schraeder fittings.

6.4.8 Airline hoses should be routed carefully (preferably overhead) to prevent damage from moving traffic and to eliminate tripping hazards.

6.4.9 Vortex Cooling and Heating Tubes (See Figure 6-4) may be used in conjunction with hooded airline respirators to provide cooling or heating relief for respirator users exposed to hot or cold working environments.

6.4.10 Parts of airline respirators from different manufacturers or from other models of the same manufacturer shall not be indiscriminately interchanged, thereby voiding the NIOSH approval. Approval of airline respirators covers not only the hood or facepiece, but also the breathing tube, vortex tube (if available), and airline hose.

6.4.11 Signs are posted above airline stations clearly labelling their location as shown in Figure 6-5.

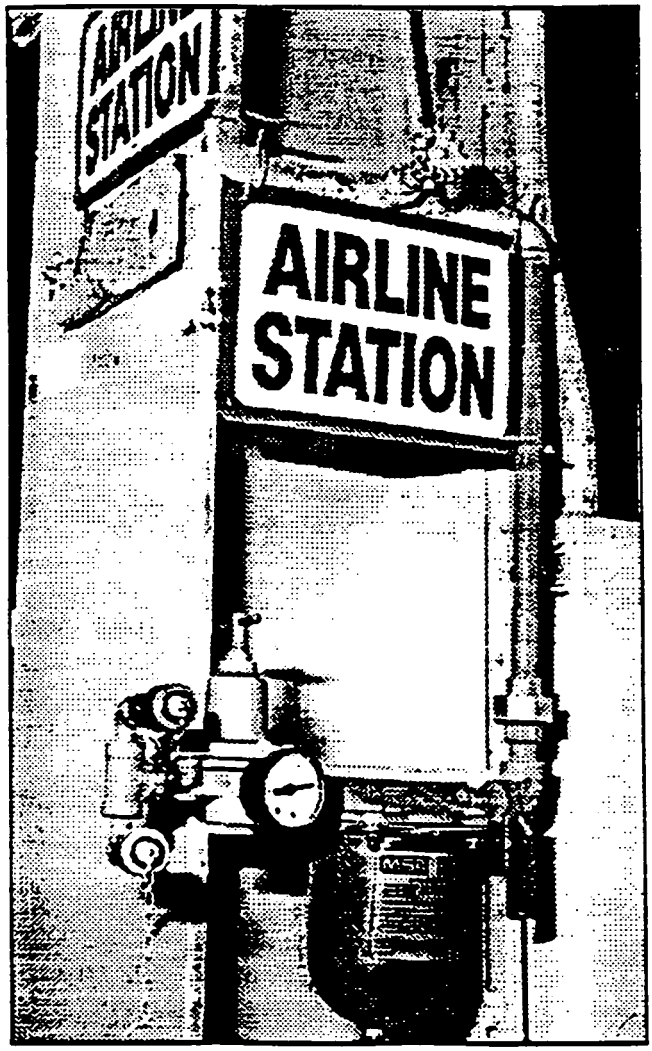
6.4.12 Airline respirators should be used with at least the minimum pressure settings listed in Table 6-1. A sign shall be posted at airline stations listing the proper air pressure settings. For airline respirators not listed on the sign, the quantity of air shall be at least the amount required as a minimum by the manufacturer.

6.4.13 If the pressure at the airline station cannot be set high enough to accommodate the use of a particular respirator type or a vortex tube, then the airline respirator shall not be used at that station.

6.4.14 Where not listed in Table 6-1, continuous flow airline respirators having a tight faceseal require at least 4 cubic feet per minute (cfm) flowrate.

6.4.15 Loose fitting (hooded) airlines require at least 6 cfm. Air flowrate may be checked using a rotameter borrowed from Industrial Hygiene.

CHAPTER 6.0 (cont.)



GREEN AND WHITE LABELLED AIRLINE STATION
Figure 6-5

CHAPTER 6.0 (cont.)

6.4 AIRLINE RESPIRATOR USAGE (cont.)

TABLE 6-1

Minimum Pressure Settings For Airline Respirators

Airline Respirator	Pressure Setting (psig)*
Welder's Half Mask	*35-40*
Full-Face	*35-40*
Hood	*12-45*
Bullard Hood With Vortex Tube	*80-90*

* *Do Not Use Less Than The Recommended Pressure Setting. Do Not Use More Than 300 Feet of Hose per Respirator.*

6.4.16 No more than 300 feet of hose shall be used per airline respirator.

6.4.17 An automatic carbon monoxide alarm to monitor breathing air is in constant service at the FEMP. When the carbon monoxide alarm signal (4-1, 4-1) is sounded, employees shall, as soon as it can be safely accomplished (e.g., after turning off welding flames, exiting the area requiring a respirator, closing enclosure doors, etc.), cease using airline respirators throughout the entire FEMP site, until a Supervisory Alert signal (3-3, 3-3) is sounded and a message is given over the Emergency Message System confirming that the problem has been resolved. Supervisors and other employees shall make sure that airline users in their areas have heard the alarm, left the respirator area, and removed their airline respirators.

6.4.18 Use of airline respirators is subject to the capabilities and limitations listed in Chapter 3.0 of this manual.

6.4.19 Industrial Hygiene routinely monitors the breathing air quality of airline stations to ensure the Grade D specifications of American National Standard Commodity Specifications for Air, ANSI Z86.1-1973 (Compressed Gas Association Commodity Specification for Air, G-7.1, 1973) for oxygen, carbon monoxide, carbon dioxide, condensed hydrocarbons, water vapor, and odor are met. Cylinder air, cascade breathing air systems, or air from portable compressors also must meet these same requirements, and users shall contact Industrial Hygiene to determine monitoring requirements for a particular application.

6.4.20 Portable air compressors used to supply airline respirators shall be of a type specifically designed to supply breathing air. If an oil lubricated compressor is used, it shall be equipped with a high temperature alarm and/or a carbon monoxide alarm. The compressor shall be situated or protected such that exhaust gases and contamination will not enter the air supply. The user shall contact Industrial Hygiene for approval before use of any portable compressor for breathing air.

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CHAPTER 6.0 (cont.)

6.4 AIRLINE RESPIRATOR USAGE (cont.)

6.4.21 Cascade breathing air systems shall be operated according to the manufacturer's written procedure.

6.5 SCBA AND ELSA USAGE

6.5.1 Any positive pressure self-contained breathing apparatus (SCBA) shall be used for entry into known hazardous atmospheres or potentially hazardous atmospheres of unknown concentration or contaminant. SCBA use shall be required in any situation where atmospheric contaminants and/or dusts and mists could be or are likely to be present in concentrations which exceed the capacity of or cannot be captured by other respiratory protection devices.

6.5.2 SCBAs shall be used in IDLH atmospheres only with proper precautions: e.g., appropriate standby personnel present as determined by the Safety and Fire Services, proper protective clothing worn, etc. (SCBA units have either a 30 minute or one hour air supply under normal conditions, depending on whether the 2200 psi - 45 cu. ft or 4500 psi. - 90 cu. ft. air cylinders are used).

6.5.3 Emergency Life Support Apparatus (ELSA) units are permissible only for use as an escape device and are not acceptable for entry into hazardous or unknown atmospheres. (ELSA units have a 5 minute air supply.)

6.5.4 Only specially trained personnel shall use SCBA. (See Section 5.4.)

6.5.5 Use of SCBA and ELSA units is subject to the capabilities and limitations listed in Section 3.0 of this manual.

6.6 FACIAL HAIR POLICY

6.6.1 Determination of which employees are Respiratory Protection Program participants is based upon need (e.g., employees who work at jobs or enter into areas where respiratory protection is or may be required, who may have to participate in activities during non-routine situations which may require respiratory protection, or who may require respiratory protection as a part of an emergency response function). These criteria have been used to derive the list of job classifications shown in Table 4-3.

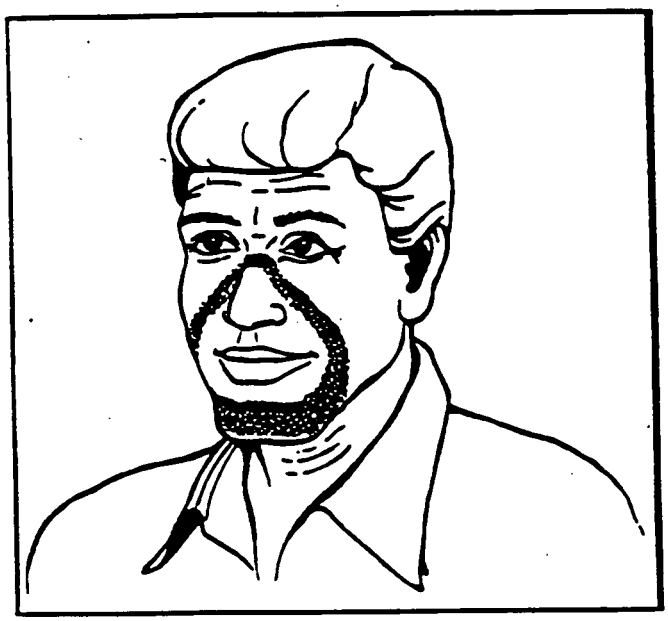
6.6.2 Employees who apply to one of these job classifications are participants in the Respiratory Protection Program and shall comply with all of the program requirements. Program participants shall become and remain clean-shaven in all face-sealing areas.

6.6.3 Based on this requirement, program participants shall have no interfering facial hair, defined as more than one days growth, below one finger's width of their lower lip (unless it falls on the neck beneath the face-sealing area).

CHAPTER 6.0 (cont.)

6.6 FACIAL HAIR POLICY (cont.)

6.6.4 The half-mask respirator sealing area is shown as the shaded face region in Figure 6-6.



HALF-MASK RESPIRATOR FACE-SEALING AREA
Figure 6-6

CHAPTER 6.0 (cont.)

6.6 FACIAL HAIR POLICY (cont.)

6.6.5 The full-face respirator sealing area is shown as the shaded region in Figure 6-7.

FULL-FACE RESPIRATOR FACE-SEALING AREA
Figure 6-7

CHAPTER 6.0 (cont.)

6.6 FACIAL HAIR POLICY (cont.)

6.6.6 Facial hair inside the facepiece (e.g. mustache or goatee) must be kept short enough to prevent interference with the operation of the exhalation valve.

6.6.7 Supervisors shall ensure that all their employees who are Respirator Program participants comply with these facial hair requirements. Employees found not to be in compliance shall be restricted from respirator use and subject to discipline according to the Company Rules of Conduct.

6.7 CORRECTIVE LENSES AND DENTURE USE

6.7.1 Standard prescription glasses shall not be worn inside full-face respirators due to their interference with proper mask-to-face seals.

6.7.2 When necessary, prescription glasses mounted completely inside the facepiece will be provided by WEMCO. To obtain spectacle kits for a respirator, employees should order a kit from Inventory Control and Warehousing and provide it and a current lens prescription (less than 2 years old) to Safety and Fire Services.

NOTE: Different spectacle kits are necessary for use with air-purifying and airline full-face respirators than the ones used in SCBA units.

6.7.3 As an option, contact lenses, regardless of type, can be worn inside full-face respirators provided the FEMP Occupational Health Services staff physician determines that the employee is able to wear contacts when using respiratory protection equipment.

6.7.4 Contact lenses can be worn without restriction with non-full-face respirators, but shall not be worn in areas where initiating or corrosive air contaminants may come into contact with eyes. For example, contacts shall not be worn in atmospheres that may contain ammonia or hydrogen fluoride. Where these contaminants are absent appropriate eye protection (i.e., safety glasses or goggles) must be worn over contact lenses if the wearer is inside an area requiring use of safety glasses.

6.7.5 Dentures may be worn while using a respirator only if those dentures were worn when the respirator was successfully fit tested by Industrial Hygiene.

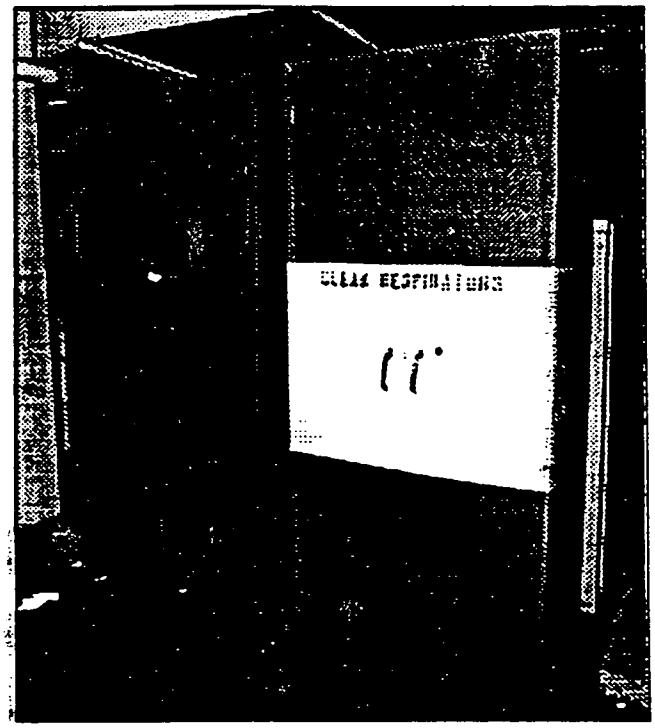
CHAPTER 7.0 - STORAGE

7.1 STORAGE CABINET GUIDELINES

7.1.1 Each plant/building/area/or section using respirators should have a respirator cabinet.

7.1.2 Only unused new or clean reconditioned respiratory protection equipment and other unused safety and health equipment (i.e., ear plugs, extra goggles, gloves, etc.) shall be kept in storage cabinets.

7.1.3 Respirator storage cabinets should be painted green and white and labelled. (See Figure 7-1 for an example of a typical respirator storage cabinet.) The Paint Shop Supervisor shall provide proper painting requirements.



FEMP RESPIRATOR STORAGE CABINET
Figure 7-1

CHAPTER 7.0 (cont.)

7.1 STORAGE CABINET GUIDELINES (cont.)

7.1.4 Respirator storage cabinets should be located as far away from potentially contaminated areas as possible.

7.1.5 Storage cabinet doors should be kept unlocked and unblocked at all times to allow employee access. Their doors shall be kept closed at all times when not in use.

7.1.6 Respirator storage cabinets should be kept clean, both inside and outside.

7.1.7 Adequate supplies of necessary respirator types and sizes should be maintained based on employee needs. They should be neatly arranged and organized, with separate clearly-marked compartments for respirator types and sizes as appropriate.

7.1.8 Current fit test result summaries should be posted in cabinets by supervisors to serve as reminders for employees of which types and sizes of respirators they are authorized to use. Industrial Hygiene periodically provides updated summaries to supervisors.

7.1.9 Supervisors with respirator storage cabinets within their jurisdiction are responsible for ensuring maintenance and cleaning of those cabinets.

7.1.10 SCBA units are stored in separate cabinets, which shall be opened only in case of emergency use or for monthly Safety and Fire Services inspection.

7.1.11 To remind would-be respirator users that respirators in storage cabinets are only to be issued by trained supervisors (or designees) who have attended training (Chapter 5.5), respirator cabinets shall be posted as follows:

Respirators to be issued by trained personnel only See _____ for issuance

The blank space will contain the name(s) of the issuer(s) for that area.

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CHAPTER 7.0 (cont.)

7.2 AIR-PURIFYING RESPIRATOR STORAGE REQUIREMENTS

7.2.1 Clean respirators awaiting use shall be stored in clean, sealed plastic bags.

7.2.2 Once issued to an individual, respirators stored in a locker, tool box, or vehicle shall be stored inside a box to prevent them from being crushed.

7.2.3 Employees shall be responsible for returning used respirators to recycling receptacles at the end of the day or job, whichever is sooner.

7.2.4 Respirators that have not been inspected within the last 12 months as indicated by the tag placed in their sealed storage bag or carton shall be taken out of storage, reinspected, and recycled, if necessary.

7.3 AIRLINE RESPIRATOR STORAGE REQUIREMENTS

7.3.1 Clean airline respirator facepieces, breathing tubes, and belts shall be stored in sealed, clean plastic bags in storage cabinets.

7.3.2 Airline hoses shall be capped on both ends or attached together, coiled, and stored in sealed clean plastic bags in a separate cabinet when not in use.

7.3.3 Airline hoses not in use, but at the job location, shall be capped and hung off the floor.

7.4 SCBA AND ELSA STORAGE REQUIREMENTS

7.4.1 SCBA facepieces and ELSA units shall be stored in clean plastic bags or cases inside specially designed cabinets, which are located near the entrances to buildings or other areas easily accessible in emergencies.

7.4.2 After any length of use Safety and Fire Services shall be notified immediately by the user or his/her supervisor, so that a replacement SCBA or ELSA unit can be substituted while the emptied air bottle is refilled.

7.5 POWERED AIR-PURIFYING RESPIRATORS (PAPRs)

7.5.1 PAPRs shall be stored with caps on the ends of breathing hoses and with caps on filter outlets.

7.5.2 PAPR batteries shall be recharged after use, but shall not be left on continuous charge.

7.5.3 PAPR batteries which have failed shall be properly disposed of per RCRA requirements.

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CHAPTER 8.0 - RECYCLING RECEPTACLES

8.1 Each plant/building/area/section using respirators should have an adequate number of recycling receptacles for used respirators. These receptacles are typically a 30 or a 55 gallon drum such as shown in Figure 8-1.

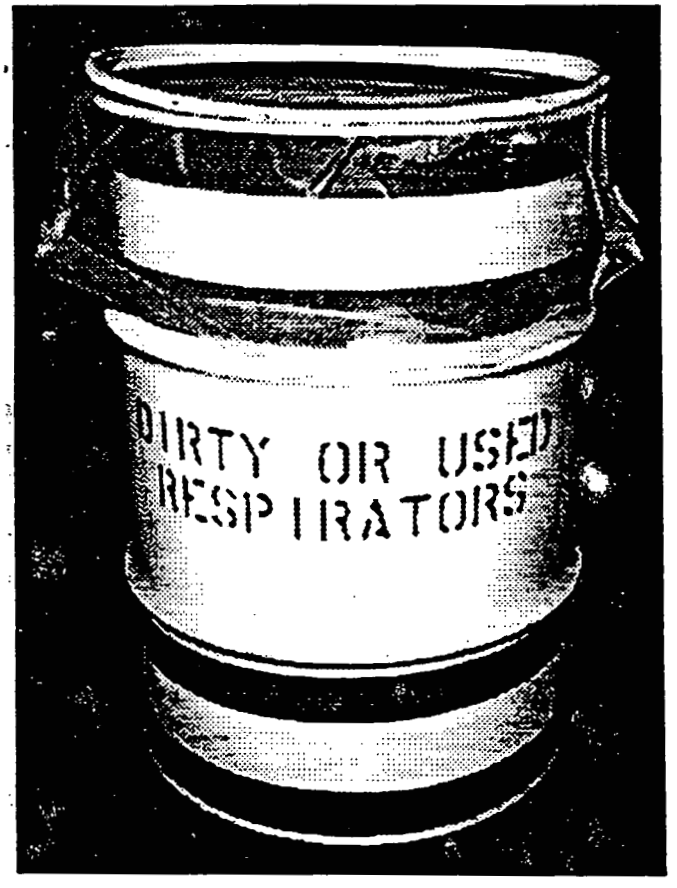
8.2 Recycling receptacles should be painted green and white and labelled. Contact the Paint Shop Supervisor for proper painting requirements.

8.3 Only used, defective, or outdated respiratory protection equipment shall be placed in recycling receptacles. Used disposable items such as Tyvek hoods, cartridges, and canisters should be disposed of separately in containers for other potentially contaminated materials.

8.4 Recycling receptacles should be lined with plastic bags and have tightly affixed lids which should be kept in place except while loading or unloading receptacles.

8.5 Supervisors with recycling receptacles in their areas of responsibility shall ensure the receptacles are emptied periodically, (at least weekly or when full) and contents are delivered to the respirator reconditioning facility.

CHAPTER 8.0 (cont.)



RESPIRATOR RECYCLING RECEPTACLE
Figure 8-1

CHAPTER 9.0 - CLEANING, SANITIZING, AND RECONDITIONING

9.1 Cleaning, sanitizing, reconditioning, and inspection of respiratory protection equipment is one of the most important components of the Respiratory Protection Program. Cleaning, will remove any foreign materials from respirators. Sanitizing respirators assures that all remaining living matter, whether bacterial or viral, is destroyed. Finally, reconditioning ensures that any defective or missing parts are repaired or replaced. Unrepairable equipment shall be discarded.

9.2 Recycled respirators (respirators placed in recycling receptacles) shall be thoroughly cleaned, sanitized, and reconditioned.

9.3 Reconditioned respirators shall be placed in clean, sealed plastic bags for reissuance. They shall be visually reinspected by Industrial Hygiene and checked for possible fixed and removable radioactive contamination by Radiological Safety prior to being sent out to Inventory Control and Warehousing for requisitioning. This is required when the respirator is recycled because of use.

9.4 Respirators in storage found to have expired dates (greater than 12 months) shall be reinspected and recycled if defective; otherwise, new expiration dates shall be added.

9.5 Laundry and IRS&T shall inspect respirators for operational use prior to forwarding to Inventory Control and Warehousing for requisitioning. However, a respirator with defective or missing parts could get through the system. Therefore, it is vitally important that each respirator user fully inspect his/her respirator prior to using it (refer to Section 6.1).

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CHAPTER 10.0 - SUBCONTRACTOR, VENDOR, AND VISITOR REQUIREMENTS

10.1 GENERAL REQUIREMENTS

10.1.1 Subcontractors, vendors, DOE employees, and visitors must be medically certified, trained and fit tested before using respiratory protection equipment. WEMCO personnel who request the services or presence of such individuals shall be responsible for ensuring that they are properly qualified to use respirators required for access to FEMP areas where potential respiratory hazards might be encountered. WEMCO personnel requesting these services must monitor the individual's use of the respiratory protection equipment.

10.1.2 Subcontractors, vendors and visitors may arrange to use the services of competent organizations of their own choice to be medically certified, trained and/or fit tested. They may also arrange to use WEMCO facilities for this purpose. WEMCO personnel who request the services or presence of subcontractors, vendors, and visitors shall be responsible for providing the appropriate documentation verifying that those individuals have been properly medically certified, trained and/or fit tested and forwarding it to Industrial Hygiene for review and approval. Industrial Hygiene shall keep a copy of these records and maintain a computerized summary of these records as it does for WEMCO employees.

10.1.3 Industrial Hygiene may also consult the FEMP Occupational Health Services regarding the documentation of medical certification. All documentation must comply with WEMCO's record requirements (See Section 10.2).

10.1.4 Industrial Hygiene shall notify the responsible subcontractor or WEMCO supervisors of whether or not the documentation has been approved and of what further actions are necessary, if any.

10.1.5 If WEMCO facilities will be required to provide medical certification, training fit testing, Industrial Hygiene shall be contacted well in advance to allow for the necessary scheduling. WEMCO will accommodate schedules whenever possible.

10.1.6 If non-FEMP respiratory protection equipment is to be used on site by any subcontractor, vendor or visitor, Industrial Hygiene approval shall be obtained before it is brought on site. Only NIOSH-approved equipment shall be used on site. Use of FEMP respiratory protection equipment is preferred.

10.1.7 Only WEMCO-trained personnel shall be permitted to use WEMCO self-contained breathing apparatus (SCBA) units. Additional information regarding the Respiratory Protection Program requirements for non-FEMP employees may be obtained by contacting Industrial Hygiene.

CHAPTER 10.0 (cont.)

10.2 RECORD REQUIREMENTS

10.2.1 Medical Certification Records

The medical record must contain the conclusions of a competent physician regarding an evaluation of the potential respiratory protection equipment user and must indicate whether the potential user is medically able to use respiratory protection equipment.

The evaluation must state whether the potential user is able to either wear air-purifying respirators, airline respirators, or both.

The medical records shall be signed by the evaluating physician and dated within one year of the date of the intended use of the respiratory protection equipment. If the evaluating physician is a non-FEMP Occupational Health Services staff physician, the record shall be approved by Industrial Hygiene before it will be considered valid.

10.2.2 Training Records

Training records must document that the potential user received respirator training within one year of intended use and must be signed by an official of the company. Industrial Hygiene must approve records before they will be considered valid.

10.2.3 Proper Fit Test Records

The fit test records must document that the potential user was fit tested by a competent tester with reliable testing equipment. The fit test records must document the following:

- Specific make, size, and model respirator tested
- Name of person tested
- Name of person giving test
- Date of test (must be within one year of intended use)
- Result (fit test factor or percent leakage) for respirator fitted
- If asbestos work will be involved, fulfillment of the quantitative respirator fit test requirements given in Appendix C of 29 CFR 1926.58

Industrial Hygiene must approve such records before they will be considered valid.

CHAPTER 11.0 - EMERGENCY, RESCUE, AND NON-ROUTINE USE

11.1 Respiratory protection shall be required for employees whenever potential respiratory hazards are present at concentrations that could present a health concern. This is true for routine situations as well as for emergency, rescue, and non-routine situations.

11.2 Emergency situations requiring the use of respiratory protection devices for escapes from a work area are unlikely at the FEMP. However, respiratory protection suitable for escape can be made available in specific areas. Employees should be able to escape/leave without the need of respiratory protection equipment by following emergency procedures and by leaving the area by the quickest available route while avoiding the release or spill.

11.3 If employees are wearing a routine use respirator when an emergency occurs, they should continue wearing the respirator while leaving the area as quickly as possible. An employee not wearing a respirator, should leave the area as quickly as possible without trying to find a routine use respirator.

11.4 Rescue situations requiring the use of respiratory protection devices are also unlikely at the FEMP. However, in the event they are needed, Self-Contained Breathing Apparatus (SCBA) units are located at strategic points in specially designed and labelled cases throughout the site for use by trained personnel.

11.5 In the event of an unplanned release, spill, other emergency, and/or rescue situation, only a SCBA, worn with appropriate protective clothing, is permissible for entry into hazardous areas. They shall be worn only by trained personnel. The IRS&T Department may authorize the use of other equipment as appropriate.

11.6 For non-routine situations, such as unscheduled maintenance activities, each individual situation shall be evaluated by Industrial Hygiene and/or Radiological Safety. In situations where known concentrations of known radioactive or chemical contaminants are present, appropriate air-purifying or air-supplied respirators, as determined by Industrial Hygiene (for chemical contaminants) or Radiological Safety (for radioactive contaminants), shall be required. In situations where unknown concentrations of known or unknown radioactive or chemical contaminants are present, only SCBA units shall be worn. For CERCLA activities where real-time organic vapor monitoring (e.g., photoionization instruments) or dust monitoring (e.g., photometers) can be used to verify that workers are not being exposed to vapor or dust levels exceeding limits prescribed in task-specific health and safety plans, use of air-purifying or airline respirators is allowed.

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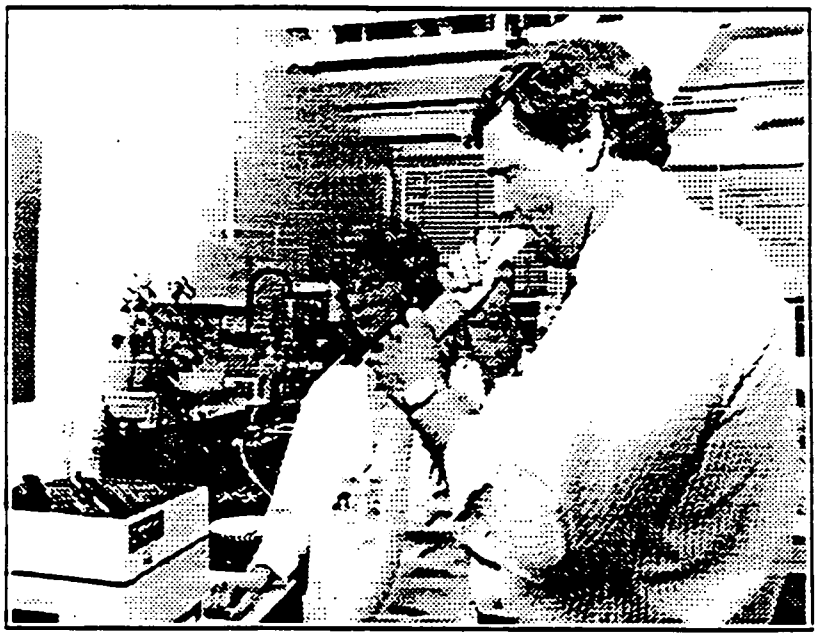
CHAPTER 12.0 - MEDICAL SURVEILLANCE

12.1 FEMP Occupation Health Services may, as necessary, conduct medical surveillance studies of respirator users to determine if users are being provided with adequate respiratory protection. Such studies may include physical examinations, blood tests, spirometric testing (See Figure 12-1), urine sampling, and other necessary tests. Occupational Health Services shall be contacted for further information on medical surveillance studies.

12.2 Industrial Hygiene and/or Radiological Safety may, following incidents, upon request, or when otherwise necessary, conduct bioassay surveillance studies of respirator users to determine if users are being provided with adequate respiratory protection. Such studies may include urine or blood analysis for contaminants or metabolites of fluoride, uranium, arsenic, lead, benzene, etc. The Analytical Bio Assay Laboratory may also analyze FEMP urine samples.



EMPLOYEE PERFORMING SPIROMETRIC TEST TO ASSESS LUNG FUNCTION FOR RESPIRATOR USE

Figure 12-1

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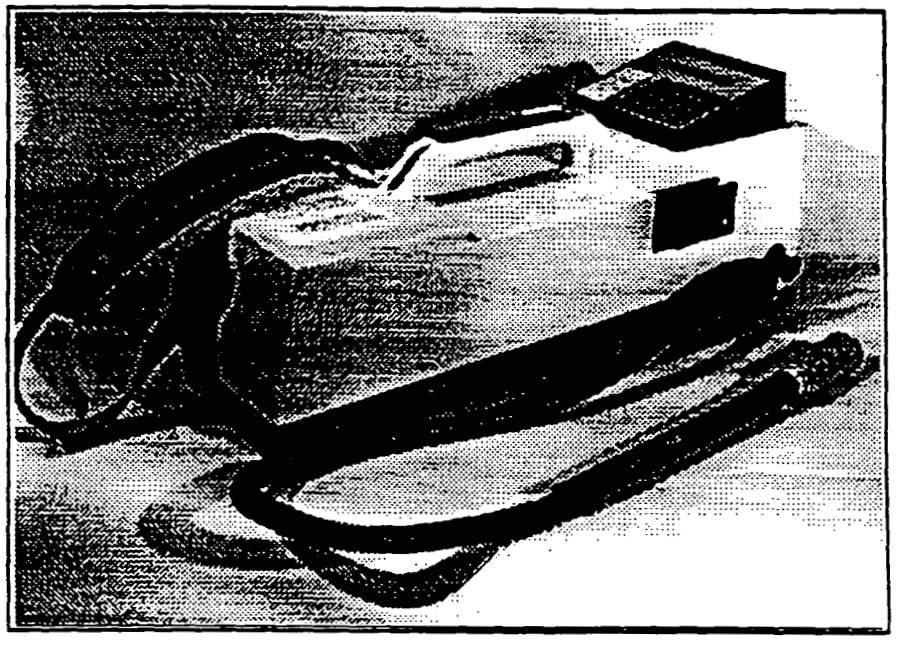
CHAPTER 13.0 - HAZARD SURVEILLANCE

13.1 The Industrial Hygiene Section routinely monitors for potential non-radioactive respiratory hazards in the workplace as part of the WEMCO general air sampling program. Radiological Safety also routinely monitors for potential radioactive hazards in the workplace. Monitoring is performed or samples are taken to ensure that employees are not working near or around potential respiratory hazards without proper protection. Typical air sampling equipment is shown in Figures 13-1 and 13-2.

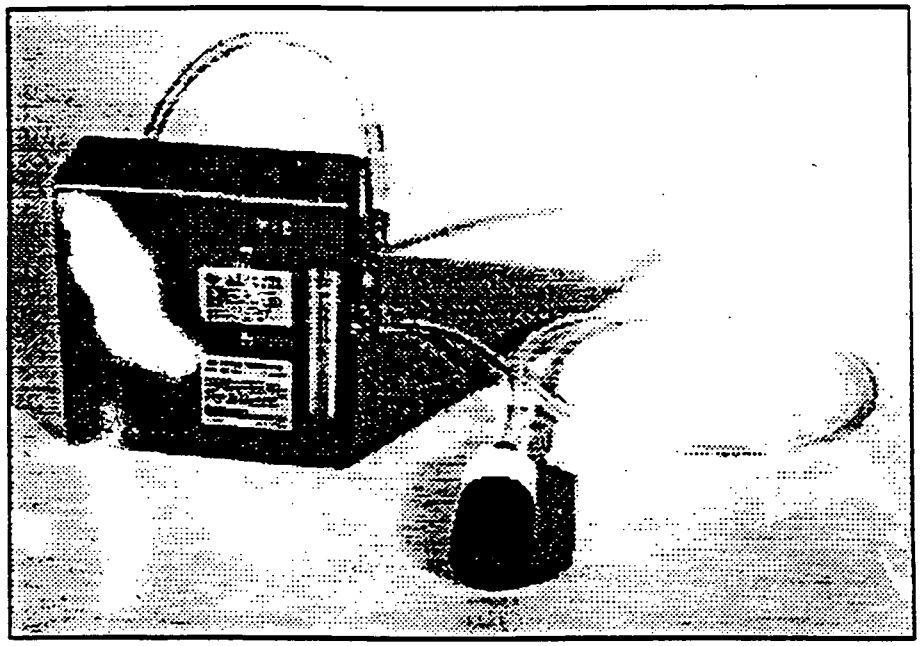
13.2 Sample results are evaluated by Industrial Hygiene for chemical concerns, and by Radiological Safety for radiation concerns, to determine whether respiratory protection is necessary and if so, the level of protection that is required. Factors such as employee comfort, eye protection, and skin protection are also considered in equipment selection.

13.3 Industrial Hygiene and Radiological Safety equipment selections are provided in writing to supervisors via Standard Operating Procedures, Work Permits, memoranda, Health and Safety Plans, etc. Supervisors are responsible for ensuring that their employees are issued and use the proper equipment (See Section 5.0). Questions concerning selection shall be referred to Industrial Hygiene for chemical concerns or to Radiological Safety for radiation concerns.



MIRAN 1B INFRARED ANALYZER
Figure 13-1

CHAPTER 13.0 (cont.)



PERSONAL SAMPLING PUMP WITH FILTER
Figure 13-2

CHAPTER 14.0 - REFERENCES

14.1 ANSI Z88.2-1980, "Practices for Respiratory Protection"

14.2 DOE Order 5480.4, "Environmental Protection, Safety, and Health Standards"

14.3 NRC 10 CFR 20, "Standards for Protection Against Radiation"

14.4 NRC Regulatory Guide 8.15, "Acceptable Practices for Respiratory Protection"

14.5 OSHA, 29 CFR 1910.134, "Respiratory Protection"

14.6 OSHA, 29 CFR 1926.58, Appendix C, "Quantitative Fit Testing"

14.7 Bureau of Mines, 30 CFR 11, "Respiratory Protective Devices; Tests for Permissibility; Fees"

14.8 OSHA, 29 CFR 1910.1001, "Asbestos", (g), "Respiratory Protection", Appendix C, "Qualitative and Quantitative Fit Testing Procedures"

14.9 OSHA, 29 CFR 1926.58, "Asbestos", (h), "Respiratory Protection", Appendix C, "Qualitative and Quantitative Fit Testing Procedures"

14.10 OSHA, 29 CFR 1910.1017, "Vinyl chloride", (g), "Respiratory Protection"

14.11 OSHA, 29 CFR 1910.1018, "Inorganic arsenic", (h), "Respiratory Protection"

14.12 OSHA, 29 CFR 1910.1025, "Lead", (f), "Respiratory Protection", Appendix D, "Qualitative Fit Test Protocols"

14.13 OSHA, 29 CFR 1910.1028, "Benzene", (g), "Respiratory Protection", Appendix E, "Qualitative and Quantitative Fit Testing Procedures"

14.14 OSHA, 29 CFR 1910.1043, "Cotton dust", (f), "Use of Respirators"

14.15 OSHA, 29 CFR 1910.1044, "1,2-dibromo-3-chloro propane", (h), "Respirators"

14.16 OSHA, 29 CFR 1910.1045, "Acrylonitrile", (h), "Respiratory Protection"

14.17 OSHA, 29 CFR 1910.1047, "Ethylene oxide", (g), "Respiratory Protection and Personal Protective Equipment"

14.18 OSHA, 29 CFR 1910.1048, "Formaldehyde", (g), "Respiratory Protection"

BUILDING EMERGENCY PROCEDURE

NON-CONTROLLED COPY

SSOP-0077

Effective Date: 09-30-92

AUTHORIZED BY: _____ 9/29/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
09-30-92	0	Building Emergency Procedure, required per Request No. S92-160, initiated by Sam Duley.

1.0 PURPOSE

This procedure provides instructions to all Fernald Environment Management Project (FEMP) employees for emergency response action to be taken during abnormal situations at the FEMP.

2.0 SCOPE

This procedure applies to all FEMP employees, Department of Energy (DOE) employees, and all other persons at the FEMP site at the time of an abnormal situation. This procedure is used in conjunction with IM-7006, "Incident Building Evacuation Requirements."

3.0 DEFINITIONS

Acts of Violence - Use of physical force to cause damage or injury to persons or property.

Assistant Emergency Duty Officer (AEDO) - The Emergency Management Authority on-site when the Emergency Operational Center (EOC) is not operational. Also the AEDO is the Incident Commander & the FEMP emergency response activities.

All Clear Signal - A 3-3 horn signal sounded over the Plant Alarm System (PAS) that precedes an announcement of ALL CLEAR.

Beta Cam Detection System - Individual units that monitor Beta radiation in the air. If radiation levels exceed the preset level, an alarm sounds and personnel must evacuate the area

Emergency - Any significant deviation from planned or expected behavior or course of events which could endanger or adversely affect people, property, and/or the environment.

Emergency Message System (EMS) - A one-way speaker system used by Communication Center personnel to transmit instructions and/or information to site personnel following the sounding of an alarm signal.

Emergency Response Team (ERT) - A group of professional and volunteer personnel trained for emergency response to fire, hazardous material release, radiological release, on medical emergencies.

Employees - All persons employed by Westinghouse Environmental Management Company of Ohio (WEMCO), and the DOE site office normally assigned to work areas at the FEMP facility.

3.0 **DEFINITIONS** (cont.)

Explosion - Violent expansion, usually accompanied by noise, caused by a sudden release of energy from a rapid chemical reaction or release of highly compressed liquid.

Femp Employee - Those personnel employed by WEMCO, DOE, and Sub-contractors employed by either WEMCO or DOE.

Fire/Ambulance Signal - The 2-2 horn signal will be sounded only when additional ERT personnel are needed. The announcement over the EMS will give the location of the fire/ambulance run for the additional ERT personnel.

NOTE: Pulling a lever on fire alarm boxes located throughout the site transmits a coded signal identifying the box location to the communication center.

Hazardous Material Release - Any unplanned spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of closed containers in an unpermitted area).

Local Evacuation Alarm (LEA) - A local horn type signal that indicates the need for building evacuation in an emergency.

Nuclear Accident Dosimeter (NAD) - A mounted area dosimeter which may be used to investigate the dose from a criticality accident.

Plant Alarm System (PAS) - The site-wide horn alarm system used by the Communication Center to transmit the Emergency Response (2-2), Supervisor Alert (3-3), and CO Alert (4-1) signals.

NOTE: The 2-2 signal will only precede an announcement for additional ERT personnel. The 3-3 signal precedes an announcement of general interest or All Clear. The 4-1 signal precedes a warning to discontinue the use of airline respirators.

Radiation Detection Alarm System (RDA) - Air horns and rotating red lights that are activated when the radiation level exceeds 80 mR/hr.

Subcontractors - Direct employees of companies other than WEMCO, who are assigned to work at the FEMP facility, or vendors who require access to the FEMP to fulfill contractual obligations.

Visitors - Any persons other than WEMCO and DOE employees, subcontractor or vendor personnel who have been properly authorized and issued temporary or permanent credentials for access to the FEMP.

4.0 RESPONSIBILITIES

FEMP Employee

- Notifies nearby personnel to evacuate danger areas and proceed in accordance with this procedure.
- Becomes familiar with the provisions of this procedure for reporting emergencies.
- Proceeds in accordance with this procedure in emergency situations.
- Becomes familiar with the location and use of emergency items.
- Becomes familiar with and carries out the response to the emergency signals in use at the FEMP.
- Participates in emergency procedure drills conducted in accordance with the FEMP Emergency Plan.
- Notifies the supervisor or the AEDO of emergency or non-routine events immediately.

Supervisor/Manager

- Directs the activities of personnel in emergency situations and calls for assistance.
- Informs the AEDO of existing conditions and cooperates with the AEDO to resolve the emergency situation.
- Conducts the periodic training of:
  - Assigned employees in the location and use of fire and evacuation alarm system controls and building exits.
  - Assigned employees in the provisions of this procedure.
  - New and newly relocated employees in the location and basic use of fire extinguisher and safety shower/eye bubblers in their immediate work area and
  - Employees with regard to immediate actions to be taken for all credible types of emergencies that could occur in their building.
- Assigns employee/alternate to turn off equipment and utilities in the event of an emergency shutdown.

4.0 **RESPONSIBILITIES** (cont.)

- Assigns/designates employees to perform specific tasks relating to an individual building during an emergency situation.

AEDO

- Complies with OM-FMPC-0002 "Personnel Accountability" as follows:

  - Conducts a Rally Point Accountability only for those personnel affected when a building or area is evacuated.

  - Conducts an In-Place Accountability for the personnel that have been directed to shelter, and

  - Conducts a Site-wide Accountability if more than 50 employees are evacuated from a building or area. lly point accountability for those persons evacuated to rally p s and an In-Place, accountability for the remainder c te personnel.

- Complies with all site procedures relat to emergency and abnormal situations.

5.0 **GENERAL**

To report an emergency or summon an ambulance in case of fire, explosion or hazardous material release, personnel shall initiate an alarm by pulling the lever on the nearest Fire Alarm Box. If there is not a Fire Alarm Box nearby use a portable radio or phone X6511 and make a report to the Commun ation Center.

When an emergency occurs in a building and evacuation is ordered, all employees will bypass the Personal Contamination Monitors.

When an emergency has been declared for any reason, e.g., fire, explosion, hazardous material release, the rescue of persons from an evacuated building, or area that has been evacuated, shall be undertaken only by the ERT.

When an alarm sounds, personnel shall follow instructions broadcast over the EMS, portable radio and/or Supervisors' directions.

All personnel shall refer to the individual building tabs located at the end of this procedure for information concerning evacuation routes, location of Fire Alarm Boxes, and specific information relevant to their individual building.

6.0 PREREQUISITES

This "Building Evacuation Procedure" (SSOP-0077) must be used with IM-7006, "Incident Building Evacuation Requirements."

6.1 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

None

6.2 PERSONNEL REQUIREMENTS

None

6.3 TOOLS AND MATERIALS REQUIRED

None

7.0 PROCEDURE

NOTE: This Section applies to all FEMP Employees.

7.1 FIRE

1. Pull lever on the nearest Fire Alarm Box. If an alarm box is not near, report directly to the Communication Center on X6511 or use a portable radio.

2. If trained to use fire fighting equipment and you can do so without endangering yourself, combat the fire cautiously until the ERT arrives.

WARNING

USING THE WRONG TYPE OF EXTINGUISHER CAN BE HAZARDOUS. DO NOT USE WATER TO EXTINGUISH ELECTRICAL, LIQUID, OR METAL FIRES.

NOTE: Use METL-X for burning metal fires.

Use CO_2, ABC, or dry chemical for electrical or flammable liquid fire.

Use Class "A" (water) extinguisher or ABC fire extinguisher for trash, wood, and paper fires.

7.0 **PROCEDURE** (cont.)

3. **If possible and safe,** shut off gas, electrical power, and operating equipment. Remove combustible or other hazardous material to a secure location.

4. If it becomes evident that the fire cannot be controlled by local action, immediately notify all personnel to evacuate the building either by a LEA or contacting the Communication Center by telephone or portable radio.

5. Close all Fire and Exit doors after building has been evacuated.

> **WARNING**
>
> DO NOT LOCK FIRE OR EXIT DOORS

6. After evacuation, report to your Primary Rally Point.

   NOTE: Management shall account for personnel per OM-FMPC-0002.

   NOTE: Instruct all persons in transit to avoid the building and the surrounding area.

7.2 EXPOSURE TO SMOKE OR FUMES

NOTE: The following steps apply when the building is not directly involved by a fire in a nearby building.

1. Close doors and windows facing fire or those through which smoke or fumes may enter.

2. Close air intakes of ventilation systems and shut down any exhaust fans that are drawing in smoke or fumes.

3. If outside, avoid smoke or fumes that are visible or have an odor. Do not enter the area containing smoke or fumes and avoid their path of travel.

4. If exposed to smoke or fumes, report to Medical Services as soon as possible after exposure.

5. If ordered to evacuate the building by a supervisor or an announcement by the EMS, proceed to the appointed Primary Rally Point using a safe route away from smoke or fumes.

7.0 **PROCEDURE** (cont.)

6. Instruct all persons in transit to avoid the building and surrounding area.

   NOTE: Management shall account for personnel per OM-FMPC-0002.

7.3 EXPLOSION

1. Pull lever on nearest Fire Alarm Box. If an alarm box is not near, report directly to the Communication Center on the telephone X6511 or use a portable radio.

2. Activate the LEA if one is available in the building, and evacuate the building.

3. After evacuating the building, proceed to the appointed Primary Rally Point or as directed by the EMS.

4. Instruct all persons in transit to avoid the building and surrounding area.

   NOTE: Management shall account for personnel per OM-FMPC-0002.

7.4 HAZARDOUS MATERIAL RELEASE (OUTSIDE BUILDING)

1. Shut off all ventilation air intakes, air conditioners, and any other mechanism that brings air into the building if hazardous release causes fumes.

2. Do not evacuate the building unless so directed by a LEA evacuation alarm, the EMS, or a supervisor.

3. If evacuation is ordered for your building, avoid fumes which are visible or have an odor. Do not enter the fume release area or the path of the fume travel.

4. Evacuate to the appointed Primary Rally Point.

   NOTE: Management shall account for personnel per OM-FMPC-0002.

7.5 HAZARDOUS MATERIAL RELEASE (INSIDE BUILDING)

1. Shut down equipment and/or operations causing the hazardous material release if it can be done safely and by trained personnel.

7.0 **PROCEDURE** (cont.)

2. If the release is minor in nature and can be controlled by personnel present, notify your supervisor or AEDO if no supervisor is present.

3. If the hazardous material release presents any danger to personnel, pull the lever on a Fire Alarm Box or activate the local evacuation alarm if one is available.

4. Notify the Communication Center by phoning X6511 or by portable radio of the situation and reason for the building evacuation. Inform the Communication Center if there is a possibility of other buildings or areas being affected.

5. Evacuate to the Primary Rally Point.

   NOTE: Management shall account for personnel per OM-FMPC-0002.

7.6 MEDICAL EMERGENCIES

1. Notify the supervisor of the involved employee of illness or injury. If supervisor is not available, request assistance from the nearest person.

2. If qualified, perform first aid.

3. Notify the Communication Center by phoning X6511, using a portable radio and/or pull lever of the nearest Fire Alarm Box. Inform the Communication Center of the type of injury or illness, location, your name and badge number, and any other information requested.

   NOTE: Someone shall remain with the ill or injured person at all times.

4. Upon arrival of the medical personnel, direct the team to the injured or ill person. Inform the medical team if a chemical was involved.

7.7 EARTHQUAKE

WARNING

RESPONSE SHALL BE IMMEDIATE. DO NOT WAIT FOR INSTRUCTIONS.

7.0 **PROCEDURE** (cont.)

1. Take shelter under a sturdy desk or table. If a desk or table is not available, go to a supported doorway.

2. If possible, kneel down, bend head close to knees, cover the sides of head with the elbows, and clasp hands firmly behind neck.

3. Avoid walls, shelves, and glassed areas. If inside, do not evacuate while tremors are occurring.

4. If outside, move to an open area away from power lines, piping, buildings, and kneel or lie down.

5. After the shock has subsided, evacuate the building.

   NOTE: Do not use elevators following an earthquake.

6. While evacuating, move away from structures, avoid electrical wires, broken/leaking pipes, visible fumes, and other hazards that may be encountered. Do not enter building.

7. Assemble at your Primary Rally Point or as directed by the EMS.

   NOTE: Managers shall account for personnel per OM-FMPC-0002.

7.8 TORNADO WARNING ANNOUNCEMENT

NOTE: Tornado has been sighted in or near the vicinity of the FEMP.

1. All personnel in trailers are to evacuate the trailers and seek shelter in permanent structures.

2. All personnel in permanent structures will proceed to assigned shelter area or interior hallway.

> **WARNING**
>
> **AVOID GLASSED AREA, LARGE ROOF SPANS, CORRIDORS WITH OPENINGS TO SOUTH OR WEST WINDWARD SIDE OF BUILDING, AND LOAD BEARING WALLS.**

3. If outside, lie face down in the nearest depression, such as a ditch. Protect your head with your hands.

7.0 **PROCEDURE** (cont.)

4. Await instructions from your supervisor or the All Clear Message.

7.9 TORNADO WATCH ANNOUNCEMENT

NOTE: Conditions are favorable for the formation of a tornado or tornados.

1. Proceed according to instructions of your supervisor or announcement over the EMS.

7.10 HIGH WINDS AND THUNDERSTORMS ANNOUNCEMENTS

WARNING

AVOID WORKING IN HAZARDOUS SITUATIONS SUCH AS HIGH, UNPROTECTED AREAS OR AREAS WHERE MATERIALS MAY BE BLOWN BY WIND.

1. Close and secure windows, doors, and other openings through which wind or rain could enter.

2. Move away from windows.

3. In external storage areas, secure loose materials such as empty drums and boxes by tying, weighing down, reducing stack height, or sheltering.

4. Move valuable equipment and materials to a sheltered location.

5. Shut down equipment that is unsafe to operate during wind or rainstorm.

6. Cover equipment that cannot be moved but may be damaged.

7.11 ACTS OF VIOLENCE

1. Any act(s) of violence shall be reported to Security (X6511) immediately.

2. Give details of person(s) involved, the incident and location.

3. Isolate the incident as much as possible.

7.0 **PROCEDURE** (cont.)

4. Await arrival of Security personnel and provide any information, details and assistance if requested.

5. All personnel in the immediate area shall leave in an inconspicuous manner and move to another convenient area until the incident is resolved.

7.12 CRITICALITY

WARNING

ROTATING RED LIGHTS ON THE EXTERIOR OF A BUILDING INDICATE ACTIVATION OF A RADIATION ALARM. DO NOT ENTER OR APPROACH THE BUILDING.

NOTE: This procedure is performed in response to a RDA Signal.

1. Upon hearing the RDA, immediately leave the building by the nearest exit.

WARNING

IF NAD RETRIEVAL WOULD PREVENT PROMPT EVACUATION OF BUILDING THE NAD SHOULD BE LEFT FOR LATER RETRIEVAL.

2. If available, pick up a NAD.

3. After leaving the building, proceed to the middle of the street and continue to one of the following locations:

   Personnel in Process Area: Evacuate to the first floor hallway at the rear of the Service Building.

   Personnel in Laboratory: Evacuate to the cafeteria.

   Personnel in Receiving Building: Evacuate to their Primary Rally Point.

7.0 **PROCEDURE** (cont.)

4. Upon reaching the assembly area, report to supervisor.

   NOTE: Supervisors shall accompany employees to assembly area. Using a portable radio or nearest telephone call the Communication Center on X6511 and report "This is (Name) reporting from extension (_____). A RDA has sounded at (Building)." Report results of accountability.

5. If All Clear signal sounds, return to work.

6. If a NAD was obtained, turn the NAD over to a Radiation Safety Technician or the supervisor.

7. If alarm is actual (not a test), submit a urine sample for radiation monitoring, and complete questionnaires that may be required.

   NOTE: Supervisors shall maintain order in the group and assist employees in following instructions for radiation monitoring, if necessary.

8. If outside of a building when a RDA sounds for that building, DO NOT ENTER OR APPROACH THE BUILDING.

9. Supervisors of non-alarmed buildings should conduct an In-place Accountability.

7.13 BOMB THREATS:

NOTE: Anyone who receives a threat or finds a suspicious object in their area shall immediately notify the Security Communication Center (X6511).

1. By Telephone:

   - Signal someone to listen to the call.
   - If another line is available, have another employee call the Communication Center (X6511).

     NOTE: Keep the line open to Communication Center.

   - Keep the caller on the line as long as possible. Ask that the message be repeated.
   - Write down every word spoken by the person.

7.0 **PROCEDURE** (cont.)

- If the caller does not reveal the location of the bomb or the time of possible detonation, ask for the information.
- Inform the caller that the building is occupied and the detonation of a bomb could result in death or serious injury to many people.
- Listen for background noises, such as motors running, background music, and any other sounds that give a clue to the location.
- Pay close attention to the voice characteristics of the caller.

  NOTE: Listen for the following characteristics: sex, age, emotional state, accent, speech impediments, intoxication.

- Immediately after the caller hangs up, take over the open line and report to the Communication Center (X6511).

2. In Writing

CAUTION

HANDLE MATERIALS AS LITTLE AS POSSIBLE TO PRESERVE THE CONDITION AND ANY FINGERPRINTS.

- Save all materials, including any envelope or container.
- If possible, place the message between sheet of clear plastic or on a clipboard.
- Record where the message was found and/or how delivered, by whom, and at what time.
- Notify the Communication Center (X6511)
- Release the message only to a Security Officer.

7.0 **PROCEDURE** (cont.)

3. Personal Contact

- Question the informant for the time of detonation, location of the device, size of the device, type of explosive and arming device, who planted the explosive, how the device was planted, and why the device was planted.

- Determine where, when, under what circumstances, and from whom did the informant learn about the explosive.

- Ask the informant how he rates the reliability of the person alleged to have planted the bomb.

- Verbally attempt to detain the informant. If possible, get the informant's license plate number and vehicle description.

CAUTION

DO NOT ATTEMPT ANY PHYSICAL ACTIONS TOWARD THE INFORMANT.

- If the informant can not be detained, attempt to obtain the informant's name, address, and a good physical description.

- Immediately notify the Communication Center (X6511) of the contact. Supply the AEDO with information collected.

4. Finding a Suspicious Object

NOTE: Reasons for an object being noted are: foreign to the area; origin is questionable; labeled "bomb", "danger", or "dangerous"; or has unusual shape, size, or audibility.

- Call the Communication Center (X6511) immediately and notify the AEDO of the location of the object. State your name and extension number.

- Follow instructions given by AEDO or supervisor.

5. Searching Area For a Bomb

NOTE: Action to be taken by the Manager or Department Head.

7.0 **PROCEDURE** (cont.)

- If advised by the AEDO, ask local personnel to conduct a search of the area for any suspicious objects.

  NOTE: Reasons for an object to be suspect are: foreign to area; origin is obscure; labeled "bomb", "danger", or similarly; has an has an unusual size, shape, or audibility.

  NOTE: Employees not involved in the search shall evacuate as directed and await instructions.

- Inform the searchers that they are not to move, jostle, jar, or touch the object or anything attached to it.

> **WARNING**
>
> **DO NOT USE RADIOS DURING THE SEARCH. RADIOS MAY CAUSE DETONATION.**

- If a suspicious object is found, notify the Communication Center of the location. Describe the object briefly and accurately.

- Open windows and doors to minimize primary blast damage.

- Move hazardous materials from the surrounding area if time permits.

- If personnel complete the search without finding anything, report this to the Communication Center and withdraw searchers to the perimeter.

7.14 EMERGENCY SHUTDOWN ANNOUNCEMENT (3-3 SIGNAL)

1. Turn off gas-burning equipment or gas sources.

2. Shut down all operations.

3. Turn off all window-type air conditioners.

4. Shut down ventilation equipment.

5. Turn off electrical equipment.

7.0 PROCEDURE (cont.)

6. Close all windows in the building.

7.15 POST DISASTER

WARNING

IF HAZARDOUS MATERIALS (I.E. ACIDS, CAUSTICS, MERCURY, ASBESTOS) WERE RELEASED, DO NOT ENTER THE BUILDING OR AREA UNTIL MONITORING HAS BEEN CONDUCTED BY INDUSTRIAL HYGIENE.

NOTE: The measures necessary and the procedures advisable for resumption of plant operations will depend on damage surveys as reported to management.

1. Do not start equipment until the following checks have been made.

   NOTE: The manager shall request Maintenance to check utilities.

   - Check equipment, unit by unit, in accordance with applicable SOPs.
   - Check materials for damage.
   - Check with Boiler Plant to ensure the availability of steam.
   - Check with Water Treatment to ensure that water is available.
   - Check with Utilities engineer to ensure that electrical power is available.
   - Check product supplies for damage.
   - Ensure that Fire and Safety, Industrial Hygiene and Radiological Safety have checked the area.

7.0 PROCEDURE (cont.)

WARNING

IF PROPANE OR NATURAL GAS WERE INVOLVED WHEN EQUIPMENT WAS DAMAGED, DO NOT START EQUIPMENT UNTIL FIRE AND SAFETY HAS CHECKED FOR EXPLOSIVE GAS.

WARNING

IF RADIOACTIVE MATERIALS WERE RELEASED, DO NOT ENTER THE BUILDING OR AREA UNTIL A CHECK FOR RADIOACTIVITY HAS BEEN CONDUCTED BY RADIOLOGICAL SAFETY.

- A complete engineering survey of damage, necessary repairs, and replacements is required if the building was involved with fire and/or corrosive or damaging fumes.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE Order 5500-3A, "Planning and Preparation for Operational Emergencies"
- PL-3015, "FEMP Emergency Plan"

8.2 REFERENCES

- DOE Order 5480.9 "Conduct of Operations"

SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0716
REVISION NO. 0

NON-CONTROLLED COPY

CONTROL OF PROCESSES

SSOP-0716

Effective Date: 03-17-93

AUTHORIZED BY: _____ _____
M. C. Kaufman, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
03-17-93	0	Control of processes required per Request No. S92-173, initiated by Tim Huey. This document replaces FMPC-0716 dated 06-20-90, Revision 1.

1.0 PURPOSE

This procedure provides instruction for Fernald Environmental Restoration Management Corporation (FERMCO) to maintain a program for the control of processes affecting the quality of items or services at the Fernald Environmental Management Project (FEMP). Such processes shall be performed under controlled conditions in accordance with applicable standards and codes.

This procedure also provides guidelines for qualifying special processes/procedures and ensuring that operating personnel are qualified and certified as needed for special processes. Normal processes are controlled by documents, procedures, specifications, drawings, or other appropriate means (checklist, travelers, etc.).

2.0 SCOPE

This procedure applies to all Fernald Environmental Restoration Management Corporation (FERMCO) employees, subcontractors, and Department of Energy (DOE) employees and describes the responsibilities and required actions for defining the special and normal processes used at the FEMP which require qualification and/or control, and for verifying their accomplishment.

3.0 DEFINITIONS

Normal Processes - Processes used in the construction, maintenance and monitoring of normal processes which are not classified as special processes.

Operator Candidates - Candidates who have demonstrated, through written or oral tests or on-the-job performance-related activities, abilities gained through education, training, or experience, qualifying them to perform a required function.

Process Owner - Person who has control and responsibility for the process.

Qualified Process - A special or normal process that has been demonstrated to meet the specified requirements for its intended purpose.

Special Processes - A process, the results of which are highly dependent on either the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection. These processes are those covered by industry standards and codes.

3.0 DEFINITIONS (cont.)

Technical Work Documents - Used to control hands-on work with radioactive materials and are approved by the Radiological Control Organization.

Verification - The act of reviewing, assessing, testing, checking, auditing, or otherwise determining and documenting whether items, processes, or documents conform to specified requirements.

4.0 RESPONSIBILITIES

Centralized Manager, Training

- Ensures training and qualifications are certified technical instruction or outside vendors who conform to FERMCO training standards as set forth in Site Policy and Procedure FMPC-0102, "Training".
- Documents any and all training.
- Maintains centralized training records.

Document Preparers, Reviewers, Issuers

- Preparing the procedures which describe the processes and method for accomplishing control.
- Ensure technical accuracy and compliance to codes and standards.
- Issuance and maintenance of procedures.

QA Manager schedules verification audits/activities to assess performance.

Process Owner

- Establishes criteria for determining which processes, utilities, maintenance, analytical, and other service type processes and/or equipment require qualification.

  NOTE: These criteria will define which processes are special processes and what level of controls will be required.

- Ensures that standard operating procedures are prepared and are current for normal and special processes.

4.0 **RESPONSIBILITIES** (cont.)

- Ensures that controlled normal and special processes are performed in accordance with written instructions such as Operating Procedures.
- Conducts tests of normal and special processes in accordance with an approved Plant Test Authorization or Start-up Test Plan.

QC Manager

- Develops procedures and instructions for those quality verification activities that are designated as special processes.
- Performs and documents process verification activities.
- Verifies that special process procedures, equipment and personnel are qualified and that process control records are maintained.

5.0 **GENERAL**

Processes to be controlled fall into the following categories:

- Those designated as normal processes.
- Those designated as special processes, including welding, brazing, soldering, heat treating, and nondestructive testing.
- Normal and special processes support activities, including environmental and radiological monitoring, waste shipment certification, utilities, maintenance, analytical, and others as designated by responsible management or customer requirements.
- Quality verification activities, including quality assurance auditing and surveillance, and normal and special processes assessment.

The organizations responsible for performing either normal or special processes will prepare procedures which describe the process and methods for its control, including the control and accountability of nuclear materials. These documents will implement applicable codes, standards, and quality requirements.

Qualification of special processes, process equipment and personnel performing such work will be conducted in accordance with approved procedures. The process qualification procedure includes the qualification methods and techniques, equipment, tools, materials, instrumentation, and acceptance criteria.

5.0 **GENERAL** (cont.)

All affected organizational managers participate in the qualification of the special processes by conducting test operations in accordance with an approved Plant Test Authorization or Start-up Test Plan.

Changes to qualified processes shall be accomplished under controlled conditions, including procedure change control procedures and qualification steps described in this procedure.

6.0 **PREREQUISITES**

None

7.0 **PROCEDURE**

NOTE: For planning radiological work and work preparation refer to RM-0009 "Radiological Controls".

7.1 PREPARATION OF PROCESS PROCEDURES

DOCUMENT PREPARERS

1. Prepare the procedure such as a Standard Operating Procedure, welding procedure, or Nondestructive Examination procedure, which describes the process and method for accomplishing control. Refer to Table 1 for examples of control elements.

DOCUMENT REVIEWERS

2. Review process procedures for technical adequacy and compliance to applicable codes and standards.

3. Approve/disapprove proposed procedures or procedure changes in accordance with departmental procedures.

DOCUMENT ISSUERS

4. Issue and maintain procedures describing controlled processes.

7.2 QUALIFICATION OF SPECIAL PROCESS PROCEDURES, EQUIPMENT AND PERSONNEL

PROCESS OWNER

1. Develop and document the criteria for determining which normal and special processes require qualification and/or certification. Examples of special processing operations that require certified personnel include auditor certificates for QA auditors, state license for water plant operators, certificates for NDE inspectors, etc.

Table 1. Guidelines for Preparation of Documents for Control of Processes

The following is a suggested list of elements for inclusion in the development of documents which control processes. Such documents may include Standard Operating Procedures, Manufacturing Specifications, System Operability Tests, Maintenance Standards, Work Orders, welding procedures, and nondestructive examination procedures.

- Process parameters to be controlled
- Environmental conditions requiring maintenance or control of process operation
- Process parameter operational limits
- Personnel and plant operational limits
- Process equipment or process system calibration requirements
- Method and/or sequence of operator actions for process operation
- Method and/or forms for recording necessary process monitoring, parameter levels, and/or process conditions
- Process maintenance requirements
- Acceptance criteria for each quality characteristic
- Nuclear materials control and accountability requirements
- Operational safety requirements
- Rotating equipment design limitations
- Critical (safety-related) design-based limitations for new or modified facilities
- Industrial health and safety requirements

7.2 QUALIFICATION OF SPECIAL PROCESS PROCEDURES, EQUIPMENT AND PERSONNEL (cont.)

PROCESS OWNER

2. Prepare and issue the qualification procedure for each special process which is determined to require qualification. The procedure should provide for compiling and documenting data needed to support qualifications, including verification actions required of Quality.

   NOTE: The qualification procedure may be part of a start-up Test Plan or a Plant Test Authorization (See PP-0721). All special processes require qualification.

DOCUMENT REVIEWERS

3. Review the qualification procedure for technical adequacy and compliance to applicable codes and standards.

PROCESS USERS

4. Schedule and conduct special qualification process procedures for equipment, and trained operator candidates. Qualification actions will be done in accordance with the approved qualification procedure.

   NOTE: Qualification of personnel will be ensured by centralized Training in accordance with training standards set forth in FMPC-0102, "Training".

PROCESS OWNER

5. Compare results of qualification actions to acceptance criteria and document specific procedures, equipment and personnel which meet or fail to meet qualification criteria.

COGNIZANT MANAGER

6. Approve the qualification procedure for use.

   NOTE: Qualified procedures should be in place prior to QA verification.

7.2 QUALIFICATION OF SPECIAL PROCESS PROCEDURES, EQUIPMENT AND PERSONNEL (cont.)

QUALITY CONTROL

7. Perform quality verification activities, including quality control audits, surveillance, and inspection activities, to ensure that personnel, procedures, and equipment are qualified.

7.3 CONTROL OF NORMAL PROCESS PROCEDURES, EQUIPMENT AND PERSONNEL

PROCESS OWNER

1. Ensure that process parameters are controlled and that specified environmental conditions are maintained by the control of normal processes through instructions, procedures, drawings, checklists, travelers, or other appropriate means.

PROCESS USERS

2. Schedule and conduct normal process operations using approved process procedures, equipment and trained operator candidates.

   NOTE: Training of personnel will be ensured by Centralized Training in accordance with training standards set forth in FMPC-0102, "Training."

COGNIZANT MANAGER

3. Approve the process procedure for use.

QUALITY CONTROL

4. Perform quality verification activities, including quality control audits, surveillance, and inspection activities.

7.4 CONTROL OF PROCESSES

DOCUMENT PREPARERS

1. Specify in procedure used for production, fabrication, assembly or repair of items, the use of those process procedures, equipment and personnel which are qualified.

PROCESS USERS

2. Train and qualify operators and supervisors before use of the procedure. Consult Centralized Training for qualification requirements.

7.4 CONTROL OF PROCESSES (cont.)

QUALITY CONTROL

3. Perform quality verification activities, including quality control audits, surveillance, and inspection activities, to ensure that the process is qualified and meets the requirements of this procedure.

4. Conduct operations in accordance with approved qualifications and operating procedures, and ensure that procedures are followed.

DOCUMENT PREPARERS

5. Update procedures when process changes are made in accordance with document change procedures.

7.5 RECORDS

DOCUMENT ISSUERS

Maintain records in accordance with management procedures relative to special and normal process applications at the FEMP to include:

- Qualification records for process procedures, equipment and personnel.
- Process procedures.
- Nuclear materials control and accountability records.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- ANSI/ASME NQA-1, "Quality Assurance Program Requirements for Nuclear Facilities"
- DOE Order 5700.6C, "Quality Assurance"
- FD-1000, "FEMP Sitewide CERCLA Quality Assurance Project Plan"
- RM-0012, "Quality Assurance Program Description"

8.2 REFERENCES

- PP-0721, "Test Authorization"
- FMPC-0102, "Training"

Control No: - 4554 -

SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0082
REVISION NO. 0

QUALITY IMPROVEMENT

NON-CONTROLLED COPY

SSOP-0082

Effective Date: 10-30-92

AUTHORIZED BY: _____ 10/30/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
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WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 11
Title: **QUALITY IMPROVEMENT**		DOCUMENT NO: SSOP-0082 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 10-30-92

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WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		**SITE STANDARD OPERATING PROCEDURE** Page 2 of 11
Title: **QUALITY IMPROVEMENT**		DOCUMENT NO: SSOP-0082 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 10-30-92

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
10-30-92	0	Procedure required describing the principles, practices, techniques, and responsibilities necessary to implement a quality improvement system per Request No. S92-174, initiated by D. Lambert.

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 3 of 11
Title: **QUALITY IMPROVEMENT**		DOCUMENT NO: SSOP-0082 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 10-30-92

1.0 PURPOSE

This procedure provides instructions for establishing and implementing quality principles, practices, techniques, and responsibilities and promotes continuous quality improvement of processes and products at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure applies to all employees of the Westinghouse Environmental Management Company of Ohio (WEMCO) with support from Total Quality, Continuous Improvement Processes, and Self-Assessment. It provides direction for planning, performing, appraising, and continually improving all products and work processes.

3.0 DEFINITIONS

Assessment/Verification - The act of reviewing, inspecting, testing, checking, conducting surveillances, auditing, or otherwise determining and documenting whether items, processes, or services meet specific requirements. The terms assessment and verification, as used in DOE Order 5700.6C, are synonymous; their use is determined by who is performing the work. Assessments are performed by or for senior management. Verifications are performed by the line organization.

Audit - A planned and documented activity systematically performed to determine by investigation, examination, or evaluation of objective evidence the quality of operation of some function or activity. Audits may be of two basic types: (1) performance audits in which quantitative data are independently obtained for comparison with routinely obtained data in a measurement system or (2) system of audits of a qualitative nature that consists of an on-site review of the quality assurance system and physical facilities for sampling, calibration, and measurement.

Corrective Action - Measures taken to rectify significant conditions adverse to quality and, where necessary, to preclude repetition.

Cost-Time Management (CTM) - A management tool which provides a snapshot of any business, activity, or process from both the time and money perspective. That snapshot provides a measure of the effects of time on day-to-day operations or on long-term planning.

Cost-Time Profile - A graphical representation of the buildup of cost over time. Analysis of the cost-time profile helps identify and quantify opportunities to improve productivity, customer value and quality.

Deviation - A departure from specified requirements.

3.0 **DEFINITIONS** (cont.)

Process - A series of actions that achieve an end result.

Product - Any item (hardware, software, service, documents) produced for a customer.

Quality - The degree to which an item or process meets or exceeds the user's/customer's requirements and expectations.

Quality Assurance - Actions that provide confidence that quality is achieved.

Self Assessment - An ongoing process that is continually conducted at all levels of a line organization. It involves forming judgements about organizational strengths and weaknesses based on the performance data derived from overseeing operations and activities.

Service - The performance of work, such as design, fabrication, inspection, nondestructive examination, repair, or installation.

Surveillance - The act of monitoring or observing to verify whether an item or activity conforms to specified requirements.

Total Quality - Performance leadership in meeting customer requirements by doing the right things right the first time.

Validation - The manner of evaluating a product at the end of the entire development process to ensure compliance with requirements.

Value Engineering - A method for improving product value by improving the relationship between the function of a product and its cost. In performing a value engineering analysis each element of product worth is related to its corresponding element of cost, in order to provide the function of the product at least cost in resources.

4.0 **RESPONSIBILITIES**

Site Management's Interactive Role with Employees in Implementing Quality Improvement

- Provide leadership in developing, implementing, and nourishing an organizational culture in which every employee is truly committed to continuous Quality Improvement.

- Reinforce the fact that Quality Improvement requires the interactive involvement of all employees.

4.0 **RESPONSIBILITIES** (cont.)

- Challenge all employees to apply their collective talents in improving the way they do their jobs so that continued quality improvement becomes a way of life.
- Appoint a TQ advocate.
- Participate on the TQ Council.
- Promote the employee Quality Improvement suggestion program.
- Recognize employees for quality performance.

Self-Assessment and Continuous Improvement Processes

- The Vice President of Self-Assessment and Continuous Improvement Processes is responsible for three sections: TOTAL QUALITY, CONTINUOUS IMPROVEMENT PROCESSES, and SELF-ASSESSMENT.
- The responsibilities for each section in supporting Quality Improvement are as follows:

Total Quality

- Establish an interactive organizational structure for facilitating internal and external customer interfaces, actively promoting safety and operational excellence, and adding value to the products and services provided to customers.
- Promote and emphasize the importance of Total Quality and motivate employees to integrate the Total Quality process into their workplace so that the right things are done right the first time.
- Administer the employee Quality Improvement Program.

Continuous Improvement Processes

- Identify and assist in implementing opportunities to reduce process cycle time and cost, through the use of various productivity and diagnostic techniques.
- Facilitate and assist teams in establishing a system to measure process results, identify the root causes of deviations in the process, and implement appropriate corrective action.
- Administer the FEMP Cost Reduction Program.

4.0 **RESPONSIBILITIES** (cont.)

Self-Assessment

- Establish a system to evaluate and assess performance in the management of activities at the FEMP.

5.0 **GENERAL**

None

6.0 **PREREQUISITES**

None

7.0 **PROCEDURE**

7.1 PROMOTING AND DEMONSTRATING QUALITY IMPROVEMENT

SITE MANAGEMENT

1. Develop an understanding of internal and external customer needs and expectations.

2. Articulate a vision for the ultimate goal of the organization along with a clear expression of the driving forces (regulations, customer requirements, competition) which make Quality Improvement essential.

3. Communicate the vision and drivers to every member of the organization.

4. Foster a "no-fault" attitude to encourage employees to identify nonconforming items and processes per RM-0012, WEMCO Quality Assurance Program Description, Criterion 3, "Quality Improvement".

5. Require the establishment of objectives, strategies and tactics, including setting up an accountability structure that will allow management to know where the organization stands in the Quality Improvement process on specific projects.

6. Demonstrate daily consistency of actions and words -- what is said and written is in accordance with what is done.

7.1 PROMOTING AND DEMONSTRATING QUALITY IMPROVEMENT (cont.)

7. Become dedicated to Quality Improvement and manifest that to all levels of the organization by the way agendas are set, time is spent, rewards and promotions are given out, disciplinary action and penalties are administered, themes of major meetings are established, and the focus of reviews and audits are established.

8. Participate in developing WEMCO's annual quality improvement objectives.

9. Communicate company and department quality improvement objectives to employees.

10. Assure that department quality improvement objectives are supported in employee Performance Measurement System (PMS) forms.

7.2 SELF-ASSESSMENT AND CONTINUOUS IMPROVEMENT PROCESSES

7.2.1 Promoting and administering the Total Quality Program

TOTAL QUALITY

1. Provide administrative management assistance for the implementation of the Total Quality process consistent with objectives, directives, and priorities established by WEMCO's Total Quality Council.

2. Facilitate meetings of the Total Quality Council per FMPC-0232, WEMCO Total Quality Council Charter, and schedule monthly reports from Total Quality Improvement Teams.

3. Administer the Outstanding Performers Recognition Program, the Gemstone Total Quality Award Program, the TQ Salutes Program, Technology Presentations, Advocate Team, and Subteam meetings.

4. Facilitate, coordinate, and conduct staff management involvement activities, including new employee orientation, TQ team meetings, workplace visits, sit-down sessions with employees or managers, and Total Quality workshops.

7.2 SELF-ASSESSMENT AND CONTINUOUS IMPROVEMENT PROCESSES (cont.)

5. Conduct Total Quality Improvement Workshop training for employees to create awareness of the internal customer/supplier relationship, various tools for problem solving, and encourage participation in the Total Quality process.

6. Support the TQ Council in developing the annual Total Quality Improvement Plan.

7. Promote the submission of Total Quality Improvement ideas by employees, on designated forms.

8. Interact with the bargaining unit leadership for promoting labor/management harmony by way of special assignments of bargaining unit employees to promote Total Quality in the workplace.

9. Identify activities for enhancing improvements through the Advocate Subteams.

TOTAL QUALITY

10. Encourage ownership of the workplace and promote the professional development of all employees.

7.2.2 Performing Cost-Time Management (CTM)

CONTINUOUS IMPROVEMENT PROCESSES

1. Facilitate and assist groups in developing a prioritized list of alternative solutions through the application of Cost-Time Management techniques to reduce cycle times and cost and to improve quality.

2. Identify opportunities to reduce process cycle time and costs through the use of various analytical techniques and tools such as: Cost-Time Management, Process Mapping, Time Scaled and Pure Logic Diagrams, Pareto Analysis, Linear Regression/Trend Analysis, Just-In-Time (JIT) techniques, Work Sampling, Cause and Effect Diagrams, Statistical Process/Quality Control (SPC/SQC), specialized performance/cost measurement computer software packages (i.e., MacProject II and Primavera).

7.2 SELF-ASSESSMENT AND CONTINUOUS IMPROVEMENT PROCESSES (cont.)

3. Encourage and facilitate the use of the multifunctional team structure to deal with Quality issues.

4. Promote extensive employee involvement and ownership in the improvement process.

5. Facilitate and assist teams/individuals in developing implementation plans consisting of the appropriate actions/ initiatives, time schedules, resources needed, and team/ individual responsibilities.

6. Assist teams/individuals in establishing targets/goals for each improvement opportunity.

7. Help teams/individuals in securing management approval on prioritization and implementation of improvement projects.

8. Aid teams/individuals in establishing measurable objectives and conducting periodic reviews/assessments of the effectiveness of process improvements.

COST-TIME MANAGEMENT (CTM)

9. Facilitate and assist teams/individuals in establishing a feedback system to measure the success of process improvements as well as the cause of deviations from process results that require corrective action.

10. Encourage teams/individuals to apply and integrate other disciplines and methodologies, such as Value Engineering, to measure and improve the design of products and processes.

11. Promote and support savings through sharing and lessons learned from successful process improvement projects with other Department of Energy sites and contractors.

7.2.3 Administering the Cost Reduction Program

CONTINUOUS IMPROVEMENT PROCESSES

1. Analyze and verify each cost reduction action and be the focal point for the Fernald Environmental Management Project Cost Reduction Program.

   NOTE: Consult PP-5034, "Cost Reduction Program", to implement steps 2 through 5.

7.2 SELF-ASSESSMENT AND CONTINUOUS IMPROVEMENT PROCESSES (cont.)

CONTINUOUS IMPROVEMENT PROCESSES

2. Assist the originators to ensure that each cost reduction action is on the proper form and that cost reduction backup information is with the package as required.

3. Present each cost reduction action to the Cost Reduction Board.

4. Record and track accumulated cost reduction totals.

5. Prepare and present the annual cost reduction performance report to management.

7.2.4 Performing Self-Assessments

SELF-ASSESSMENT

1. Consolidate and integrate the results from line self-assessments.

2. Produce an annual Management Assessment Report.

8.0 **APPLICABLE DOCUMENTS**

8.1 DRIVERS

- PO-FMPC-1001, Conduct of Operations Policy
- U.S. Department of Energy (DOE) Order 5700.6C, Criterion 3, "Quality Improvement"

8.2 REFERENCES

- FMPC-0232, WEMCO Total Quality Council Charter
- FMPC-0707, Audit Program
- PL-3016I.1, Evaluation and Assessment System (EASY), a Management Self-Assessment Process Plan
- PP-0709, Conduct of Independent Surveillance Activity

8.0 **APPLICABLE DOCUMENTS** (cont.)

- PP-5034, Cost Reduction Program
- RM-0012, WEMCO Quality Assurance Program Description, Criterion 3, "Quality Improvement"
- SSOP-0023, "Deviation and Corrective Action Reporting"
- WEMCO:SA/CIP(VP):92-083, WEMCO Self-Assessment Program Implementation Plan

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 24 4554
Title: **DEVIATION AND CORRECTIVE ACTION REPORTING**		DOCUMENT NO: SSOP-0023 REVISION NO. 2
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 06-25-92

NON-CONTROLLED COPY

1.0 PURPOSE

To describe the process for the identification, response, evaluation and resolution of deviations and corrective actions required at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure identifies the assigned responsibilities and required actions for identifying, documenting, responding and evaluating deviations and corrective actions observed during audits, reviews, surveillances, inspections or tests performed at the FEMP by internal and external organizations. It also covers the evaluation of supplier-proposed disposition and corrective action plans.

3.0 DEFINITIONS

Condition Adverse to Quality (CAQ) - An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, violations of regulatory requirements or nonconformances.

Corrective Action - Measures taken to rectify significant conditions adverse to quality or violations of regulatory requirements and, where necessary, to preclude repetition.

Corrective Action Report (CAR) (See Figure 1) - A form used to document the corrective action process for significant conditions adverse to quality or violation of regulatory requirements discovered during audits, reviews, surveillances, inspections or tests performed by internal or external organizations. This form can be either the CAR form shown in Figure 1 or a computer generated form which contains the same information. This report is used to identify and resolve recurring problems, programmatic deviations and significant conditions adverse to quality.

Deviation - As used in this procedure, "deviation" means a departure from a specified requirement discovered during an audit, review, surveillance, inspection or test. A deviation can be a condition in which characteristics of an item or service do not conform to prescribed limits, a required document is not available or is inadequate, a regulatory requirement was violated, or a procedure does not yield the desired results. These conditions can occur at any point in the fabrication, handling, shipment, storage, installation, or operation of an item; the performance of a service; or the execution of quality assurance activities.

3.0 DEFINITIONS (cont.)

Deviation Report (DR) (See Figure 2) - A form used to document the disposition, verification and closure of deviations. This form can be either the DR form shown in Figure 2 or a computer generated form which contains the same information. This report is used to identify and resolve a specific deviation.

Disposition - The action necessary to correct or resolve a specific deviation.

Priority Level - As used in this procedure, "Priority Level" is the rank or the seriousness of an observed condition. Priority levels are used to ensure that corrective action of the more serious conditions are implemented first.

Requisitioner - The individual who authorizes and/or initiates a purchase request.

Root Cause - The most basic reason for an effect, which, if corrected, will prevent recurrence of that effect. The correction must be achievable by WEMCO and it cannot interfere with WEMCO's goals and objectives. Most negative effects of interest will have a root cause that falls into one of three categories: Personnel Error, Procedural Error, or Equipment Failure.

Senior Management - Management reporting directly to the President of WEMCO.

Significant Condition Adverse to Quality (SCAQ) - A condition which, if uncorrected, could have an impact on safety of employees and general public or operability, or violate a regulatory requirement.

4.0 RESPONSIBILITIES

4.1 WEMCO Personnel/Preparer

- Notify Environmental Compliance and Quality Assurance (EC&QA) of deviations by completing sections 1 and 2, as appropriate, of the Deviation Report (DR) form Figure 2.

4.2 Environmental Compliance and Quality Assurance (EC&QA)

- Evaluates deviations to see if a Deviation Report will be issued.
- Identifies, documents, and requests disposition of deviations on a DR form.

4.0 RESPONSIBILITIES (cont.)

- Evaluates proposed disposition for DRs.
- Verifies that disposition actions are complete and acceptable, and closes DRs.
- Evaluates Deviation Reports for issue of Corrective Action Reports (CARs), Figure 1.
- Accepts the proposed corrective action for CARs.
- Performs verification of corrective action and closes out CARs.
- Performs trend analysis of Deviation Reports.

4.3 Self-Assessment

- Performs trend analysis of Corrective Action Reports (CARs) and issues a CAR for identified adverse trends.

4.4 Commitment Control

- Provides sequential numbers for Corrective Action Reports.
- Maintains the central data base for tracking the atus of corrective actions.
- Issues status reports on corrective actions.
- Retains official records and files related to the documentation of Corrective Action Reports.

4.5 Senior Manager/Activity Manager/Cognizant Engineer

- Evaluates and determines the root cause for each deviation reported on a Corrective Action Report.
- Responds to DRs and CARs by completing section 3 of the DR and/or CAR form.
- Proposes and accomplishes disposition for Deviation Reports and corrective action for Corrective Action Reports.
- Notifies EC&QA when disposition action and/or corrective action is complete.

4.0 RESPONSIBILITIES (cont.)

- Approves Supplier Disposition Requests.

4.6 Procurement

- Coordinates Supplier Disposition Requests for disposition/corrective action approval.

4.7 Evaluator

- Initiates a DR or CAR form and signs off in section 2 of the appropriate form.
- Evaluates the responses to the DR or CAR and signs off in section 4 of the appropriate form.
- Verifies the completion of disposition action or corrective action and signs off in section 6 of the appropriate form.

4.8 Administrator of Deviations (EC&QA)

- Provides sequential numbers for Deviation Reports.
- Maintains the central data base for tracking the status of Deviation Reports.
- Issues status reports on deviations.
- Retains official records and files related to the documentation of deviations issued.
- Reviews completed Deviation Reports and stamps them as validated QA records.
- Performs trend analysis of Deviation Reports.

5.0 GENERAL

5.1 Deviations may or may not be a significant condition adverse to quality. The effect on the quality of the item or service involved depends on the severity of the condition. Those deviations determined to be significant conditions adverse to quality require corrective action in accordance with this procedure. Corrective Action Reports shall be evaluated for root cause determinations.

5.0 GENERAL (cont.)

5.2 Repetitive non-significant conditions adverse to quality noted over a short period of time require corrective action in accordance with the requirements of this procedure.

5.3 A trend analysis of DRs and CARs is performed to identify chronic problem areas. Results of this trend analysis are reported in a letter and a CAR is issued for any adverse trends identified in the letter. The CAR is issued to the responsible manager who determines the root cause of the adverse trend and develops corrective actions.

5.4 All personnel issuing Deviation Reports or Corrective Action Reports shall have training or orientation on the WEMCO deviation and corrective action system prior to issuing a DR or CAR.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

None

7.0 PROCEDURE

7.1 Deviation Reports

WEMCO PERSONNEL/PREPARER

7.1.1 Evaluate deviations in accordance with the Priority Levels identified in Table 1.

7.1.2 Identify and document deviations in sections 1 and 2 of the Deviation Report (DR) form (see Figure 2).

NOTE: For Priority Level 3, issue a letter or other report describing the condition observed to responsible individuals.

7.1.3 Sign and date the "Prepared By" block in section 2.

7.1.4 Forward the DR to Environmental Compliance and Quality Assurance (EC&QA), Administrator of Deviations.

ADMINISTRATOR OF DEVIATIONS

7.1.5 Forward DR to the appropriate EC&QA section for evaluation.

7.0 **PROCEDURE** (cont.)

EC&QA EVALUATOR

7.1.6 Evaluate the deviation for significant and actual violation of requirement/specifications.

7.1.6.1 If a deviation exists, assure a clear description of the deviation is provided.

7.1.6.2 If an actual DR is not required, notify the preparer that a DR is not required.

7.1.7 Verbally notify the senior manager/activity manager/cognizant engineer of the deviation in a timely manner.

7.1.8 Evaluate deviations for Significant Conditions Adverse to Quality (SCAQ) and check the appropriate block in section 2 of the DR form.

NOTE: See Figure 4 for criteria and examples for determining the need for a Corrective Action Report.

7.1.8.1 For those deviations determined to be SCAQ, complete a Corrective Action Report in accordance with section 7.2

7.1.9 Sign and date the "Evaluator" block in section 2.

7.1.10 Ensure a Quality Nonconformance Tag, Form FS-F-2708 (see Figure 3) is attached to a nonconforming item (hardware or material), where practical.

NOTE: Quality Nonconformance Tags shall be removed only after completion of the disposition action identified on the DR.

7.1.10.1 If not practical to affix Nonconformance Tag, ensure other precautions are taken to preclude inadvertent use or further processing.

7.1.11 Obtain and enter a DR number from the computer DR data base or from the Administrator of Deviations on the DR form.

NOTE: The unique number is composed of the last two digits of the current year, a three digit number, and the letters DR after the number (Example 92-001 DR).

7.0 PROCEDURE (cont.)

EC&QA EVALUATOR

7.1.12 Issue the DR to the senior manager/activity manager/cognizant engineer of the organization responsible for the item or activity in which the deviation was discovered and forward a copy to the EC&QA Administrator of Deviations and the preparer.

ADMINISTRATOR OF DEVIATIONS

7.1.13 Enter the following data into the data base: DR number, date of discovery, responsible organization representative, provide disposition by, description of the deviation, evaluator's name, date evaluator signed (date issued), description of required action to be completed (such as response required) and department issuing DR.

SENIOR MANAGER/ACTIVITY MANAGERS/COGNIZANT ENGINEER

7.1.14 Separate hardware items in designated hold areas or implement other precautions to stop inadvertent use, as appropriate.

7.1.15 Evaluate deviations for reportability under the Event Notification and Reporting system (ED-0001) and Occurrence Reports system (PR-FMPC-4006).

7.1.16 When an Occurrence Report (OR) is required, enter this as the proposed disposition and the DR will be closed out based upon the issue of an OR.

7.1.17 Enter the proposed disposition by checking the appropriate block in section 3 of the DR. Disposition involves the following:

7.1.17.1 Accept-as-is - item is acceptable for use when supported with technical justification.

7.1.17.2 Rework - item needs further processing to conform to specified requirements.

7.1.17.3 Repair - item needs processing to become acceptable for use but does not conform to specified requirements.

7.1.17.4 Reject - a decision that a nonconforming item cannot be accepted-as-is, reworked, or repaired. Rejected items shall be scrapped, identified, and altered so as to be inapplicable for their original use, or returned to the supplier, as appropriate.

7.0 PROCEDURE (cont.)

SENIOR MANAGER/ACTIVITY MANAGERS/COGNIZANT ENGINEER

7.1.17.5 Other - describe in space provided on DR form the specific actions taken or to be taken such as revise procedure, develop procedure, provide training, etc.

NOTE: For non-hardware deviations check the "Other" block and enter the disposition in the space provided.

7.1.18 Enter the scheduled completion date in section 3.

7.1.19 Provide a technical justification for items which are labeled "Accept-As-Is" or "Repair".

NOTE: This justification must identify specific engineering calculations or higher tier documents which provide evidence that the item will function reliably and safely even though it does not conform to the original requirement. An unsupported belief, opinion, or recommendation is not an acceptable technical justification.

NOTE: When "accept-as-is" or "repair" are used for the disposition, configuration control records shall be updated to reflect changes.

7.1.20 Sign and date the Responsible Organization Representative block, and return the original DR with the disposition to the Evaluator within the requested time frame.

EC&QA EVALUATOR

7.1.21 Evaluate proposed disposition action(s), with the assistance of the preparer, as necessary, and notify the senior manager/activity manager/cognizant engineer of the responsible organization of the results.

7.1.22 Sign the "Evaluation of Disposition" section, after acceptable response is obtained, and forward original to responsible organization with a copy to the Administrator of Deviations.

ADMINISTRATOR OF DEVIATIONS

7.1.23 Enter the following data into the data base: Date response provided, date for completion of disposition, description of action to be completed and date response was approved by evaluator.

7.0 PROCEDURE (cont.)

SENIOR MANAGER/ACTIVITY MANAGERS/COGNIZANT ENGINEER

7.1.24 Complete disposition action(s) as scheduled.

7.1.25 Sign and date section 5 when disposition action(s) is complete and forward the DR to the evaluator.

EC&QA EVALUATOR

7.1.26 Monitor accomplishment of disposition action(s) and verify completeness and acceptability.

7.1.27 Close DR by signing the "Verification of Disposition Action Completion" section of the DR form. Notify the activity/cognizant engineer of the organization responsible for disposition action, of closure.

7.1.28 Ensure Nonconformance tags are removed and release any hardware items from hold status.

7.1.29 Forward original completed DR to the Administrator of Deviations.

ADMINISTRATOR OF DEVIATIONS

7.1.30 Enter the date of completion of Disposition into the tracking data base.

7.1.31 Review the completed DR form and validate the form by stamping it as a record copy.

NOTE: If the form is not correct, contact evaluator and have it corrected.

7.1.32 Maintain the official record copy of all deviation reports.

7.2 Corrective Action Reports

EVALUATOR

7.2.1 Evaluate deviations for Significant Conditions Adverse to Quality (SCAQ).

NOTE: See Figure 4 for criteria and examples for determining the need for a Corrective Action Report.

7.0 PROCEDURE (cont.)

EVALUATOR

7.2.2 Evaluate the need to issue the CAR to Senior Management in accordance with Figure 4.

NOTE: A Deviation Report is not required in order to issue a CAR.

7.2.3 When a CAR is required, obtain a CAR number from Commitment Control.

NOTE: The unique number is composed of the last two digits of the current year, a three digit number and the letters CAR (Example 92-001 CAR).

COMMITMENT CONTROL

7.2.4 Provide a CAR number from the computer data base for corrective action reports and enter the appropriate data into the commitment tracking system.

7.2.5 Prepare commitment planning form and notify evaluator.

EVALUATOR

7.2.6 Provide timely notification of deviations to affected senior manager/activity manager/cognizant engineer.

7.2.7 Identify and document the request for corrective actions in sections 1 and 2 of the CAR form Figure 1.

7.2.8 Obtain the concurrence of the Evaluator's manager.

7.2.9 Issue the Corrective Action Report along with commitment planning form to the senior manager/activity manager/cognizant of the organization responsible for the deviation, with a copy to Commitment Control.

COMMITMENT CONTROL

7.2.10 Enter the appropriate data into the commitment tracking system.

SENIOR MANAGER/ACTIVITY MANAGER/COGNIZANT ENGINEER

7.2.11 Evaluate deviations for reportability under the Event Notification and Reporting system (ED-0001) and Occurrence Reports system (PR-FMPC-4006).

7.0 PROCEDURE (cont.)

SENIOR MANAGER/ACTIVITY MANAGER/COGNIZANT ENGINEER

7.2.12 When an Occurrence Report (OR) is required, enter this as the corrective action and the CAR will be closed out based upon the issue of an OR.

7.2.13 Determine the underlying (root) cause of the problem and document it in Section 3A of the CAR form.

7.2.14 If necessary, perform an investigation to determine if any similar work is affected by the problem and, if so, identify the action taken/proposed and the schedule to correct it in Section 3B of the CAR form.

7.2.15 Describe in section 3C of the CAR form the action taken/proposed to correct the root cause and to prevent recurrence of the problem. Enter the scheduled completion date for corrective action in Section 3D.

7.2.16 Provide response to the Evaluator within the time frame requested.

EVALUATOR

7.2.17 Evaluate proposed corrective action(s), if acceptable, sign block 4 of CAR form and obtain evaluating manager's approval.

7.2.18 Forward the original CAR to the senior manager/activity manager/ cognizant engineer of the responsible organization indicating the results of the evaluation and forward a copy to Commitment Control.

COMMITMENT CONTROL

7.2.19 Enter the appropriate data into the commitment tracking system.

SENIOR MANAGER/ACTIVITY MANAGER/COGNIZANT ENGINEER

7.2.20 Complete corrective action(s) as scheduled.

7.2.21 Sign and date section 5 when corrective action(s) is complete and forward the CAR to the evaluator.

EVALUATOR

7.2.22 Monitor accomplishment of corrective action(s) and verify completeness and acceptability.

7.0 PROCEDURE (cont.)

EVALUATOR

7.2.23 Verify completion of corrective action and close CAR by signing section 6 of the CAR form.

7.2.24 Notify the senior manager/activity manager/cognizant engineer of the organization responsible for corrective action, of closure.

7.2.25 Forward the original completed CAR to Commitment Control.

COMMITMENT CONTROL

7.2.26 Enter the appropriate data into the commitment tracking system.

7.2.27 Maintain the official record copy of Corrective Action Reports.

7.3 External Findings/Deviations

EC&QA

7.3.1 Receive external findings from external organizations (such as Tiger Teams, Technical Safety Appraisal, etc.).

7.3.2 Process the finding in accordance with 7.2.

7.4 Supplier Request for Disposition/Corrective Action Approval

BUYER

7.4.1 Receive Supplier Disposition Requests (SDR) (see Figure 5), with proposed dispositions.

7.4.2 Forward the SDR with proposed disposition to requisitioning department and send a copy to Environmental Compliance and Quality Assurance for review and concurrence.

REQUISITIONER

7.4.3 Evaluate the supplier's proposed disposition, obtain concurrence from Environmental Compliance and Quality Assurance concerning its acceptability and if appropriate, approve the disposition action in an approval memorandum.

NOTE: If disposition action is unacceptable, the Requisitioner initiates correspondence through the Buyer back to the supplier until resolution is reached.

7.0 PROCEDURE (cont.)

REQUISITIONER

7.4.4 Forward the approval memorandum and supporting documentation to the Buyer.

BUYER

7.4.5 Issue disposition approval memorandum to supplier.

7.4.6 File a copy of disposition approval memorandum, completed SDR and supporting documentation in the purchase order file.

7.5 Trend Analysis

SELF-ASSESSMENT

7.5.1 Maintain a trend analysis program for Corrective Action Reports.

7.5.2 Issue a Corrective Action Report for identified trends in accordance with 7.2.

ADMINISTRATOR OF DEVIATIONS

7.5.3 Maintain a trend analysis program for Deviation Reports.

7.5.4 Issue a Corrective Action Report for identified trends in accordance with 7.2.

7.6 Tracking of Deviations

COMMITMENT CONTROL

7.6.1 Maintain a computer tracking/history system on open and closed Corrective Action Reports.

7.6.2 Provide status reports on the status of Corrective Action Reports.

ADMINISTRATOR OF DEVIATIONS

7.6.3 Maintain a computer tracking/history system on open and closed Deviation Reports.

7.6.4 Provide reports on the status of Deviation Reports.

8.0 APPLICABLE DOCUMENTS

8.1 Drivers

- RM-0012, "Quality Assurance Program Description"

8.2 Reference Documents

- PR-FMPC-4006, Occurrence Reports (OR)
- ED-0001, "Event Notification and Reporting"

9.0 APPLICABLE FORMS

- Form FS-F-2909 Deviation Report (DR)
- Form FS-F-2708, Quality Nonconformance Tag
- Form FS-F-2909-1, Corrective Action Report (CAR)
- Form FS-F-2642, Supplier Disposition Request

10.0 FIGURES

- Figure 1 - Corrective Action Report Form (CAR)
- Figure 2 - Deviation Report (DR)
- Figure 3 - Quality Nonconformance Tag
- Figure 4 - Criteria for Determining If a Corrective Action Report Is Required and Criteria for Determining If a Corrective Action Report Is Required To Be Issued To Senior Management
- Figure 5 - Supplier Disposition Request (SDR)

TABLE 1

Priority Levels	DR REQUIRED
Priority Level 1 - A situation which poses a imminent threat to safety, health or the environment or which warrants immediate corrective action due to major or significant non-compliance, or to avoid an enforcement action by state or federal agencies or the DOE, or to avoid possible disruption of a vital site program.	YES
Priority Level 2 - A situation or non-compliance issue which by itself does not pose an imminent threat to safety, health or the environment but could pose an imminent threat at a future date (i.e. under different conditions).	YES
Priority Level 3 - A situation which does not pose a significant threat to safety, health or the environment, or risk of programmatic impact; which can be corrected immediately by personnel in the work area or can be scheduled for routine correction; are Best Management Practices,or housekeeping issues that do not warrant a priority level 1 or 2.	NO

Fernald Site
CORRECTIVE ACTION REPORT

CAR NUMBER	REVISION

SECTION 1

DATE DISCOVERED	RESPONSIBLE ORGANIZATION
RESPONSIBLE ORGANIZATION REPRESENTATIVE	
ACTIVITY	LOCATION

SECTION 2

REQUIREMENTS

DEVIATION

VERBALLY NOTIFIED MANAGEMENT	EVALUATOR	DATE
PROVIDE DISPOSITION BY	EVALUATING MANAGER	DATE

SECTION 3 - Response to the Request for Corrective Action

A. REASON FOR THE DEVIATION (ROOT CAUSE)

B. ACTION TAKEN/PROPOSED TO INVESTIGATE AND CORRECT SIMILAR WORK

C. ACTION TAKEN TO PREVENT RECURRENCE

D. DATE(S) ACTION(S) WILL BE COMPLETE

RESPONSIBLE ORGANIZATION REPRESENTATIVE	DATE

SECTION 4 - Evaluation of Corrective Action Reponse

EVALUATOR	DATE
EVALUATING MANAGER	DATE

SECTION 5 - Completion of Corrective Action

RESPONSIBLE ORGANIZATION REPRESENTATIVE	DATE

SECTION 6 - Verification of Corrective Action Completion

EVALUATOR	DATE

VERIFICATION ACTION

FS-F-2909-1 (REV 5-7-92)

CORRECTIVE ACTION REPORT
Form FS-F-2909-1
Figure 1 (Sheet 1 of 2)

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 17 of 24
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Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 06-25-92

CORRECTIVE ACTION REPORT (CAR) - INSTRUCTIONS

EVALUATOR - COMPLETE SECTION 1 AND 2 AS FOLLOWS	
ITEM	INSTRUCTIONS
DATE OF DISCOVERY	Enter date that corrective action was discovered to be required.
RESPONSIBLE ORGANIZATION	Enter the organization responsible for the item or activity in which a corrective action is required.
RESPONSIBLE ORGANIZATION'S REPRESENTATIVE	Enter name of the representative responsible for corrective action.
ACTIVITY	Enter activity performed (Example Audit 189-1)
LOCATION	Location of the activity (Example Plant 6)
REQUIREMENTS	Identify the procedure, instruction, standard, or code which establishes the acceptance criteria for the activity or item being evaluated
DEVIATION	Fully describe the deviation as it relates to the requirements.
VERBALLY NOTIFIED MANAGEMENT	List the date that the responsible organization's management was verbally notified of the potential deviation
CAR NO.	Obtain and enter on the CAR Form a CAR Number from Commitment Control
REVISION	Enter the current revision number 0, 1, etc
PROVIDE DISPOSITION BY DATE	Request the organization deemed responsible to provide dispositioning action by a certain date outlining steps taken or planned to correct immediate problem.
EVALUATOR	Sign and date Section 2 of the CAR form
EVALUATING MANAGER	Obtain the concurrence of the Evaluator's Manager

RESPONSIBLE ORGANIZATION REPRESENTATIVE - COMPLETION OF DISPOSITION ACTION SECTION 3	
A. REASON FOR THE DEVIATION (ROOT CAUSE)	Determine the underlying (root) cause of the problem and document it in Section 3A of the CAR form.
B. ACTION TAKEN/PROPOSED TO INVESTIGATE AND CORRECT SIMILAR WORK	If necessary, perform an investigation to determine if any similar work is affected by the problem and, if so, identify the action taken/proposed and the schedule to correct it in Section 3B of the CAR form.
C. ACTION TAKEN TO PREVENT RECURRENCE	Describe action taken/proposed to correct the root cause and to prevent recurrence of the problem in Section 3C of the CAR form
D. DATE(S) ACTION(S) WILL BE COMPLETE	Enter the scheduled completion date for corrective action in Section 3D.

EVALUATOR - COMPLETION OF THE EVALUATION OF CORRECTIVE ACTION RESPONSE SECTION 4
Receive and evaluate the proposed corrective action to determine its adequacy for solving the specific problem identified in the deviation report.
Document acceptance of the proposed corrective action in Block 4 by signature and date.
Notify the organization responsible for corrective action of the rejection of the proposed corrective action and coordinate with the organization to obtain a revised response.

RESPONSIBLE ORGANIZATION REPRESENTATIVE - COMPLETION OF CORRECTIVE ACTION SECTION 5
Completes corrective action sign Block 5 and forward to evaluator.

EVALUATOR - COMPLETION OF THE VERIFICATION AND CLOSURE OF DISPOSITION ACTION SECTION 6
Monitor the corrective action and verify that the actions taken to correct the deviation have been completed satisfactorily
Approve acceptance of verified corrective action in Section 6 by signature and date. Enter the verification action performed
Ensure the removal of nonconforming item tag(s) only after verifying satisfactory completion of all dispositioning actions
Forward the closed out corrective action report (CAR) to the Commitment Control with a copy to responsible organization management

FS-F-2909-1 (REV 5/7/92)

CORRECTIVE ACTION REPORT (CAR) - INSTRUCTIONS
Form FS-F-2909-1
Figure 1 (Sheet 2 of 2)

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 18 of 24
Title: DEVIATION AND CORRECTIVE ACTION REPORTING		DOCUMENT NO: SSOP-0023 REVISION NO. 2
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 06-25-92

Fernald Site
DEVIATION REPORT

DR NUMBER | REVISION

SECTION 1

DATE DISCOVERED | RESPONSIBLE ORGANIZATION

RESPONSIBLE ORGANIZATION REPRESENTATIVE

ACTIVITY | LOCATION

SECTION 2

REQUIREMENTS

DEVIATION

VERBALLY NOTIFIED MANAGEMENT | PREPARED BY | DATE

PROVIDE DISPOSITION BY | CORRECTIVE ACTION REPORT REQUIRED? ☐ YES ☐ NO

EVALUATOR | DATE

SECTION 3 - Response to the Request for Disposition

DISPOSITION ☐ Accept-As-Is ☐ Rework ☐ Repair ☐ Reject ☐ Other

ACCEPT-AS-IS/REPAIR JUSTIFICATION

SCHEDULED COMPLETION DATE(S)

RESPONSIBLE ORGANIZATION REPRESENTATIVE | DATE

SECTION 4 - Evaluation of Disposition Response

EVALUATOR | DATE

SECTION 5 - Completion of Disposition Action

RESPONSIBLE ORGANIZATION REPRESENTATIVE | DATE

SECTION 6 - Verification of Disposition Action Completion

EVALUATOR | DATE

VERIFICATION ACTION

FS-F-2909 (REV 5/7/92)

DEVIATION REPORT
Form FS-F-2909
Figure 2 (Sheet 1 of 2)

DEVIATION REPORT (DR) - INSTRUCTIONS

PREPARER - COMPLETE SECTION 1 AND 2 AS FOLLOWS	
ITEM	INSTRUCTIONS
DATE OF DISCOVERY	Enter date that deviation was discovered.
RESPONSIBLE ORGANIZATION	Enter the organization responsible for the item or activity in which a deviation is discovered.
RESPONSIBLE ORGANIZATION'S REPRESENTATIVE	Enter name of the representative responsible for disposition/corrective action.
ACTIVITY	Enter activity performed. (Example Audit 189-1)
LOCATION	Location of the activity (Example Plant 6)
REQUIREMENTS	Identify the procedure, instruction, standard, or code which establishes the acceptance criteria for the activity or item being evaluated.
DEVIATION	Fully describe the deviation as it relates to the requirements
VERBALLY NOTIFIED MANAGEMENT	List the date that the responsible organization's management was verbally notified of the deviation
PREPARED BY	The preparer signs and dates for Section 2

EVALUATOR - COMPLETE SECTION 2 AND HEADING AS FOLLOWS	
IS CORRECTIVE ACTION REPORT REQUIRED	Evaluate deviation for issue of a Corrective Action Report. Check "Yes" if required, or "No" if not required.
DR NO.	Obtain and enter on the DR Form a DR Number from the Computer DR Data Base or from the Administrator of Deviations.
REVISION	Enter the current revision number 0, 1 etc.
PROVIDE DISPOSITION BY DATE	Request the organization deemed responsible to provide dispositioning action by a certain date outlining steps taken or planned to correct immediate problem
EVALUATOR	Sign and date Section 2 of the DR form

RESPONSIBLE ORGANIZATION REPRESENTATIVE - COMPLETION OF DISPOSITION ACTION SECTION 3	
DISPOSITION	Check the appropriate block for Accept-as-is, Rework, Repair, Reject or Other and indicate the appropriate disposition in the space provided. If disposition is Accept-as-is or Repair, provide a technical justification. Enter the date that disposition action will be completed.

EVALUATOR - COMPLETION OF THE RECEIPT AND EVALUATION OF PROPOSED DISPOSITIONS SECTION 4
Receive and evaluate the proposed disposition action to determine its adequacy for solving the specific problem identified in the deviation report.
Document acceptance of the proposed disposition in Block 4 by signature and date
Notify the organization responsible for disposition action of the rejection of the proposed disposition action and coordinate with the organization to obtain a revised response.

RESPONSIBLE ORGANIZATION REPRESENTATIVE - COMPLETION OF DISPOSITION ACTION SECTION 5
Complete disposition action sign Block 5 and forward to evaluator.

EVALUATOR - COMPLETION OF THE VERIFICATION AND CLOSURE OF DISPOSITION ACTION SECTION 6
Monitor the disposition and verify that the actions taken to correct the deviation have been completed satisfactorily
Approve acceptance of verified disposition in Section 6 by signature and date. Enter the verification action performed
Ensure the removal of nonconforming item tag(s) only after verifying satisfactory completion of all dispositioning actions.
Forward the closed out deviation report (DR) to the Administrator of Deviations with a copy to responsible organization management

FS-F-2909 (REV 9/7/92)

DEVIATION (DR) REPORT - INSTRUCTIONS
Form FS-F-2909
Figure 2 (Sheet 2 of 2)

QUALITY NONCONFORMANCE

P.O./SHIPMENT/LOT/PACKAGE/CONTAINER I.D. No.: _____

RECEIVING REPORT NO.: _____ INSPECTION REPORT NO.: _____

DESCRIPTION OF NONCONFORMANCE: _____

_____

_____

NAME: _____ BADGE No.: _____ PHONE No.: _____

TO BE REMOVED BY AUTHORIZED PERSONNEL ONLY

FS-F-2708 (REV. 10/10/91)

QUALITY NONCONFORMANCE

P.O./SHIPMENT/LOT/PACKAGE/CONTAINER I.D. No.: _____

RECEIVING REPORT NO.: _____ INSPECTION REPORT NO.: _____

DESCRIPTION OF NONCONFORMANCE: _____

_____

_____

NAME: _____ BADGE No.: _____ PHONE No.: _____

TO BE REMOVED BY AUTHORIZED PERSONNEL ONLY

FS-F-2708 (REV. 10/10/91)

QUALITY NONCONFORMANCE
FORM FS-F-2708
Figure 3

CRITERIA FOR DETERMINING IF A CORRECTIVE ACTION REPORT IS REQUIRED

A Corrective Action Report shall be issued for deviations with:

- o Significant Conditions Adverse to Quality - Deviations which have, or may have, serious effect on safety, health, operability, environment or reliability.
- o Quantity/Frequency - Repetitive deviations or similar deviations resulting from activities or conditions which are common to the deviations.
- o Ineffective Implementation of Dispositions - Deviations which have not been properly or promptly dispositioned or resolved and which, if uncorrected, could result in other deviations or significant conditions adverse to quality.

The following are examples of significant conditions adverse to quality and shall be processed in accordance with this procedure:

- o Approved and released documents such as design documents, procurement documents, procedures, instructions, reports, and data found to contain significant errors or to be inadequate for their intended function.
- o In-process checks that indicate process or test limits may be exceeded and may have serious effect on safety, operability, or reliability.
- o Out-of-calibration standards or instruments used to verify process limits and may have serious effect on safety, operability, or reliability.
- o Significant adverse trend analysis results.

CRITERIA FOR DETERMINING IF A CORRECTIVE ACTION REPORT IS REQUIRED TO BE ISSUED TO SENIOR MANAGEMENT

An evaluation shall be performed of each CAR for issue to Senior Management. If the CAR meets the following criteria, it shall be issued to Senior Management:

a) Significant and repetitive trends in deviation documents, audit/surveillance findings, and other inspections for which corrective action measures have proven ineffective or inadequate.
b) Delinquent Corrective Action that cannot be resolved at a lower level of management.
c) Significant conditions adverse to quality which require more than a routine evaluation, analysis and corrective action.

CRITERIA FOR DETERMINING IF A CORRECTIVE ACTION REPORT IS REQUIRED
Figure 4

Fernald Site

SUPPLIER DISPOSITION REQUEST

SDR SERIAL NUMBER:	SUBCONTRACT NUMBER:
TO BE COMPLETED BY SUPPLIER	
1 Waiver ☐ (W) Non Conformance ☐ (N) Attn: _____ SUBCONTRACT ADMINISTRATOR	2 From: (SUPPLIER NAME & ADDRESS) _____ 3 DRAWING NUMBER & REVISION:
4 COMPONENT AND SERIAL NUMBER:	5 PART NAME AND SERIAL NUMBER:
6 DESCRIPTION OF SPECIFICATION OR DRAWING REQUIREMENTS TO BE WAIVED OR INTERPRETATION REQUIRED: (W) OR DEFICIENT CONDITION: (N)	
7 SDR'S PREVIOUSLY ISSUED ON THIS PART:	8 OTHER PARTS AFFECTED: ☐ YES ☐ SDR NO. _____ (W) ☐ NO ☐ Quantity _____ (N)
9 (A) SUPPLIER'S RECOMMENDED DISPOSITION (WAIVER). (B) JUSTIFICATION FOR WAIVER (W). (A) SUPPLIER'S RECOMMENDED DISPOSITION. (B) JUSTIFICATION. (C) CORRECTIVE ACTION BEING TAKEN TO PREVENT RECURRENCE. (N)	
10 THIS DISPOSITION WOULD AFFECT: INTERCHANGEABILITY ☐ YES ☐ NO OPERATION ☐ YES ☐ NO REPAIR PARTS ☐ YES ☐ NO	
11 LIST ATTACHMENTS.	12 SIGNATURE OF SUPPLIER'S AUTHORIZED REPRESENTATIVE: DATE:
TO BE COMPLETED BY WEMCO	
13 BASELINE ENG'R. DOCUMENTS AFFECTED (ECR REQUIRED): ☐ YES ☐ NO ☐ MAJOR SCOPE CHANGE	
14 DISPOSITION ACTION: APPROVED AS RECOMMENDED ☐ DISAPPROVED ☐ OR AS BELOW ☐	
15 THIS REQUEST AFFECTS INSPECTION OR INSTALLATION AT SITE: ☐ YES ☐ NO	
16 SIGNATURE & APPROVALS:	17 DISTRIBUTION:
ENGINEERING APPROVAL: DATE: _____ QUALITY DATE: _____ SUBCONTRACT ADMINISTRATOR/BUYER: DATE: Subcontract Consideration Required ☐ Yes ☐ No _____ DOE IAS REQUIRED: DATE:	

The supplier accepts full responsibility for the accuracy and completeness of the information above.
The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FS-F-2642 (5/01/92)

SUPPLIER DISPOSITION REQUEST
Form FS-F-2642
Figure 5 (Sheet 1 of 2)

INSTRUCTIONS FOR PREPARATION OF SUPPLIER DISPOSITION REQUEST

GENERAL

It shall be the responsibility of the Supplier to initiate an SDR for each waiver or nonconforming condition and submit it to WEMCO for approval prior to implementing the supplier's recommended disposition. Attach all supplemental sheets as necessary to provide detailed explanations for these factors that cannot be fully explained in the space provided on the SDR form. Reports and dispositions via telephone or TWX are not prohibited, however, the supplier is responsible to execute an SDR on all deviations from drawing, specifications or contract requirements. Any work done before receipt of written approval of the recommended disposition shall be at the supplier's risk. Items shall not be released for shipment before approval of the recommended disposition.

The supplier shall maintain an SDR log and record a sequential, numerical identification number on each SDR submitted. The subcontract or purchase order number, and the serial number shall be entered on the top of each SDR submitted.

PROCEDURE

Supplier Responsibility

Box 1 - Record the name of the cognizant Subcontract Administrator and check Box W or N.
Box W (Waiver) shall be used to identify a design change which will produce a better or less expensive product or improve the delivery schedule, but requires waiving one or more requirements of the procurement document.
Box W shall also be checked if a clarification of specified requirements is requested.
Box N (Nonconformance) shall be used to identify a deviation from procurement document requirements which has occurred unintentionally during fabrication.

Box 2 - Record the mailing address as stated on the purchase order.

Box 3 - Record the drawing number and revision for the affected parts.

Box 4 - Record name of article as described in purchase order including serial number if applicable.

Box 5 - Record name of the affected part as shown on the drawing recorded in block 3, including serial number if applicable.

Box 6 - (W) For waiver or clarification request: Describe the problem or question, identifying specification section for which the waiver is requested.
(N) For nonconformance: Record the condition, including specification section violated.
(Both) Include sufficient detail to allow complete evaluation. Describe in detail those conditions not characterized by numerical variables.

Box 7 - List by serial number all previous SDR'S submitted on the material defined by the information in blocks 5 and 6.

Box 8 - Evaluate and record whether other parts are influenced by the condition in block 6.
(W) For waiver or clarification request: Enter number of associated SDR.
(N) For nonconformance: Record the quantity of parts which are part of the same lot having the same attributes as described in block 6 for which disposition has not been requested.

Box 9 - Record the recommended disposition, the justification for such disposition and the corrective action to be taken to prevent recurrence (if applicable).

Box 10 - Record what effect the recommended disposition would have on interchangeability, operation and repair parts in so far as the Supplier can determine. Attach supplemental sheets explaining in detail what the effects are, if any of the blocks are checked "yes".

Box 11 - List attachments to the SDR.

Box 12 - Signature and title of the Supplier's authorized representative.

Mail to the cognizant Subcontract Administrator.

WEMCO Responsibility

Box 13 - Responsible WEMCO Engineer shall indicate if Baseline Engineering Documents are affected. If an Engineering Change Request is required, process and obtain required reviews and approvals prior to obtaining the required signatures in Box 16.

Box 14 - The WEMCO Engineer shall record the disposition action after coordination with Quality and Procurement. Reason for disapproval shall be stated.

Box 15 - The WEMCO Engineer shall check the appropriate box after coordination with Quality. The affected superintendent or manager shall be notified immediately.

Box 16 - The representatives of Engineering, Quality and Subcontracts will endorse the disposition by their signature.

Box 17 - Distribute copies of completed form to signers and receiving inspection.

NOTE: The Subcontract Administrator will record in the SDR log the date of transmittal to the disposition to the supplier.

FS-F-2642 (8/31/82)

INSTRUCTION FOR PREPARATION OF SUPPLIER DISPOSITION REQUEST
Form FS-F-2642
Figure 5 (Sheet 2 of 2)

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 24 of 24
Title: **DEVIATION AND CORRECTIVE ACTION REPORTING**		DOCUMENT NO: SSOP-0023 REVISION NO. 2
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 06-25-92

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
06-27-91	0	Issued to identify the assigned responsibilities and required actions for identifying, documenting, and providing dispositions for deviations and corrective actions observed during audits, reviews, initiated by M. A. Malone per Request No. P91-220.
02-04-92	1	Incorporation of temporary revisions T91-021 thru T91-025 per Request Nos. S92-012 thru S92-016, initiated by M. Malone.
06-25-92	2	Revision to SSOP-0023, per Request No. S92-048, initiated by M. Malone.

CONTROL NO. - 4554-
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0100
REVISION NO. 0

READINESS REVIEW PROCESS

NON-CONTROLLED COPY

SSOP-0100

Effective Date: 01-15-93

AUTHORIZED BY: _____ 1/14/93
N. C. Kaufman, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
01-15-93	0	New procedure to provide a Readiness Review instruction per Request No. S92-246, initiated by Carol Kilberg / Bob Gorog.

(530

1.0 PURPOSE

This procedure establishes the conditions and/or requirements to be used by Fernald Environmental Restoration Management Corporation (FERMCO), for implementing a Readiness Review (RR) process. The Readiness Review Process is a management tool which establishes and verifies the status and degree of readiness of an activity to start up or to proceed to the next phase of work. Formal mechanisms are described in this procedure for recording measures that will ensure the desired state of readiness. The RR process is a systematic and documented review of project/activity readiness to proceed toward completion. This procedure provides a uniform and consistent strategy with an independent overview of startups, restarts, and shutdowns. The RR Process assures conformance with DOE directives/orders which have been developed in response to Defense Nuclear Facility Safety Board (DNFSB) recommendations. This procedure provides a systematic and documentable approach for validating planned actions, to ascertain and record that a state of readiness to proceed has been achieved. The primary components in support of these activities are a RR conducted by FERMCO and an Operational Readiness Evaluation (ORE) conducted by DOE.

2.0 SCOPE

This procedure is applicable to all FEMP site activities relating to facilities, operations, processes, systems, construction/demolition efforts, and projects.

The information contained in this procedure provides guidelines for RRs conducted by FERMCO. FERMCO's RRs are classified as LEVELS 1 through 4. This shall suffice in covering all activities undertaken at the FEMP. Where applicable, a higher level RR may be requested or directed by DOE-FN. In those cases, the DOE-FN will provide authorization to proceed through the Office of the President.

3.0 DEFINITIONS

Acceptance Criteria - Established, documented, and measurable conditions necessary to satisfactorily resolve an item with and RR criteria problem.

Activity - A facility, operation, process, system, construction effort, or project that may have the RR Process applied.

Exemption - An activity that does not require an RR prior to startup, restart or shutdown based on the outcome of the RR needs assessment process. Assessment should make use of the Safety Analysis Report, Risk Assessment Management, and the DOE Radiological Control Manual processes. Exemptions most frequently apply to routine maintenance activities or activities that are minor in nature.

3.0 DEFINITIONS (cont.)

Facility Shutdown - The condition in which a non-reactor facility ceases the operation for which the facility was being operated (i.e., program work ceases). During the shutdown condition, all applicable operational safety, technical specifications, safety and health, and environmental requirements must be met for the facility.

Graded Approach - A methodology using weighted factors that take into account applicable facets of operational readiness and are designed to reduce subjectivity during the review process. The rigor of the evaluation and the judgement of what constitutes acceptable performance in the area being evaluated will be based on the importance of that area to safety (radiological, industrial, and facility), environmental protection, and other critical issues (as applicable).

Non-reactor Nuclear Facility - Those activities or operations that involve radioactive and/or fissionable materials in such a form and quantity that a nuclear hazard potentially exists to the employees or the general public. Included are activities that: (1) produce, process, or store radioactive liquid, solid waste, or fissionable materials; and (2) perform environmental remedy or waste management activities involving radioactive materials. The incidental use and generation of radioactive materials in a facility operation (e.g., check and calibration sources, use of radioactive sources in research, experimental or analytical laboratory activities, electron microscopes, and x-ray machines) would not ordinarily require the facility to be included in this definition.

Notification Letter - See Section 6.1

Operational Readiness Evaluation (ORE) - The DOE evaluation of the activities that were undertaken by the contractor (including the RR) to ensure safety of facility operations after restart/startup. An appropriately written ORE is performed to a written, detailed, and approved ORE Plan.

Operational Readiness Review (ORR) - Activities undertaken by the Contractor, which involves an independent and structured method for determining that the project, process, or facility (referred to as an activity) is ready to operate, occupy, or shut down. It includes, as a minimum, review of the readiness of plant, hardware, personnel, and administrative controls (e.g., procedures) and a determination of compliance with DOE Orders and Directives.

Planned Shutdown - A non-reactor nuclear facility shutdown required to perform scheduled activities (such as facility maintenance, surveillance, tests, inspections, and/or safety upgrades-or modifications) or for programmatic reasons unrelated to the facility's ability to operate.

3.0 **DEFINITIONS** (cont.)

Poststart Finding - A finding which may be resolved before or after a declaration of "readiness to operate" is issued. These findings have been carefully evaluated and documented to ensure adequate technical justification exists to exclude from the prestart findings.

Prestart Finding - A finding which must be resolved before a declaration of "readiness to operate" is issued. These findings could adversely affect the safe operation of the facility or function of the activity.

Program Work - Work in a non-reactor facility that is accomplished to further the goals of the facility mission and/or the program for which the facility is operated. Program work is not accomplished when the facility is shut down. Program work does not include work that would be required to maintain the facility in a safe shutdown condition, minimize radioactive material storage, or to accomplish modifications and correct deficiencies required before program work can recommence.

Readiness - When the facility, equipment, personnel, procedures, and administrative systems are verified to be in place at the required state to support operation.

Readiness Review (RR) - See definition for ORR. the distinction is provided to identify activities undertaken at the FEMP.

Readiness Review (RR) Board - A multi-discipline group that conducts RRs and judges the "readiness to proceed." Appointees shall not have direct involvement in the process or facility being reviewed. The RR Board is a standing board and consists of appointed personnel as defined in the RR Board Charter. See RR Board charter. The Board acts as an independent entity in applying the RR process.

Readiness Review (RR) Criteria - A formalized listing of prerequisite detailed conditions or issues which must be satisfactorily resolved to achieve a specified state of readiness. This may be evaluated in checklist form or by use of Management Oversight and Risk Tree (MORT) methods.

Readiness Review (RR) Type - A designation for ORR which is based on hazard potential and the minimum approval authority needed. Type designation is consistent with DOE orders.

Readiness Review (RR) Level - A designation of RR activities encountered at FEMP. See also RR Review Level Determination Section 6.3

Readiness Review (RR) Plan - See Section 6.2

Readiness Review (RR) Process - An independent, systematic, and documented process for verification that planned activities have achieved a state of defined readiness as determined by a RR. Inherent in the process is the application of the graded approach.

3.0 DEFINITIONS (cont.)

Readiness Review (RR) Team - Designated individuals from the functional areas who are responsible for performing the major tasks required to carry out the RR process (e.g., identifying checklist items, compiling the associated documentation, completing certification statements.) The RR Team is directed by the Cognizant Division Manager or his designated representative.

Restart - Recommence facility program work after shutdown of the activity. A restart requires an authorization action to resume facility program work. The EM Policy under 8.1 "DRIVERS" Provides guidelines for defining this activity.

Semiannual Readiness Review Status Report - A report that is issued semiannually (March & September) by the Board that gives a status of all RR activities. Only activities that appear on the Status Report shall be considered for review by the Board.

Unplanned Shutdown - An unplanned non-reactor nuclear facility shutdown caused by equipment, personnel error, or by an on-shift operator in response to indications of an unsatisfactory situation or a situation that would have unsafe consequences without shutdown. These shutdowns include those completed at the direction of facility management, local DOE officials, or by DOE headquarters. The EM Policy under 8.1 "DRIVERS" Provides guidelines for defining this activity.

4.0 RESPONSIBILITIES

Office of the President (OP) - Overall responsibility of the RR Process to insure the process is carried out and executed in accordance with applicable procedures and DOE orders. Establishes the RR process, charter, and procedure, and appoints the RR Board Chair and membership. Provides authorization based on RR Board recommendations and interfaces with DOE-FN/HQ. Advises the RR Board and provides interface with other ORR activities throughout the DOE complex.

Cognizant Division Manager - The Cognizant Division Manager is the manager with ownership of the activity for which a RR is conducted. He or his designated representative is assigned a non-voting membership on the RR Board for the specific activity under review. The Cognizant Division Manager, or his designated representative, also has the following responsibilities.

- Assures all processes, systems, facilities, or activities under his/her cognizance are assessed for required RR action per DOE Orders/directive Provides this information to RR Board for Semiannual Status Report preparation.

4.0 RESPONSIBILITIES (cont.)

- Initiates the review process by establishing the RR Team and providing the information to be used in the RR process.
- Initially assesses, for RR Board concurrence, the RR type or level to be conducted.
- Ensures resources and funding for RRs are identified and allocated to the activities.
- Provides justification for exemptions for Board Chair consideration.

Readiness Review (RR) Team Leader - Senior person (usually the Project Engineer or lead project person) on the RR Team with knowledge and experience adequate to assess the planned activity. The Team Leader can be designated as the cognizant division managers representative and has the following responsibilities:

- Direct and coordinate RR Teams efforts with overall responsibility for execution/implementation.
- Direct and coordinate the RR Team to provide the needed function(s) to close out each element or relevant item of the applicable criteria.
- Compile and retain the RR process records as quality records.
- Assure actions are taken to correct deficiencies identified during the review process.
- Develop preliminary recommendations for authorization to proceed as directed by the RR Board.

Readiness Review Team - The management-appointed multi-discipline group that evaluates the subject activity's state of readiness and identifies/provides the supporting objective evidence. The team has the following responsibilities:

- Prepares the RR plan.
- Uses analytical techniques (checklists or MORT Analysis) to ensure total coverage of the subject activity.
- Develops RR Criteria and response actions that are required to satisfy closure actions for each of the RR Criteria Elements.
- Identifies and verifies the objective evidence which supports the status of readiness for each applicable checklist element.

4.0 RESPONSIBILITIES (cont.)

- Prepares the readiness criteria documentation for submittal to the RR Board in a timely manner.

Readiness Review Board - Conducts the formal, focused readiness review and makes recommendations regarding proceeding to the next activity phase.

- Rules on concurrence of RR Level required for the activities.
- Integrates issues raised by external Committees or DOE ORE into the review process.
- Reviews and approves the RR Plan and the readiness criteria and response actions developed by the RR Team.
- Verifies compliance with criteria.
- Evaluates the risks associated with proceeding with the activity's next increment of work.
- Documents all RR Board actions and ensures that such documents are included as part of the RR Process permanent record.
- Issues the Semiannual RR Status Report that shows the proposed activities that are scheduled for RRs, the level of review, and the status of each.
- Compiles lists of prestart findings, poststart findings, and lessons learned. Prepares recommendation(s) and/or approvals for appropriate actions.

Readiness Review Board Chairperson - The RR Board Chairperson should have the knowledge and experience required to adequately assess the activity being reviewed. A necessary qualification is an ability in managing and conducting the RR activities. The Chairperson is responsible for overseeing the RR Process which consists of the following:

- Recommends RR Board membership.
- Plans, coordinates, and acts as the lead during the RR.
- Estimates the level of effort and schedule requirements.
- Establishes RR objectives and milestones.

4.0 RESPONSIBILITIES (cont.)

- Serves as Management and DOE point-of-contact during the review.
- Compiles or acquires access to all necessary background information.
- Maintains RR documentation files.
- Resolves all conflicts between the RR Board and Team.
- Directs all closeout activity.
- Determines applicability of RR process to activities (i.e., Exemptions).

Readiness Review Board Coordinator

- Assistant to the Board Chairperson.
- Coordinates Board meetings and attends as a non-voting member. Compiles and issues meeting minutes.
- Maintains the RR database that provides status and progress of readiness criteria for each RR.
- Maintains the RR Board files for completeness.
- Coordinates the preparation of the Semiannual Status Report.

5.0 GENERAL

5.1 Six Startup/Restart Types of ORRs are established by DOE Order. The classification of types is based on the complexity/magnitude of the activity and the level of authority needed for signoff. DOE Types 1 through 4 are higher level activities which require an in-depth Contractor ORR and an overview by the DOE Area/Field Office in the form of an ORE. General guidelines are provided in DOE guidance documents. These documents do not address new starts that are authorized at the lower levels (DOE Types 5 & 6) which are undertaken and authorized following the requirements specified in DOE 4700.1, Project Management System.

5.0 GENERAL (cont.)

5.2 The purpose of a RR is to obtain assurance that a facility, a process, or a system (i.e., activity):

- Is constructed as designed;
- Will perform as designed
- Can be operated safely (or if a shutdown, can be safely stopped, decommissioned and/or demobilized);
- For shutdowns or decommissioning, is returned to a stable and environmentally sound state;
- Will be operated by trained and competent personnel;
- Is in conformance with applicable DOE Orders and regulatory requirements;
- Will be operated so that no undue risk to employees, the public, or the environment is created; and
- All of the above items and properly and adequately documented.

5.3 The RR shall provide a comprehensive review of the activity, reflect an independent appraisal, and fully disclose the actual state of readiness. The RR process will provide assurance that the following objectives are accomplished and documented.

- Review of management practices and overall administrative systems of the activity;
- Inspection of the hardware;
- Interviews, observations, and records of examination of personnel; and
- Examination of documentation.

These evaluations provide the basis for the determination made by FERMCO and DOE management that an activity is ready to commence operations or to proceed to the next phase.

5.0 GENERAL (cont.)

5.4 When an Activity has been identified on the Semiannual Status Report as requiring a RR, the activity shall not start up (or shutdown) until the RR process, including the DOE ORE, has been completed. Status changes of a RR in progress can only be accomplished by a directive from the OP. A specific definition of the startup/shutdown requirements for the RR shall be contained in the RR Plan. Included in this definition shall be a consideration of the hazards introduced once the activity has commenced (or in the case of a shutdown, ceased) operations.

Phased execution of the RR process may be considered if the RR involves the assessment of a number of different processes or systems that may be brought online (or shutdown) at different times or if the RR will be conducted over an extended period of time.

5.5 Preparations for the startup, restart, or shutdown of an activity shall be disciplined and documented, and shall provide an adequate basis for the readiness determination. The primary components in support of the startup, restart, or shutdown determinations is a RR initiated by the responsible Manager and an ORE conducted by the DOE.

- The RR shall focus on the readiness of all hardware, personnel, procedures, and compliance with the requirements.
- The DOE ORE shall focus on the adequacy of the RR and the effectiveness of the preparation for operation.

5.6 Due to the many variations encountered in the RR process, actual performance of the individual RRs will be varied. Focus will be based on the activity's scope and level of review that is needed to demonstrate a satisfactory state of readiness to proceed.

5.7 The graded approach is used to determine what Level(s) are required for a specific Activity. The Level of review needed for a specific activity will be determined as outlined in Section 6.3.

5.8 The Independent Safety Review Committee (ISRC) will interface when applicable with the RR Board by providing copies of its findings on reviews of safety documentation and reviews for configuration control and pre-operational readiness (for safety). The ISRC provides a separate independent review of facility safety criteria, equipment, and operations which supplement the RR process.

5.0 GENERAL (cont.)

5.9 An overview of the parameters used for RR level determination can be found in Table 2. Each review may be at a level lower than the overall RR level. For example, a process may have two reviews at Level 3 for partial turnover or acceptance and a final review at Level 2. The RR process for multiple turnover or partial acceptance of projects/programs should consider partial reviews of each acceptance.

5.10 All levels of RRs will make use of analytical techniques and graded approach to ensure a methodical identification of circumstances or considerations which could affect the activity. Level 1 reviews shall make use of Attachment C MORT (Management Oversight and Risk Tree) techniques or the equivalent, to provide objective results for the review. The use of project management computer software and the network logic diagrams developed from using each readiness criteria as a scheduled event will provide an adequate tracking mechanism.

5.11 The RR Process includes establishing a RR Team, defining readiness criteria, developing readiness trees (or equivalent), identifying sources of information for assessing criteria, collecting this information, scheduling and conducting RRs, and formulating recommendation and/or informing the OP, depending on the FEMP level of review conducted.

5.12 The RR level is determined by hazards and risks from the activities, facilities, or processes where the effects of failures involve hazardous conditions from radioactive, hazardous, or toxic materials, or result in significant economic impact. The hazards of operating are determined by the Nuclear and System Safety Section via safety assessments, safety analysis reports, and safety studies. Actions to mitigate the hazards are provided in the Operational Safety Requirement (OSR) document for that system or facility/activity.

5.13 Auditable and meaningful documentation must exist behind each signature (e.g., audit report, surveillance report, letter, training sheet, test results.)

6.0 PREREQUISITES

For restart activities, implement the requirements of SEN-16B-91, DOE Approval of Facilities Shutdown for Safety Reasons and for Startup of Major New Facilities and the Office of Nuclear Energy procedure for the Restart of Reactors and Non-Reactor Nuclear Facilities.

6.0 PREREQUISITES (cont)

6.1 RR Notification Letter

Initialization of the RR Process is accomplished by the submittal of a notification letter prepared by the Cognizant Divisional Manager to the RR Board Chairman. Based on the level assignment from Table 1, the Manager will provide a copy of the RR notification letter to the DOE. The notification letter shall specify the start of the RR and briefly describe the proposed RR Process along with a schedule for accomplishment. Other pertinent information may be included as well. The proposed Level of the RR and the approval authority required for the startup, restart, or shutdown of the activity under review should also be identified. If the activity warrants a Level 4 determination, notification letter should provide sufficient documentation for board verification.

6.2 RR Plan

1. A RR Plan shall be prepared by the RR Team and submitted for RR Board approval prior to commencing RR activities. The RR Plan identifies RR Team members, the purpose or scope, scope limitations or exclusions, organizational responsibilities, and a preliminary level determination. The Plan will identify the acceptance criteria to be used and the basis for determining prestart and post-start findings. A preliminary schedule for execution shall be provided with the Plan.

2. Guidelines for using a graded approach for designating DOE Types/FEMP Level assignments are provided in Section 7.2. For higher level ORRs (DOE Types 1 to 3), the Plan will be prepared and provided in accordance with DOE Orders and Directives. For RRs performed at the FEMP (DOE Types 4 to 6/FEMP LEVELS 1 to 4), a letter report may be sufficient to define the plan for conducting the RR. However, the higher FEMP levels are required to be more structured and definitive in scope, specifically in the areas relating to health, safety, regulations, codes, and standards. The plan may be part of or attached to the RR Notification Letter.

3. Only Plans for activities listed on the Semiannual Status Report will be considered for review by the RR Board. Activities not listed are considered as not having proper FERMCO Management and DOE-FN approval. Special dispensation is granted to directives from FERMCO's OP.

6.0 PREREQUISITES (cont.)

6.2 RR Plan

4. For lower level RRs (FEMP Levels 3 and 4) that are repetitive in nature, the Plan may consist of a cover letter, prior approved plant procedures, and a predeveloped checklist. Higher level RRs (FEMP Levels 1 and 2), the Plan should include, as a minimum, the following elements: Title/Approval page, Introduction, Objectives, Scope, Copies of engineering and safety documentation, QA criteria, Work Plans, Review Process, Reporting and Resolution, and Schedule.

6.3 RR Level Determination

1. Integration of the RR Process throughout the DOE complex provides a system which establishes methodology for classifying or rating activities. The method used is a graded approach to determine the depth and scope of the review required for the activity. The graded approach offers a well defined basis for determining the requirements, taking into account pertinent facets of operational readiness and reducing the subjectivity of the decision making process. Since the different activities being considered for RRs can vary considerably in scope and complexity, the graded approach can be used to specify the category of review necessary to be all encompassing. This categorization is defined as the readiness review DOE Type/FEMP Level. Outlined in the procedure are four distinct FEMP LEVELS of review. Based on hazard levels, safety issues, risk associated, and other relevant factors, the DOE Type/FEMP Level of review needed are assigned descending numerical order of significant.

2. DOE Order requires operational readiness reviews defined by type. Six types have been identified and compliance is achieved for types 4, 5, and 6 by applying the procedure outlined herein. For types 1, 2, and 3, DOE Orders and Guidance documents provide guidelines. Some overlap may be encountered for types 3 and 4; however, these should be considered on an individual basis. See Table 1 for readiness review DOE TYPE/FEMP LEVELS THAT ARE assigned to the various Activity types. DOE TYPE/FEMP LEVEL determinations are based on a score derived from the significance factor assigned to the pertinent facets associated with the activity (see Tables 2, and 3).

6.0 **PREREQUISITES** (cont.)

6.3 RR Level Determination

3. Table 2 provides a matrix of relevant factors anticipated for a given activity and the level of significance or intensity of occurrence. For each of the factors given in Table 2 a significance or intensity of occurrence number is assigned. These numbers are recorded on the work sheet provided in Table 3. A subtotal score is determined for each column which in turn provides an overall work sheet total score. The score on Table 3 is then compared with the corresponding ranges of numbers shown in Table 1. From this comparison, the appropriate RR DOE TYPE/FEMP LEVEL is then selected.

TABLE 1. Readiness Review Levels and Approval Authority

DOE Type	FEMP Level	DOE - HQ	DOE - FN	FEMP President	Division Manager	Total Score (Table 3)
1		A	C	R	R	30
2		A	C	R	R	25 - 29
3		A	C	R	R	19 - 24
4	1	A	C	R	R	13 - 18
5	2		A	C	R	7 - 12
6	3				A	1 - 6
	4 *				A **	0

A = Approval C = Concurrence R = Recommendation

* Activity may qualify for exception status

** ATTACHMENT "B" signatures

TABLE 2. Factors Considered Using the Graded Approach

RR General Factors	Significance Factors			
	Very Low (0)	Low (1)	Moderate (2)	High (3)
Criticality - nuclear process characteristics	None. No significant quantities of fissionable material are present under either normal or abnormal conditions	Presence of fissionable material within the facility but the mass remains subcritical through the process	Use of parameter control for nuclear criticality safety within the process, but not enough to exceed the subcritical limits during normal and abnormal operations. (DOE Order 5480.5) The Double Contingency criterion is satisfied.	Use of all parameter controls and administrative controls for nuclear criticality safety within the process. A significant likelihood of the process becoming critical without them. Double Contingency criterion may not be satisfied for all conditions of operations
Personnel Radiation Exposure	None. Facilities in areas limited in coverage by standing radiation worker permits (RWP).	RWPs required for infrequent entry that may include monitoring and anticontamination clothing, but there is no airborne hazard present. Anticipated dose is less than 2 rem per year.	RWPs for entry that include monitoring, anticontamination clothing, and respirators for airborne radiological hazards. Several radiological controls are required to maintain anticipated dose to less than 2 rem per year.	RWPs for entry that include monitoring, anticontamination clothing, respirators and extensive continuous monitoring required to maintain anticipated dose to less than 2 rem per year.
Process Hazards - fire protection, safety analysis, maintenance, emergency preparedness, issues management, industrial safety and technical standards.	Very Low or None. An acceptable level of risk for personnel injury or equipment damage, without administrative controls.	Minimal administrative controls for process hazards described in the Safety Analysis Report.	Significant chemical and/or radiological protective measures to mitigate the consequences of uncontrolled chemical and/or radiological accidents to plant personnel and the public. < 11 safety systems are required	Extensive personnel and equipment protective measures to mitigate the consequences of uncontrolled chemical and/or radiological accidents to plant personnel and the public. ≥ 11 safety systems are required.
Assigned QA level	Level 4	Level 3	Level 2	Level 1
Seriousness level rationale assigned by Risk Assessment Report	None	1 & 2	3 & 4	5 & 6

7.1 SEQUENTIAL STEP-BY-STEP EXECUTION (cont.)

RR TEAM

5. Prepares a summary of completed work which objectively demonstrates compliance through the use of MORT methods, readiness criteria checklist, or elements of the checklist established as applicable by the RR Board.

RR BOARD CHAIRMAN

6. Convenes the RR Board

RR BOARD

7. Reviews and evaluates presented information, applies the graded approach to the RR process and makes judgement accordingly, conducts interviews, and tours the facility to evaluate the state of readiness.

8. Issues readiness status assessments to the RR Team, describing items needing additional verification data for specific criteria, elements, or deficiencies identified in the review.

9. Makes judgmental decision as to the state of readiness.

RR TEAM

10. Continues the review and close-out of criteria items.

11. Prepares prestart and poststart finding lists.

12. Completes the readiness criteria work sheet or checklist. Tracks and provides status for Checklist Items.

13. Resolves the identified RR Board findings or concerns.

14. Prepares a summary of completed work to objectively demonstrate compliance to the readiness criteria.

15. Conducts a final evaluation of the RR and compiles a final report which evaluates the activity's readiness to proceed to the next sequence.

RR TEAM

16. Maintains established RR criteria pending approval to proceed.

7.1 SEQUENTIAL STEP-BY-STEP EXECUTION (cont.)

RR TEAM

17. Submits written recommendation(s) regarding the state of readiness to the Cognizant Division Manager.

COGNIZANT DIVISION MANAGER

18. Approves Teams recommendation or submits the teams recommendation for approval in accordance with Table 1.

RR BOARD

19. Conducts a final evaluation of the RR criteria.

20. Make judgment on readiness to proceed and provides recommendations accordingly.

RR BOARD CHAIRMAN

21. Compiles a final report which evaluates the activities readiness to proceed to the next sequence.

22. Submits a written recommendation regarding the state of readiness to the FERMCO President for approval to proceed (For Levels 1 & 2 only).

FERMCO PRESIDENT

23. Takes approval action based upon RR Board recommendation.

24. Requests DOE authorization to proceed when moderate or high hazard levels have been identified for the activity or when DOE has requested to review the RR.

25. Requests DOE authorization to proceed for restart of a activity affected by SEN-16B-91, *DOE Approval of Facilities Shutdown for Safety Reasons and for Startup of Major New Facilities* and the Office of Nuclear Energy procedure for the Restart of Reactors and Non-Reactor Nuclear Facilities.

DOE-FN

26. Review and concur with the Semiannual Status Report and identify activities requiring OREs.

27. Perform ORE and provide authorization to proceed.

7.2 READINESS REVIEW PROCESS BY DOE TYPES/FEMP LEVELS

DOE TYPES 1, 2 AND 3

Activities of these types will consist of a major undertaking normally directed at the DOE Program level requiring considerable commitments of time, effort, and cost. Levels of oversight and approval authority are required by the same higher management levels.

Due to the nature of work undertaken at the FEMP, it is anticipated that no activities at this Site will require this level of review. As a result, this procedure does not address these types. In the event that it becomes necessary to participate in a DOE Type 1, 2, or 3 activity, the RR Board will take the lead in directing the efforts.

DOE TYPE 4, FEMP LEVEL 1

In general, activities classified as a DOE TYPE 4/FEMP LEVEL 1 review will be the highest level of review encountered at the FEMP. A LEVEL 1 will require RR Board overview and coordination of readiness preparations using Management Oversight and Risk Tree (MORT) techniques, or the equivalent. The RR Team has the responsibility for implementing the review process. An example of the MORT method is provided as Attachment C.

Authorization to proceed to the next phase of operation is required by the DOE-HQ/FN with concurrence provided by the FERMCO OP. A request for authorization is initiated by the RR Board Chairperson with a report to the OP describing crucial findings and mitigating actions, poststart conditions, and statements relating to the overall state of readiness.

The Board's recommendation will address resolution of concerns expressed by any applicable independent review committee and will insure resolution of findings identified in the ORE conducted by DOE-HQ/FN. The report prepared by the RR Board Chairman will contain a draft letter stating the status with appropriate recommendations. The OP will submit the letter to DOE. Approval to the FERMCO OP by DOE-HQ/FN will constitute authorization to proceed.

Documentation in the form of documents with properly executed signatures, letters, certification certificates and regulatory authorizations shall be compiled and maintained in a complete and auditable form. All documents will be compiled and maintained in the RR Boards files.

7.2 READINESS REVIEW PROCESS BY DOE TYPES/FEMP LEVELS (cont.)

DOE TYPE 5, FEMP LEVEL 2

Activities classified as a DOE TYPE 5/FEMP LEVEL 2 review will require the level and depth of review specified in the Criteria Element Checklist provided in Attachment A. A LEVEL 2 will require RR Board overview and coordination of readiness preparations. The RR Team has the responsibility for implementing the review process.

Authorization to proceed is required from the DOE-FN with concurrence by the FERMCO OP. Authorization is provided with the preparation of a letter by the Board Chairperson to the OP describing crucial findings and mitigating actions, poststart conditions, and statement relating to the overall state of readiness. The Board's recommendation will take into consideration recommendations provided by any independent review committee and will accommodate findings identified in the ORE conducted by DOE-FN. Approval by the DOE-FN to the FERMCO OP will constitute authorization to proceed.

Required documentation will consist of verifiable evidence insuring that all applicable items of the Criteria Element Checklist have been properly addressed and closed out. This information will be compiled and maintained in an auditable file by the RR Board

DOE TYPE 6, FEMP LEVEL 3

Activities classified as a DOE TYPE 6/FEMP LEVEL 3 review will be completed in accordance with the applicable elements contained in the Criteria Element Checklist provided in Attachment A. The RR Board will review and approve the applicability of checklist elements. The RR Team Leader will insure implementation and satisfactory closeout of the relevant checklist elements. Authorization to proceed will be provided by the Cognizant Division Manager with concurrence from the RR Board. A summary report describing crucial findings, any mitigating actions required, poststart conditions, and statements relating to the overall state of readiness to proceed, shall be prepared by the RR Team for submittal to the OP.

7.2 READINESS REVIEW PROCESS BY DOE TYPES/FEMP LEVELS (cont.)

Required documentation will consist of verifiable evidence insuring that all applicable Checklist Elements have been properly addressed and closed out. This information will be compiled by the RR Team and maintained in the project files.

FEMP LEVEL 4

Attachment B provides a checklist of items deemed applicable in accordance with criteria defined in Project Management System DOE Order 4700.1. The RR Team will verify close out by initialling each item in the provided blank. Sign-off by the appropriate authorization shown on Attachment B will constitute verification and authorization to proceed. A copy of the signed off checklist with cover letter will be provided for the RR Board file. At the RR Board chairpersons discretion, copies will be sent to the QA Independent Program Assessment & Oversight office for independent verification.

Auditable documentation will consist of the cover letter with sign-off checklist attached and any pertinent supporting documents. A copy of the letter and checklist will be sent to the OP for informational purposes only. The authorization letter and applicable documents will be compiled by the RR Team and maintained in the project files.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- SEN-16B-91, "DOE Approval for Restart of Facilities Shutdown for Safety Reasons and for Startup of Major New Facilities"
- Office of Nuclear Energy procedure for the Restart of Reactors and Non-Reactor Nuclear Facilities.
- DOE Order 5480.5, "Safety of Nuclear Facilities"
- DOE Order 4700.1, "Project Management System"
- DOE Order 5480.6, "Safety of Department of Energy Owned Nuclear Reactors"
- DOE Order 5480.1B, "Environmental, Safety, and Health Program for Department of Energy Operations"
- DOE Order 5481.1, "Safety Analysis and Review System"
- OR 5481.1, "Safety Analysis and Review System"

8.0 APPLICABLE DOCUMENTS (cont.)

8.1 DRIVERS

- DOE Order 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements"
- DOE/OR 548X.1, "Operational Readiness"
- DOE OR-879, "Operational Readiness Evaluation and Recommendations"
- OR 5700.6, "Quality Assurance"
- DOE Order 6430.1A, "General Design Criteria"
- ERDA-76-45-1 (SSDC-1), "Occupancy - Use Readiness Manual"
- DOE-76-45/11 (SSDC-11), "Risk Management Guide"
- DOE 76-14/15 (SSDC-15), "Work Process Control Guide"
- DOE-76-45/39 (SSDC-39), "Process Operational Readiness and Operational Readiness Follow On"
- EM Policy, "EM Policy & Guidance for Readiness Determination"
- DOE 5480. RESTART DRAFT DATED 07-07-92. "STARTUP and RESTART of NUCLEAR FACILITIES.""

8.2 REFERENCE

- FMPC-508, "Safety Analysis Documentation Program"
- PO-0712, "Risk Assessment and Management (RAM) System Policy"
- SM-0001, "Risk Assessment and Management (RAM) System Manual"
- DOE-76-454 (SSDC-4), "MORT User's Manual"
- DOE N5450.6, "Radiological Control Manual"

READINESS REVIEW CRITERIA ITEMS

NOTE: The checklists in this attachment are to be used as items to be addressed in a RR checklist. This list should not be construed as limiting or restricting the scope of the RR. Additional guidance may be found in DOE-76-454 (SSDC-4), "MORT User's Manual" and DOE-76-45/11 (SSDC-11), "Risk Management Guide."

HARDWARE

1. Conformance of the design with applicable codes (e.g., fire, electrical, toxic chemical)

2. Design reviews complete and documented in accordance with PMP-325 and DOE 4700.1.

3. Required nuclear safety evaluations completed and reviewed.

4. Necessary safety analyses and environmental assessments and impact statements completed and approved.

5. Installed vessels, piping, instrumentation, and other facility hardware are compatible with process parameters (flow rates, pressure, temperature, chemicals). Storage tanks and pressure systems tested.

6. Latest drawings approved and distributed.

7. Equipment configuration agrees with as-built drawings, or exceptions noted on latest drawings.

8. Acceptance review of plant modifications complete.

9. Essential equipment items identified (safety system and design features for safety equipment on the MMICS and field tagging complete), calibrated, and preventative maintenance complete and online.

10. Backup equipment essential to process on hand.

11. Plant Protection systems installed, checked out, and on-line.

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READINESS REVIEW CRITERIA ITEMS (cont.)

HARDWARE

12. Safety related instrumentation identified, calibrated, and preventative maintenance complete.
13. Material handling equipment installed.
14. Sampling equipment installed.
15. Quality Assurance inspection equipment ready.
16. Offices ready.
17. Analytical laboratory services ready, equipment operable, computer and data reporting operable, analysis chemicals available.
18. No outstanding work requests or change orders.
19. Construction interfaces resolved.
20. Explosion potentials identified and resolved.
21. Fire protection equipment functional and operational.
22. Safety showers and eye-wash fountains operable.
23. Safety signs and barriers in place.
24. Appropriate protective clothing and respiratory protection equipment on hand. Airline Breathing Air Stations (if installed) properly installed and operational.
25. Decontamination equipment available.
26. Primary filter media checked; HEPA filters DOE certified; in-place DOP testing of HEPA filters (if present) completed.
27. Liquid or solid waste system on-line.
28. Atmospheric protection system on-line; associated instruments calibrated.
29. Stack or process effluent monitor calibrated and on-line.

READINESS REVIEW CRITERIA ITEMS (cont.)

HARDWARE (cont.)

30. Process control warning system on-line.

31. Tracking system for equipment/instrument malfunctions operable.

32. Local exhaust ventilation and process makeup air equipment functional and operational.

33. Essential chemical stocks adequate and Material Safety Data Sheets available in the work area for those chemicals.

34. All applicable utilities on-line.

35. Emergency power equipment operable.

36. Tag outs and lock outs current.

37. Scales calibrated.

38. Tanks and piping have proper hazard warning identification.

39. Noise levels measured and appropriate precautions taken.

40. Configuration of process equipment, emission control equipment, sampling equipment or other equipment, agrees with the terms and conditions or limiting conditions for operation of applicable permits or safety requirements.

41. Pre operational functional tests complete.

42. Human Factor considerations tested as required.

43. Review and acceptance by the Project Manager completed.

44. Waste Storage Containers available and in place.

ATTACHMENT A
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READINESS REVIEW CRITERIA ITEMS (cont.)

PERSONNEL

1. Operating personnel indoctrinated to:

   a. Manufacturing Specifications (MS), Operational Safety Requirements (OSR), and Standard Operating Procedures (SOP) and changes.

   b. Importance of correct entries in logs.

   c. Emergency responses to process abnormalities.

   d. Hazards of materials associated with operation (MSDS) reviewed.

   e. Emergency notification lists (back shifts).

   f. Operational irregularity reporting procedure.

   g. Importance of operational constraints.

   h. Terms and conditions or limits and conditions of applicable air and water permits or safety requirements.

   i. Technical support available.

2. Facility, process and safety training complete (current) and documented for:

   a. Supervisors/foremen

   b. Operators (includes motor vehicle operators, transportation laborers, traffic personnel, and heavy equipment operators)

   c. ERM and IH technicians

   d. COO/Waste Certification

ATTACHMENT A
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READINESS REVIEW CRITERIA ITEMS (cont.)

PERSONNEL (cont.)

2. Facility, process and safety training complete (current) and documented for: (cont.)

   e. Emergency Response Team

   f. Maintenance craft

   g. Technical engineers

3. Emergency personnel identified and trained.

4. All shifts are fully staffed.

5. Appropriately medically certified, trained, and fit tested personnel (if respiratory protection is required for this operation).

ATTACHMENT A
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READINESS REVIEW CRITERIA ITEMS (cont.)

ADMINISTRATIVE

1. Procedures necessary for operation have been identified, prepared, and approved. Master list of Maintenance Standards and Standard Operating Procedures including revision.

2. Risk Assessment updated for operations phase.

3. Safety Analysis Report complete and approved.

4. Operational Safety Requirements (OSR) document complete and approved.

6. Operational constraints, terms and conditions or limiting conditions, if any, identified and visible in Standard Operating Procedures or other documents.

7. Document change procedure in place.

8. Lessons Learned input evaluated for the activity.

9. Workability and completeness of all SOPs verified in plant.

10. Maintenance Standards, Standard Operating Procedures, and current forms distributed and available to operating crews.

11. Emergency plan prepared and approved.

12. Evacuation plan prepared.

13. ALARA analysis of anticipated personnel exposure complete.

14. COO Program complete and approved.

15. Quality Assurance Plan complete and approved.

16. All expendable equipment parts (seals, bearings, sensors, etc.) have been set up as stores items to minimize downtime and hazards.

17. Housekeeping evaluation of area.

18. Configuration Management safety systems and design features for safety systems identified and established to prevent unauthorized modification.

READINESS REVIEW CRITERIA ITEMS (cont.)

ADMINISTRATIVE (cont.)

19. All necessary federal and state permits (Air/Water PTI/PTO, NESHAP, etc.) are in-place.

20. Relevant Training programs have approved lesson plans and documentation.

21. Notification of regulatory agencies for startup or initiation has been completed as required by the applicable PTI/PTO/permit.

22. Organization is in place to ensure safe and proper operation of the facility/activity.

23. Activity/program environment has been evaluated for weather or adverse conditions impact and appropriate procedural guidance provided to mitigate.

24. Human Factors applications have been evaluated and incorporation into procedures, administrative policies and tested as required.

25. All Readiness review criteria open items are complete or have documentation to provide tracking of item to be completed.

26. Review and acceptance by the project manager completed.

27. Maintenance has two copies of all Operator Manuals, Repair Parts Manuals, Manufacturer's Bulletins, etc., for all new equipment, system, or process changes or new installations.

28. Repair parts needed to provide for safety or promote continuity of operations been identified and if necessary been established as FEMP store items.

29. Facility "Pre-Fire Plan" is complete.

30. Health & Safety Plan.

31. All Waste Material has been Characterized Per SSOP-0002 "MATERIAL EVALUATION FORM PROCEDURE."

32. Satellite accumulation area established for Temporary accumulation of hazardous waste.

33. Storage Planning.

ATTACHMENT B
LEVEL 4 - READINESS REVIEW CHECKLIST

Project Name: _____

INITIALS

_____ 1. Conformance of the design with applicable codes (fire, electrical, toxic chemical, etc.)

_____ 2. Safety signs and barriers in place.

_____ 3. All applicable utilities on-line.

_____ 4. Design reviews complete and documented.

_____ 5. Latest drawings approved and distributed.

_____ 6. Housekeeping evaluation of area.

_____ 7. No outstanding work requests or change orders.

_____ 8. Construction interfaces resolved.

_____ 9. Organization is in place to ensure safe and proper operation of the facility/activity.

_____ 10. Activity/program environment has been evaluated for weather or adverse conditions impact and appropriate procedural guidance provided to mitigate.

_____ 11. Readiness review criteria open items are complete or have documentation to provide tracking of item to be completed.

_____ 12. Review and acceptance by the project manager completed.

_____ 13. "As Built" drawings complete.

_____ 14. NEPA document complete and all air and water permits in place.

_____ 15. Safety Assessment Report (SAR) complete.

_____ 16. CAT Test complete and accepted.

ATTACHMENT B
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_____ 17. Operational testing complete and accepted.

_____ 18. O&M manuals, spare parts list provided with complete turnover package.

* This list is not exclusive and other items may be included.

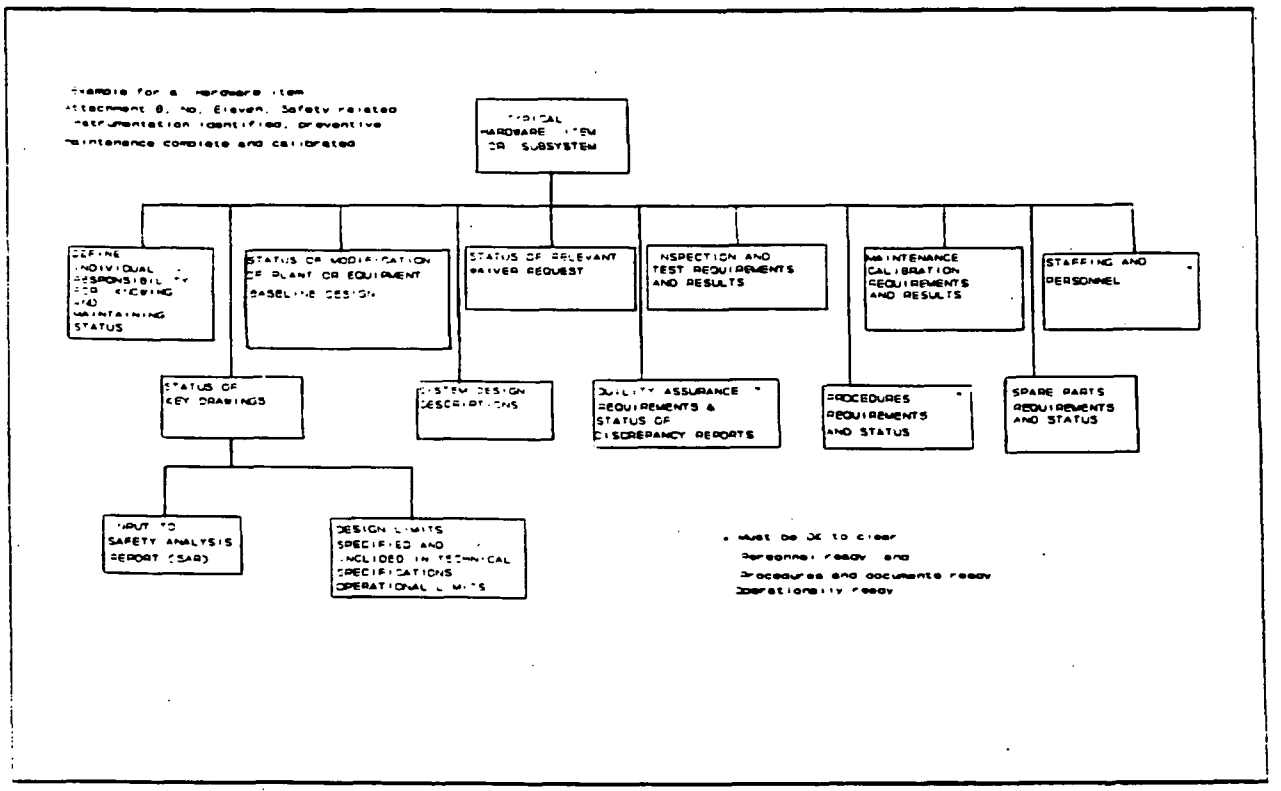
_____ Project Team Leader

_____ Project Manager

_____ Facility Owner

_____ Facility Owner Division Mgr.

ATTACHMENT C
MORT TREE EXAMPLE,



Other items for consideration:

- o Physical tagging of instrument reflects safety status
- o Physical configuration of instrument matches design and drawing
- o Physical configuration to support on-line operation is described in SOPs or MS and configurations agree
- o Drawings identify safety related instrumentation
- o SOPs reflect safety related requirements
- o Power and/or support systems for the safety function identified
- o Operator actions for on-line system operations identified
- o Off normal events for the instrument reflected in alarm or emergency procedures
- o MS's reflect the calibration requirements to assure operation
- o MMICS numbering complete.

The use of network logic diagrams in project management scheduling software to develop horizontal trees for the RRP may aid in RR completion. Each RR criteria item should be a scheduled event with successor and predecessor relationships established to detail RR actions required for completion of the review.

- 4554-

SPILL INCIDENT REPORTING AND CLEAN-UP

NON-CONTROLLED COPY

SSOP-0067

Effective Date: 11-20-92

AUTHORIZED BY: _____ 11/13/92
H. F. Daugherty, President — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

541

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 22
Title: **SPILL INCIDENT REPORTING AND CLEAN-UP**		DOCUMENT NO: SSOP-0067 REVISION NO. 0
Authorization: H. F. Daugherty, President	Replaces: FMPC-0503, Dated 10-25-88. Rev. 0	Effective Date: 11-20-92

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
11-20-92	0	Spill Incident Reporting and Cleanup is authorized per Request No. S92-112, initiated by David Ponke.

1.0 PURPOSE

This procedure provides instructions for Westinghouse Environmental Management Company of Ohio (WEMCO) to maintain a policy at the Fernald Environmental Management Project (FEMP) by which all spill incidents are contained, cleaned up, classified, reported to responsible FEMP organizations, and reported to off-site organizations in accordance with all applicable state and federal regulations and laws.

2.0 SCOPE

This procedure describes actions and responsibilities for initial reporting, clean-up operations, and follow-up actions which include final on-site disposition for spill incidents at the FEMP.

3.0 DEFINITIONS

Assistant Emergency Duty Officer (AEDO) - The AEDO is the on-site management authority for all shifts and for all abnormal events. This position is filled by the Utilities Engineer.

Best Management Practices (BMPs) - Plans by which industry shall control conditions to prevent the discharge of hazardous materials to the environment. In general, the types of discharges controlled by BMPs consist of plant site runoffs, leaks, spills, sludge and waste disposal, and drainage from material storage areas.

Communications Center Operator (CCO) : The person assigned responsibility for operating the communications equipment in the FEMP Communications Center for notifications, announcements, and reports as necessary.

Daily Operations Report - A one-page bullet list of occurrence information condensed from the Fact Sheet.

Event - An unplanned, unwanted occurrence which requires classification by the AEDO.

Extremely Hazardous Substances - A substance listed by the USEPA as extremely hazardous under Section 302(a) of the Emergency Planning and Community Right-to Know Act of 1986 (SARA).

Emergency Duty Officer (EDO) - Trained member of FEMP Management responsible for the management and oversight of FEMP emergency response activities until the FEMP Emergency Operations Center (EOC) is declared operative.

3.0 **DEFINITIONS** (cont.)

Emergency Operation Center (EOC) - The command and control center designed and equipped for directing and coordinating emergency response actions, located in the Administration Building.

Emergency Response Team (ERT) - A group of professional and volunteer personnel trained for minor event mitigation, including emergency response to fire, hazardous materials release, radiological release and medical emergencies. Members must meet special physical, medical, and training requirements.

Environmental Compliance Release Evaluator (ECRE) - A designated individual within the responsibility for ensuring that FEMP notifications and reporting in response to an environmental event comply with federal and state environmental laws.

Fact Sheet - Approximately one page summary of occurrence information in outline form including the background, significance to ES&H/Public/Personnel, next step, corrective actions, and notifications made. A Fact Sheet is required for all Off-Normal and higher events.

Hazardous Material - A substance or material including a "hazardous substance" (see below) which has been determined by the U.S. Department of Transportation to be capable of posing an unreasonable risk to health, safety and property when transported in commerce and which has been so designated.

Hazardous Substance - Any substance designated as a "Hazardous Substance" under the Clean Water Act (CWA), any "Hazardous Waste" regulated under the Resource Conservation and Recovery Act (RCRA), and "Toxic Pollutant" listed under the Clean Water Act, any "Hazardous Air Pollutant" listed under Clean Air Act (CAA), any substances regulated by the EPA under Section 8 of the Toxic Substances Control Act (TSCA), any additional substances designated by USEPA as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or any substance regulated under the Occupational Safety and Health Act (OSHA). The term hazardous substance does not include petroleum.

Hazardous Waste - A waste material identified as a hazardous waste by 40 CFR Part 261 (RCRA) or identified in applicable state regulations.

Loggable Event - A non-routine event which is not required to be reported to DOE. It must, however be recorded (along with events of higher classification) in a log maintained by the operating contractor. This log will be available to DOE and contractor management for trend analysis and review as a part of the functional appraisal process.

3.0 **DEFINITIONS** (cont.)

Notification Report - The initial documented report to DOE of an event or condition that meets the reporting criteria defined in DOE Order 5000.3A with Change 2 (9/20/91). The Notification Report shall consist of fields 1 through 18 of the Occurrence Report.

Occurrence Report (OR) - A report that is required after each occurrence or event.

Oil - Oil of any kind or in any form, including but not limited to: petroleum, fuel oil, sludge, oil refuse, and oil mixed with waste other than dredged spoils. (40 CFR, Part 110)

Public Affairs - The section of the Communications Center responsible for informing the public, neighbors, DOE Public Affairs, and employees of significant events at the FEMP.

Release - For the purposes of this procedure, a release is defined as a spill incident.

Reportable Quantity (RQ) - Quantity of substance released to the environment which must be reported to regulatory agencies. For a listing of reportable substances and their RQ, consult 40 CFR 172, 302, and 355 or contact Environmental Compliance.

Spill Incident - A spill includes any spilling, leaking, pumping, pouring, injection, escaping, emitting, emptying, leaching, releasing, dumping, discharging or disposing of a hazardous substance, extremely hazardous substance, hazardous material, toxic pollutant, hazardous air pollutant, radioactive substance, oil or Toxic Substances Control ACT (TSCA) Section 8(e) chemical substance or mixture into the environment.

NOTE: Measured and planned discards of uranium-contaminated waste water to the river, and measured and calculated emissions to the atmosphere from process dust collectors and scrubber stacks in compliance with DOE Orders are not considered spill incidents.

TSCA Section 8 (e) Chemical Substance - A chemical substance or mixture which presents a substantial risk of injury to health or the environment, as defined in the Toxic Substance Control Act (TSCA).

4.0 RESPONSIBILITIES

Assistant Emergency Duty Officer (AEDO)

- Reports to, and communicates with the Emergency Duty Officer (EDO).
- Initiates all actions necessary to stabilize and minimize the results of an event/incident, including the authority to classify the event and to activate the FEMP off-site emergency warning system, the Emergency Response Team, the plant-wide alarm, The Emergency Operations Center, the Joint Public Information Center and to notify appropriate agencies.
- Classifies the event and determines if it is reportable to DOE following DOE-FN incident classification guidelines established in "FEMP Emergency Plan" (PL-3015).

  NOTE: The DOE-FN incident classification system classifies an event as an emergency or a non-routine event.

> **CAUTION**
>
> **ALL EMERGENCY AND REPORTABLE NON-ROUTINE EVENTS MUST BE REPORTED TO DOE-HQ**

- Provides necessary information to the Emergency Duty Officer (EDO) and the designated Environmental Compliance Release Evaluator (ECRE) to determine if a spill incident or abnormal discharge event is reportable to regulatory agencies.

  NOTE: After a determination by the EDO and ECRE that an event is reportable to regulatory agencies, the AEDO communicates this determination to DOE, recommends that DOE notify appropriate agencies within the time specified by regulation(s), and confirms that DOE has made this notification.

- Directs emergency event activities.
- Reports emergency events to the Local Emergency Coordinator and Planning Committees as directed by the EDO or the Emergency Operations Center (EOC).
- May direct IRS&T to assign the Radiological Safety or Industrial Hygiene personnel to perform analyses and monitor efforts.
- Logs all events and ensures that all original reports, forms, and logs are placed in Emergency Preparedness files.

4.0 **RESPONSIBILITIES** (cont.)

Best Management Practices (BMP) Committee

- Reviews periodically those Occurrence Reports (ORs) which result from spill incidents or events and formulates recommendations to WEMCO management to prevent the recurrence of similar incidents or events.

Communication Center Operator

- Receives reports of events from employees, supervisors, or by alarm circuits, and promptly contacts the Assistant Emergency Duty Officer (AEDO).
- Notifies the Emergency Chief of the event, if directed to do so by the AEDO.
- Makes local regulatory and other notifications, as directed by the AEDO.

Emergency Chief

- Directs the Emergency Response Team, in an emergency event, to the reported event and supervises emergency activities.
- Reports to the AEDO.

Emergency Duty Officer (EDO)

- Provides management oversight to the AEDO.
- Ensures that notifications and response actions are appropriate.
- Contacts the designated Environmental Compliance Release Evaluator (ECRE) if the event is a spill or release, who advises the EDO if the spill incident is reportable to regulatory agencies.
- Notifies the WEMCO President, Office of Counsel, Director of Public Affairs, and DOE Manager of regulatory reportable events.
- Assures that Westinghouse Corporate Environmental Affairs has been notified of a reportable event.
- Ensures that a Fact Sheet and Daily Operations Report Summary are developed and transmitted to the DOE Fernald Office by the first normal workday noon, immediately following submittal for the 24-hour Notification Report.

4.0 **RESPONSIBILITIES** (cont.)

Emergency Operations Center (EOC)

- Responsible for notification of the DOE (all notifications) and local agencies as required by regulation.

Employee

- Takes steps, if possible (without risk of injury by valving off, blocking, etc.), upon the discovery of a spill incident, abnormal discharge, emission or leak to immediately control the situation.

- Promptly notifies Immediate or Area Supervisor (or AEDO through the Communication Center Operator in supervisor's absence), in accordance with departmental procedures, FEMP site procedures, and/or the FEMP Emergency Plan, PL-3015.

Environmental Compliance Release Evaluator (ECRE)

- Evaluates release for reportability. If reportable, follows Regulatory Compliance Guide (RCG) H-1, "Spill Evaluation, Reporting and Documentation" and EC&QA procedure EQP-16.05, "Release Evaluation, Reporting and Documentation".

  NOTE: The ECRE is also responsible for assisting as needed with disposition of spilled material and to identify and correct any current practice that is not acceptable from a compliance standpoint.

Industrial, Radiological, Safety & Training (IRS&T) Technician

- Conducts analyses and monitoring of spilled substances in accordance with IRS&T procedures and reports analytical results to the AEDO.

- Determines the exposure risk and appropriate personal protective equipment.

Manager

- Evaluates the nature of the spill incident and ensures that spill clean-up actions are conducted and completed in accordance with applicable site and departmental procedures and regulatory requirements.

  NOTE: If assistance is required, the Emergency Response Team (ERT) can aid in spill containment and clean-up.

4.0 **RESPONSIBILITIES** (cont.)

- Completes an entry into the daily logs as required by the Conduct of Operation Guidelines. Included in this entry will be enough information to reconstruct the event and its associated corrective actions plus the estimated dollar amount, of damage to property or the cost of the corrective actions taken. A copy of this entry will be forwarded to Emergency Preparedness within 24 hours.

  NOTE: Clean-up actions include proper disposition of waste from clean-up.

Supervisor

- Reports the incident immediately to the AEDO through the Communication Center Operator, or directly to the AEDO by radio.
- Investigates and performs a preliminary evaluation of the magnitude and nature of the incident.
- Isolates and secures affected areas.
- Reports the spill incident to the Area or Plant Manager.
- Conducts an incident critique after the spill is cleaned up and maintains a log of such events.

Public Affairs

- Assist the AEDO in determining the event classification, and whether to report information to the public and/or plant neighbors.
- Coordinate news releases, announcements, statements prepared in response to queries, and in information to be provided to neighbors of the plant with permission of WEMCO management and the DOE-FN Assistant to the Manager for Public Information.

Staff Manager

- Reviews each OR for compliance with applicable procedures. Directs an investigation of each OR to determine the sequence of events which caused the spill incident and initiates corrective action.
- Completes an Occurrence Report (OR), as applicable, in accordance with FEMP site procedure PR-FMPC-4006, "Occurrence Reports", after the spill is cleaned-up.

4.0 **RESPONSIBILITIES** (cont.)

- Assign written follow-up reporting for incident spill required by regulatory agencies, following requirements specified in the Regulatory Compliance Guide H-1.

  NOTE: Environmental Compliance will advise in determining these follow-up reporting requirements.

5.0 **GENERAL**

5.1 All alarms and/or detection devices used to indicate spills, leaks, emissions, and abnormal discharges shall be tested and maintained on a regular basis in accordance with plant operational and maintenance standards. Each plan area shall be provided with a phone clearly marked "Emergency Reporting", as an alternative mode of communication with the Communication Center Operator for spill notification purposes.

5.2 All plant employees shall be familiar with the use of the applicabl departmental and FEMP emergency procedures. Employees shall provid adequate and pertinent information when reporting an event. Such information, when provided, will save valuable time, prevent possible confusion, and aid in the proper classification of the event.

6.0 **PREREQUISITES**

6.1 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

- All posted safety requirements (i.e., safety glasses, gloves, etc.) and radiological requirements (i.e., respirators, protective clothing, etc.) shall be complied with in accordance with topical manuals FMPC-2128, Industrial Hygiene and Safety"; RM-0006, "Industrial Safety "; RM-0009, "Radiation Controls; and IN-6025, "Fire Protection Requirements."

- Spill incidents involving RCRA materials shall be reported to the Environmental Compliance Release Evaluator in Environmental Compliance.

6.0 **PREREQUISITES** (cont.)

6.2 PERSONNEL REQUIREMENTS

- Supervisors shall be responsible for contacting Industrial Hygiene for chemical air contaminants, or Radiation Safety for radioactive contaminants, to determine appropriate respiratory protection. Determination of these requirements will be in accordance with topical manual, FMPC-2128, "Industrial Hygiene and Safety."

- RM-0009 requires continuous RST coverage for "airborne" work. "Prior to any testing or inspection that may result in radioactive contamination becoming airborne, a supervisor shall be informed. The responsible supervisor shall obtain a Request for Work Permit (RWP) from Radiological Safety prior to commencing work. , All employees are responsible for complying with safety requirements as specified by Radiological Safety."

- Personnel shall review applicable Project Specific Health and Safety Plans, work permits, etc., for health and safety requirements.

- Any circumstance that may have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T, Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

6.3 TOOLS AND MATERIAL REQUIRED

- Leather palm gloves shall be worn when handling sharp-edged or abrasive materials, containers, lids, and banding materials.

- Neoprene gloves shall be worn when handling liquids.

- Safety glasses shall be worn by all personnel at all times in posted areas, except when another type of eye protection equipment is specified.

6.0 **PREREQUISITES** (cont.)

- Respirators shall be made available by supervision for each employee working with waste materials and shall be used in accordance with, RM-0009, "Radiation Controls."

7.0 **PROCEDURE**

7.1 REPORTING OF A SPILL INCIDENT

EMPLOYEE

1. Immediately alert nearby workers and leave the area of the spill incident.

2. Promptly notify Immediate or Area Supervisor (or AEDO through the Communication Center Operator in supervisor's absence) of the magnitude, location, status, and type of material spilled, as well as any other pertinent information.

   NOTE: Unless dangerous conditions exist, a personal observation shall be made in order to provide adequate information for purposes of the notification.

SUPERVISOR

3. Report the incident to the AEDO through the Communications Center Operator or directly via radio or telephone, as soon as accurate information is available.

4. Notify the plant or area manager of the event.

   NOTE: The AEDO may be contacted as follows:
   Through the Communication Center Operator at: Ext. 6295
   Or telephone: Ext. 6431
   Radio: Unit 202
   Cellular Phone: 535-1365 or 535-2197

COMMUNICATION CENTER OPERATOR

5. Receive reports of events from employees, supervisors, or by alarm circuits, and promptly contacts the Assistant Emergency Duty Officer (AEDO).

6. Notify the Emergency Chief of the event, if directed to do so by the AEDO.

7.1 REPORTING OF A SPILL INCIDENT (cont.)

COMMUNICATION CENTER OPERATOR

7. Makes local regulatory and other notifications, as directed by the AEDO.

8. Completes a shift report of activities and events.

MANAGER

9. Conduct in depth evaluation of the event to determine the extent and seriousness of the event.

10. Provide updates of the initial evaluation of the event to the Communications Center Operator or the AEDO, as necessary.

11. Notify the appropriate staff manager.

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

12. Log and classify the event following the EP-2, "Duty Officer Guideline Procedure" (Incident Notification); PL-3015, "FEMP Emergency Plan"; and ED-0001, "Event Notification and Reporting".

13. Notify the EDO of a reportable non-routine or an unusual event. Activate the Emergency Operations Center (EOC) in an emergency event.

14. Provide the necessary spill incident information to the Emergency Duty Officer (EDO) and the designated Environmental Compliance Release Evaluator (ECRE). The EDO and the ECRE will determine if the event must be reported to the off-site regulatory agencies.

15. Issue the one-page Notification Report within 24 hours of the event categorization. The Report also identifies the Staff Manager who will complete the OR reporting requirements.

IRS&T TECHNICIAN

16. Sample and monitor the spilled substance in accordance with IRS&T procedures.

17. Report the monitoring results to the AEDO.

7.1 REPORTING OF A SPILL INCIDENT (cont.)

EMERGENCY DUTY OFFICER (EDO)

18. Advise the AEDO and oversee the spill response.

19. Contact the designated Environmental Compliance Release Evaluator, to determine if the event is reportable to regulatory agencies.

ENVIRONMENTAL COMPLIANCE RELEASE EVALUATOR (ECRE)

20. Determine if a spill incident is reportable to regulatory agencies, using guidelines established in RCG H-1 and procedure EQP-16.05 based on information from EDO or AEDO.

21. Advise the EDO of this determination.

    NOTE: In events when the reportability requirements are difficult to determine, the Release Emissions Reportability (RER) Manager and the Environmental Compliance Manager and/or WEMCO Legal department will jointly make the reportability determination. No report is to be made to offsite agencies until Westinghouse Environmental Affairs (WEA) has been notified.

EMERGENCY DUTY OFFICER (EDO)

22. Communicate the determination of reporting requirements for the spill event to the AEDO.

23. Notify the DOE Site Manager, WEMCO President, Office of Counsel, and Director of Public Affairs of a reportable event.

24. Ensure that Westinghouse corporate Environmental Affairs has been notified of a reportable event.

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

25. Communicate WEMCO's determination and recommendation of spill event regulatory reporting requirements to DOE.

26. Confirm that DOE has made appropriate notifications to regulatory agencies.

27. Instruct the Communication Center Operator to notify local authorities, as directed by the EDO or the Emergency Operations Center.

7.1 REPORTING OF A SPILL INCIDENT (cont.)

PUBLIC AFFAIRS

28. Coordinate and issue any necessary news releases, announcements, statements prepared for responses to queries, and information to be provided to neighbors about the spill event.

SUPERVISOR

29. Complete a critique of the event and maintain a log before the end of the shift when the incident occurred.

STAFF MANAGER

30. Review the 24-Hour Notification Report.

31. Direct an investigation of any 24-Hour Notification Report to determine sequence of events causing the incident.

32. Complete an Occurrence Report in accordance with PR-FMPC-4006, "Occurrence Reports" within ten days after the occurrence of the event and follow-up action.

33. Initiate any necessary corrective action(s).

34. Assign written follow-up reporting for spills, as required by regulatory agencies, specified by the Environmental Compliance Release Evaluator. Ensure that the written follow-up reports are completed and submitted within the regulatory deadlines.

BEST MANAGEMENT PRACTICES COMMITTEE

35. Convene meetings with WEMCO management, when necessary, to determine resolution of problems and trends related to spills, leaks, and abnormal discharges.

36. Recommend corrective actions to management, as necessary, to prevent recurrence of similar events.

7.2 CLEAN-UP OF A SPILL INCIDENT

EMPLOYEE

1. Take steps, if possible (without risk of injury by valving off, blocking, etc.), upon the discovery of a spill, abnormal discharge, emission or leak to immediately control the situation.

   NOTE: Do not risk personal injury to control the discharge.

SUPERVISOR

2. Determine the nature and magnitude of the incident.

3. Secure and isolate the affected area.

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

4. Direct IRS&T to assign Industrial Hygiene and/or Radiological Safety technicians to perform monitoring and analyses of the spill, as necessary.

5. Classify the event and determine if it is reportable to DOE following DOE-FN incident classification guidelines established in "FEMP Emergency Plan" (PL-3015).

6. Activate the Emergency Response Team, if necessary, by contacting the Control Center Operator and the Emergency Chief.

EMERGENCY CHIEF

7. Assemble and direct the Emergency Response Team (ERT) to the incident area in an emergency event, based on the information provided by the Communications Center Operator or the AEDO.

8. Direct and coordinate the emergency field response.

9. Supervise efforts to contain the spill, leak, or discharge in accordance with established requirements and site/departmental procedures.

IRS&T TECHNICIAN

10. Sample and monitor the spilled substance in accordance with IRS&T procedures.

7.2 CLEAN-UP OF A SPILL INCIDENT (cont.)

MANAGER

11. Assure that spill incident clean-up efforts are conducted and completed in accordance with the following guides and procedures:

    - FMPC-2194, FMPC Spill Prevention Control and Countermeasure Plan
    - PP-0314, Packaging, On-Site Movement and Off-Site Shipment of Material
    - SSOP-0003, Receiving, On-Site Movement and Off-Site Shipment of Material of Non-Radioactive Hazardous Material
    - PL-3015, FEMP Emergency Plan
    - SOP-20-C-606, Hazardous Material Spill Clean-up
    - Regulatory Compliance Guide H-1, Spill Evaluation, Reporting and Documentation
    - Regulatory Compliance Guide H-2, PCB Recordkeeping Requirements
    - Regulatory Compliance Guide N-1, PCB Disposal Requirements
    - Regulatory Compliance Guide N-4, Satellite Accumulation Areas

    <u>NOTE</u>: If a Satellite Accumulation Area (SAA) does not exist in the immediate area (usually within 50 ft.) for the specific material spilled, then it must be properly containerized, labeled and stored in an approved storage area for that specific material. Contact waste management for assistance in determining proper storage. Remember, the intent of the regulation is to provide and take the most direct route from generation of material/waste to approved storage.

    <u>SPECIFIC NOTE</u>: When a spill occurs from a vehicle onto a street, it <u>MUST NOT</u> be swept up by a street sweeper and taken to the 3rd street pile. It must be handled as described in the above NOTE (oil or similar type material spills are to be disposed of in an approved storage area as it could contain RCRA constituents). The ECRE can provide waste disposition guidance in many cases.

7.2 CLEAN-UP OF A SPILL INCIDENT (cont.)

MANAGER

12. The spill incident area shall remain isolated and secured until IRS&T monitoring indicates area is safe for re-entry without use of personal protective equipment.

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE

NOTE: No action of waste disposition is to take place until direction is provided by the AEDO.

GENERATOR OF THE WASTE

Certain wastes have received previous determination for disposition. Guidance on disposition of these wastes is described below. Otherwise, the generator of the waste must follow the steps as indicated below in step 5.

1. Mercury Spills:

   If a small amount of Mercury is spilled, the resulting waste generated from cleanup per SOP 20-C-711, "HAKO 'Minute Man' Portable Vacuum Cleaner Operation," can be taken directly to Building 79, since it has previously been characterized as "RCRA hazardous waste." No specific containerization is required. The waste will be added to an accumulation drum in this warehouse. Contact Site Services or Controller prior to movement, so they will know to expect the waste. Mark the container "mercury contaminated waste."

2. Gasoline or Motor Oil Spills:

   If there is a spill involving gasoline or oil that could have come in contact with gasoline, then it can be cleaned up using either absorbent pads or oil dry type absorbent and taken directly to building 79 since it has previously been characterized as "RCRA hazardous waste" for Benzene (D018). It is preferred that pads be used to absorb the spill in the interest of waste minimization and segregation. Again, there is no specific containerization required. Contact Site Services or Controller prior to movement of waste. The waste will be added to an accumulation drum in this warehouse. Use WEMCO:EM(FME):92-195 and MEF #1501 as a reference. This Material Evaluation Form (MEF) number must also be indicated on the accumulation drum.

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE (cont.)

GENERATOR OF THE WASTE

3. Hydraulic Fluid or Diesel Fuel Spills:

If the spill involves hydraulic fluid or diesel fuel, it can be handled in exactly the same way as gasoline with the exception that it will go directly to Plant 1. Contact the supervisor, since it has previously been characterized as "Non-hazardous waste." Again, it is preferred that pads be used in the interest of waste minimization and segregation. The container should be marked "oil" or "diesel fuel" in some way. Use WEMCO:EM(FME):92-196 and MEF #1293 as reference. This MEF number must also be indicated on the accumulation drum.

4. Antifreeze Spills:

The same disposition steps used for hydraulic fluid also applies to antifreeze. Contact the Plant 1 supervisor, and make sure the word "antifreeze" is also indicated on the drum that this waste goes into. Use MEF #1293 for reference.

The ECRE is available to assist in the disposition of spilled generated waste. It is expected that other similar waste, not specifically listed on the letters WEMCO:EM(FME):92-195 and MEF #1501 or WEMCO:EM(FME):92-196 and MEF #1293 will be encountered. If it is an item that is different from these already listed, the ECRE will work with Facilities & Materials Evaluation (F&ME) to expedite the proper guidance needed for disposition.

5. Other Spills

If the spill does not involve mercury, gasoline, motor oil, hydraulic fluid, diesel fuel, and/or antifreeze, then the generator is responsible for proper disposition of the waste following the guideline below:

- Materials must be properly containerized. This will usually be a 55 gallon drum. However, other containers may be applicable. The ECRE can advise you on this.

- Containers must have a lot ID number. Obtain this from Material Control & Acquisition (MC&A). Sometimes, the ECRE can help you obtain this number.

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE (cont.)

GENERATOR OF THE WASTE

- Call F&ME, to see if similar material has been previously characterized, which may therefore possibly eliminate the need to generate another MEF. This will determine where material must be taken for storage. If material has been characterized, obtain a copy of this to accompany the container for verification to storage personnel.

- Initiate an MEF, per SSOP-0002, "Completing the Material Evaluation Form," if still required after above step. The original is submitted to F&ME. Again, a copy of the submitted MEF must accompany the container to storage to verify characterization has been done or is in progress. Any additional information that may help the F&ME group to understand more about the generation of the waste should be attached to the MEF when it is originally submitted.

- Contact MC&A to find out where waste may be sent for interim or permanent storage.

- Complete a 65 card, available from MC&A. Administrative area maintenance and the lab facility owner also have these forms.

- Complete a 68/69 card, also available MC&A, or fill out an Interplant Transfer Record. Check with MC&A for which card applies. These are also available from maintenance lab.

- Complete a pre-transfer checklist. This is only required if waste is known to be RCRA. It is also available from MC&A.

- Each container will need to be weighed prior to shipment. Transportation personnel can help with this depending upon where waste was generated, or MC&A or Plant 1 personnel may be of assistance.

- Contact transportation to arrange for shipment.

8.0 <u>APPLICABLE DOCUMENTS</u>

8.1 DRIVERS

- CH-0210, Best Management Practices Committee Charter

- DOE 5000.3A, Occurrence Reporting and Processing of Operations Information

8.0 **APPLICABLE DOCUMENTS** (cont.)

- ED-0001, Event Notification and Reporting
- FMPC-2194, FMPC Spill Prevention Control & Countermeasure Plan
- FMPC-USB-011, Best Management Practices Plan
- PL-3015, FEMP Emergency Plan
- PR-FMPC-4006, Occurrence Reports

8.2 REFERENCES

- EP-1, FMPC Offsite Emergency Warning System Procedure
- EP-2, FMPC Joint Public Information Center Procedure
- EP-3, Duty Officer Guideline Procedures (Incident Notification)
- EQP-16.05, Release Evaluation, Reporting and Documentation
- FMPC-2128, FMPC Industrial Hygiene and Safety Manual
- IN-6025, Fire Protection Requirements Manual
- MEF #1293, (WEMCO:EM(FME):92-196) Management of Spill Residues From Non-Hazardous Automotive Product Spills
- MEF #1501, (WEMCO:EM(FME):92-195) Management of Spill Residues From Hazardous Automotive Product Spills
- PP-0314, Packaging, On-Site Movement and Off-Site Shipment of Material
- RCG H-1, Spill Evaluation Reporting and Documentation
- RCG H-2, PCB Recordkeeping Requirements
- RCG N-1, PCB Disposal Requirements
- RCG N-2, Satellite Accumulation Areas
- RM-0006, Industrial Safety
- RM-0009, Radiation Controls
- SSOP-0002, Completing the Material Evaluation Form

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8.0 **APPLICABLE DOCUMENTS** (cont.)

- SSOP-0003, Receiving, On-Site Movement and Off-Site Shipment of Material of Non-Radioactive Hazardous Material
- SOP-20-C-606, Hazardous Material Spill Clean-up
- SOP 20-C-711, HAKO "Minute Man" Portable Vacuum Cleaner Operation

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		**SITE STANDARD OPERATING PROCEDURE** Page 1 of 14
Title: **CONTROL OF BOX-TYPE WASTE CONTAINERS**		DOCUMENT NO: SSOP-0027 REVISION NO. 0
Authorization: W. H. Britton W. H. Britton, President	Supersedes: None	Effective Date: 2-7-92

1.0 **PURPOSE**

This document details the tracking of box-type waste containers (white metal and International Shipping Organization) from purchase to final shipment off site.

2.0 **APPLICABILITY**

This procedure is applicable to white metal and ISO containers used for shipping waste off site.

NON-CONTROLLED COPY

3.0 **DEFINITIONS**

3.1 International Shipping Organization Containers - Containers (previously identified by a trade name, "Sea/Land Containers") utilized for bulk shipment of wastes.

3.2 Waste - Material or equipment with low levels of uranium or thorium contamination or uncontaminated, generated during a construction, demolition, or maintenance activity and which is unusable for the project.

3.3 Waste Container - White metal boxes or ISO containers (either top load or end load) into which waste will be loaded.

3.4 Waste Generator - Individual who generates and/or packages waste.

4.0 **RESPONSIBILITIES**

4.1 **Stores** shall be responsible for purchasing, issuing, and the recordkeeping of new waste containers.

4.2 **Environmental Compliance and Quality Assurance (EC/QA)** shall be responsible for inspecting waste containers to verify container integrity.

4.3 **Waste Generators** shall be responsible for the following:

4.3.1 Loading waste containers in accordance with applicable requirements.

4.3.2 Coordinating with MC&A and PM&A to move containers.

4.3.3 Assisting EC/QA, PM&A, and MC&A to control waste containers.

4.4 **MC&A** shall be responsible for maintaining inventory and location of waste containers.

4.0 **RESPONSIBILITIES** (cont.)

4.5 **Project Quality Assurance (PQA)** shall be responsible for ensuring all construction containers are prepared per applicable procedures and completing surveillance forms and audit results for construction project waste.

5.0 **GENERAL**

5.1 Each waste container shall have a unique serial and inventory number to track the container.

Warnings and Cautions precede the step to which they apply. Notes follow the applicable step.

6.0 **PROCEDURE**

6.1 Receiving Waste Containers On Site

RECEIVING

6.1.1 Verify the amount of containers received and container(s) serial number(s) against the shipping report.

6.1.1.1 If a discrepancy is noted, contact Purchasing.

6.1.2 Verify the stencilled serial number against the stamped metal tag.

6.1.2.1 If a discrepancy is noted, contact Purchasing.

6.1.3 Notify Stores and EC/QA that container(s) have been received on site.

STORES

6.1.4 Enter container information into inventory records.

6.1.5 Contact Traffic to transport container(s) to holding area or delivery location.

6.1.6 Notify EC/QA of container location for inspection.

TRAFFIC

6.1.7 Transport containers in accordance with applicable department procedure to delivery location or holding area.

6.0 **PROCEDURE** (cont.)

6.2 Inspecting Waste Containers

EC/QA

6.2.1 Inspect container for defects per applicable department procedure.

6.2.1.1 If no damage is present, tag container as acceptable and notify the generator or Stores the container may be used for packaging waste.

NOTE: Do not mark the container. Only tags shall be used to identify container condition.

6.2.1.2 If damage is present, tag container as not acceptable and dispose of container per applicable department procedure.

6.3 Issuing Waste Containers

GENERATOR

6.3.1 As needed, request container(s) from Stores by completing Sections I and II on a "Request for White Metal Boxes/ISO Containers" (See Figure 1).

STORES

6.3.2 Upon receipt of request, complete Section III and issue containers to generator.

6.3.3 Notify MC&A of serial numbers issued, to whom, and the name of project or department receiving containers.

GENERATOR

6.3.4 When the requested containers are received, complete a "Verification of Receipt" (See Figure 2) and distribute.

6.4 Filling Waste Containers

GENERATOR

6.4.1 Prior to filling the container, notify MC&A of container serial number and obtain all-site inventory number.

6.4.2 Stencil inventory number on container.

6.0 PROCEDURE (cont.)

MC&A

6.4.3 Enter container number into All-Site Inventory Recording System.

6.4.4 Provide generator an inventory number for the container.

GENERATOR

6.4.5 Prepare container per SSOP-0024.

6.4.5.1 For construction waste to be packaged, notify PQA.

PQA REPRESENTATIVE

6.4.5.2 Ensure container packaging has been properly prepared per applicable department procedure.

GENERATOR

6.4.6 Using containers, package waste material per SSOP-0024.

GENERATOR AND SUPERVISOR

6.4.7 Sign the 65 card.

MC&A

6.4.8 When a completed 65-card (See Figure 3) is received, verify the 65 card has been signed and enter card information into All-Site Inventory Recording System.

6.4.9 Distribute copies of 65 card to applicable organizations.

6.5 Moving Waste Containers to New Location or Storage

GENERATOR

6.5.1 Prior to moving container to a new location, notify MC&A.

MC&A

6.5.2 Complete and sign a "Nuclear Material Transfer/Receipt/ Identification Record", W-68/69 card (See Figure 4) to document container movement to a holding location or storage location.

6.0 **PROCEDURE** (cont.)

GENERATOR

6.5.3 Sign the W-68/69 card and notify Traffic container requires transfer to location designated on card.

6.5.4 Notify MC&A by phone or radio that the container is being moved and container destination.

NOTE: MC&A shall authorize Traffic to move filled containers from construction projects.

TRAFFIC

6.5.5 Move container(s) to designated storage location per applicable department procedure and sign 68/69 card.

FACILITIES AND WAREHOUSING (F&W)

6.5.6 When containers are received into area, sign 68/69 card.

6.6 Storing Filled Waste Containers

TRAFFIC

6.6.1 Upon notification from generator of containers requiring transfer to storage, check with MC&A to ensure that a Specialist is present at the container storage location to log in container storage location.

6.6.2 Move the container(s) to the designated storage location.

6.6.3 Place the container(s) in storage as follows:

6.6.3.1 Check the storage location surface. If the surface is unpaved, place 4 inch X 4 inch (or larger) wood blocks on the ground where the containers will be stored.

6.6.3.2 Ensure that the container will be placed so that a 24 inch aisle will be maintained between rows of containers.

6.6.3.3 Place the container on the blocks with container identification visible.

6.6.4 Deliver the W-65 and W-68/69 cards to the Plant 6 MC&A Inventory Office.

6.0 PROCEDURE (cont.)

MC&A

6.6.5 Record the storage location of all white metal boxes and ISO containers.

6.6.6 Distribute the W-65 card and W-68/69 card.

6.6.7 Record data for all containers on a "Waste Inventory Number Assignment" log (See Figure 5).

6.7 Moving Containers Within the Storage Location

F&W

6.7.1 Notify MC&A of the inventory and/or serial number of each container to be moved.

6.7.2 Notify Traffic of containers to be moved.

NOTE: MC&A Specialist must be present when containers are moved within and/or transferred from storage area.

MC&A

6.7.3 Inform F&W of the location of the containers.

6.7.4 Prepare a "Waste Material Movement and Overpack or Repackage" sheet, Form FMPC-SS-3370 (See Figure 6) for containers that are to be moved within the storage location.

6.7.4.1 If the container is to be moved to Plant 1 and/or staging area for shipment, prepare a W-68/69 card in addition to the movement form.

F&W

6.7.5 Move container(s) to location designated on movement form and/or 68/69 card.

6.8 Shipping Containers Off-Site

F&W

6.8.1 Prepare containers for offsite shipment and complete shipping documentation per applicable SOPs.

6.0 PROCEDURE (cont.)

MC&A

6.8.2 Notify Waste Certification of the container(s) being shipped.

WASTE CERTIFICATION

6.8.3 Verify container(s) are ready for shipment offsite per applicable department procedure.

6.8.4 Distribute copies of the finalized shipping order to applicable departments.

7.0 APPLICABLE DOCUMENTS

7.1 Drivers

7.1.1 DOE Order 5480.2A, "Handling, Storage, and Disposal of Low Level Radioactive Waste"

7.2 References

None

8.0 APPLICABLE FORMS

8.1 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"

8.2 FMPC-CONT-1990, -2220, -2221, "Nuclear Material Transfer/Receipt/Identification Record"

8.3 FMPC-SS-3369, "Waste Inventory Number Assignment"

8.4 FMPC-SS-3370, "Waste Material Movement and Overpack or Repackage"

8.5 FS-F-3468, "Request for White Metal Boxes/ISO Containers"

8.6 FS-F-3503, "Verification of Receipt"

Fernald Site

REQUEST FOR WHITE METAL BOXES/ISO CONTAINERS

SECTION 1. - TO BE COMPLETED BY REQUESTER

REQUESTED BY:	PHONE NUMBER	MAIL STOP
PROJECT:		
DATE OF REQUEST:	COST ACCOUNT NUMBER	
OBJECT CLASS CODE:	QUANTITY REQUESTED	
AUTHORIZED BY:		

SECTION 2. - TO BE COMPLETED BY REQUESTER

INTENDED DISPOSITION OF BOXES

TO BE SHIPPED TO NTS.	FOR ON-SITE STORAGE
☐ YES ☐ NO	☐ YES ☐ NO
OTHER:	
LOCATION OF DELIVERY:	

SECTION 3. - TO BE COMPLETED BY STORES

CONTAINER NUMBER(S)

FS-F-3468 (REV. 11/22/91)

REQUEST FOR WHITE METAL BOXES/ISO CONTAINERS
Form FS-F-3468
Figure 1

Fernald Site

WHITE METAL BOXES/ISO CONTAINERS - VERIFICATION OF RECEIPT

BY:		PHONE NUMBER:	MAIL STOP:
PROJECT:			
DATE OF VERIFICATION:	COST ACCOUNT NUMBER:	REQUEST FORM NUMBER:	
WHITE METAL BOX:	ISO CONTAINER:	QUANTITY REQUESTED	

CONTAINER NUMBER(S)					

NO.	DISTRIBUTION
1	GENERATOR
2	STORES - BUILDING 12

FS-F-3503 (11/21/91)

VERIFICATION OF RECEIPT
Form FS-F-3503
Figure 2

4554-

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD. MBA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS				
				MATERIAL IS AS CODED			PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-XX (REV. 12/18/88)

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD. MBA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS				
				MATERIAL IS AS CODED			PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-66 (REV. 12/18/88)

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD. MBA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS				
				MATERIAL IS AS CODED			PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-66 (REV. 12/18/88)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FMPC-CONT-1945-XX
Figure 3

NUCLEAR MATERIAL TRANSFER RECORD

CARD PL NO: 68

NEGATIVE	DATE TRANSFERRED MO	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO / SOURCE	MBA (FROM) / PLANT	NO. OF CONTAINERS OR ITEMS: NUMBER / DESCRIPTION
MATERIAL CLASS / MATERIAL TYPE	MBA (TO) / PLANT	GROSS WEIGHT
LOT SEQUENCE NO	STORAGE LOCATION	TARE WEIGHT
MATERIAL DESCRIPTION		
SHAPE CODE		

SIGNATURES

FMPC-CONT-1990 (REV. 8/17/89) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL NO: 69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO	DAY	YEAR	SHIFT	TRANS. BY BADGE NO

P.O. NO. / SOURCE	MBA (FROM) / PLANT	NO. OF CONTAINERS OR ITEMS: NUMBER / DESCRIPTION
MATERIAL CLASS / MATERIAL TYPE	MBA (TO) / PLANT	GROSS WEIGHT
LOT SEQUENCE NO.	STORAGE LOCATION	TARE WEIGHT
MATERIAL DESCRIPTION		
SHAPE CODE		

SIGNATURES

FMPC-CONT-2220 (REV. 8/17/89) (SHIPPER) (TRANSPORTATION) (RECEIVER)

MATERIAL IDENTIFICATION RECORD

CARD PL NO: XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO	DAY	YEAR	SHIFT	TRANS. BY BADGE NO

P.O. NO. / SOURCE	MBA (FROM) / PLANT	NO. OF CONTAINERS OR ITEMS: NUMBER / DESCRIPTION
MATERIAL CLASS / MATERIAL TYPE	MBA (TO) / PLANT	GROSS WEIGHT
LOT SEQUENCE NO	STORAGE LOCATION	TARE WEIGHT
MATERIAL DESCRIPTION		
SHAPE CODE		

SIGNATURES

FMPC-CONT-2221 (REV. 8/17/89) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL TRANSFER/RECEIPT/IDENTIFICATION
FMPC-CONT-1990-2220-2221
Figure 4

FMPC
CONTROLLER - MC&A
WASTE INVENTORY NUMBER ASSIGNMENT

INVENTORY DATE	INVENTORY DATE	INVENTORY DATE	INVENTORY DATE
INVENTORY NUMBER W	INVENTORY NUMBER: W	INVENTORY NUMBER: W	INVENTORY NUMBER W
PO NUMBER	PO NUMBER	PO NUMBER	PO NUMBER
SOURCE	SOURCE	SOURCE	SOURCE
MATERIAL CLASS	MATERIAL CLASS	MATERIAL CLASS	MATERIAL CLASS
MATERIAL TYPE	MATERIAL TYPE	MATERIAL TYPE	MATERIAL TYPE
LOT SEQUENCE	LOT SEQUENCE	LOT SEQUENCE	LOT SEQUENCE
DRUM NUMBER	DRUM NUMBER	DRUM NUMBER	DRUM NUMBER
GROSS WEIGHT	GROSS WEIGHT	GROSS WEIGHT	GROSS WEIGHT
TARE WEIGHT	TARE WEIGHT	TARE WEIGHT	TARE WEIGHT
NET WEIGHT	NET WEIGHT	NET WEIGHT	NET WEIGHT
MBA	MBA	MBA	MBA
MATERIAL DESCRIPTION	MATERIAL DESCRIPTION	MATERIAL DESCRIPTION	MATERIAL DESCRIPTION
LOCATION	LOCATION	LOCATION	LOCATION
AREA	AREA	AREA	AREA
ROW	ROW	ROW	ROW
STACK	STACK	STACK	STACK
LEVEL	LEVEL	LEVEL	LEVEL
DRUM SIZE	DRUM SIZE	DRUM SIZE	DRUM SIZE
LARGE DRUM SIZE	LARGE DRUM SIZE	LARGE DRUM SIZE	LARGE DRUM SIZE
POOS (✓) ☐ YES ☐ NO	POOS (✓) ☐ YES ☐ NO	POOS (✓) ☐ YES ☐ NO	POOS (✓) ☐ YES ☐ NO
TSCA (✓) ☐ YES ☐ NO	TSCA (✓) ☐ YES ☐ NO	TSCA (✓) ☐ YES ☐ NO	TSCA (✓) ☐ YES ☐ NO
REMARKS	REMARKS	REMARKS	REMARKS
PROJECT NAME	PROJECT NAME	PROJECT NAME	PROJECT NAME
SURVEY NUMBER	SURVEY NUMBER	SURVEY NUMBER	SURVEY NUMBER
SERIAL NUMBER	SERIAL NUMBER	SERIAL NUMBER	SERIAL NUMBER
FOR OFFICE USE ONLY:	FOR OFFICE USE ONLY:	FOR OFFICE USE ONLY:	FOR OFFICE USE ONLY:
DRUM EQUIVALENT	DRUM EQUIVALENT	DRUM EQUIVALENT	DRUM EQUIVALENT
RUST WORK NUMBER	RUST WORK NUMBER	RUST WORK NUMBER	RUST WORK NUMBER
NMR CODE	NMR CODE	NMR CODE	NMR CODE
%U Actual	%U Actual	%U Actual	%U Actual
Factor	Factor	Factor	Factor
Tentative	Tentative	Tentative	Tentative
U-235	U-235	U-235	U-235

FMPC-SS-3369 Rev 10/91

WASTE INVENTORY NUMBER ASSIGNMENT
FMPC-SS-3369
Figure 5

FMPC
CONTROLLER - MC&A
WASTE MATERIAL MOVEMENT AND OVERPACK OR REPACKAGE

DATE	INVENTORY NUMBER	OLD LOCATION					NEW LOCATION					GROSS WEIGHT	TARE WEIGHT	NET WEIGHT	MBA		REMARKS	OP (✓)	RP (✓)
		L	A	R	S	L	L	A	R	S	L				OLD	NEW			

FMPC-SS-3370 (8/15/91)

WASTE MATERIAL MOVEMENT AND OVERPACK OR REPACKAGE
FMPC-SS-3370
Figure 6

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
02-07-92	0	Site procedure required for tracking box-type containers per Request No. P91-230, initiated by K. Dunbar.

REQUIREMENTS MANUAL

RM-0005
Issue Date: 06-05-92
Revision No. 2

FEMP

NON-CONTROLLED COPY

LOT MARKING
AND
COLOR CODING SYSTEM

AUTHORIZED BY: _____ 5/27/92
H. F. DAUGHERTY, PRESIDENT DATE

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. BOX 398704
CINCINNATI, OHIO 45239-8704

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
08-23-91	0	Original issue of RM-0005 supersedes Internal Special FMPC-2178, Dated 7/1/89.
12-27-91	1	Incorporation of T91-004, T91-005, T91-006, and T91-031 per Request No. S92-034, S92-035, S92-036 and S92-037, initiated by D. Dunaway.
06-05-92	2	Minor revision to RM-0005 updating source or origin codes in Chapter 4, per Request No. S92-076, initiated by D. Dunaway.

LIST OF EFFECTIVE PAGES

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2	2.1 thru 2.3	0	08-23-91
3	3.1 thru 3.5	0	08-23-91
3	3.6	1	12-27-91
3	3.7 thru 3.20	0	08-23-91
4	4.1	0	08-23-91
4	4.2	2	06-05-92
4	4.3 thru 4.7	0	08-23-91
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2	Color Coding System	2.1
3	Material Description Codes	3.1
4	Source or Origin Codes	4.1

INTRODUCTION

R The Fernald Environmental Management Project (FEMP) Lot Marking and Color Coding
R System has been in use at the FEMP to provide a means for the control and accountability of nuclear materials. Although the FEMP is no longer a production facility, there is still a large amount of nuclear material stored at the FEMP that requires the same degree of control and accountability. The same system used for the identification of nuclear materials is now being applied to hazardous waste, i.e., Resource Conservation and Recovery Act (RCRA) and Toxic
R Substance Control Act (TSCA) waste and low-level radioactive waste in Westinghouse Environmental Management Company of Ohio (WEMCO) remediation activities. Control and accountability is required to satisfy Department of Energy (DOE) and Environmental Protection Agency (EPA) concerns. WEMCO is in
R the process of identifying all packaged materials on-site according to the Lot
R Marking and Color Coding System. This procedure is intended to provide the
R information necessary to identify any container of waste material.

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CHAPTER 1 Lot Marking System

The FEMP lot mark will consist of five basic elements as follows:

	Element	Thorium	Enriched; Depleted; and Normal Uranium
1.0	Production Order Number	None	4 digits
2.0	Origin or Source Code	3 digits	3 digits
3.0	Class or Enrichment Code combined with	1 digit	1 digit
4.0	Material Description Code	3 digits	3 digits
5.0	Lot or Sequence Number	4 digits	4 digits
	Total Digits	11 digits	15 digits

Elements 1.0, 2.0, 3.0, and 5.0 are alpha-numeric (contain numbers or letters or both).

Element 4.0 is numbers only.

Elements 3.0 and 4.0 will be combined into a four-character material type code.

Elements 2.0, 3.0 and 5.0 will be separated from their predecessors by hyphens or dashes.

A detailed description of the composition of each element follows:

1.0 Production Order Number (P.O.)

This designation was assigned by the Production Scheduling Section to identify certain key production activities. It usually consisted of one letter followed by three digits, e.g., A500. In the lot marking system, it is always used in identification of enriched, depleted and normal materials. Waste packaged specifically for shipment to NTS may be marked with the PO Number N003.

CHAPTER 1 Lot Marking System (cont.)

When enriched uranium materials of irregular percent U^{235} content, for which no Production Order is applicable, are received or generated, special designations are assigned as outlined in the following paragraphs:

1.1 "S", followed by three digits indicating the shipper's percent U^{235} to two decimal places, is used to identify receipts of unusual U^{235} levels.

1.2 "S", followed by three digits, indicates the on-site producing plant's best estimate of the highest isotopic processed over a particular campaign. It is used to identify residue materials generated from the processing of materials of irregular U^{235} levels in FEMP operations. Materials containing up to 9.99 percent U^{235} will be coded as S plus the 3 digit isotopic value. Materials containing 10.00 to 19.99 percent U^{235} will be coded with only the isotopic value (4 digits).

1.3 "W", followed by three digits, indicates the on-site generating plant's best estimate of the highest isotopic associated with nonrecoverable contaminated waste material.

CHAPTER 1 Lot Marking System (cont.)

1.4 "X", followed by three digits, as indicated in the summary below, designating a range of percent U^{235}, will be used to identify certain residues produced from the mixing of materials of regular production but differing U^{235} levels (all numbers are inclusive):

1.4.1 X948 for 0.148 to 0.193 & 0.207 to 0.709

1.4.2 X110, X111, X118 & X119 for 0.710 to 0.712

1.4.3 X008 for 0.713 to 0.756

1.4.4 X884 for 0.757 to 0.853

1.4.5 X500 for 0.867 to 0.940

1.4.6 X888 for 0.954 to 1.243

1.4.7 X767 for 1.257 to 1.593

1.4.8 X911 for 1.607 to 2.093

1.5 "P", followed by three digits, indicates the on-site producing plant's estimate of the highest isotopic associated with uranium products or residues containing trace quantities of plutonium requiring special handling.

1.6 "R", followed by three digits, indicate the on-site producing plant's estimate of the highest isotopic associated with uranium products or residues containing RCRA mixed hazardous materials requiring special handling.

2.0 Origin or Source Code

This is a three-digit code with a block of 100 numbers assigned to each plant, as indicated in the following table. The plants are divided into sub-areas with subordinate blocks of numbers assigned to each.

FEMP Origin or Source Code

000-099	Reserved for future needs	500-599	Plant 5
		600-699	Plant 6
100-199	Plant 1	700-799	Miscellaneous facilities
200-299	Plants 2 & 3		
300-399	Pilot Plant	800-899	Plant 8
400-499	Plant 4	900-999	Plant 9

CHAPTER 1 Lot Marking System (cont.)

2.1 For example, Plant 5 is assigned 500-599 and the Reduction Area in Plant 5 is assigned 510 to 529. Within the area, each operation or piece of equipment which may generate a material for coding is assigned a source number. In the Plant 5 Metal Reduction Area, the Rockwell furnaces are assigned 516 and the breakout area dust collectors 520. The intention is to provide a flexible system which can be used to identify a particular item of equipment as a source, if this is desirable, or to allow coding by general area or by plant if this is all that is required.

2.2 A complete list describing all FEMP Source or Origin codes currently assigned will be found in Chapter 4.

2.3 Off-site origin codes used in processing receipts from other nuclear facilities are alphabetically designated using the three-letter Reporting Identification Symbol (RIS) of the shipper. See discussion on special handling of external receipts on page 1.11.

3.0 Class or Enrichment Code

This code consists of one digit or letter designating the general class or enrichment into which the material falls. Those categories currently most important in our operations have been assigned a number or letter as indicated.

CHAPTER 1 Lot Marking System (cont.)

Class or Enrichment Codes - Alphabetic

Code	Category	Detail	$\%U^{235}$	Additive or Alloy Level
A	Normal	Alloy		Alloy
B	Enriched	Alloy	Various	Alloy
C	Enriched		2.10	Other[1]
D	Depleted			Standard
E				
F				
G	Normal			Alloy 601
H	Enriched		0.947	Alloy 601
J				
K				
L	Enriched		0.947	Other[1]
M	Enriched		1.25	Alloy 601
N	Normal	Waste	0.710 to 0.712	None
P	Depleted	Waste	<0.710	None
Q				
R				
T	Thorium			None
U				
V	Enriched	Waste	>0.712	None
W				
X	Enriched		Other[1]	Other[1]
Y				
Z				

NOTE: Letters I, O, and S will not be used.

[1] Not specified. Refer to P.O. for U^{235} or additive level.

CHAPTER 1 Lot Marking System (cont.)

R

Class or Enrichment Codes - Numeric

Code	Category	Detail	$\%U^{235}$	Additive or Alloy Level
1	Normal		0.710 to 0.712	Std
2	Enriched	Recycle Tails	Various	None
3	Enriched		1.10	Std
4	Enriched		1.25	Std
5	Enriched		0.947	Std
6				
7	Enriched	Sweetener	Various	None
8	Enriched		0.86	Std
9	Enriched		2.10	Alloy 601
0	Enriched		Other[1]	Std

[1] Not specified. Refer to P.O. for U^{235} or additive level.

The use of this code in combination with the Material Description Code makes it possible to assign the same material description code to similar materials regardless of their class, enrichment or special nature.

For ready reference, a table of class codes arranged by material categories, $\%U^{235}$ and additive or alloy levels is also included below.

CHAPTER 1 Lot Marking System (cont.)

Class Codes by Material Categories

Category	Detail	$\%U^{235}$	Additive or Alloy Level				
			None	Std	601[2]	Other[2,3]	Alloy[4]
Depleted				D			
Depleted	Waste	<0.710	P				
Normal	Waste	0.710 to 0.712	N				
Enriched	Waste	>0.712	V				
Enriched		0.86		8			
Enriched		0.947		5	H	L	
Enriched		1.10		3			
Enriched		1.250		4	M		
Enriched		2.10			9	C	
Enriched	Alloy	Other[1]		0		X	B
Enriched	Recycle Tails	Various	2				
Enriched	Sweetener	Various	7				
Thorium			T				

[1] Not specified. Refer to P.O. for U^{235} or additive level.

[2] Properly applied to only material which has actually achieved this additive level; not appropriate for UO_3, UF_4, or derbies.

[3] Any additive level other than "Standard" or Alloy 601; refer to P.O. or I.P.O. (Interplant Production Order) for details.

[4] Materials, ordinarily from off-site, containing a concentration of alloying materials usually far above additive (ppm) levels.

CHAPTER 1 Lot Marking System (cont.)

4.0 Material Description Code

This is a three digit code, subdivided into residue and product categories as follows:

Low Grade Residues	000-099
High Grade Residues	100-149
Refinery Feeds	150-199
Intermediate Products	200-299
Remelt Feeds	300-399
Casting Products	400-449
Rolling and Extrusion Products	450-499
Machining Products	500-599

The intent in setting up the material descriptions was to make them general whenever possible, with the Class and Source Codes aiding in the specific identification of the material.

A complete list of all Material Description Codes currently assigned will be found in Chapter 3.

The one-digit or letter Class or Enrichment Code and the three-digit Material Description Code are combined into a four-character Material Type Code which is the basic unit of the FEMP Lot Marking system.

4.1 The low grade residue category (000-099) is intended to include all low uranium or thorium content residues and some higher grade uranium or thorium content residues which require extensive handling and processing before use as oxidation or refinery feed. In general, the low grade residues have been arranged in order of increasing quality. In other words, the lowest uranium or thorium content and lowest quality materials are designated by lower numbers and the high quality materials by higher numbers.

4.2 High grade residues (100-149) are, in general, high uranium or thorium content residues which require some processing such as screening or oxidation. They correspond in many cases to the feed for Plant 8.

4.3 Refinery feeds (150-199) are materials which were suitable for introduction into the refinery without further processing.

CHAPTER 1 Lot Marking System (cont.)

4.4 The intermediate product category (200-299) includes products from the various processes involved in converting refinery feed to metal. It also includes recycle metal which requires some pretreatment such as sawing or pickling before remelting.

4.5 Remelt feeds (300-399) are materials ready for remelt without further treatment.

4.6 Casting products (400-449), rolling and extrusion products (450-499), and machining products (500-510) are the products from these operations.

5.0 Lot or Sequence Number

This is a four-digit number which is used to identify consecutive lots of specific material in sequence where more than one lot is produced per month. Where not more than one lot is produced per month, the lot sequence number indicates the consecutive month of production starting with January 1962 as lot 0001. October 1991 is lot 0358.

To identify the category of trash, the lot or sequence number should include the product month number (May 1989 = 329), preceded by a numeric code that represents the category of 003 material. These categories are:

1 - Glass
2 - Rubber Hose
3 - Plastic
4 - Metal
5 - Concrete, Ceramics, Soil
6 - Contaminated Burnables
7 - Oily Rags, Air Filters and Gaskets
8 - Floor Sweepings
9 - Other - Stencil type of trash on containers

CHAPTER 1 Lot Marking System (cont.)

6.0 Additional Information

6.1 Examples of Lot Marking

The preceding sections of this discussion have been generalized to explain the intent of the system. The following examples are offered to illustrate the application of the general system structure in developing lot markings to identify specific material produced at the FEMP. Marking of material received from off-site is discussed in subsequent paragraphs.

Example 1 (Normal) H110 - 263 - 1200 - 0418

H110	Applicable to P.O. H110
263	Produced in Plant 2/3 (Refinery), Denitration System North Side Packaging
1	"Normal" Uranium
200	UO_3, Product
0418	Lot Sequence Number

Example 2 (Enriched) A500 - 965 - 5069 - 0541

A500	Applicable to P.O. A500
965	Produced in Plant 9, Sump Liquor Processing Area
5	0.947% U^{235} Enriched Uranium
069	Wet Sump Cake, Non-Oily, Non-Halide
0541	Lot Sequence Number

Example 3 (Thorium) 380 - T069 - 0126

380	Produced in Pilot Plant Sump Area
T	Thorium
069	Wet Sump Cake, Non-Oily, Non-Halide
0126	Lot Sequence (Indicates June 1972)

Example 4 (Depleted) A948 - 951 - D110 - 0329

A948	Applicable to P.O. A948
951	Produced in Plant 9, LeBlond Rapid Borer
D	Depleted Uranium
110	Non-briquettable Chips and Turnings for Oxidation
0329	Lot Sequence (Indicates May 1989)

CHAPTER 1 Lot Marking System (cont.)

Example 5 (Depleted) W020 - 501 - P003 - 6329

W020	Applicable to Waste (0.20% U^{235})
501	Plant 5 Maintenance
P003	Depleted Non-recoverable Trash - for storage or shipment for off-site burial
6	Contaminated Burnables
329	May 1989

6.2 Lot Marking of External Receipts

Lot marking of material received from off-site by WEMCO will conform in general to the format described in previous sections. There are, however, certain exceptions which should be noted:

6.2.1. The Source Code will be the three-letter Reporting Identification Symbol (RIS) as illustrated in the table below.

6.2.2. The Lot Sequence Number will be the DOE Form 741 number assigned by the shipper in all cases except:

FTA Extrusions - Use 0000

Example 6 (Depleted Receipt) H082 - FTA - D455 - 0000

H082	Applicable to P.O. H082
FTA	RMI Company, Inc. (Shipper)
D	Depleted Uranium
455	Mark 31 Extruded Tubes - Inner
0000	Indeterminate Lot Sequence Number

6.3 External Source or Origin Codes

The table below shows the external source or origin codes that have been used for lot marking material received from off-site.

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
AIC	Atomics International	NA Aviation	Canoga park, California
AGT	General Electric Company	ANP Project	Cincinnati, Ohio
ALA	Sandia Corp.	Sandia Lab.	Albuquerque, New Mexico
ALD	Sandia Corp.	Sandia	Livermore, California
ALO	Dow Chemical	Rocky Flats	Golden, Colorado
ARF	Rockwell International	Rocky Flats	Golden, Colorado
ARM	IIT Research Inst.		Chicago, Illinois
ASA	Dow Chemical Company	Rocky Flats	Golden, Colorado
ATA	Mason & Hanger	Silas Mason	Burlington, Iowa
AUA	Los Alamos Nat. Lab.		Los Alamos, New Mexico
AVA	Monsanto	Mound	Miamisburg, Ohio
AVB	EG&G	Mound	Miamisburg, Ohio
AWA	Mason & Hanger	Pantex	Amarillo, Texas
AXA	General Electric Company	Neutron	St. Petersburg, Florida
AYA	Mason & Hanger		San Antonio, Texas
AZA	Mason & Hanger		Fort Campbell, Kentucky
BBA	Bridgeport Brass Company	Extrusion Plant	Ashtabula, Ohio
BMI	Battelle Memorial Inst.		Columbus, Ohio
BWD	Martin Marietta	Gaseous Diff.	Oak Ridge, Tennessee
BXA	Martin Marietta	Gaseous Diff.	Portsmouth, Ohio
BYC	Martin Marietta	Gaseous Diff.	Paducah, Kentucky
BZA	Brookhaven Laboratory		Upton, New York
CAA	USAEC	Chicago Office	Chicago, Illinois

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CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
CAE	Atomics International	NA Aviation	Canoga Park, California
CAF	Battelle Memorial Inst.		Columbus, Ohio
CAK	Ames Laboratory	Iowa State U.	Ames, Iowa
CBH	New Brunswick Laboratory	NBL	New Brunswick, New Jersey
CBJ	New Brunswick Laboratory		Argonne, Illinois
CCP	MIT		Cambridge, Mass.
CCS	Babcock and Wilcox Company	Research Cen.	Lynchburg, Virginia
CDY	Whittaker Corporation	Nuclear Metals	West Concord, Mass.
CGE	General Electric Company	ANP Project	Cincinnati, Ohio
CKY	Union Carbide	Gaseous Diff.	Paducah, Kentucky
CWA	Fermi Laboratory		Batavia, Illinois
CYT	Union Carbide	Y-12 Plant	Oak Ridge, Tennessee
CZA	Argonne National Laboratory		Argonne, Illinois
CZC	Argonne National Laboratory		Argonne, Illinois
DCC	Nuclear Fuel Services, Inc.	Davidson Chem.	Erwin, Tennessee
DYA	Sylcor Division	Sylvania EPI	Hicksville, L.I., New York
DZA	Westinghouse Savannah River Co.	Savannah River	Aiken, South Carolina
FAA	Oak Ridge Operations	USDOE	Oak Ridge, Tennessee
FAK	Middlesex Storage Plant	USAEC	New Brunswick, New Jersey
FAL	University of Virginia		Charlottesville, Virginia
FAQ	National Lead	Albany	Albany, New York
FAV	Kerr-McGee Nuclear Products		Cushing, Oklahoma
FAX	Nuclear Fuel Services, Inc.	Davidson Chem.	Erwin, Tennessee

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
FBA	General Electric Company	Energy Systems	Evendale, Ohio
FBB	General Electric Company	NMPO	Idaho Falls, Idaho
FBE	New Brunswick Laboratory	USAEC	New Brunswick, New Jersey
FBX	Vitro Chemical Company		Chattanooga, Tennessee
FCZ	Tenessee Nuclear Spec.		Jonesboro, Tennessee
FTA	Reactive Metals Inc.	Extrusion Plant	Ashtabula, Ohio
FUA	Reactive Metals Inc.	Extrusion Plant	Ashtabula, Ohio
FVA	National Lead of Ohio	FEMP	Cincinnati, Ohio
FVB	General Atomic	Storage Fac.	Youngsville, North Carolina
FVC	WEMCO	FEMP	Cincinnati, Ohio
FWA	Mallinckrodt Chemical Works		Weldon Spring, Missouri
FXA	Goodyear Atomic	Gaseous Diff.	Portsmouth, Ohio
FYA	Union Carbide	Gaseous Diff.	Paducah, Kentucky
FYC	Martin Marietta	Gaseous Diff.	Paducah, Kentucky
FZA	Union Carbide	Gaseous Diff.	Oak Ridge, Tennessee
FZB	Union Carbide	Y-12 Plant	Oak Ridge, Tennessee
FZC	Union Carbide	ORNL	Oak Ridge, Tennessee
FZE	Martin Marrietta	Gaseous Diff.	Oak Ridge, Tennessee
FZF	Martin Marrietta	Y-12 Plant	Oak Ridge, Tennessee
FZG	Martin Marrietta	ORNL	Oak Ridge, Tennessee
GAT	Goodyear Atomic	Gaseous Diff.	Portsmouth, Ohio
GDA	General Dynamics	General Atomic	San Diego, California
HGE	General Electric Company	Hanford	Richland, Washington

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
HRA	Rockwell Int.	Hanford	Richland, Washington
HUA	Westinghouse Hanford Co., HEDL	Hanford	Richland, Washington
HUD	Westinghouse Hanford Co., CPD	Hanford	Richland, Washington
HUE	Westinghouse Hanford Co., DRD	Hanford	Richland, Washington
HVA	Atlantic Richfield	Hanford	Richland, Washington
HWA	Isochem, Inc	Hanford	Richland, Washington
HXA	United Nuclear Corp. Inc.	Hanford	Richland, Washington
HYA	Battelle Memorial Inst., PNL	Hanford	Richland, Washington
HZA	General Electric Company	Hanford	Richland, Washington
JSA	Allied Chemical	Aerojet	Idaho Falls, Idaho
JSB	Aerojet Nuclear	Idaho Falls	Idaho Falls, Idaho
JSG	EG&G Idaho	Idaho Falls	Idaho Falls, Idaho
JWB	Idaho Nuclear Corp.	Idaho Falls	Idaho Falls, Idaho
JXI	Westinghouse Idaho Nuclear Co.	Idaho Falls	Idaho Falls, Idaho
KMG	Kerr-McGee Nuclear Products		
KZA	Knolls Atomic Power Laboratory		Schnectady, New York
LAB	University of California	Lawrence Lab.	Livermore, California
LAE	Atomics International		Canoga Park, California
LAL	Rockwell International		Canoga Park, California
LAQ	Bureau of Mines		Albany, Oregon
LAW	(Gulf) General Atomic		San Diego, California
LAZ	General Electric Company	Nuclear Energy	San Jose, California
LLB	Sandia Corp.	Livermore	Livermore, California

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
LZA	University of California	Berkeley	Berkeley, California
LZB	University of California	Livermore	Livermore, California
MAA	Worchester Polytechnic	USAEC	New York, New York
MAD	Pratt & Whitney Aircraft Div.	CANEL	Middletown, Connecticut
MAP	Aeroprojects, Inc.		West Chester, Pennsylvania
MAY	Nat. Bureau of Standards		Washington, D. C.
MBB	Reactive Metals Inc.	Extrusion Plant	Ashtabula, Ohio
MBL	Martin Marietta	Nuclear Div.	Baltimore, Maryland
MBM	MIT		Cambridge, Mass.
MBN	Nuclear Metals Inc.	Textron	West Concord, Mass.
MBP	U. of Rochester		Rochester, New York
MBR	Babcock and Wilcox Company	R&D Div.	Lynchburg, Virginia
MBT	Babcock and Wilcox Company	R&D Div.	Lynchburg, Virginia
MBU	United Nuclear Corp.	Development	White Plains, New York
MBW	Babcock and Wilcox Company		Lynchburg, Virginia
MBY	Vitro Laboratories		West Orange, New Jersey
MCW	Mallinckrodt Chemical Works	Uranium Div.	Weldon Spring, Missouri
MCY	Westinghouse Electric Co.	NES	Pittsburgh, Pennsylvania
MIO	Nuclear Metals Inc.		West Concord, Mass.
MPW	Pratt & Whitney Aircraft Div.	CANEL	Middletown, Connecticut
MSA	USAEC, NY Operations		New York, New York
NBL	New Brunswick Laboratory	USAEC	New Brunswick, New Jersey
NBX	Middlesex Storage Plant	USAEC	New Brunswick, New Jersey

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
NCF	National Carbon Co.	Union Carbide	Fostoria, Ohio
NLA	National Lead	Albany	Albany, New York
NMC	Martin Marietta	Nuclear Div.	Middle River, Maryland
NME	Nuclear Mat. & Equip. Corp.	NUMEC	Apollo, Pensylvania
OGE	General Electric Company	NM Propulsion	Cincinnati, Ohio
ORF	EG&G	Rocky Flats	Golden, Colorado
PAB	Duquense Light Co.	Shippingport	Shippingport, Pennsylvania
PAP	Babcock and Wilcox Company		Apollo, Pensylvania
PZA	Westinghouse Electric Co.	Bettis APL	West Mifflin, Pennsylvania
QAA	USAEC	Headquarters	Washingtion, D. C.
SAF	Mason & Hanger	Silas Mason	Fort Campbell, Kentucky
SBN	Mason & Hanger	Silas Mason	San Antonio, Texas
SBX	Monsanto	Mound	Miamisburg, Ohio
SRS	Sylcor Division	Sylvania EPI	Hicksville, L.I., New York
RBR	Brazil		
TOA	K-65, Q-11		
VAC	National Research		Cambridge, Mass.
VCC	Vitro Chemical Company		Chattanooga, Tennessee
VXB	UNC Industries (Waste)	Hanford	Richland, Washington
WCP	Combustion Engineering, Inc.	Naval Reactors	Windsor, Connecticut
WEB	Westinghouse Power Div.	Bettis APL	Pittsburg, Pennsylvania
XHP	General Atomic	Storage Fac.	Youngsville, North Carolina
YAK	Department of the Navy	NFEC	Alexandria, Virginia

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
YAM	Coast Guard Academy		New London, Connecticut
YAQ	National Electric Coil		Louisville, Kentucky
YDE	Nuclear Fuel Services	West Valley	West Valley, New York
YEC	Kerr-McGee	Cimarron	Crecent, Oklahoma
YEF	Smithsonian Inst.	Hist. & Tech.	Washingtion, D. C.
YJL	Colgate University		Hamilton, New York
YLE	Westinghouse	Waltz Mill	Madison, Pennsylvania
YPF	U. of Alabama at Auburn		Auburn, Alabama
YQK	GSA Stockpile		Washingtion, D. C.
YST	TNS		Jonesboro, Tennessee
YQM	Frankfork Arsenal	DOD	Philadelphia, Pennsylvania
YUD	Exxon Nuclear	Hanford	Richland, Washington
YVX	Nuclear Metals		Concord, Mass.
ZCM	Bucknell University		Lewisburg, Pennsylvania
ZCY	Carnegie-Mellon U.		Pittsburgh, Pennsylvania
ZDB	Case Western Reserve U.		Cleveland, Ohio
ZDC	Catholic University		Washingtion, D. C.
ZFZ	Fairleigh Dickenson U.		Teaneck, New Jersey
ZDP	University of Cincinnati		Cincinnati, Ohio
ZDS	Clarke College		Dubuque, Iowa
ZDT	Clarkson University		Potsdam, New York
ZEF	Combustion Engineering		Windsor, Connecticut
Z1B	Scientific Ecology		Oak Ridge, Tennessee

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
ZKB	Iowa State University		Ames, Iowa
ZKL	Kansas State U.		Manhattan, Kansas
ZLD	Ledoux & Co.		Teaneck, New Jersey
ZLR	Louisiana Tech. U.		Ruston, Louisiana
ZLU	University of Louisville		Louisville, Kentucky
ZMH	Manhattan College		Riverdale, Bronx, New York
ZMK	Marquette University		Milwaukee, Wisconsin
ZMR	University of Maryland		College Park, Maryland
ZND	University of Minnesota		Minneapolis, Minnesota
ZNE	3M Company		St. Paul, Minnesota
ZNG	University of Mississippi		University, Mississippi
ZNX	National Lead	Albany	Albany, New York
ZOV	Manufacturing Sciences		
ZPG	University of Nevada		Reno, Nevada
ZQC	Northeastern University		Boston, Mass.
ZQG	Northwestern University		Chicago, Illinois
ZQM	Nuclear Fuel Services, Inc.		Erwin, Tennessee
ZQN	Nuclear Mat. & Equip. Corp.	NUMEC	Apollo, Pensylvania
ZQX	Ohio University		Athens, Ohio
ZSF	Pittsburgh University		Pittsburgh, Pennsylvania
ZSK	Princeton University		Princeton, New Jersey
ZST	Chamberlain Mfg.		Waterloo, Iowa
ZVF	Syracuse University		Syracuse, New York

CHAPTER 1 Lot Marking System (cont.)

SOURCE OR ORIGIN CODES FOR OFF-SITE RESIDUES AND SCRAP AT THE FEMP (cont.)

SOURCE CODE	NAME OF SHIPPER	PLANT	ADDRESS
ZVX	Texas Tech. University		Lubbock, Texas
ZWB	Toledo University		Toledo, Ohio
ZWY	Utah State University		Logan, Utah
ZXA	Vanderbilt University		Nashville, Tennessee
ZXC	U. of Virginia		Charlottesville, Virginia
ZXF	Villanova University		Villanova, Pennsylvania
ZXH	Virginia Polytechnic Inst.		Blacksburg, Virginia
ZXZ	Washington University		St. Louis, Missouri
ZYG	West Virginia Inst. of Tech.		Montgomery, West Virginia
ZYP	Westinghouse	Atomic Power	Cheswick, Pennsylvania
ZZA	University of Wisconsin		Madison, Wisconsin
ZZM	Yale University		New Haven, Connecticut

CHAPTER 1 Lot Marking System (cont.)

7.0 SOLVENT AND ORGANIC CHEMICALS NAMES TO BE STENCILED ON CONTAINERS

	Acetone
	Acetonitrile
	Agitene
	Benzene
	n-Butyl alcohol
	Carbon disulfide
	Carbon tetrachloride
	Chlorinated fluorocarbons
P	Chlorobenzene
P	Chlorodane
	Chloroform
	m-Cresol
	o-Cresol
	p-Cresol
	Cresols
	Cresylic Acid (Cresols plus phenols)
	Cyclohexane
	Cyclohexanone
P	2, 4-D
P	o-Dichlorobenzene
P	1, 4-Dichlorobenzene
	1, 2-Dichloroethane
	1, 1-Dichloroethylene
	2, 4-Dinitrotoluene
	1, 4-dioxane
P	Endrin
	2-Ethoxyethanol
	Ethyl acetate
	Ethyl benzene
	1, 1, 2-Trichloro-1, 2, 2-trifluoroethane
	Ethyl ether
P	Heptachlor (and its hydroxide)
P	Hexachlorobenzene
	Hexachlorobutadiene
	Hexachloroethane
	Isobutanol
P	Lindane
	Methanol
P	Methoxychlor
	Methyl ethyl ketone (2-Butanone)
	Methyl isobutyl ketone
	Methylene chloride
	Nitrobenzene
	2-Nitropropane
P	Pentachlorophenol
	Phenol
	Pyridine
	Tetrachloroethylene
	Toluene
P	Toxaphene
P	2, 4, 5-TP acid Silvex
	1, 1, 1-Trichloroethane
	1, 1, 2-trichloroethane
	Trichloroethylene
	Trichlorofluoromethane
P	2, 4, 5-Trichlorophenol
P	2, 4, 6-Trichlorophenol
	Vinyl chloride
	Xylene

P = Pesticide

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CHAPTER 2 Color Coding System

In addition to the lot marking system described for identifying nuclear materials, color coding is applied as a secondary method of designating depleted, normal, and enriched uranium and thorium.

Three basic colors, black, red and white, are used for painting the body of containers in service at the FEMP.

Black drums are used for depleted uranium, normal uranium, unrestricted (for Nuclear Safety) enriched uranium compounds and residues, RCRA and TSCA waste and thorium.

All-red drums are used for enriched, restricted uranium (e.g., mass, geometry, or concentration).

White drums and white metal boxes are used for off-site shipment of low-level uranium waste; white drums are used for thorium waste.

Container identification markings required for long-term storage such as lot marks, weights, drum numbers, alloying chemical symbols and percent U^{235} are routinely applied by stencil over the basic paint colors as specified in Table I. "Markal" or equivalent type white or black paint sticks are used for applying temporary identification markings to residue and waste containers and to other specific materials in the production areas, including some off-site receipts and the reidentification of materials on the storage pad. Pre-printed identification labels that contain barcodes may also be used.

Color coding of black drums will be further implemented by application of a narrow stripe around the circumference above the gross, tare and net weight information on each container. The colors to be used for this stripe are as follows:

CHAPTER 2 Color Coding System (cont.)

Material in Black Drums	% U^{235}	Stripe Color
(a) Depleted Uranium	<0.710	Green
(b) Normal Uranium	0.710 to 0.712	Yellow
(c) Enriched Uranium - Unrestricted compounds and residues	>0.712	Red
(d) Thorium		Blue
(e) RCRA and TSCA waste		None

An exception to the container body painting and stencilling requirement is permitted for enriched oxides packaged in 6" diameter by 15" high metal cans. A narrow red-tape stripe around the periphery of the can and a printed label are applied.

It will not be necessary to apply a stripe to all drums.

Containers characterized and identified as containing RCRA and TSCA waste and which have been declared to be below the economic discard limit will have their color stripe obliterated with black paint before they are placed in storage in the RCRA warehouses.
NOTE: Drums with color stripes which are already in storage need not be changed.

Red targets or red-white cards, or yellow-white or green-white cards and pressure-sensitive tape are used to color code enriched, normal and depleted uranium metal on skids, hoppers, dollies, metal pieces not in containers, or boxes and major components of process equipment such as vessels, sumps, machinery, dust collectors, etc. An explanation of their use is detailed in procedures 20-C-101 (latest version), "SOP-Moving and Storing Nuclear Materials On-Site at the FMPC," 20-C-102, "SOP-For Receiving, Storing, Repackaging and Moving Enriched Uranium Materials $\leq$20.% U^{235} From Off-Site," and 20-C-904, "SOP-Nuclear Safety General Requirements."

Old identification markings will be obliterated with paint immediately upon emptying containers.

Off-site receipts which do not comply with FEMP color coding requirements are color coded with a band of paint around the periphery of the container - yellow for normal, red for enriched, green for depleted, and blue for thorium, as a substitute for painting the entire container. The proper color coding is applied as soon as the analytical results are received from the Laboratory.

CHAPTER 2 Color Coding System (cont.)

TABLE I

FEMP Color Code Specification
for Basic Container Paints and
Identification Markings

Type of Material	Basic Container Paint Color	Identification Markings Paint Color	Stripe Paint Color
Normal uranium	Black	White	Yellow
Enriched uranium, unrestricted	Black	White	Red
Enriched uranium mass, geometry or concentration restricted	Red	White	None
Depleted uranium	Black	White	Green
Thorium	Black	White	Blue
Thorium Waste	White	Black	Blue
Uranium Waste Shipments	White	Black	None
RCRA and TSCA Waste	Black	White	None

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CHAPTER 3 MATERIAL DESCRIPTION CODES

LOW-GRADE RESIDUES

001 DISCARD PROCESS RESIDUES, TRAILER CAKES, WASTE SLURRIES, RAFFINATES, ETC.

002 SUMP CAKE - COPPER CONTAMINATED, LOW URANIUM

003 NON-RECOVERABLE TRASH - FOR STORAGE OR SHIPMENT FOR OFF-SITE BURIAL, see p. 1.09

004 CONTAMINATED STEEL AFTER WASHING AND/OR CLEANING

005 CONTAMINATED ZIRCONIUM

006 CONTAMINATED LEATHER GLOVES FOR LAUNDRY

007 TRAILER CAKES, WASTE SLURRIES, RAFFINATES NOT MEETING DISCARD SPECIFICATION

008 GRIT BLAST RESIDUE

009 CONTAMINATED OIL - SOLUBLE; COOLANT

010 CONTAMINATED WATER, CONTAINING CHLORIDES

011 CONTAMINATED SOIL, ROCKS, SAND, BRICKS AND CERAMICS

012 CONTAMINATED WATER OR SUMP LIQUOR, NON-CHLORIDE

013 CONTAMINATED SOLVENT OR ORGANIC CHEMICAL - STENCIL TYPE OF CHEMICAL OR SOLVENT ON CONTAINER (SEE LIST OF SOLVENT AND CHEMICAL NAMES ON PAGE 1.21.)

014 GLASS AND SAMPLE BOTTLES

015 CONTAMINATED OIL, INSOLUBLE

016 CONTAMINATED COPPER - FOR DISCARD

017 CONTAMINATED GRAPHITE - UNCRUSHED BUT BROKEN INTO LARGE PIECES

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

LOW-GRADE RESIDUES (cont.)

018 CONTAMINATED ALUMINA-SODA LIME (HIGH Cl^-)

019 CONTAMINATED MAGNESIUM

020 CONTAMINATED MERCO-DRI AND HILCO CAKE

021 DRUM DECONTAMINATION RESIDUES; WET MGF_2

022 CONTAMINATED TBP AND/OR KEROSENE MIXTURES AND SLUDGES

023 OILY MGF_2

024 CONTAMINATED GRAPHITE - CRUSHED

025 CONTAMINATED METALLIC FILTER ELEMENTS

026 CONTAMINATED CARBON FILTER ELEMENTS

027 CONTAMINATED RAGS, PAPER AND POLYETHYLENE

028 CONTAMINATED ASBESTOS MATERIALS

029 DUST COLLECTOR BAGS

030 MAGNESIUM OXIDE AND MAGNESIUM ZIRCONATE FROM CRUCIBLE CLEANOUT

031 ROASTED MGF_2 (BLENDED WITH OTHER MATERIALS)

032 INCINERATOR ASHES - MATERIAL PASSING THROUGH GRATE OR SCREEN

033 INCINERATOR CINDERS - MATERIAL NOT PASSING THROUGH GRATE OR SCREEN

034 MGF_2 FOR MILLING OR DISCARD

035 MGF_2 OR CAF_2, GOOD LINER MATERIAL

036 MGF_2, -20 MESH, HIGH FREE METAL FOR PLANT 8 ROASTING (ENRICHED ONLY)

611

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

LOW-GRADE RESIDUES (cont.)

037 MGF_2, GROUND

038 MGF_2, +20 MESH, LOW U CONTENT, TO BE CRUSHED

039 SLUDGES, OILY

040 SLUDGES, FOR BLENDING AND SCREENING

041 SLUDGES, OILY, FOR OXIDATION, HIGH FREE METAL

042 SLUDGES, CLEANOUT, NON-OILY, FOR ROASTING

043 SLUDGES, SOLVENT - STENCIL TYPE OF SOLVENT ON CONTAINER (SEE LIST OF SOLVENT AND ORGANIC CHEMICAL NAMES ON PAGE 1.21.)

044 SLUDGES, SALT, SOFT, CHLORIDE (FOR PLANT 8 RECOVERY)

045 SLUDGES, SALT, SOFT, NON-CHLORIDE

046 SLUDGES, NON-OILY, FOR OXIDATION INCLUDING HIGH OR LOW FREE METAL

047 SAMPLES, NON-METALLIC, MISCELLANEOUS

048 OIL BURNER ASH

049 LEAD AND LEAD-CONTAMINATED MATERIALS

050 PCB MATERIALS, BALLAST, PCB-CONTAMINATED RAGS

051 MERCURY-CONTAMINATED MATERIALS, MERCURY BATTERIES

052 BARIUM-CONTAMINATED MATERIALS

053 NON-BURNABLE METAL WITH URANIUM CONTENT

054 HIGH LEVEL CLEANING RESIDUES

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

LOW-GRADE RESIDUES (cont.)

055 DEPLETED U METAL - NOT SUITABLE FOR REACTOR PRODUCT STREAMS (NOT TOP CROPS)

056 DEPLETED U INGOT CROPS (TOP CROPS) FROM PRIMARY INGOTS

057 WET CRUSHED SLAG FROM FURNACE POT BLOW-OUTS

058 CONTAMINATED CaF_2 - MgO

059 ASH FROM BURNING DUST COLLECTOR BAGS

060 FURNACE SALT, SOLIDIFIED, CHLORIDE (FOR PLANT 8 RECOVERY)

061 FURNACE SALT, SOLIDIFIED, NON-CHLORIDE

062 DUST COLLECTOR RESIDUES - HIGH FLUORIDE

063 KOH REVERSION CAKE

064 DUST COLLECTOR RESIDUES, PYROPHORIC, HIGH FLUORIDE

065 SCRAP SALTS, HIGH FLUORIDE, INCLUDING FLOOR SWEEPINGS

066 SCRAP SALTS, LOW FLUORIDE, INCLUDING FLOOR SWEEPINGS

067 WET SUMP OR FILTER CAKE, HALIDE CONTD

068 WET SUMP OR FILTER CAKE, OIL CONTD

069 WET SUMP OR FILTER CAKE, NON-OILY AND NON-HALIDE

070 ROCKWELL SPILLS

071 ROCKWELL CLEANINGS

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

LOW-GRADE RESIDUES (cont.)

072 U OR TH NITRATE SOLUTIONS, HIGH IMPURITY SUCH AS ZIRNLO DECOPPERING SOLUTIONS - FOR REFINERY PROCESSING

073 U OR TH CHLORIDE OR FLUORIDE SOLUTIONS, HIGH IMPURITY - SUCH AS PLANT 8 METAL DISSOLVER PRODUCT - NOT FOR REFINERY FEED

074 U OR TH SULPHATE SOLUTIONS

075 CLAD METAL FOR HNO_3 DISSOLVER

076 ZIRNLO ENDS - TO BE CLASSIFIED FOR RECOVERY

077 DRY CRUSHED SLAG FROM FURNACE POT BLOW-OUTS

078 OFF-SPEC TH OXALATE, FRENCH SOURCE

079 UNFIRED REDUCTION CHARGES PLUS MGF_2 FROM LINER CAVE-INS

080 PARTIALLY OXIDIZED METAL FOR SORTING CONTAINING METL-X

081 PARTIALLY OXIDIZED METAL FOR SORTING CONTAINING NO METL-X

082 OFF-SPEC UF_4 OR TH_4

083 U OR TH CHLORIDE SALTS, REJECT

084 BAD REDUCTION (NO DERBY)

085 U_3O_8 - ROTEXED - OTHER THAN PLANT 8'S OWN PRODUCT

086 U308 ROTEXED - PLANT 8'S OWN PRODUCT NOT MEETING REFINERY SPECIFICATIONS FOR CONTINUOUS DIGESTION

087 ROASTED SUMP CAKE - HIGH FLUORIDE - FOR MILLING

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

LOW-GRADE RESIDUES (cont.)

088 UNROASTED BUT MILLED MGF_2 (BLENDED WITH OTHER MATERIALS)

089 U_3O_8 ROTEXED - FROM CONCRETED CHIPS - CALCIUM

R 090 THORIUM RESIDUES

R 091 MAGNESIUM URANATE

095 COLD METAL OXIDES - NON RADIUM-BEARING

096 AUSTRALIAN RADIUM CAKE

097 RADIUM-BEARING MATERIALS - SAMPLES, K-65, INCLUDING Q-11 CONTAMINATED MATERIALS

098 MATERIAL HELD FOR HISTORICAL PURPOSES

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

HIGH-GRADE RESIDUES

100 SCRAP U_3O_8 OR THO_2, LOW FLUORIDE

101 SCRAP U_3O_8 OR THO_2, HIGH FLUORIDE

102 SCRAP UO_2

103 INGOT CROPS (TOP CROPS) FROM PRIMARY INGOTS

104 METAL SPILLS AND EXTRUSION ENDS; METAL HIGH IN IMPURITIES AND SPILLS

105 THO_2 PRODUCED FROM UNPURIFIED HANFORD THORIUM NITRATE VIA THORIA GEL PROCESS

106 CHIPS EMBEDDED IN CONCRETE - HIGH CALCIUM

107 CHIPS AND TURNINGS CONTAMINATED WITH NON-U MATERIALS - FOR OXIDATION

108 WET PHOSPHATE CAKE

109 SAWDUST FOR OXIDATION

110 NON-BRIQUETTABLE CHIPS AND TURNINGS FOR OXIDATION

111 BRIQUETTALE CHIPS AND TURNINGS FROM STANDARD METAL

112 BRIQUETTABLE CHIPS AND TURNINGS, HIGH IMPURITIES, FOR BRIQUETTING AND DOUBLE MELTING

113 ZIRCONIUM CLAD METAL, FROM OFF-SITE, TO BE DECLAD BY ZIRNLO SYSTEM

114 ZIRNLO FEED, CLASSIFIED AND SAWED

115 WET THORIUM OXALATE CAKE

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

HIGH-GRADE RESIDUES (cont.)

116 WET THORIUM HYDROXIDE

117 WET AMMONIUM DIURANATE CAKE

118 HOLLOW CORES WITH BROKEN DRILLS - ALL TYPES - BITS TO BE REMOVED AND CORES PICKLED PRIOR TO REMELT

119 SOLID METAL, OTHER THAN CORES, WITH EMBEDDED STEEL

120 CHEMICAL REJECT PRIMARY INGOTS

121 U_3O_8, +8 MESH - HIGH FLUORIDE

122 U_3O_8, +8 MESH - LOW FLUORIDE

123 CALCIUM URANATE

124 ZIRNLO; PARTIALLY DECLAD FUEL ELEMENTS

125 UNRECYCLED SLAG +20 MESH, BALL MILL PRODUCT

126 OXIDES MIXED WITH ZIRCONIUM BUT CLAD WITH OTHER ELEMENTS

128 CLAD URANIUM METAL; DECLAD BY MACHINING OR CHEMICAL TREATMENT

129 DIRTY PRILL, CODE 5 DERBIES, AND PLANT 1 TITAN MILL CLEAN-OUT, HIGH U CONTENT

130 PARTIALLY OXIDIZED METAL FOR DISSOLVER

131 PARTIALLY OXIDIZED METAL OXIDATION FEED

132 DUST COLLECTOR RESIDUES, LOW FLUORIDE

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

HIGH-GRADE RESIDUES (cont.)

133 OXIDES CLAD OR MIXED WITH ALUMINUM

134 U_3O_8 FOR REOXIDATION

135 DUST COLLECTOR RESIDUE, HIGH FLUORIDE, GREATER THAN 20% ASSAY

136 METAL TO BE OXIDIZED

137 MISCELLANEOUS MATERIAL - RECOVERY METHOD TO BE DETERMINED (NOT FOR USE BY INDIVIDUAL PLANTS)

138 OXIDES CLAD OR MIXED WITH ANY METALLIC ELEMENT OTHER THAN ALUMINUM, ZIRCONIUM OR STAINLESS STEEL

139 URANIUM ALLOYED OR CANNED WITH ELEMENTS OTHER THAN ALUMINUM, MOLYBDENUM OR ZIRCONIUM

140 OXIDES CLAD OR MIXED WITH ZIRCONIUM

141 CLAD METAL FOR ACID DISSOLUTION - NOT FOR ZIRNLO PROCESSING

142 OXIDES CLAD OR MIXED WITH STAINLESS STEEL

143 ROASTED CALCIUM-PRECIPITATED SUMP AND FILTER CAKES

144 OFF-SITE SUMP AND FILTER CAKES AFTER ROASTING AT FEMP

145 ROASTED AMMONIUM-PRECIPITATED SUMP AND FILTER CAKES

146 ROASTED MAGNESIUM-PRECIPITATED SUMP AND FILTER CAKES

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

REFINERY FEEDS

150 URANYL OR THORIUM NITRATE SOLUTION

151 OFF-SPEC THO_2, FRENCH SOURCE

152 U_3O_8 ROTEXED PLANT 8 FURNACE PRODUCT

153 -8 MESH PRODUCT FROM OXIDIZING +8 METAL

154 U_3O_8 ROTEXED PLANT 8 FURNACE PRODUCT

155 U_3O_8 -8 MESH FROM ROTEXING OF OTHER THAN PLANT 8'S OWN PRODUCTS - LOW FLUORIDE

156 MILLED UO_2

157 REJECT UO_3

158 PHOSPHATE ASH

159 ROASTED, MILLED AND/OR SCREENED CALCIUM-PRECIPITATED SUMP AND FILTER CAKES

160 IMPURE URANYL OR THORIUM NITRATE - SOLID

161 URANIUM CARBIDE, UC

162 OFF-SITE SUMP AND FILTER CAKES AFTER ROASTING, MILLING, AND/OR SCREENING AT FEMP

163 ROASTED, MILLED AND/OR SCREENED AMMONIUM-PRECIPITATED SUMP AND FILTER CAKES

164 ROASTED, MILLED AND/OR SCREENED MAGNESIUM-PRECIPITATED SUMP AND FILTER CAKES

165 U_3O_8 - NOT REQUIRING RE-OXIDATION

166 UO_2 (OR THO_2) PELLETS - REFINERY FEED

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

REFINERY FEEDS (cont.)

167 UO_2 (OR THO_2) POWDER - REFINERY FEED

168 CRUSHED FURNACE SALTS AND SLUDGES
NON-CHLORINE

169 ROASTED FURNACE SALTS AND SLUDGES
NON-CHLORINE

170 ORE CONCENTRATE - MISCELLANEOUS

190 U_3O_8 FOR RE-OXIDATION

191 RE-OXIDIZED ENRICHED CALCINER U_3O_8 FOR
SCREENING AND MILLING

192 OXIDE FOR SCREENING AND MILLING

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

INTERMEDIATE PRODUCTS

200 UO_3 PRODUCT

201 UO_3 REACTOR RECYCLE TAILS

202 UO_2 OR THO_2 PRODUCT

203 UF_6, URANIUM HEXAFLUORIDE

204 PURIFIED URANYL OR THORIUM NITRATE SOLUTION

205 THO_2 PRODUCED FROM SOL-GEL PROCESS

206 BLENDED UF_4 OR TH_4 CHARGE

207 PURIFIED URANYL OR THORIUM NITRATE SOLID

209 URANIUM OR THORIUM TETRACHLORIDE

210 UF_4 OR TH_4

211 UF_4 FROM PILOT PLANT UF_6

212 UF_4 FROM HANFORD UO_3

214 U_3O_8 FROM RECYCLE UO_3 (ROR PROCESS)

215 THORIUM HYDROXIDE, DRY

216 CHARGED UF_4 POTS, WIP

218 CLEAN PRILL FOR DOUBLE MELTING

219 METAL FROM SPILLS FOR DOUBLE MELTING

220 CODE 2 DERBIES FOR DOUBLE MELTING OR SHOT CLEANING

221 SOLID METAL FOR PICKLING PRIOR TO REMELT DOES NOT REQUIRE BLENDING (<12")

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

INTERMEDIATE PRODUCTS (cont.)

222 SOLID METAL - INCLUDES PHYSICAL BUT NOT CHEMICAL REJECT INGOTS; TO BE SAWED OR CRUSHED AND PICKLED PRIOR TO REMELT (≥12")

223 SOLID METAL TO BE SAWED, SHEARED, OR CRUSHED, BUT NOT PICKLED PRIOR TO REMELT

224 SOLID METAL, NOT PICKLED, OTHER THAN SPILLS AND TOP CROPS, FOR DOUBLE MELT

225 SR STANDARD METAL TO BE SAWED AND PICKLED PRIOR TO REMELT

227 METAL SAMPLES FOR DOUBLE MELTING

228 SOLID METAL TO BE PICKLED

229 FIRST GENERATION TOP CROPS FROM PRODUCT INGOTS - FOR PRIMARY INGOT REMELT CHARGES

230 SAWED SECTIONS, REQUIRING PICKLING, FROM PRIMARY INGOTS CONTAINING FIRST GENERATION TOP CROPS

231 SAWED SECTIONS, REQUIRING PICKLING, FROM PRIMARY INGOTS CONTAINING NO TOP CROP METAL

232 PICKLED METAL FOR DOUBLE MELTING - OTHER THAN FIRST GENERATION TOP CROPS

233 CLASSIFIED SHAPES FOR DOUBLE MELTING

234 PHYSICAL REJECT BILLETS TO BE SAWED PRIOR TO REMELT

235 TUBULAR ELEMENTS TO BE CRUSHED

236 EXTRUSION BUTTS TO BE PICKLED

237 PARTIALLY DECLAD METAL, OTHER THAN ZIRNLO, FOR DOUBLE MELTING

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

INTERMEDIATE PRODUCTS (cont.)

238 SOLID METAL FOR PICKLING AND DOUBLE MELTING, OTHER THAN FIRST GENERATION TOP CROPS

239 CHEMICAL REJECT SAWED REMELT METAL - TO BE CAUSTIC LEACHED AND PICKLED

240 DOUBLE MELT INGOTS TO BE SAWED AND PICKLED PRIOR TO REMELT

241 DOUBLE MELT INGOTS TO BE SAWED, BUT NOT PICKLED, PRIOR TO REMELT

242 CHEMICAL REJECT INGOTS (AND OTHER CHEMICAL REJECT MATERIAL) TO BE SAWED AND PICKLED, OR TO BE ROLLED, SHEARED AND PICKLED, PRIOR TO REMELT

243 CHEMICAL REJECT SOLID METAL TO BE SAWED, BUT NOT PICKLED PRIOR TO REMELT

244 CHEMICAL REJECT DOUBLE MELT INGOTS FROM DOUBLE MELTING TO BE SAWED AND PICKLED

245 CHEMICAL REJECT DOUBLE MELT SOLID METAL TO BE SAWED, BUT NOT PICKLED, PRIOR TO REMELT

246 INGOTS FROM OFF-SITE TO BE REWORKED

251 CHEMICAL REJECT SOLID METAL FOR PICKLING PRIOR TO REMELT

252 BRIQUETTES HIGH IN IMPURITIES FOR DOUBLE MELITNG

254 CODE 4 OR BOTTOM BURNOUT DERBIES FOR DOUBLE MELTING

260 TOP CROP FROM PRODUCT 4A FLAT BILLETS (SECOND GENERATION)

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

INTERMEDIATE PRODUCTS (cont.)

261 PHYSICAL SCRAP FROM RECYCLE 4A FLAT BILLETS
(SECOND GENERATION)

262 CHEMICAL SCRAP FROM RECYCLE 4A FLAT BILLETS
(SECOND GENERATION)

263 OFF-SITE 4A SCRAP RETURNS
(SECOND GENERATION)

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

REMELT FEEDS

300 DERBIES, CODE 1 AND CODE 3

302 BRIQUETTES

303 CHIPS-CLEANED NON-BRIQUETTABLE-SUITABLE FOR CASTING

304 SOLID REMELT METAL - LOW IMPURITIES - DOES NOT REQUIRE BLENDING OR PICKLING - NOT FROM DOUBLE MELTS

305 PICKLED ARF REMELT METAL

306 EXPERIMENTAL SHAPES - INCLUDING CLASSIFIED SHAPES NOT TO BE CRUSHED

307 ZIRNLO PRODUCT

308 INGOT CROPS AND DUDS

310 PICKLED CROPS FROM SR METAL

311 SR STANDARD SOLID METAL - FOR REMELT

313 PICKLED CROPS FROM HW METAL

314 PICKLED PRIMARY INGOT SECTIONS CONTAINING FIRST GENERATION TOP CROPS

315 PICKLED PRIMARY INGOT SECTIONS CONTAINING NO TOP CROP METAL

316 PICKLED Ti ALLOY REMELT SCRAP - DOES NOT REQUIRE BLENDING (NOT DERIVED FROM PRIMARY INGOTS)

322 CHEMICAL REJECT SOLID REMELT METAL - DOES NOT REQUIRE PICKLING

323 REJECT ELEMENTS - OUTER

324 REJECT ELEMENTS - INNER

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

REMELT FEEDS (cont.)

325 REJECT CORES

326 REJECT BILLETS, INCLUDING SAWED BILLET SECTIONS

327 PICKLED REJECT BILLETS OR BILLET SECTIONS

330 PRIMARY INGOT SECTIONS, NOT PICKLED, CONTAINING FIRST GENERATION TOP CROPS

331 PRIMARY INGOT SECTIONS, NOT PICKLED, CONTAINING NO TOP CROP METAL

333 PICKLED CHEMICAL REJECT CROPS

334 PICKLED CHEMICAL REJECT CROPS FROM DOUBLE MELT INGOTS

335 CRUSHED TUBULAR ELEMENTS

336 PICKLED EXTRUSION BUTTS

337 DECLAD METAL, OTHER THAN ZIRNLO

340 SECTIONS FROM CHEMICAL REJECT PRIMARY INGOTS, NOT PICKLED

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

CASTING PRODUCTS

401 SPECIAL SOLID INGOTS OR SLABS

402 SPECIAL HOLLOW INGOTS

403 SPECIAL CASTINGS, INCLUDING STATIC AND CENTRIFUGAL

404 N REACTOR INGOTS - RAW

405 N REACTOR INGOTS - DIRECT CASTINGS FOR FINISHED BILLET MACHINING

406 MARK 31 CASTINGS - RAW - INNER

407 MARK 31 CASTINGS - RAW - OUTER

408 MARK 31 CASTINGS - FINISHED - INNER

409 MARK 31 CASTINGS - FINISHED - OUTER

410 N REACTOR INGOTS - FINISHED

411 URANIUM SHOT

412 MARK 15 CASTINGS - RAW - INNER

413 MARK 15 CASTINGS - RAW - OUTER

414 MARK 15 CASTINGS - FINISHED - INNER

415 MARK 15 CASTINGS - FINISHED - OUTER

416 MARK 25 CASTINGS - RAW - INNER

417 MARK 25 CASTINGS - RAW - OUTER

418 MARK 25 CASTINGS - FINISHED - INNER

419 MARK 25 CASTINGS - FINISHED - OUTER

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

ROLLING AND EXTRUSION PRODUCTS

450 BILLETS, ROLLING MILL

451 MARK 15 EXTRUDED TUBES - INNER

452 MARK 15 EXTRUDED TUBES - OUTER

453 N REACTOR EXTRUDED TUBES

454 N REACTOR RAW BILLETS - SAWED EXTRUSIONS

455 MARK 31 EXTRUDED TUBES - INNER

456 MARK 31 EXTRUDED TUBES - OUTER

457 SPECIAL RODS AND/OR TUBES

459 N REACTOR RAW BILLETS - UPSET FORGED

461 MARK 25 EXTRUDED TUBES - INNER

462 MARK 25 EXTRUDED TUBES - OUTER

CHAPTER 3 MATERIAL DESCRIPTION CODES (cont.)

MACHINING PRODUCTS

500 MARK 31 ELEMENTS - INNER

501 MARK 31 ELEMENTS - OUTER

503 N REACTOR FINISHED BILLETS FROM EXTRUSIONS

505 N REACTOR FINISHED BILLETS FROM DIRECT CASTINGS

506 SPECIAL MACHINED SHAPES

507 MARK 15 ELEMENTS - INNER

508 MARK 15 ELEMENTS - OUTER

509 MARK 25 ELEMENTS - INNER

510 MARK 25 ELEMENTS - OUTER

CHAPTER 4 SOURCE OR ORIGIN CODES

PLANT 1 CODES

100 **PLANT 1 GENERAL**

101 PLANT 1 MAINTENANCE

102 MAINTENANCE SHOP (RCRA MATERIALS)

103 OIL STORAGE AREA (RCRA & TSCA)

105 PLANT 1 CONSTRUCTION WASTE

107 SOURCE UNKNOWN

110 **PLANT 1 MILLING**

111 DRUM DUMPER

112 TITAN MILL

113 DUST COLLECTOR NUMBER 64

114 DUST COLLECTOR NUMBER 76

115 THREE PHASE GALIGHER SAMPLER

116 HOPPER OR DRUM FILLING STATION

117 HOFFMAN VACUUM

119 FITZ MILL

120 **PLANT 1 STILL**

121 DRUM SIPHON

122 STILL TANK

123 WATER DRUMMING

124 RECLAIMED FLUID DRUMMING

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 1 CODES (cont.)

130 PLANT 1 DRUM RECONDITIONING

131 SHOT SCREEN

132 WHEELABRATOR SHOT BLAST UNIT

133 DRUM ROLLER

134 PANGBORN DUST COLLECTOR

135 DRUM PAINTING BOOTH

136 DRUM DRYER

137 DRUM BALER

140 PLANT 1 SAMPLING

141 SMALL SHEATHED AUGER

142 WHEELABRATOR DUST COLLECTOR

143 LARGE SHEATHED AUGER

144 PIPE SAMPLER

145 SLY DUST COLLECTOR

150 COPPER SHREDDER

R 175 PLANT 1 SOIL REMOVAL PROJECT

R 176 PLANT 1 SOIL TREATABILITY PROJECT

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANTS 2 AND 3 CODES

200 **PLANTS 2 AND 3 GENERAL**

201 PLANTS 2 AND 3 MAINTENANCE

202 MAINTENANCE SHOP (RCRA MATERIALS)

203 OIL STORAGE AREA (RCRA & TSCA)

210 **PLANT 2 DIGESTION**

211 SOUTH SIDE DIGESTORS

212 NORTH SIDE DIGESTORS

213 TURNER-HAWES DUST COLLECTOR

214 DAY-HOFFMAN DUST COLLECTOR

220 **METAL DISSOLVER**

221 OLIVER FILTER

222 METAL DISSOLVER GRATE

225 **EXTRACTION**

226 SOUTH SIDE EXTRACTION COLUMN LINE

227 NORTH SIDE EXTRACTION COLUMN LINE

228 MIXER-SETTLER

230 **SOLVENT TREATMENT**

235 **HOT RAFFINATE BUILDING**

236 FILTERS

240 TRASH BALER

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANTS 2 AND 3 CODES (cont.)

245 **REFINERY SUMP SYSTEM**

246 DORR THICKENERS

247 FILTERS

250 **RAFFINATE EVAPORATORS**

255 **ABSORBERS**

256 PLANT COLUMN ABSORBERS

260 **DENITRATION SYSTEM**

261 SCRUBBER SYSTEM

262 SOUTH SIDE PACKAGING

263 NORTH SIDE PACKAGING

267 **SAFE GEOMETRY EVAPORATOR CALCINER**

268 **PULLMAN VACMOBILE**

270 **DRUM DIGESTION**

271 CARTRIDGE FILTER

272 PLATE AND FRAME FILTER

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PILOT PLANT CODES

300 PILOT PLANT GENERAL

301 PILOT PLANT MAINTENANCE

302 MAINTENANCE SHOP (RCRA MATERIALS)

303 OIL STORAGE AREA (RCRA & TSCA)

310 GREEN SALT PRODUCTION

311 REACTOR NUMBER 1

312 REACTOR NUMBER 2

313 DUST COLLECTORS

314 VACUUM - PORTABLE

315 AUTOCLAVE

316 COLD TRAP

320 METAL REDUCTION PILOT PLANT

321 SLY DUST COLLECTOR

322 HOFFMAN VACUUM

323 ROCKWELL FURNACES

324 BREAKOUT STATION

330 DERBY SHOT BLASTING

331 PANGBORN ROTO-BLAST UNIT

332 SPENCER VACUUM

333 EAST WHEELABRATOR DUST COLLECTOR

334 DUCLONE CYCLONE

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PILOT PLANT CODES (cont.)

335 **SHOT PRODUCTION UNIT**

336 SHOT TANK

340 **PILOT PLANT REMELT AND CASTING**

341 REMELT FURNACE

343 CRUCIBLE BURNOUT

345 SAWS

346 WEST WHEELABRATOR DUST COLLECTOR

347 HOFFMAN VACUUM

350 **PILOT PLANT HEAT TREATING**

351 SALT BATH

352 WATER QUENCH

353 OIL QUENCH

355 **PILOT PLANT METAL DISSOLVING**

356 HNO3 PICKLING OR DECOPPERING

357 HF OR HCl DISSOLVER

358 FILTER

359 NEUTRALIZER

360 **PILOT PLANT AUXILIARY EQUIPMENT**

361 PRECIPITATOR

362 FILTER

364 TRAY DRYER-THORIUM

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PILOT PLANT CODES (cont.)

365 **PILOT PLANT OXIDIZING**

366 SETTLING TABLE

367 OXIDATION FURNACE

368 AIR FILTER

369 **S&W GLO-BAR FURNACE**

370 **PILOT PLANT MILLING**

371 JAW CRUSHERS

372 BALL MILL-THORIUM

375 **PILOT PLANT SOLVENT EXTRACTION**

376 SIX-INCH EXTRACTION COLUMN

377 BOILDOWN TANKS

378 PRODUCT TANK

379 TWO-INCH EXTRACTION COLUMN

380 **PILOT PLANT SUMP**

381 SUMP CATCH BASIN

382 PRECIPITATOR

383 UNCONTAMINATED SUMP

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 4 CODES

400 PLANT 4 GENERAL

401 PLANT 4 MAINTENANCE

402 MAINTENANCE SHOP (RCRA MATERIALS)

403 OIL STORAGE AREA (RCRA & TSCA)

R 407 BANK 7

R 408 BANK 8

R 409 BANK 9

R 410 TANK FARM

R 411 PLANT 4 SAMPLING

420 DUST COLLECTORS - GENERAL

421 DUST COLLECTOR G4-1

422 DUST COLLECTOR G4-2

423 DUST COLLECTOR G4-15

424 DUST COLLECTOR G4-4

425 DUST COLLECTOR G4-5

426 DUST COLLECTOR G4-6

427 DUST COLLECTOR G4-7

429 DUST COLLECTOR G4-9

431 DUST COLLECTOR G4-11

R 432 DUST COLLECTOR G4-12

433 DUST COLLECTOR G4-13

434 DUST COLLECTOR G4-14

435 PLANT 4 SUMP

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 4 CODES (cont.)

440 PACKAGING STATION - GENERAL

441 EAST (NO. 1) PACKAGING STATION

442 WEST (NO. 2) PACKAGING STATION

443 SOUTHWEST (NO. 3) PACKAGING STATION

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 5 CODES

500 **PLANT 5 GENERAL**

501 PLANT 5 MAINTENANCE

502 MAINTENANCE SHOP (RCRA MATERIALS)

503 OIL STORAGE AREA (RCRA & TSCA)

509 DRUM STORAGE PAD

510 **METAL REDUCTION AREA**

511 BLENDERS

512 BLENDING FILLING CAP AND LID AREA
DUST COLLECTORS 251, 253

513 JOLTER AREA
DUST COLLECTORS 247, 248

514 BOMB FILLING STATION

515 CAP AND LID

516 ROCKWELL FURNACES

517 COOLING TANKS

518 BREAKOUT STATIONS

519 EAST BREAKOUT AREA
DUST COLLECTORS

520 WEST BREAKOUT AREA
DUST COLLECTORS

521 DERBY QUENCH

522 SLAG CONVEYOR PIT

523 POT REAMING STATION

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 5 CODES (cont.)

530 CASTING AREA

531 REMELT FURNACES

532 SEPARATION BOOTH

533 REMELT
DUST COLLECTOR 260

534 CRUCIBLE BURNOUT

535 CRUCIBLE BURNOUT
DUST COLLECTOR 261

536 SLY DUST COLLECTOR 100

537 GRAPHITE LATHE

538 HILCO OIL FILTER

539 BURNOUT AND MOLD TANKS

540 GRAPHITE BREAKUP STATIONS

545 SUMP TREATMENT AREA

550 SAW AREA

551 HACK SAW

552 NORTH CIRCULAR SAW

553 EAST CIRCULAR SAW

554 WEST CIRCULAR SAW

560 EAST SLAG PLANT

561 CRUSHER

562 COARSE SEPARATOR

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 5 CODES (cont.)

564 BIN 4: -20 MESH MAGNESIUM FLUORIDE

565 BIN 3: +20 MESH MAGNESIUM FLUORIDE

566 BIN 5, 6, 7, 8: MAGNESIUM FLUORIDE

570 **WEST SLAG PLANT**

571 CRUSHER

572 COARSE SEPARATOR

573 FINE SEPARATOR

574 -20 MESH MAGNESIUM FLUORIDE

575 +20 MESH MAGNESIUM FLUORIDE

576 GOOD LINER SOURCE

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 6 CODES

600 PLANT 6 GENERAL

601 PLANT 6 MAINTENANCE

602 MAINTENANCE SHOP (RCRA MATERIALS)

603 OIL STORAGE AREA (RCRA & TSCA)

610 ROLLING

611 INGOT FURNACE

612 BLOOMING MILL

613 CROP SHEAR OR GAG SHEAR

614 EQUALIZER FURNACE

615 CONTINUOUS MILL

616 FLYING SHEAR

617 COOLING BEDS

618 STRAIGHTENER

619 INSPECTION - ROD AREA

620 MACHINING

621 BLANKING ACMES

622 CROSS TRANSFERMATIC

623 CENTERLESS GRINDERS

624 DRILLING ACMES

625 SUNDSTRAND LATHES

626 HEALD BOREMATICS

627 TURRET LATHES

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 6 CODES (cont.)

631 BARDONS AND OLIVER CUTOFF LATHE

632 CNC MACHINE

640 HEAT TREATING

642 SALT-OIL FURNACE

643 NU SAL FURNACE

645 BRIQUETTING

646 CHIP CRUSHER

647 CHIP PICKLING TANKS

648 CHIP BRIQUETTING PRESS

650 DUST COLLECTORS

652 TURNER HAWES

655 WATER TREATMENT AREA

656 COLLECTION TANKS

657 PRECIPITATORS

658 FILTERS

659 HOFFMAN CLARIFIES

660 DEGREASING AND PICKLING

661 DERBY PICKLING

662 CORE PICKLING

663 REMELT METAL PICKLING

665 INSPECTION

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

MISCELLANEOUS FACILITIES CODES

700 WASTE MANAGEMENT

702 MAINTENANCE SHOP (RCRA MATERIALS)

703 OIL STORAGE AREA (RCRA & TSCA)

705 CONSTRUCTION

R 706 PLANTWIDE EHSI - PHASE IV STORMWATER RUNOFF

R 710 K-65 GENERAL - AREA 34

711 SILO #1 K-65

712 SILO #2 K-65

713 SILO #3 COLD-METAL OXIDE

714 SILO #4

715 BUILDING 64

716 BUILDING 65

717 BUILDING 65 - WEST PAD

718 BUILDING 67

719 BUILDING 68

R 720

R 721 CHEMICAL PITS - GENERAL

R 722 CHEMICAL PIT NO. 1

R 723 CHEMICAL PIT NO. 2

R 724 CHEMICAL PIT NO. 3

R 725 CHEMICAL PIT NO. 4

R 726 CHEMICAL PIT NO. 5

R 727 CHEMICAL PIT NO. 6

R 728 SURGE LAGOONS

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

MISCELLANEOUS FACILITIES CODES (cont.)

R	729	ENVIRONMENTAL MONITORING
R	730	**LABORATORY GENERAL - BUILDING 15**
	731	OPERATIONS & ENGINEERING SERVICES
R	732	ANALYTICAL LABORATORY
	733	ANALYTICAL LABORATORY HAZARDOUS WASTE
R	734	BIO-CHEMISTRY LABORATORY
R	735	SERVICE - BUILDING 11
R	736	LAUNDRY
R	737	HUMAN RESOURCES AND GUARD HOUSE - BUILDING 28
	738	GARAGE (RCRA)
R	739	GARAGE OIL (RCRA)
R	740	ADMINISTRATION - BUILDING 14
R	741	GARAGE - BUILDING 31
R	742	DECONTAMINATION - BUILDING 69
	743	STORES-RECEIVING
R	744	TRUCK DOCK - PLANT 1
	745	**MAINTENANCE SECTION**
	746	MACHINE SHOP (RCRA)
	747	MACHINE SHOP OIL STORAGE (RCRA & TSCA)
	748	PAINT SHOP (RCRA)
	749	INSTRUMENT SHOP (RCRA)
R	751	EXPANSION PLANT - BUILDING 51
R	755	SAFETY AND HEALTH - BUILDING 53

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

MISCELLANEOUS FACILITIES CODES (cont.)

	756	DOSIMETRY LABORATORY HAZARDOUS WASTE
R	759	BUILDING 3045 - LABORATORY MACHINE SHOP - RUST
R	760	DELETED
	761	GENERAL SUMP
	762	INCINERATOR
R	763	OIL BURNER AT BOILER PLANT (OPERATED BY NLO PRODUCTION)
	764	GRAPHITE BURNER
	765	WATER TREATMENT
	766	SEWAGE TREATMENT
	767	BOILER PLANT
	768	BOILER PLANT (RCRA)
	769	BOILER PLANT OIL STORAGE (RCRA)
	775	LAB MAINTENANCE SHOP (RCRA)
	776	LAB OIL STORAGE AREA (RCRA & TSCA)

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 8 CODES

800 **PLANT 8 GENERAL**

801 PLANT 8 MAINTENANCE

802 MAINTENANCE SHOP (RCRA MATERIALS)

803 OIL STORAGE AREA (RCRA & TSCA)

805 DRUM WASHER

806 DRUM RECONDITIONING

810 **WET-CHEMICAL SYSTEM**

811 PRIMARY CALCINER

812 PLANT 8 MILLING

813 SUMP

814 DIGESTION

815 EIMCO FILTERS

816 PRECIPITATION

817 OLIVER FILTER

818 CALCINATION

819 LEACH TANK

820 **OXIDATION SYSTEM**

821 CRUSHER

822 ROTEX SCREENING

823 MUFFLE FURNACE

824 BOX FURNACE

825 OXIDATION FURNACE NUMBER 1

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 8 CODES (cont.)

R	826	ROTARY KILN - OLD UNIT
	827	OXIDATION FURNACE NUMBER 2
R	828	PLANT 8 DUST COLLECTORS
R	830	ROTARY KILN FACILITY - NEW UNIT
	836	THO2 PLANT 8
	845	HYDRAULIC SEPARATOR
	852	BLENDING AND SCREENING OPERATION
	853	OIL DECANTATION
	854	DUST COLLECTOR & FILTER BAG WASHING
	855	AIR SEPARATOR
	856	HAND SORTING

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 9 CODES

900 **PLANT 9 GENERAL**

901 PLANT 9 MAINTENANCE

902 MAINTENANCE SHOP (RCRA MATERIALS)

903 OIL STORAGE AREA (RCRA & TSCA)

910 **REDUCTION**

911 JOLTERS

912 F MACHINE AND CAPPING

913 ROCKWELL FURNACES -
MOLTEN SALT CLEANING

914 BREAKOUT STATION

915 TURNER-HAWES, HOFFMAN VACUUM SYSTEM

916 COOLING TANK

917 SPENCER PORTABLE VACUUM

920 **CASTING**

921 NPR FURNACE

922 CINCINNATI MILLING MACHINE

924 NPR PRIMARY HOFFMAN VACUUM UNIT

925 NPR BAG HOFFMAN VACUUM UNIT

926 NPR AAF DUST COLLECTOR

927 NPR AAF DUST COLLECTOR PRIMARY SEPARATOR

933 G9-NI 1035 DUST COLLECTOR

935 **EXTRUSION SAWING**

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 9 CODES (cont.)

940 **MACHINING**

941 GISHOLT TURRET LATHE

942 J+L AUTOMATIC LATHE

945 L+S DUOMATIC LATHE

949 J+L TURRET LATHE

951 LEBLOND RAPID BORER

953 WARNER AND SWASEY LATHE

954 MONARCH ENGINE LATHE

955 **BRIQUETTING**

956 CRUSHER AND METSO WASH

957 CHIP PICKLING AND RINSING

958 CHIP CENTRIFUGING

959 MAGNETIC SEPARATOR & BRIQUETTE PRESS

960 **PICKLING**

961 REMELT PICKLING AND RINSING

962 CORE DEGREASING AND PICKLING

965 **SUMP LIQUOR PROCESSING**

966 COLLECTION TANKS

967 PRECIPITATORS

968 FILTERS

970 **HEAT TREATING**

CHAPTER 4 SOURCE OR ORIGIN CODES (cont.)

PLANT 9 CODES (cont.)

980 ZIRNLO PROCESS - GENERAL

981 HACKSAW

982 DEGREASER

983 DECOPPERING

984 DEZIRCING

985 ACID FILTRATION

986 NEUTRALIZATION

987 NITRIC ACID PICKLE

988 KOH PICKLE

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM		Page 1 of 7 Revision No. 0 Revision Date: N/A
REMEDIATION SUPPORT OPERATIONS PROCEDURE	Physical Inventory of Nuclear Materials	SOP 20-C-011 Area: As Applicable
Per C92-164 Authorization: R.L. Gardner, Facilities & Waste Operations Mgr.	Supersedes: None	Issue Date: 04-01-93

1.0 PURPOSE

The purpose of this document is to establish the procedure for conducting a physical inventory of nuclear materials and recoverable residues annually or as directed by the DOE.

2.0 APPLICABILITY

This procedure is applicable to nuclear materials including recoverable residues, in RSO areas.

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3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Participating in training prior to the inventory.

3.1.2 Reviewing the "Inventory Requirements" letter for instructions.

3.1.3 Coordinating with Materials Control & Accountability (MC&A) to conduct the inventory.

3.1.4 Obtaining and posting a "Radiation Work Permit" when required.

3.1.5 Directing the stoppage of movement of nuclear materials (except as required) for taking the inventory.

3.1.6 Halting nuclear material transfer between Material Balance Accounts (MBAs).

3.1.7 Ensuring personnel are qualified per the established training requirements identified by the Division Manager.

3.1.8 Contacting ES&H to determine the appropriate respiratory protection for the area where the inventory is being conducted.

3.1.9 Issuing the required respiratory protection to personnel.

3.1.10 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.2 Operators shall be responsible for complying with this SOP.

3.3 MC&A shall be responsible for the following:

3.3.1 Providing training for involved operators, supervisors and MC&A specialists prior to the inventory.

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3.0 **RESPONSIBILITIES** (cont.)

3.3.2 Issuing the "Inventory Requirements" letters.

3.3.3 Coordinating with the F&WO supervisor to conduct the physical inventory.

3.3.4 Issuing "Permanent Inventory Record" forms to inventory teams.

3.3.5 Receiving and verifying completed inventory forms returned by inventory teams.

3.3.6 Assisting in the determination that the inventory is complete.

3.3.7 Ensuring all inventory record forms originally issued have been returned.

3.3.8 Comparing the inventory records with book records and computer database and reconciling any differences.

3.3.9 Entering the inventory data onto the physical inventory system.

3.3.10 Ensuring that Nuclear Materials Accountants generate inventory reports and activity listings.

4.0 **DEFINITIONS**

None

5.0 **APPLICABLE DOCUMENTS**

5.1 Drivers

5.1.1 DOE Order 5633.3, "Control and Accountability of Nuclear Materials"

5.1.2 PO-D-026, "Site Services Document Program"

5.1.3 "FEMP Conduct of Operations Manual"

5.2 References

5.2.1 SOP 20-C-912, "Checking Scale Operation"

5.2.2 RM-0005, "FEMP Lot Marking and Color Coding System"

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 A "Radiation Work Permit" shall be posted at the area of work.

6.2 Leather or leather-palm gloves shall be worn when handling containers and nuclear material.

6.3 Respiratory protection issued by the supervisor shall be worn when required by ES&H.

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6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.4 Cover goggles shall be worn where there is a possibility of exposure to dust, organic solvent, acid, or caustic.

6.5 Safety glasses are required at all times except when other eye protection is specified by ES&H.

6.6 Drums shall be handled by mechanical material handling equipment.

6.7 Nuclear safety limits and restrictions of the applicable Manufacturing Specification or Nuclear Safety documents shall be followed.

6.8 Anti-contamination clothing specified by Radiological Safety shall be worn while working in contaminated areas.

6.9 Operators shall have reviewed and be familiar with information contained in Material Safety Data Sheets for the chemicals/hazardous materials being used.

6.10 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a Supervisor. The Supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Control Department for evaluation. When the suspect isotope is uranium, the involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow up urine sample. When the suspect isotope is other than uranium, the involved personnel shall report to the Dosimetry Section of the Radiological Control Department for further determination of actions. Employees are responsible for complying with additional requirements as specified by the Radiological Control Section.

6.11 Any situation which could have resulted in the inhalation, ingestion, or absorption of a hazardous material shall immediately be reported to a Supervisor or to the Assistant Emergency Duty Officer (AEDO), who will immediately report the circumstances to Medical and Industrial Hygiene. The involved personnel shall be directed by the Supervisor or AEDO as to when and where to report for medical evaluation, completion of an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the Step or Item to which they apply.

7.2 When appropriate, derbies and ingots will be inventoried by bar code.

7.3 Physical inventories require that there be no movement of nuclear materials during inventory.

8.0 PROCEDURE

8.1 Preparation for Inventory

SUPERVISOR

8.1.1 Halt transfer of nuclear material to or from other MBAs.

OPERATOR

8.1.2 Drum residues, if any.

8.1.3 Weigh drums of residue per SOP 20-C-912.

8.1.4 Identify drums per RM-0005.

MC&A

8.1.5 Issue "Permanent Inventory Record" sheets, Form FMPC-CONT-367 (See Figure 1) to inventory teams.

8.1.6 Issue "Inventory Labels" (See Figure 2), printed with the month and year, to the teams.

8.2 Conducting the Inventory

OPERATOR

8.2.1 Remove, if possible, existing inventory labels from items to be inventoried.

NOTE: The label shall be applied over old labels that could not be removed (if any) or in a visible location.

8.2.2 Apply a current Inventory Label to containers/skids/pallets being inventoried.

NOTE: For single items, a notation shall not be made.

8.2.3 If a single label represents more than one item, make an appropriate notation (such as "one skid - four drums") on the label.

8.2.4 Record inventory data on the inventory record.

8.2.5 Give completed inventory records to the supervisor.

SUPERVISOR

8.2.6 Give inventory records to MC&A.

9.0 APPLICABLE DOCUMENTS

9.1 FMPC-CONT-367, "Permanent Inventory Record"

FMPC
CONTROLLER'S ORGANIZATION - MATERIALS CONTROL AND ACCOUNTABILITY
PERMANENT INVENTORY RECORD

DATE:		INVENTORY SHEET NUMBER:
PLANT:	AREA:	NUCLEAR MATERIAL:

LINE NO	BADGE NUMBER (1-8)	INVENTORY NUMBER	LOT NUMBER					DRUM NO.	GROSS WEIGHT POUNDS	TARE WEIGHT POUNDS (74-80)	NET WEIGHT POUNDS (74-80)	MBA (40-42)	LOCATION			DRUM SIZE (40-47)	(✓) TYES	
			P O NUMBER (20-23)	SOURCE (24-26)	CLASS (27)	MATERIAL (28-30)	SEQUENCE (31-34)						ROW.	STACK	LEVEL		OP	POOS
1																		
2																		
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FMPC CONT 367 (8 8 90)

PERMANENT INVENTORY RECORD
FORM NO. FMPC-CONT-367
Figure 1

4554

NOVEMBER 30, 1992

EXAMPLE OF INVENTORY LABEL
Figure 2

RECORD OF ISSUE/REVISIONS

DATE	REV.NO.	DESCRIPTION AND AUTHORITY
04-01-93	0	Procedure requirement for Physical Inventory of Nuclear Material per P92-323 (C92-164). SOPs 1-C-903, 4-C-903, 5-C-911, 6-C-902, 8-C-504, 9-C-903, and 11-C-215 were superseded by CIO C92-164.

HANDLING CONTAINERS OF UNIDENTIFIED MATERIAL

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SSOP-0039

Effective Date: 09-30-92

AUTHORIZED BY: _____ 9/30/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
09-30-92	0	Required in order to establish a procedure for handling unidentified material per Request No. P91-652, initiated by K. Murrin.

1.0 PURPOSE

The purpose of this document is to provide instructions for the processing of unidentified, or mis-labeled, containers of material/substances.

2.0 SCOPE

This procedure is applicable to unmarked, or suspect, mis-labeled containers (such as drums, boxes,and cans) whose content is unknown or suspected to be not as labeled.

3.0 DEFINITIONS

Acute toxic - Chemical substance that can poison personnel who are exposed to the substance.

Assistant Emergency Duty Officer (AEDO) - The emergency management authority on site when the Emergency Operations Center (EOC) is not operational, and the incident commander of FEMP emergency response activities.

Emergency Response Team (ERT) - A group (composed partially of professional and partially of volunteer personnel) whose members are trained for on-scene event mitigation, including fire, hazardous substance release, radioactive material release, and medical emergencies.

Flammable Liquids - Any liquid having a flash point below 100 deg.F, except any mixture having components with flash points of 100 deg.F or higher, the total of which make up 99 percent or more of the total volume of the mixture/substance.

Hazardous Substance - Any substance as defined in 29 CFR 1910.120, which can include substances which are toxic, infectious, corrosive, chemically reactive, and/or unstable after prolonged storage.

Highly Corrosive - Classification assigned to any substance that can cause severe chemical burns to personnel and can also dissolve ordinary steel.

Incompatible - Substances that have an undesirable, usually violent, reaction when they come in contact with each other.

Radioactive - Any substance having a specific activity greater than 0.002 microcuries per gram (uCi/g).

Shock Sensitive - A chemical or substance that may explode when struck, jarred, or moved.

3.0 **DEFINITIONS** (cont.)

Unknown Content - Material in any type of container that carries no identifying markings or documentation by which the material's origin and composition can be clearly established.

4.0 **RESPONSIBILITIES**

Department Managers

- Ensures that department personnel are trained in the requirements of this procedure.
- Provides, upon request, equipment and/or personnel to assist in handling containers of unknown content.
- Notifies the AEDO, when applicable, of the discovery of a container with unknown content.

Engineering shall be responsible for coordinating with applicable departments to obtain the services of off-site professional organizations, when assistance is required for identification and disposition of unknown substances, in accordance with appropriate site procedures.

Environmental Compliance (EC) shall be responsible for ensuring that containers of unknown substances are disposed of in accordance with environmental and/or regulatory requirements.

Industrial, Radiological Safety & Training (IRS&T) shall be responsible for determining the safety equipment required to protect personnel handling unidentified substances, the environment, and property.

Facility Owners shall be responsible for assisting the AEDO to determine the contents of an unmarked container.

5.0 **GENERAL**

Material in an unidentified container shall be assumed to be either acute toxic, highly corrosive, flammable, incompatible with other material, radioactive and shock sensitive, and could be potentially hazardous waste until proven otherwise.

Unidentified containers shall not be handled in any manner until specific instructions are received from EC and IRS&T.

6.0 PREREQUISITES

None

7.0 PROCEDURE

7.1 NOTIFICATION

EMPLOYEE

1. Inform the supervisor (or the AEDO in the supervisor's absence), of the container with unknown contents.

SUPERVISOR

2. Inform the Facility Owner of the location of the container(s) with unknown contents.

7.2 INVESTIGATING CONTAINERS WITH UNKNOWN CONTENTS

FACILITY OWNER OR DESIGNEE

1. Determine, through historical information and/or process knowledge, the identity of the unknown contents of the container.

2. Contact the reporting supervisor and request assistance in obtaining the historical information and/or process knowledge required.

SUPERVISOR/FACILITY OWNER

> **WARNING:**
>
> **DO NOT MOVE, OPEN, OR TOUCH CONTAINERS WITH UNKNOWN CONTENTS AS THE SUBSTANCE COULD BE SHOCK SENSITIVE.**

3. If material identification is established, complete a "Material Evaluation Form" (MEF) and process that material per SSOP-0002 since it will no longer fall under this procedure.

   NOTE: If the contents of the container are still unknown, notify the AEDO.

7.2 INVESTIGATING CONTAINERS WITH UNKNOWN CONTENTS (cont.)

SUPERVISOR/FACILITY OWNER

4. Using appropriate devices, such as barricades, **WARNING** or **CAUTION** tape, flashing lights, erect barriers around the container, to prevent personnel from entering the area.

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

5. Notify the Emergency Duty Officer of the situation and request instructions.

6. Inform EC and IRS&T of the container with unknown contents.

7.3 DISPOSING OF CONTAINERS OF UNKNOWN CONTENTS

EC&QA/IRS&T

1. Recommend the outside organization or WEMCO department that will handle the container.

FACILITY OWNER OR DESIGNEE

2. Prepare a project/task specific "Health and Safety Plan" for the disposition of the container, as outlined in the FEMP "Health and Safety Plan".

3. Obtain EC and IRS&T approval of the project/task specific "Health and Safety Plan."

4. Notify the AEDO when the container is scheduled for disposal.

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

5. Arrange for the Emergency Response Team to be present while the container with unknown contents is being handled.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response

8.2 REFERENCES

- SSOP-0002, "Completing the Material Evaluation Form"

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1.0 PURPOSE

The purpose of this procedure is to allow waste generators to evaluate bulk waste streams designated as Low Level Radioactive Waste (LLRW). The waste streams must be evaluated to ensure the material is properly characterized as non hazardous (as defined by the Resource Conservation and Recovery Act) prior to packaging and shipment for disposal.

2.0 APPLICABILITY

This document is applicable to plastic, rubber, paper, fiberglass, rope, scrap wood, scrap metal, and scrap vehicles (including light/medium duty vehicles and forklifts) waste streams being packaged (excluding wastes associated with a Hazardous Waste Management Unit) for disposal as low level radioactive waste.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that only trained personnel perform this procedure.

3.1.2 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection requirements.

3.1.3 Providing waste generator with the required respiratory protection.

3.2 Waste generators shall be responsible for submissions of Material Evaluation Forms (MEF) and associated characterizations per site procedures.

3.3 Logistics Administration shall be responsible for transporting material to the packaging area upon request.

3.4 Centralized Training shall be responsible for supporting the training and maintaining training records supplied by Site Services.

4.0 DEFINITIONS

4.1 Low Level Radioactive Waste - Radioactive waste that is not classified as high level waste, transuranic waste, spent nuclear fuel, or by product material as defined by DOE order 5820.2A. However, test specimens of fissionable material irradiated for research and development purposes only, and not for the production of power or plutonium, may be classified as low level radioactive waste provided the activity of transuranic material is less than 100 nCi/g.

4.2 Waste Generator - Organization (point of generation) at which waste originates.

4.0 **DEFINITIONS** (cont.)

4.3 RCRA (Resource Conservation Recovery Act) - The federal statute which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control and proper management of solid and hazardous wastes

4.4 Entrapped Liquids - Collected fluids that have accumulated by exposure to elements.

4.5 Internal Fluids - Liquid within equipment which functioned as a working component of the equipment.

4.6 Waste Streams - For the purpose of this procedure, this term is defined as wood, metal, light/medium duty vehicles or fork lifts designated as Low Level Radioactive Waste.

4.7 Hazardous Waste Management Unit - Any unit/facility where hazardous waste is currently controlled or an empty unit which held hazardous waste (e.g. treatment, storage or disposal).

4.8 Empty - A container is considered "Empty" of hazardous waste residues as defined by OAC 3745-51-07 in lieu of 40 CFR 261.7.

5.0 **APPLICABLE DOCUMENTS**

5.1 Drivers

5.1.1 DOE 5820.2A, Radioactive Waste Treatment

5.1.2 OAC 3745-51-07, Residues of Hazardous Waste in Empty Containers

5.1.3 40 CFR 262.11, Hazardous Waste Determination

5.1.4 PO-D-0026, "Site Services Document Program"

5.1.5 FEMP Conduct of Operations Manual

5.2 References

5.2.1 SSOP-0002, "Completing the Material Evaluation Form"

5.2.2 SOP 20-C-605, "Establishment and Control of Satellite Accumulation Areas"

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 Safety glasses with side shields shall be worn unless other eye protection is specified by IRS&T.

6.2 Respiratory protection provided by the supervisor shall be worn when required by IRS&T.

6.3 Leather-palmed gloves shall be worn to protect hands from rough material and contamination.

6.4 HEPA type filter vacuum cleaners or an IRS&T approved vacuum shall be used for cleaning.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.5 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

6.6 Use proper lifting techniques when manually lifting wood or metal material. Heavy objects shall be lifted with mechanical lifting devices.

6.7 Do not work under a suspended load unless load has been blocked or supported with jack stands.

7.0 PROCEDURE

7.1 General

7.1.1 Warnings, Cautions, and Notes in this procedure precede the step to which they apply.

7.1.2 Generators inspect/prepare and evaluate scrap wood per Step 7.2 using checklist Form No. FS-F-3465, scrap metal per Step 7.3 using checklist Form No. FS-F-3464, scrap vehicles per Step 7.4 using checklist Form No. FS-F-3472, and plastic, rubber, paper, fiberglass and rope per Step 7.5 using checklist Form No. FS-F-3580.

7.2 Evaluating Scrap Wood Waste Stream

7.2.1 Visually inspect and evaluate every item to be packaged for disposal using the criteria of Section I of Materials Evaluation and Container Information-Wood, Form No. FS-F-3465 (See Figure 1).

7.2.2 Check the "YES," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If one answer to items 1 through 5 is "NO", the item being evaluated must be set aside - not packaged - and a Material Evaluation Form (MEF)completed for that item. Contact Facilities and Material Evaluation (FME) Dept. for guidance. A "NO" to one of items 1 through 5 checked on a form causes rejection of the package for shipment by quality assurance.

7.2.3 Complete Section II of Form No. FS-F-3465 as material is packaged.

7.2.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.

7.2.3.2 List the MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3465, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.

7.0 **PROCEDURE** (cont.)

7.2.4 The completed Form No. FS-F-3465 must be signed by the waste packager, the packager's supervisor, and then sent to quality assurance for approval.

7.2.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-5 in Section I are all checked "YES" or "N/A".

7.2.6 Distribute form as required by the distribution block in the lower left corner of each form.

7.3 Evaluating Scrap Metal Waste Stream

7.3.1 Evaluate every item to be packaged for disposal using the criteria of Section I of Materials Evaluation and Container Information - Metal, Form No. FS-F-3464 (See Figure 2).

7.3.2 Check the "YES," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If one answer to items 1 through 5 is "NO", the item being evaluated must be set aside - not packaged - and a Material Evaluation Form (MEF) completed for that item. Contact Facilities and Material Evaluation (FME) Dept. for guidance. A "NO" checked on items 1 through 5 of a form causes rejection of the package for shipment by quality assurance.

7.3.3 Complete Section II of Form No. FS-F-3464 as material is packaged.

7.3.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.

7.3.3.2 List the MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3464, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.

7.3.4 The completed Form No. FS-F-3464 must be signed by the waste packager's supervisor and the operator, and then sent to quality assurance for approval.

7.3.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-5 in Section I are all checked "YES" or "N/A".

7.3.6 Distribute the form as required by the distribution block in the lower left corner of each form.

7.4 Evaluating Scrap Vehicles and Forklifts Waste Stream

NOTE: Only light/medium duty vehicles and forklifts are to be evaluated per this procedure. This document is not applicable to heavy equipment.

7.4.1 Evaluate every vehicle to be packaged for disposal using the criteria of Section I of Evaluation and Container Information - Scrap Vehicle, Form No. FS-F-3472 (See Figure 3).

7.0 PROCEDURE (cont.)

7.4.2 Check the "YES," "UNKNOWN," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If the appropriate answer to the criteria is "NO", the vehicle being evaluated cannot be packaged and a Material Evaluation Form (MEF) must be completed for that vehicle. Contact Facilities and Material Evaluation Dept. for guidance. A "NO" checked on a form causes rejection of the package for shipment by quality assurance.

7.4.3 Complete Section II of Form No. FS-F-3472 as material is packaged.

7.4.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.

7.4.3.2 List the MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3472, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.

7.4.4 The completed Form No. FS-F-3472 must be signed by the waste packager's supervisor and the operator. Send Form to Quality Assurance for approval.

7.4.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-12 in Section I are all checked "YES" or "N/A".

7.4.6 Distribute form as required by the distribution block in the lower left corner of each form.

7.5 Evaluating Scrap, Plastic, Paper, Fiberglass & Rope Waste Stream

7.5.1 Visually inspect and evaluate every item to be packaged for disposal using the criteria of Section I of Materials Evaluation and Container Information-plastic, rubber, paper, fiberglass and rope, Form No. FS-F-3580 (See Figure 4).

7.5.2 Check the "YES," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If one answer to items 1 through 7 is "NO", the item being evaluated must be set aside - not packaged - and a Material Evaluation Form (MEF) completed for that item. Contact Facilities and Material Evaluation (FME) Dept. for guidance. A "NO" to one of items 1 through 7 checked on a form causes rejection of the package for shipment by quality assurance.

7.5.3 Complete Section II of Form No. FS-F-3580 as material is packaged.

7.5.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.

7.5.3.2 List MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3580, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.

7.0 **PROCEDURE** (cont.)

7.5.4 The completed Form No. FS-F-3580 must be signed by the waste packager, the packager's supervisor, and then sent to quality assurance for approval.

7.5.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-7 in Section I are all checked "YES" or "N/A".

7.5.6 Distribute form as required by the distribution block in the lower left corner of each form.

8.0 **APPLICABLE FORMS**

8.1 Form No. FS-F-3465, "Materials Evaluation and Container Information - Wood"

8.2 Form No. FS-F-3464, "Materials Evaluation and Container Information - Metal"

8.3 Form No. FS-F-3472, "Evaluation and Container Information - Scrap Vehicle"

8.4 Form No. FS-F-3580, "Materials Evaluation and Container Information - Plastic, Rubber, Paper, Fiberglass, Rope"

FEMP
LOW-LEVEL RADIOACTIVE WASTE
MATERIALS EVALUATION AND CONTAINER INFORMATION - WOOD

Reference MEF # 905

4554

SECTION I

WASTE EVALUATION	YES	NO	N.A.
1. Treated a. Material free from creosote treatment			
2. Residues: a. Free from process or waste residues			
3. Stains. a. Stains cover less than 10% of wood surface or Stain covers more than 10% of wood surface caused by green salt, black oxide, white salt, or orange oxide			
4. Paint a. Free from lead-based paint or Paint covers less than 10% of material			
5. Plastic Rubber: a. Material consists of less than 20% by volumes other materials and does not contain any oil, solid residues, or entrapped liquids (e.g. plastic or rubber parts hardware)			
6. Metal. a. Metal constitutes more than 10% by volume (If yes, then metals checklist (FS-F—3464) must also be used.)			

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN DESCRIPTION

2. PACKAGING START DATE	PACKAGING FINISH DATE	3. OPERATOR(S) SIGNATURE	DATE
4. CONTAINER NUMBER		5. CONTAINER TYPE ☐ S/L ☐ WHITE METAL BOX	
6. 65 CARD NUMBER		7. LOCATION PACKAGED:	
8. * MEF NUMBER:		9. % COMBUSTIBLE	
APPROVED BY: SUPERVISOR(S) SIGNATURE/DATE		APPROVED BY: QA SIGNATURE/DATE	

* When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number and material must be recorded.

GENERATOR TO MAKE DISTRIBUTION:		
1	Original to Facilities and Material Evaluation	MS46
2	Copy to Waste Shipping	MS63
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

FS-F-3465 (REV 4/7/92)

LLRW MATERIALS EVALUATION AND CONTAINER INFORMATION-WOOD
Form No. FS-F-3465
Figure 1

FEMP
LOW-LEVEL RADIOACTIVE WASTE
MATERIALS EVALUATION AND CONTAINER INFORMATION - METAL

Reference MEF # 1088
4554

SECTION I

WASTE EVALUATION		YES	NO	N.A.
1. Free from the following	a. Grease/oils			
	b. Solid residues			
	c. Entrapped liquids			
	d. Internal fluids			
2. Material tagged as drained				
3. Paint: Material free from lead-based paint or Paint covers less than 10% of materials or Material is greater than 1/16 inch thick				
4. Electrical Equipment:	a. Ballasts removed			
	b. Starter caps removed			
	c. Mercury switches removed			
	d. Dielectric fluid removed			
5. Plastic/Rubber:	a. Material consists of less than 20% other materials by volume and meets the criteria set in #1 (e.g. plastic, or rubber parts hardware)			
6. Wood:	a. Constitutes more than 20% by volume (If yes, then wood checklist (FS-F-3465) must also be used.)			

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN DESCRIPTION

2. PACKAGING START DATE	PACKAGING FINISH DATE	3. OPERATOR(S) SIGNATURE	DATE
4. CONTAINER NUMBER		5. CONTAINER TYPE	
6. 95 CARD NUMBER		7. LOCATION PACKAGED	
8. * MEF NUMBER		9. % COMBUSTIBLE	
APPROVED BY: SUPERVISOR(S) SIGNATURE/DATE		APPROVED BY: QA SIGNATURE/DATE	

* When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number and material must be recorded.

GENERATOR TO MAKE DISTRIBUTION:		
1	Original to Facilities and Material Evaluation	MS46
2	Copy to Waste Shipping	MS83
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

FS-F-3464 (REV 4/7/92)

673

LLRW MATERIALS EVALUATION AND CONTAINER INFORMATION-METAL
Form No. FS-F-3464
Figure 2

Fernald Site
LOW-LEVEL RADIOACTIVE WASTE

Reference MEF # 12304

454

EVALUATION AND CONTAINER INFORMATION - SCRAP VEHICLE

SECTION I

WASTE EVALUATION	YES	UNKNOWN	NO	N/A
1. Free from the following fluids a. Anti-freeze				
b. Brake fluid				
c. Gasoline				
d. Transmission fluid				
e. Engine oil				
f. Power steering				
g. Differential fluid (rear end)				
h. Windshield Wiper Fluid				
2. Removed: a. Radios				
b. Distributor coils and amplifiers				
c. Alternators				
d. Electronic fuel injector circuit				
3. Fuel tank removed				
4. Propane tank removed				
5. Tires Deflated				
6. Tire valve stem removed				
7. Freon pumped/contained for recycling				
8. Auxiliary Hydraulic Unit removed or drained				
9. Oil filter removed				
10. Oil filter drained				
11. Oil filter replaced in vehicle or discarded and oil line capped				
12. Batteries removed				

SECTION II - CONTAINER INFORMATION

1. MATERIAL OR GENERAL DESCRIPTION

2. PACKAGING START DATE	PACKAGING FINISH DATE	3. OPERATOR'S SIGNATURE	DATE

4. CONTAINER NUMBER	5. CONTAINER TYPE
6. 65 CARD NUMBER	7. LOCATION PACKAGED
8. * MEF NUMBER	9. % COMBUSTIBLE

GENERATOR TO MAKE DISTRIBUTION:		
1	Original to Facilities and Material Evaluation	MS46
2	Copy to Waste Shipping	MS63
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

APPROVED BY

SUPERVISOR'S SIGNATURE DATE

* When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number and material must be recorded

FS-F-3472 (12/12/91)

LLRW MATERIALS EVALUATION AND CONTAINER INFORMATION-SCRAP VEHICLE
Form No. FS-F-3472
Figure 3

Reference MEF # 1539

LOW-LEVEL RADIOACTIVE WASTE
MATERIALS EVALUATION AND CONTAINER INFORMATION - PLASTIC,RUBBER,PAPER,FIBERGLASS,ROPE

SECTION I

WASTE EVALUATION		YES	UNKNOWN	NO	N A
1 Liquids	Materials do not contain entrapped or internal liquids				
2 Residues	Free from process or waste residues				
3. Stains:	Stains cover less than 10% of material surface or Stain covers more than 10% of material surface by green salt, black oxide, white salt, or orange oxide				
4. HWMU:	Material was not generated within the physical limits of a hazardous waste management unit (HWMU)				
5. SWMU:	Material was not generated within the physical limits of a solid waste management unit (SWMU) which had a known or suspected routine and systematic release of hazardous wastes or hazardous materials				
6. Containers:	Waste containers (i.e. plastic bottles) must be "empty" as defined by OAC 3745-51-07 in lieu of CFR 40 261.7				
7. Other:	Materials other than plastic, rubber, paper, fiberglass, rope, * wood and metal (see footnote) constitute less than 20% by volume				

* If metal and or wood constitutes more than 10% by volume then metal checklist (FS-F-3464) and/or wood checklist (FS-F-3455) must also be used. When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number must be recorded in Section II, question 8. If YES or N/A was checked for all of the above, the material is covered by MEFs listed above and should be handled as Low Level Radioactive non-hazardous waste. If not, contact FME. Radioactive characterization based on generation in a radiologically controlled area and can be changed based on a radiation survey of the material.

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN/DESCRIPTION:

2. PACKAGING START DATE:	PACKAGING FINISH DATE:	3. OPERATOR(S) SIGNATURE:	DATE:

4. CONTAINER NUMBER:	5. CONTAINER TYPE: ___SIL ___WHITE METAL BOX ___OTHER: _____
6. 65 CARD NUMBER:	7. LOCATION PACKAGED:
8. * MEF NUMBER:	9. % COMBUSTIBLE:
APPROVED BY:	APPROVED BY:
SUPERVISOR(S) SIGNATURE / DATE	QA SIGNATURE / DATE

FS-F-3580

GENERATOR TO MAKE DISTRIBUTION:		
1	Original to Facilities and Materials Evaluation	MS46
2	Copy to Waste Shipping	MS63
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

LOW-LEVEL RADIOACTIVE WASTE MATERIALS
EVALUATION AND CONTAINER INFORMATION - PLASTIC, RUBBER, PAPER, FIBERGLASS, ROPE
Figure 4

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
06-26-92	0	Requirement for procedure Evaluating Low Level Radioactive Waste (LLRW) per Request No. P92-106, initiated by M. J. Krauss.
11-05-92	0	Reissue procedure to include the addition of plastic, rubber, paper, fiberglass and rope waste streams per Request No. P92-226, initiated by P. Philpot.

FEMP WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE SERVICES DOCUMENT PROGRAM		Page 1 of 6 Revision No. 0
SITE SERVICES PROCEDURE	CHECKING SCALE OPERATION (Signature on File)	SOP 20-C-912 AREA: As Applicable
Authorization: R. L. Gardner, Facilities and Warehousing	Supersedes: See Record of Issue/Revision	Issue Date: 09-01-91

1.0 PURPOSE

The purpose of this document is to establish the procedure for checking Site Services Department scales prior to operation.

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2.0 APPLICABILITY

This procedure is applicable to all electronic, fixed position scales in the Site Services Department.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.2 Making minor adjustments to scales to ensure accuracy of weight.

3.1.3 Contacting Maintenance when scales require repair and/or calibration.

3.1.4 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.5 Providing operators with the required respiratory protection.

3.2 Operators shall be responsible for complying with this procedure.

4.0 DEFINITIONS

None

5.0 REFERENCES

None

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 Leather-palm gloves shall be worn while cleaning the scale area and while handling checkweights.

6.2 Mechanical equipment shall be used to lift weights of forty pounds or more.

6.3 Hoists/cranes shall be checked and operated per the applicable Standard Operating Procedure.

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.4 Respirators provided by the supervisor shall be worn when required by the supervisor, IRS&T, or posted signs.

6.5 Safety glasses shall be worn when required by IRS&T or posted signs.

6.6 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 PROCEDURE

7.1 Preparation

7.1.1 Check around and under the scale for dirt and debris.

7.1.1.1 Clean around the scale if required.

NOTE

The supervisor shall arrange to have an equipment operator move weights that exceed forty pounds.

7.1.2 If lifting equipment is required to move the checkweights, notify the supervisor.

NOTE

Each scale has a checkweight that is assigned to that scale. No other checkweight shall be used. Checkweights are kept in a storage area adjacent to the scale.

7.1.3 Obtain checkweights to be used.

7.1.4 Ensure that electrical power to the scale is on.

7.1.5 Check the scale for a calibration sticker.

(678

7.0 PROCEDURE (cont.)

7.1.6 Check the calibration date on the sticker.

7.1.6.1 If there is no sticker or the calibration date is not current, notify the supervisor.

7.1.7 Check to ensure that the scale platform moves freely.

7.1.7.1 If the platform sticks or binds, notify the supervisor.

7.2 Scale Check

NOTE

The calibration due date, plant number, date, badge number, scale number, and time shall be recorded on the ST card.

NOTE

ST cards are designed for recording one set of data per card. If the scale requires test weighing at two load levels, an ST card shall be prepared for each checkweight.

7.2.1 Fill out a "Scale Testweight Record" (ST) card, Form FMPC-CONT-2106.

7.2.2 If the scale has a printweigh mechanism, proceed as follows:

7.2.2.1 Position the ST card to print in the ZERO PRINT portion of the card and insert the card into the printweigh mechanism.

NOTE

No weight shall be on the scale platform and the scale weight indicator shall be at zero

7.2.2.2 Press the print button.

7.2.2.3 Check the printout.

7.2.2.4 If the scale printed more than ±1 scale graduation from zero, notify the supervisor.

R - MATERIAL REVISED, ADDED, OR DELETED

7.0 PROCEDURE (cont.)

NOTE

If the checkweight is 40 lbs or more, a forklift, handstacker, or hoist shall be used to move the weight on/off the scale platform.

7.2.2.5 Position the checkweight on the center of the scale platform.

7.2.2.6 Position the ST card to print in the TEST PRINTWEIGHT portion of the card and insert the card in the printweigh mechanism.

7.2.2.7 When the weight indicator stops moving, press the print button.

7.2.2.8 Remove the ST card from the printweigh mechanism.

7.2.2.9 Remove the checkweight from the scale.

7.2.2.10 If a another check with a different weight is required, repeat Step 7.2.2.5 thru 7.2.2.9 using the second ST card and the second checkweight.

7.2.3 If the scale does not have a printweigh mechanism, proceed as follows:

7.2.3.1 Position the checkweight on the center of the scale platform.

7.2.3.2 When the weight indicator stops moving, use a pen and record the weight in the TEST PRINTWEIGHT portion of the ST card.

7.2.3.3 Remove the checkweight from the scale.

7.2.3.4 If a check with another weight is required, repeat Steps 7.2.3.1 thru 7.2.3.3 using the second ST card and second checkweight.

7.2.4 Record the checkweight in the STANDARD TESTWEIGHT part of the ST card.

7.2.5 Compare the test printweight with the standard.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

NOTE

If a variation in weights is found, do not adjust the scale.

NOTE

The limit of error for verification tests performed by MC&A is ± 3 scale graduations (established by DOE-ORO).

7.2.6 If the printed weight varies more than ±1 scale graduation from the checkweight, notify the supervisor.

7.2.7 Give the ST cards to the supervisor.

8.0 APPLICABLE FORMS

8.1 FMPC-CONT-2106, "Scale Testweight Record"

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
09-01-91	0	Procedure requirement to provide a standard scale check per Request P91-313, initiated by C. J. Wehrfritz. SOPs 1-C-904, 2-C-909, 4-C-901, 5-C-902, 6-C-903, 8-C-905, 9-C-904, and 11-C-230 are superseded by this document.

REMEDIATION SUPPORT OPERATIONS PROCEDURE	GENERAL NUCLEAR SAFETY REQUIREMENTS	SOP 20-C-904 Area: As Applicable
Signature On File Authorization: R.L. Gardner Facilities & Waste Operations Mgr.	Supersedes: None	Issue Date: 11-17-88

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1.0 **PURPOSE**

The purpose of this document is to establish the nuclear safety requirements for material handling and storage.

2.0 **APPLICABILITY**

2.1 This document is applicable to areas that process, handle, and store depleted, normal, and/or enriched material.

3.0 **RESPONSIBILITIES**

3.1 Area Supervisors shall be responsible for ensuring that sub-contractors, visitors, and RSO personnel comply with Nuclear Safety procedures within their area of responsibility.

3.2 Supervisors shall be responsible for the following:

R 3.2.1 Ensuring that operators are qualified per the established training requirements identified by the Department/Staff Manager.

R 3.2.2 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

R 3.2.3 Ensuring that operators wear the protective equipment, including respirators, that is specified by ES&H on applicable permits.

3.3 Operators shall be responsible for complying with this SOP.

4.0 **DEFINITIONS**

4.1 Enrichment - The percent of U235 in a quantity of uranium.

R 5.0 **APPLICABLE DOCUMENTS**

R 5.1 Drivers

R 5.1.1 PO-D-026, "Site Services Document Program"

R 5.1.2 FEMP Conduct of Operations Manual

5.2 References

5.2.1 SOP 20-C-101, "Moving and Storing Nuclear Materials On- Site at the FMPC"

5.0 **APPLICABLE DOCUMENTS** (cont.)

5.2.2 SOP 20-C-102, "Nuclear Safety for Receiving, Storing, Repackaging, and Moving Enriched Uranium Materials 20% ^{235}U from Off-Site"

R 5.2.3 RM-0005, "FEMP Lot Marking and Color Coding System"

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 Spacing restrictions shall be adhered to.

6.2 Containers shall be identified per RM-0005 so that the correct nuclear safety restrictions can be determined.

6.3 Containers shall be color-coded per RM-0005 to prevent mixing of enrichment levels.

6.4 Storage areas shall be posted as required.

R 6.5 Operators shall have reviewed and be familiar with MSDSs for hazardous
R materials/chemicals that may be used or encountered.

R 6.6 Operators shall wear protective clothing specified by applicable permits
R and issued by the supervisor.

6.7 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by ES&H.

7.0 **GENERAL**

7.1 Warnings, Cautions, and Notes precede the Step or Item to which they apply.

8.0 **PROCEDURE**

NOTE: Nuclear Safety spacing restrictions maintain safe operating conditions by reducing the possibility of interaction between uranium bearing materials. Violation of spacing requirements reduces the margin of safety.

8.1 Spacing Requirements

8.1.1 Spacing between a container, mass, or material stored as a safe grouping and other material shall be per Table 1.

8.0 **PROCEDURE** (cont.)

8.1.2 Spacing between uranium bearing material stored as unlimited and other material shall be per Table 2.

8.1.3 Spacing requirements of Items 8.1.1 and 8.1.2 shall be adhered to unless specific spacing is given in the applicable procedure.

8.1.4 Aisles shall be eight feet in width to allow room for operation of material handling equipment.

NOTE: Material identification is essential to ensure that the nuclear safety restrictions for handling and storing are being followed.

8.2 Container and Material Identification

8.2.1 Containers to be filled with uranium bearing material shall be identified as follows:

8.2.1.1 Color-coded per Item 8.3.

8.2.1.2 Marked with percent enrichment.

8.2.1.3 Marked with material codes.

8.2.1.4 Marked with tare weight.

8.2.2 Filled containers shall be marked with gross and net weights.

8.2.3 Non-uranium bearing materials shall be contained in solid black cans or drums.

8.2.3.1 The containers shall have a description of the material stenciled on the side.

8.2.3.2 A generic stencil "No Fissile Material" may be used as a description.

8.2.4 Empty uranium-bearing containers shall have the material code, enrichment, and weights marked out, unless otherwise specified in the applicable procedure.

NOTE: The color-coding system ensures safe transport and storage of uranium-bearing materials by reducing the possibility of intermixing enrichments.

8.3 Color Coding

8.3.1 Drum and/or can color coding shall be in accordance with Table 3.

R 8.3.2 All containers shall be marked per RM-0005.

8.3.3 The enrichment of uranium metal on skids shall be identified by attaching a color-coded card (Refer to Table 4) to the skid.

8.0 **PROCEDURE** (cont.)

NOTE: Solid red drums/cans shall be handled with care.

8.4 Handling Requirements for Solid Red Containers

8.4.1 30 and/or 55 gallon solid red drums shall not be stacked.

8.4.2 5 gallon and 10 gallon red cans may be stacked 2 high when permitted by individual Manufacturing Specification.

8.4.3 Small containers shall not be stacked on top of 30 and/or 55 gallon drums.

8.4.4 Solid red drums/cans shall be used for enriched uranium material requiring special Nuclear Safety Restrictions.

8.4.5 Trash or non-uranium bearing material shall not be placed in solid red drums/cans.

8.4.6 Empty solid red drums/cans shall be stored in accordance with industrial safety limits.

8.4.7 Red containers shall not be used as safety barriers or for any purpose other than the intended use.

8.5 Equipment Identification

8.5.1 Equipment shall be marked with color-coded cards showing the enrichment of the uranium currently being processed.

8.6 Handling Material of Unknown Enrichment

8.6.1 Uranium of unknown enrichment shall be handled with the proper Nuclear Safety Restrictions (such as safe mass, concentration, geometry), for the highest possible enrichment until analyzed.

8.6.2 After analysis, the material shall be remarked and handled according to the limits for the actual enrichment.

8.6.3 Any material or equipment which has come into contact with uranium shall be assumed to contain uranium.

8.7 Storing and Posting Requirement

8.7.1 Signs showing the nuclear safety limits in effect for the area shall be posted in process storage areas and general (warehouse and outdoor) storage areas.

8.7.1.1 Signs posted in storage areas shall be in plain view.

8.7.1.2 The signs shall identify the material that may be stored in the area and the limits.

8.0 **PROCEDURE** (cont.)

8.7.2 Material with an enrichment greater than 2.1% U-235 shall be stored in areas surrounded by supported chains.

8.7.2.1 Standard signs or cards shall be hung on the chains or on the stanchions to mark the area.

8.7.2.2 The signs or cards shall be clearly marked with the maximum enrichment of the stored material.

8.7.2.3 Skid loaded containers shall be placed with markings outward.

8.7.3 Materials with an enrichment equal to, or greater than, 5% shall be stored indoors.

8.7.4 Process equipment and operator stations shall be posted with the nuclear safety limits and restrictions for the process.

8.8 Interplant Shipments

8.8.1 Shipments shall be per SOP 20-C-101 and SOP 20-C-102.

8.9 Isotopic Changeover, Cleanup, and Inspection

8.9.1 Refer to the SOP pertaining to the appropriate plant.

8.0 **APPLICABLE FORMS**

None

TABLE 1
SAFE GROUP SPACING

DESCRIPTION	MINIMUM ISOLATION DISTANCE
Another safe grouping	2 feet
Material stored in the unlimited category	2 feet
Process equipment	2 feet
Walls or barriers	1 foot
Non-uranium bearing material	1 foot

TABLE 2
UNLIMITED GROUP SPACING

DESCRIPTION	MINIMUM ISOLATION DISTANCE
Material stored as a safe group	2 feet
Uranium-bearing material of different enrichment stored in the unlimited category	2 feet
Non-uranium bearing material	1 foot

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TABLE 3
COLOR-CODE (DRUMS/CANS[1])

ENRICHMENT	CONTAINER	STRIPE	MARKINGS
Depleted	Black	Green	White
Natural (Normal)	Black	Yellow	White
Enriched, Unrestricted	Black	Red	White
Enriched, Restricted by Mass, Volume, Concentration, etc.	Red	None	White
Waste Shipments	White	None	Black
Thorium	Black	Blue	White

[1] Six-inch diameter bare aluminum cans marked per Item 8.2.1 shall be handled one at a time and stored according to the space requirements in Item 8.1.

TABLE 4
CARD COLOR CODE

ENRICHMENT	COLOR-CODE [1]
Depleted	Green/White
Natural (Normal)	Yellow/White
Enriched	Red/White - Enrichment marked on card

[1] UF^6 cylinders and T-hoppers shall be marked with cards indicating the enrichment.

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RECORD OF ISSUE/REVISION

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
11-17-88	0	Procedure required for defining general nuclear safety requirements for the production area per Request No. P88-137, initiated by C.A. Hill.
01-13-93	1	Revised to incorporate CIO C92-025 per Request No. P92-254 and update to conform with Procedure Program requirements.

SITE SERVICES PROCEDURE	HYDROGEN MONITORING & REMOVING NUCFIL VENT PLUGS FROM DRUMS	SOP 20-C-917 AREA: As applicable
Authorization: R.L. Gardner, Facilities & Warehousing Manager	Supersedes: None	Issue Date: 08-04-92

1.0 PURPOSE

The purpose of this document is to provide the procedure for
R monitoring the atmosphere inside drums containing materials that could evolve hydrogen gas and for removing NucFil 013 vent plugs.

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2.0 APPLICABILITY

R This procedure is applicable to drums containing material that
R could contain hydrogen and are stored or will be stored inside or under
R shelter at the FEMP.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Training Section, IRS&T.

3.1.2 Contacting Industrial Hygiene and/or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.3 Issuing operators the required respiratory protection.

3.1.4 Contacting IRS&T for assistance in establishing an isolation zone around drum monitoring and handling activities.

3.1.5 Obtaining and posting a "Radiation Work Permit", a "Confined Space Entry Permit", or a contamination survey (if required prior to handling/reventing the drums).

3.1.6 Ensuring that spill cleanup and venting supplies are available at
R the isolation zone per SOP 20-C-606, "Hazardous Material Spill Cleanup."

3.1.7 Making the final determination to overpack a drum per SOP 20-C-600.

3.1.8 Ensuring that equipment, tools, and vehicles are approved by IRS&T.

R 3.1.9 Contacting Facilities and Materials Evaluation (F&ME) to
R determine if the drums to be monitored contain RCRA, non-RCRA, or
R uncharacterized materials.

3.1.10 Directing which drums are to be monitored and in what order.

3.0 RESPONSIBILITIES (cont.)

3.1.11 Contacting MC&A to obtain the locations of materials requiring monitoring and movement/handling.

3.1.12 Contacting Transportation to arrange for drums to be moved.

3.1.13 Contacting IRS&T for specific drum movement requirements.

3.2 IRS&T shall be responsible for the following:

3.2.1 Selecting equipment and developing methods for monitoring hydrogen gas concentrations.

3.2.2 Approving isolation zones, equipment, and tools used in this procedure.

3.2.3 Providing the appropriate field personnel for this operation.

3.2.4 Providing determination for specific drum movement requirements and directing the supervisors in these requirements.

3.3 All personnel shall be responsible for complying with this SOP.

4.0 DEFINITIONS

4.1 Free-Vented Drum- A drum that is vented with open holes in the lid or in the side walls below the top chime.

4.2 Isolation Zone - A safety area isolated by barriers and controlled by supervision to prevent entry by unauthorized personnel.

R 4.3 3/4 Inch Vent Plug - NucFil 013 (or equivalent) - a 3/4 inch NPT threaded pipe plug containing a carbon filter element.

R 4.4 2 Inch Vent Plug - NucFil 016 (or equivalent) - a 2 inch NPT threaded pipe plug containing a carbon filter element.

4.5 Overpack Drum - A container into which one or more smaller containers are placed.

4.6 Lower Explosive Limit (LEL) - For the purpose of this procedure, the LEL is 40,000 ppm hydrogen in air, which contains 21% oxygen by volume. The LEL is the lowest concentration at which hydrogen combustion is possible.

5.0 APPLICABLE DOCUMENTS

5.1 DRIVERS

NONE

5.0 APPLICABLE DOCUMENTS (cont.)

5.2 REFERENCES

5.2.1 SOP 20-C-600, "Overpacking Drums"

5.2.2 SOP 20-C-606, "Hazardous Material Spill Cleanup"

R 5.2.3 SOP 20-C-630, "Receipt Inspection, Storage, and Storage Inspection of Hazardous Waste"

R 5.2.4 SOP 20-C-910, "Venting Potentially Explosive Drums"

R 5.2.5 PP-0314, "Packaging, On-site Movement and Off-site Shipment of Materials"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 An isolation zone shall be established around the area while drums are being monitored for hydrogen or while vent plugs are being removed.

6.3 Safety glasses with side shields shall be worn under a full face shield in the isolation zone when handling/monitoring drummed material covered by this procedure.

6.4 Respiratory protection provided by the supervisor shall be worn when required by the supervisor or IRS&T. Full face respirators shall be permitted in lieu of safety glasses and faceshield.

6.5 Hard hats and hearing protection shall be worn in the isolation zone.

6.6 Only personnel involved in monitoring drums for hydrogen, removing vent plugs, or moving free-vented drums shall be permitted within the isolation zone.

6.7 Leather-palm gloves shall be worn while handling/moving drums and while handling sharp or abrasive materials.

6.8 A minimum of two Metl-X fire extinguishers shall be present within the isolation zone(s) while drums are being handled or moved.

6.9 Forklift operators and the supervisor in charge of drum monitoring activities shall have communications equipment available.

6.10 Monitoring instruments and vent plug/bung removal tools shall be made of non-sparking materials which do not contain beryllium.

6.11 Tool configuration shall be such that personnel shall have no part of their bodies directly over the drum during vent plug removal.

6.12 Outer nitrile rubber gloves and chemical cover goggles shall be worn while draining water from drums.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

R 6.13 Vent plugs shall be removed from drums by hand only after it has been demonstrated the hydrogen concentration is 25 percent of the LEL or below.

R 6.14 Only drums that have been demonstrated to contain a hydrogen gas
R concentration that is 25% of the LEL or below may be moved outside an isolation zone.

6.15 Drums must be surveyed before being moved out of controlled areas.

6.16 Nylon safety nets shall conform to ANSI-A10.11 and OSHA 1926.105.

6.17 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

NOTE: Warnings, Cautions, and Notes precede the Step or Item to which they apply.

7.0 PROCEDURE

NOTE 1: The supervisor shall contact MC&A and obtain the locations of materials (Refer to Table 1) requiring reventing and movement/handling.

NOTE 2: The supervisor shall confirm availability of inside or covered
R storage for any drums requiring removal of vent plugs.

NOTE 3: The supervisor shall contact Facilities and Materials
R Evaluation (F&ME) to determine if the drums to be monitored
R contain RCRA, non-RCRA, or uncharacterized materials.

R NOTE 4: If the F&ME determination confirms the presence of RCRA or
R uncharacterized materials, the supervisor shall ensure that the
R material is transferred to a hazardous waste storage unit per
R SOP 20-C-630.

7.1 Hydrogen Monitoring and Reventing of Non-Overpacked Drums

WARNING

Concentrations of hydrogen gas in vented drums may cause a fire or explosion.

7.1.1 Establish an Isolation Zone per SOP 20-C-910.

7.0 PROCEDURE (cont.)

7.1.2 If drum covers are present, proceed as follows:

NOTE: If drums are covered under plastic, tarps, or other drum covering, IRS&T shall monitor for hydrogen under the covering.

7.1.2.1 After hydrogen monitoring, record data and remove drum coverings.

NOTE: Supervisor shall contact IRS&T to determine specific drum movement requirements.

7.1.3 If the pallets of drums to be monitored are stacked, notify the supervisor.

WARNING 1

R **Nylon safety netting shall be a minimum of 8 feet by 8 feet in size when covering single or skidded drums.**

WARNING 2

Ensure that the safety net does not touch drums on adjacent pallets.

7.1.4 Cover the drum or pallet of drums with an IRS&T approved nylon safety net per supervisors instructions (See Figure 1).

NOTE: The nylon safety net shall be sufficiently loose to allow the lid to potentially rise 4 to 10 inches above the drums.

7.1.5 For a single drum or pallet of drums, secure the safety net per supervisor instructions.

7.1.6 For drums on railcars, secure the safety net using an approved IRS&T technique.

WARNING

Only the forklift operator shall be within the isolation zone while drums are being moved.

R 7.1.7 As directed by supervision, use an enclosed cab forklift to move the pallet of drums to ground level or to an accessible area within the isolation zone.

7.0 **PROCEDURE** (cont.)

WARNING 1

Personnel shall keep head and face away from top of drums when handling drums inside the isolation zone.

WARNING 2

No personnel except the IRS&T representative, supervisor, and an operator shall be inside the isolation zone during hydrogen monitoring.

NOTE: IRS&T shall perform hydrogen monitoring.

7.1.8 Notify IRS&T when the pallet of drums is ready for hydrogen monitoring.

R **NOTE** 1: IRS&T shall monitor through open vent holes or 3/4 inch vent plugs for hydrogen.

R **NOTE** 2: At supervisor or IRS&T discretion, the hydrogen concentration may be assumed to be above 25% and proceed to 7.11.1.

R 7.1.9 If IRS&T determines for safety concerns not to monitor the drums and
R considers the drums to contain a hydrogen concentration that is greater than 25% of the LEL, proceed to Step 7.1.11.1.

R 7.1.10 For drums with vent plugs, if the hydrogen concentration is 25%
R of the LEL or below, proceed as follows:

R **NOTE**: If the 3/4 inch plug cannot be removed by hand, a non-sparking wrench or socket shall be used.

R 7.1.10.1 Remove the 3/4 inch vent plug and bung.

NOTE: The IRS&T representative shall re-monitor the drum to
R verify that the hydrogen concentration is 25% of the LEL
R or below.

R 7.1.10.2 Notify the IRS&T representative when the 3/4 inch vent plug and bung are removed and request that the drum be re-monitored.

R 7.1.10.3 If the hydrogen concentration is determined to be above 25% of the LEL, purge the hydrogen from the drum using compressed or plant air
R until the hydrogen concentration is determined to be 25% of the LEL or
R below.

NOTE: If a drum is found to have more than 25% of the LEL, then that drum must be purged before continuing handling and/or movement activities.

7.1.11 For drums with vent plugs, if the hydrogen concentration is above 25% of the LEL, proceed as follows:

7.0 PROCEDURE (cont.)

WARNING

Personnel shall keep head, face and extremities away from the top of the drum while removing the vent plug.

R 7.1.11.1 Remove the 3/4 inch vent plug using a non-sparking tool.

R NOTE: The IRS&T representative shall monitor the drum to verify that the hydrogen concentration is above 25% of the LEL.

R 7.1.11.2 Notify the IRS&T representative when the 3/4 inch vent plug is removed and request that the drum be monitored.

R 7.1.11.3 If the hydrogen concentration is above 25% of the LEL, purge the hydrogen from the drum using compressed or plant air until the
R hydrogen concentration is determined to be 25% of the LEL below.

R 7.1.11.4 Remove the bung using a non-sparking tool.

NOTE 1: The IRS&T representative shall re-monitor the drum to
R verify that the hydrogen concentration is 25% of the
R LEL or below.

NOTE 2: If a drum is found to have more than 25% of the LEL, then that drum must be purged before continuing handling and/or movement activities.

R 7.1.12 For drums with open vent holes, if the hydrogen concentration is above 25% of the LEL, purge the hydrogen from the drum using compressed or plant air until the hydrogen concentration is determined
R to be 25% of the LEL or below.

R 7.1.13 When the hydrogen concentration has been determined to be 25% of
R the LEL or below, remove the safety net.

NOTE: The supervisor will determine which drums to inspect for free standing water based on process knowledge.

R 7.1.14 For non-RCRA drums, if specified by supervision, remove the lid.

NOTE: The supervisor may specify the addition of Dicalite to the drum to absorb any remaining free standing water.

R 7.1.14.1 Inspect for free liquids, and drain any free liquids per SOP 20-C-910.

R 7.1.14.2 Install the lid on the drum.

7.1.15 For drums containing RCRA or uncharacterized material, proceed as follows:

7.0 PROCEDURE (cont.)

7.1.15.1 Install a 3/4 inch vent plug into the open vent hole.

R 7.1.15.2 Install a 2 inch vent plug into the large bung hole.

R 7.1.16 Complete a "Hydrogen Monitoring Record" sheet, Form FS-F-3569
R (See Figure 2).

NOTE 1: Single or palletized drums shall be moved to inside or covered
R storage before the end of the shift when any vent plugs are removed.

R NOTE 2: Drums in railcars shall be covered before the end of the shift when any vent plugs are removed.

R 7.1.17 If the drum contains nuclear material and is to be moved to another Material Balance Account (MBA), complete a "Nuclear Material Transfer-Receipt-Identification" card packet, Forms FS-F-1990, - 2220,
R and -2221 (See Figure 3).

NOTE 1: Supervision may specify hydrogen monitoring of selected drums during transport to storage and after placement into storage.

NOTE 2: The supervisor shall contact Transportation and arrange for drum transfer to storage.

NOTE 3: Transportation shall move the pallet of drums to an indoor storage or covered storage area per PP-0314, "Packaging, On-site Movement and Off-site Shipment of Materials"

NOTE 4: The supervisor shall notify the MC&A specialist of the location of the drum(s) if the drums were moved to a new location.

NOTE 5: The MC&A Specialist shall document drum location.

R 7.1.18 Notify the supervisor when monitoring is completed.

NOTE: The supervisor shall forward the cards to MC&A.

R 7.1.19 Give the card packet and completed FS-F-3569 form to the supervisor.

7.2 Hydrogen Monitoring and Reventing of Overpacked Drums

R 7.2.1 Perform Steps 7.1.1 through 7.1.14 for each overpack drum.

NOTE: A drum may be overpacked several times.

R 7.2.2 Perform steps 7.1.4 through 7.1.14.1 for the inner drum(s).

7.2.3 Remove the bung caps from a new lid.

7.0 **PROCEDURE** (cont.)

7.2.4 Install the new lid on the outermost overpack drum.

R 7.2.5 Perform steps 7.1.15 through 7.1.19.

8.0 **APPLICABLE FORMS**

8.1 FS-F-3569 "Hydrogen Monitoring Record" SHEET

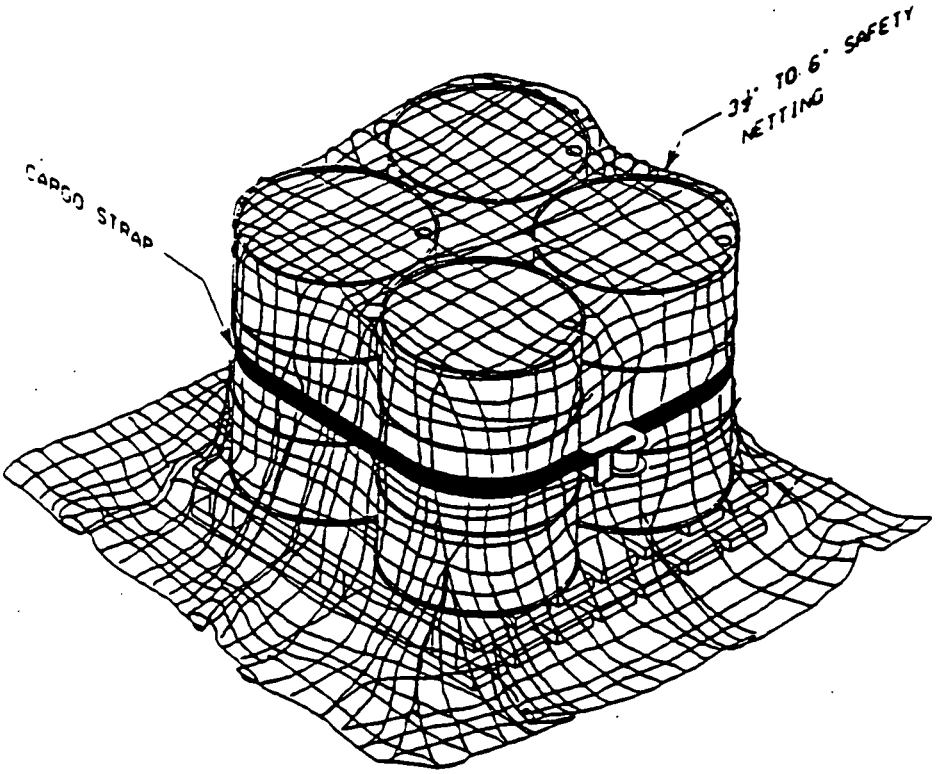
8.2 FS-F-1990, -2220, 2221 "Nuclear Material Transfer-Receipt-Identification" Card Packet"

R

TABLE 1
MATERIAL TYPE CODE (MTC) REQUIRING VENTING

R						MTC				
039[1]	040	041	042	046	055	056	070	075	076	080
081	084	098	103	104	107	109	110	111	112	113
114	118	119	120	124	125	128	129	130	131	136
137	141	153	161	218	219	220	221	222	223	224
225	227	228	229	230	231	232	233	234	235	236
237	238	239	240	241	242	243	244	245	246	251
252	254	260	261	262	263	300 and above				

(1) MTC 039 material with source codes 655-659 do not require vented drums and can be moved without restrictions.



DRUM LID ARRESTING SCHEME

SKETCH NO. RES-1964-01

DRUM LID ARRESTING SCHEME
Figure 1

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HYDROGEN MONITORING RECORD

Instrument Manufacturer:_____ Model:_____ Serial No.:_____ Calibration Da_____

Operator Name: _____ Badge No.:___ Date:_____ Location:_____

Drum No.	Lot No.	Venting Method		Overpack		Initial Hydrogen Concentration (%LEL) (1)(2)			Time	Comments
		Hole	Plug	Yes	No	Opack 1	Opack 2	Inner		

(1) A drum may be overpacked more than once.

(2) If the drum was not overpacked, enter N/A in the "Opack" columns and enter the H concentration in the "Inner" column.

FS-F-3569

HYDROGEN MONITORING RECORD SHEET
FORM NO. FS-F-3569
Figure 2

4554

NUCLEAR MATERIAL TRANSFER RECORD

CARD PL.	CARD NO.
	68

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.	SOURCE	MBA: (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS	MATERIAL TYPE	MBA: (TO)	PLANT:	NUMBER	DESCRIPTION
LOT SEQUENCE NO.		STORAGE LOCATION		GROSS WEIGHT	
MATERIAL DESCRIPTION				TARE WEIGHT	
SHAPE CODE					

SIGNATURES

FS-F-1990 (REV 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL.	CARD NO.
	69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO.

P.O. NO.	SOURCE	MBA (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS	MATERIAL TYPE	MBA (TO)	PLANT	NUMBER	DESCRIPTION
LOT SEQUENCE NO		STORAGE LOCATION		GROSS WEIGHT	
MATERIAL DESCRIPTION				TARE WEIGHT	
SHAPE CODE					

SIGNATURES

FS-F-2220 (REV 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

MATERIAL IDENTIFICATION RECORD

CARD PL.	CARD NO.
	XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO.

P.O. NO.	SOURCE:	MBA: (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS.	MATERIAL TYPE:	MBA: (TO)	PLANT:	NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		STORAGE LOCATION:		GROSS WEIGHT:	
MATERIAL DESCRIPTION				TARE WEIGHT:	
SHAPE CODE					

SIGNATURES

FS-F-2221 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL TRANSFER-RECEIPT-IDENTIFICATION CARD PACKET
FORMS FS-F-1990, 2220, AND 2221
FIGURE 3

4554

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
07-13-92	0	Requirement for procedure Hydrogen Monitoring and Removing NucFil Vent Plugs from Drums per Request No. P92-154, initiated by B. L. Krupa.
08-04-92	1	Revised to update to current operations per Request No. P92-191, initiated by L. H. Hampshire.
09-11-92	2	Revised to add RCRA requirements per Request No. P92-211, initiated by L. H. Hampshire.

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1.0 PURPOSE

The purpose of this document is to provide the procedure for venting drums containing materials that could evolve hydrogen gas.

2.0 APPLICABILITY

This procedure is applicable to the venting of drums containing (or to contain) material type codes identified in Table 1.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.2 Contacting Industrial Hygiene and/or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.3 Providing operators with the required respiratory protection.

3.1.4 Contacting IRS&T for assistance in establishing an isolation zone around drum venting activities and determining if a "Radiation Work Permit" or a contamination survey is required prior to venting the drums.

3.1.5 Ensuring all required spill cleanup and venting supplies are available and in the isolation zone prior to venting.

3.1.6 Making the final determination to overpack a drum.

3.1.7 Ensuring that equipment, tools, and vehicles approved by IRS&T are used.

3.1.8 Contacting Operable Unit 3 (OU3) Compliance to obtain a list of materials (MTC and SRC) that have been characterized and declared non-RCRA.

3.2 All personnel shall be responsible for complying with this SOP.

4.0 DEFINITIONS

4.1 Isolation Zone - A safety area isolated by barriers and controlled by supervision to prevent entry by unauthorized personnel.

4.2 Overpack Drum - A container into which one or more smaller containers are placed.

4.0 DEFINITIONS (cont.)

4.3 Unsealed Drum - A drum that may or may not have a lid but does not have a locking ring.

5.0 REFERENCES

5.1 SOP 20-C-600, "Overpacking Drums"

5.2 SOP 20-C-606, "Hazardous Material Spill Cleanup"

5.3 SOP 20-C-904, "General Nuclear Safety Requirements"

5.4 RM-0005, "FEMP Lot Marking and Color Coding System"

5.5 FMPC-2089, "On-site Transportation of Radioactive and Nonradioactive Hazardous Materials"

5.6 SSOP-0002, "Completing the Material Evaluation Form"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields and hearing protection shall be worn in the isolation zone when handling/venting filled, unvented drums of material which are sealed with a lid and locking ring.

6.3 Respiratory protection provided by the supervisor shall be worn when required by the supervisor or IRS&T.

6.4 Only personnel inside an enclosed cab vehicle shall be permitted within the isolation zone during venting.

6.5 Leather-palm gloves shall be worn when handling drums and while handling sharp or abrasive materials.

6.6 Metl-X fire extinguishers shall be present while drums are being vented.

6.7 Forklift and BOBCAT operators and the supervisor in charge of venting activities shall have communications equipment available.

6.8 An isolation zone shall be established around drum venting and moving activities.

6.9 Venting tools shall be made of non-sparking AMPCO metal.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.10 Outer protective gloves and chemical cover goggles shall be worn while draining water from drums.

6.11 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

NOTE: WARNINGS, CAUTIONS, and NOTES precede the Step or Item to which they apply.

7.0 PROCEDURE

7.1 Venting Empty or Unsealed Drums Prior to Filling

7.1.1 Check Table 1 to ensure that materials to be contained requires a vented drum.

7.1.2 Notify the supervisor that drums require venting and inform the supervisor of the MTC and SRC of the material to be drummed.

7.1.3 Obtain drums that are color coded for depleted, normal, or enriched material (Refer to RM-0005), depending on the material to be drummed.

7.1.4 Stencil the drum with identification markings (Refer to RM-0005).

NOTE: Material that is required to be stored inside or under shelter is listed in Table 2.

7.1.5 If material is to be stored outside, proceed as follows:

7.1.5.1 Obtain a bung type drum lid and NUC-FIL 013 vent plug from the supervisor.

7.0 PROCEDURE (cont.)

TABLE 1
MATERIAL REQUIRING VENTING

MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC
039(1)	040	041	042	046	055	056	070	075	076	080
081	084	098	103	104	107	109	110	111	112	113
114	118	119	120	124	125	128	129	130	131	136
137	141	153	161	218	219	220	221	222	223	224
225	227	228	229	230	231	232	233	234	235	236
237	238	239	240	241	242	243	244	245	246	251
252	254	260	261	262	263	300 and above				

(1) MTC 039 with source codes 655-659 do not require vented drums and can be moved without restrictions.

TABLE 2
SOLID METAL WASTES/PRODUCTS(1)

MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC
055	056	103	104	110	111	112	118	119	120	129
130	131	136	218	219	220	221	222	223	224	225
227	228	229	230	231	232	233	234	235	236	237
238	239	240	241	242	243	244	245	246	251	252
254	260	261	262	263						
300 and above										

(1) All listed material requires storage inside or under a shelter.

7.0 PROCEDURE (cont.)

7.1.5.2 Remove the bung plug from the lid.

7.1.5.3 Install the vent plug in the bung hole.

7.1.6 If the material is to be stored inside or under shelter (Refer to Table 2), proceed as follows:

NOTE: The method used to make the hole and required tools shall be specified by the supervisor.

7.1.6.1 Notify the supervisor that the drum is ready for venting.

NOTE: Vent holes shall be 1 inch (± 1/4 inch) below the top rim of the drum.

7.1.6.2 Ensure that the location selected for the vent hole does not interfere with the lid locking ring installation or with the drum markings.

7.1.6.3 Make a 1/4 inch to 1 inch hole in the side of the drum.

7.1.6.4 Make a second vent hole in the drum, 180 degrees from the first hole.

NOTE: The word VENT shall be 1-1/2 to 2 inches high and located under the bottom chime at the drum seam (drum centerline).

7.1.7 Using a stencil and white paint, mark the side of the drum with the word VENT to indicate the drum has been vented.

7.1.8 Complete a "Drum Venting Record" sheet, Form FMPC-OPR-3228 (See Figure 1).

7.1.9 Fill the drum per the SOP for the process being performed.

7.1.10 Install the lid and locking ring on the filled drum.

7.1.11 Notify the supervisor that venting is complete.

7.0 PROCEDURE (cont.)

NOTE: The supervisor shall notify the MC&A Specialist of the location of the drum(s) if the drums were moved to a new location.

NOTE: The MC&A Specialist shall document drum location.

NOTE: Drums with side vent holes shall be moved inside or into a covered storage area.

7.1.12 Move the drum to the storage area specified by the supervisor.

WARNING: GENERATION OF HYDROGEN GAS IN A SEALED DRUM CAN INCREASE TO FLAMMABLE OR EXPLOSIVE CONCENTRATIONS THAT CAN CAUSE FIRE AND/OR EXPLOSION.

7.2 Handling Sealed Drums Prior to Venting

NOTE: Forklift and BOBCAT Operators shall maintain radio contact with the supervisor at all times.

7.2.1 Check the communications equipment.

7.2.1.1 If communication equipment is not available or not operating, notify the supervisor.

NOTE: The supervisor shall supply non-sparking punches stamped on the side with "AMPCO".

7.2.2 Check to ensure the BOBCAT is equipped with a non-sparking punch.

7.2.2.1 If not, install a non-sparking punch.

NOTE: The supervisor shall direct establishment of the spill containment area per SOP 20-C-606 and furnish the required spill cleanup supplies.

7.2.3 If a containment pan is not being used, establish a spill containment area as follows:

7.2.3.1 Inspect the proposed area for cracks or holes in the concrete and/or established drains, storm sewer openings, or sumps.

7.2.3.2 If penetrations of the concrete are found, notify the supervisor and proceed per 20-C-606.

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7.0 PROCEDURE (cont.)

7.2.4 If a containment pan is being used, proceed as follows:

7.2.4.1 Obtain the pan from the supervisor.

NOTE: Pans shall be within 100 feet of the drum being vented.

7.2.4.2 Place the pan near the drum to be vented.

NOTE: The supervisor shall check Table 1 to ensure the drums may be vented and contact OU3 Compliance to obtain a list of materials (MTC and SRC) that have been characterized and declared non-RCRA.

7.2.5 Notify the supervisor that area is ready for drum venting.

7.2.6 Establish an isolation zone per Item 7.4.

NOTE: Only the forklift and BOBCAT drivers shall enter the isolation zone until venting is complete.

NOTE: Due to a slight explosive potential of the material being moved and the isolation zone restrictions imposed, drums for venting are excluded from tie down requirements in FMPC-2089.

7.2.7 Using an enclosed cab forklift, move the drum(s) or pallet(s) of drums into the spill containment area if a containment area was established, or into the containment pan.

NOTE: Only drums containing materials listed in Table 2 and stored inside or under cover may have vent holes.

7.2.8 Using an enclosed vehicle to approach the drum, visually inspect the drums for obvious damage such as rust, holes, dents, bulges, leaks, or other damage that could cause loss of drum integrity, and for vent holes, vent plugs, or for "VENT" stencilled on the side of the drum.

NOTE: The supervisor shall record the drum condition on the "Drum Venting Record" sheet and specify the handling method.

7.2.8.1 Notify the supervisor by radio of obvious damage or deformities.

7.0 PROCEDURE (cont.)

NOTE: The Supervisor shall specify where to move the drums and shall notify the MC&A specialist of the location of the drums if the drums are moved to a new location.

NOTE: The MC&A Specialist shall document drum location.

7.2.8.2 If the drums have a vent hole, vent plug, or "VENT" stencilled on the side to indicate venting, use the forklift to move the drum(s) or pallet(s) of drums into storage or to a staging area within the isolation zone for inspection and possible overpacking.

7.2.9 If the drum has not been vented and is intact, or approval has been granted for handling, vent the drum per Item 7.3 or 7.4.

WARNING: ALL PERSONNEL EXCEPT THE FORKLIFT AND BOBCAT OPERATORS SHALL BE OUTSIDE THE ISOLATION ZONE DURING VENTING.

7.3 Venting Sealed Drums

7.3.1 Check Tables 1 to ensure the drum(s) requires venting.

NOTE: The supervisor shall contact Solid Waste Compliance to obtain a list of materials (MTC & SRC) that have been characterized and declared non-RCRA.

7.3.2 Notify the supervisor that the drum requires venting and the MTC and SRC of the material in the drums.

7.3.3 Using the punch equipped BOBCAT, puncture the lid of the drum.

CAUTION: VENTED DRUMS SHALL STAND UNDISTURBED FOR FIFTEEN MINUTES FOR HYDROGEN DISSIPATION.

7.3.4 After a fifteen minute waiting period, use the enclosed cab forklift and move the vented drum(s) or pallet(s) of drums to the staging area specified by the supervisor.

7.0 PROCEDURE (cont.)

NOTE: Fifteen minutes after notification, the supervisor shall end the Isolation Zone.

NOTE: Personnel may approach and handle the vented drums when the Isolation Zone is ended.

7.3.5 Notify the supervisor by radio after the last drum has been vented.

7.3.6 Remove the lid and locking ring from the drum.

7.3.7 Check inside the drum for visible free standing water. If water is found, notify the supervisor.

NOTE: The supervisor shall approve removal of water from the drum.

7.3.8 At the supervisors direction, drain the water from the drum per Item 7.5.

7.3.9 Perform Step 7.1.5 and 7.1.7 or 7.1.6 thru 7.1.7 to vent the drum.

NOTE: If the drum will be stored inside and contains material listed in Table 2, the vented lid may be reused.

7.3.10 If the drum does not have side vents, install a lid with a vent plug on the drum.

7.3.10.1 If the drum has side vents, install a new, intact lid on the drum.

7.3.11 Secure the lid with a lock ring.

7.3.12 Discard unused punctured lids in a box designated for contaminated scrap metal.

NOTE: The supervisor shall make the final determination to overpack a drum.

7.3.13 At the supervisors direction, overpack the drum(s) as follows:

7.3.13.1 Overpack drums per SOP 20-C-600.

7.3.13.2 Perform Steps 7.1.5 and 7.1.7 or 7.1.6 thru 7.1.7 to vent the overpack drum(s).

7.0 PROCEDURE (cont.)

NOTE: The supervisor shall notify the MC&A specialist of the location of the drum(s) if the drums were moved to a new location.

NOTE: The MC&A Specialist shall document drum location.

7.3.14 Using a forklift, move the vented drum(s) or vented overpack drums to a covered storage area specified by supervision.

7.3.14.1 If the drum contains nuclear material and is to be moved to another MBA, complete a "Nuclear Material Transfer-Receipt-Identification" card packet, Forms FMPC-CONT-1990, -2220, and -2221 (See Figure 3).

NOTE: The supervisor shall forward the cards to MC&A.

7.3.14.2 Turn the card packet in to the supervisor.

7.3.15 Complete Form FMPC-OPR-3228, and give the form to the supervisor.

NOTE: An Isolation zone shall be established when venting sealed drums to prevent entry into the area by unauthorized personnel.

7.4 Establishing an Isolation Zone

7.4.1 Erect barricades as follows:

NOTE: Barricades shall be positioned a minimum of 100 ft. away from venting/staging activities.

7.4.1.1 Place caution tape and/or signs across all roads, walkways, and open areas leading into the isolation zone.

7.4.1.2 Place caution tape and/or signs across all entrances/exits from buildings within 100 ft. of the working area.

NOTE: Once approval is obtained, the same configuration may be set up when specified by the supervisor without completing a new form.

7.4.2 Check with the supervisor to determine if a new "Isolation Zone Approval Record" form is required.

7.4.2.1 If the form is required, diagram the barricade locations on an "Isolation Zone Approval Record", Form FMPC-OPR-3311 (See Figure 2).

7.0 PROCEDURE (cont.)

NOTE: The supervisor shall contact IRS&T for inspection and approval.

7.4.3 Notify the supervisor that the barricades are erected and give the supervisor the approval record form (if a form was filled out).

7.5 Draining Drums

7.5.1 Install an intact lid and locking ring on the drum.

7.5.2 Using the forklift, transport the drum(s) or pallet of drums to a radiologically controlled plant sump area.

7.5.3 Remove the locking ring and lid from the drum.

7.5.4 Place the inlet line from wet/dry vacuum or portable pump in the drum.

NOTE: Non-RCRA liquids shall be processed in the site water treating system.

7.5.5 If the material has been characterized and declared non-RCRA, connect the discharge line to the sump.

NOTE: Containers of uncharacterized or RCRA liquids shall be emptied into drums.

7.5.6 If the material is uncharacterized or has been declared RCRA, prepare collection drums for each material lot code as follows:

7.5.6.1 Visually check the source drum lot code and material against the containment drum lot code and material.

7.5.6.2 If there is a different lot code or liquids of the same lot code have a different appearance, set the drum to be drained aside and notify the supervisor.

NOTE: Liquids having the same lot code and appearance (such as color and consistency) may be contained on the same collection drum.

7.5.6.3 Obtain clean, empty, tare weighed bung-type drums that are color-coded for the type of material (depleted, normal, or enriched uranium) (Refer to RM-0005).

7.0 PROCEDURE (cont.)

NOTE: Use 010 or 012 for the MTC.

7.5.6.4 Fill out a "Material Evaluation Form," FMPC-OPR-3252, except use a new MTC, per SSOP-0002.

7.5.6.5 Stencil the collection drum(s) with the new MTC and the same lot markings as the source drum.

7.5.6.6 Place the wet/dry vacuum or portable pump discharge line in the collection drum.

CAUTION: KEEP HANDS OUT OF DRUM WHILE PUMPING LIQUID.

NOTE: The vacuum shall be started and operated in accordance with the applicable SOP for the unit being used.

7.5.7 Start the wet/dry vacuum or pump and remove as much water as possible.

NOTE: If pumping uncharacterized/RCRA material, leave the outlet hose in the collection drum.

7.5.8 When draining is completed, remove the vacuum/pump suction line from the drum being drained.

7.5.9 If the uncharacterized/RCRA material was transferred, decontaminate the vacuum or pump as follows:

7.5.9.1 Connect the vacuum/pump suction line to a process water outlet.

7.5.9.2 Open the Water Outlet Valve.

7.5.9.3 Start the vacuum/pump.

7.5.9.4 When at least three pump volumes of water have been pumped through the unit, shut off the vacuum/pump.

7.5.9.5 Disconnect the suction line from the process water outlet.

7.5.9.6 Remove the vacuum/pump outlet hose from the collection drum.

7.5.10 Install a lid and locking ring on the drum(s) of drained materials.

7.5.11 Process the uncharacterized/RCRA liquid collection drums as follows:

7.0 PROCEDURE (cont.)

7.5.11.1 Obtain a NUC-FIL 013 vent plug from the supervisor.

7.5.11.2 Take a sample from the drum(s) of collected liquids for fingerprint analysis (Refer to SSOP-0002).

7.5.11.3 Install the vent plug in the bung hole.

7.5.11.4 Using a forklift, move the drum to the scale to be used for weighing the liquid.

7.5.11.5 Weigh the drum(s) per the applicable SOP for the scale being used.

7.5.11.6 Stencil the drum with the gross and net weights.

7.5.11.7 Complete and "Item Production/Certification/Identification" (65) card, Form FMPC-CONT-1945-XX (See Figure 4).

NOTE: Write the original MTC in the blank space between the PLANT TO/MBA TO boxes and the heavy bar.

7.5.11.8 Record the MTC of the source material on the 1945-XX card.

7.5.11.9 If the drums are to go to a new MBA, complete a "Nuclear Material Transfer-Receipt-Identification" card packet, Forms FMPC-CONT-1990, -2220, and -2221 (See Figure 3).

7.5.11.10 Notify the supervisor that draining is completed.

NOTE: The supervisor shall transmit the 1945-XX and, if applicable, the 1990/2220/2221 card packet to the NMC Specialist.

7.5.11.11 Give the supervisor all documentation completed for the drums of liquid.

NOTE: Liquid from uncharacterized drums shall be moved to the Plant 1 Pad and liquid from RCRA drums to an approved RCRA Storage Facility.

7.5.11.12 Using a forklift, move the drums of liquid to Plant 1 or as specified by the supervisor.

7.0 PROCEDURE (cont.)

7.5.12 Using a forklift, transport the drained drum(s) or pallet of drums to the staging area designated by the supervisor.

8.0 APPLICABLE FORMS

8.1 FMPC-OPR-3228, "Drum Venting Record"

8.2 FMPC-OPR-3311, "Isolation Zone Approval Record"

8.3 FMPC-CONT-1990, -2220, -2221, "Nuclear Material Transfer-Receipt-Identification"

8.4 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"

FMPC
DRUM VENTING RECORD

Plant: _____

DRUM NUMBER	LOT NUMBER	MTC/SRC	DAMAGED/DEFORMED		DRUM VENTED		DATE	OPERATOR NAME AND BADGE NUMBER	OVERPACK	
			YES	NO	YES	NO			YES	NO

REMARKS: _____

DRUM VENTING RECORD
FMPC-OPR-3228
Figure 1

FMPC
EXCLUSION ZONE APPROVAL RECORD

Date _____

Subject: _____

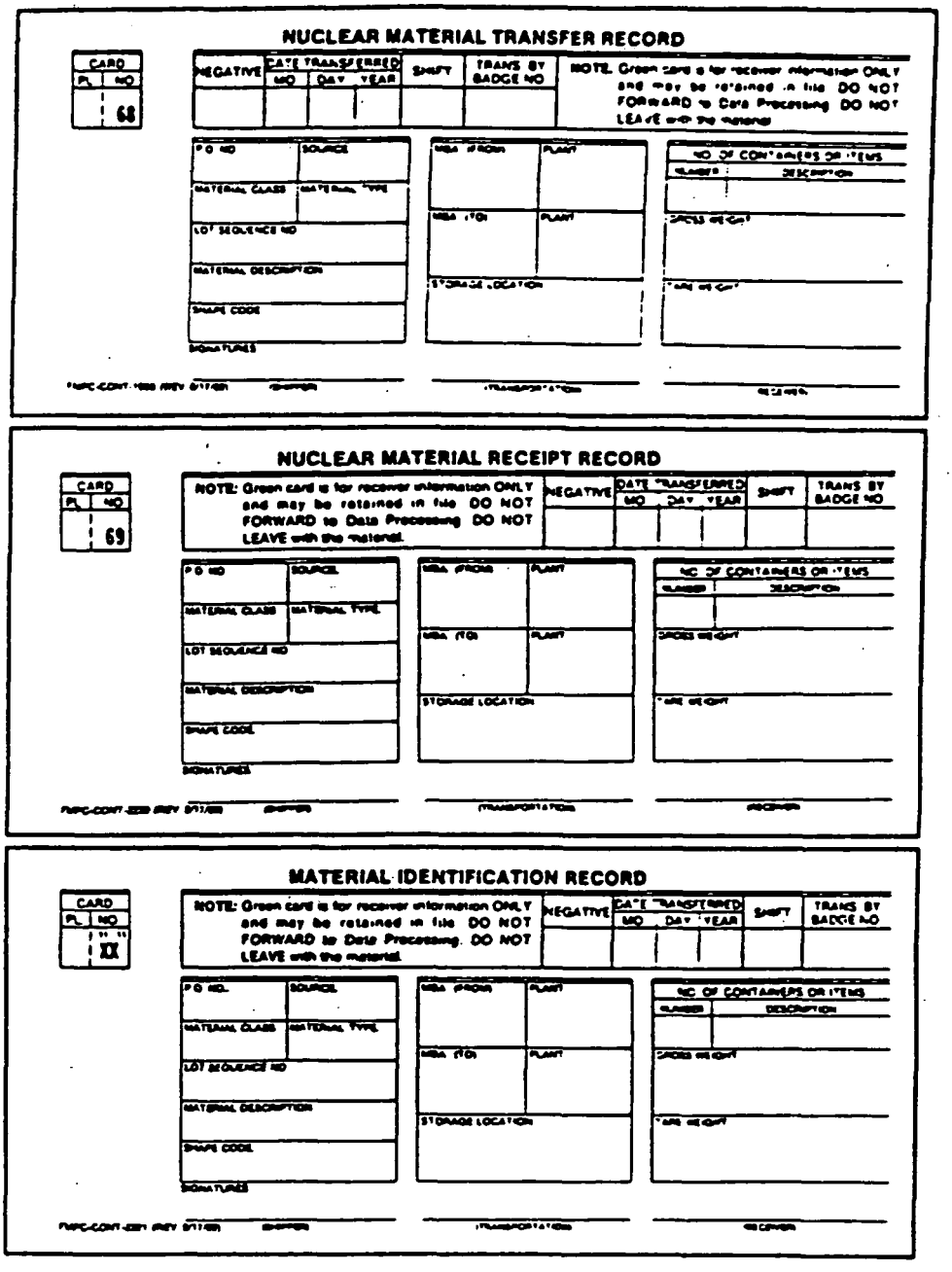
INSTRUCTIONS: Draw a diagram showing the location of the exclusion zone
(Show location of drum storage and venting activities, barriers, buildings, etc.)

ADDITIONAL REQUIREMENTS: *(To be completed by IRS&T as needed)*

PLAN APPROVED:	IRS&T	DATE	EXPIRATION DATE
	SUPERVISOR	DATE	

FMPC-OPR-3311 (2/12/91)

ISOLATION ZONE APPROVAL RECORD
FMPC-OPR-3311
Figure 2



NUCLEAR MATERIAL TRANSFER RECORD

CARD PL NO 68

NEGATIVE | DATE TRANSFERRED MO DAY YEAR | SHIFT | TRANS BY BADGE NO

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

PO NO | SOURCE
MATERIAL CLASS | MATERIAL TYPE
LOT SEQUENCE NO
MATERIAL DESCRIPTION
SHAPE CODE
SIGNATURES

MBA FROM | PLANT
MBA TO | PLANT
STORAGE LOCATION

NO OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT
TARE WEIGHT

FMPC-CONT-1990 REV 07/1991 SHIPPER TRANSPORTATION RECEIVER

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL NO 69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE | DATE TRANSFERRED MO DAY YEAR | SHIFT | TRANS BY BADGE NO

PO NO | SOURCE
MATERIAL CLASS | MATERIAL TYPE
LOT SEQUENCE NO
MATERIAL DESCRIPTION
SHAPE CODE
SIGNATURES

MBA FROM | PLANT
MBA TO | PLANT
STORAGE LOCATION

NO OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT
TARE WEIGHT

FMPC-CONT-2220 REV 07/1991 SHIPPER TRANSPORTATION RECEIVER

MATERIAL IDENTIFICATION RECORD

CARD PL NO XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE | DATE TRANSFERRED MO DAY YEAR | SHIFT | TRANS BY BADGE NO

PO NO | SOURCE
MATERIAL CLASS | MATERIAL TYPE
LOT SEQUENCE NO
MATERIAL DESCRIPTION
SHAPE CODE
SIGNATURES

MBA FROM | PLANT
MBA TO | PLANT
STORAGE LOCATION

NO OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT
TARE WEIGHT

FMPC-CONT-2221 REV 07/1991 SHIPPER TRANSPORTATION RECEIVER

NUCLEAR MATERIAL TRANSFER-RECEIPT-IDENTIFICATION RECORD
FMPC-CONT-1990, -2220, -2221
Figure 3

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO	DATE MO	DAY	YEAR	SHIFT	BADGE NO	PACKAGE NO

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD UNA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS				
				MATERIAL IS AS CODED			PLANT TO	UNA TO
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT
TARE WEIGHT
NET WEIGHT

GENERATOR SIGNATURE
FMPC-CONT-1945-XX REV 12-15-89

SUPERVISOR SIGNATURE DATE

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO	DATE MO	DAY	YEAR	SHIFT	BADGE NO	PACKAGE NO

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD UNA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS				
				MATERIAL IS AS CODED			PLANT TO	UNA TO
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT
TARE WEIGHT
NET WEIGHT

GENERATOR SIGNATURE
FMPC-CONT-1945-XX REV 12-15-89

SUPERVISOR SIGNATURE DATE

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO	DATE MO	DAY	YEAR	SHIFT	BADGE NO	PACKAGE NO

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD UNA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS				
				MATERIAL IS AS CODED			PLANT TO	UNA TO
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT
TARE WEIGHT
NET WEIGHT

GENERATOR SIGNATURE
FMPC-CONT-1945-XX REV 12-15-89

SUPERVISOR SIGNATURE DATE

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FMPC-CONT-1945-XX
Figure 4

RECORD ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
03-15-91	0	Issued per CIO C91-010 (P91-117).
05-14-91	1	Revised to incorporate requirements for venting drums of RCRA/suspect-RCRA material per Request P91-131, initiated by B. L. Krupa.
6-06-91	2	Revised to incorporate CIOs C91-018 (P91-221), C91-019 (P91-222), C91-020 (P91-223), C91-030 (P91-245), and C91-031 (P91-246).
12-18-91	3	Revised to incorporate C91-078 per Request No. P91-635.
04-08-92	0	Reissued to update technical content per Request P91-248, initiated by B. L. Krupa.

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM		Page 1 of 10 Revision No. 0 Revision Date: N/A
REMEDIATION SUPPORT OPERATIONS PROCEDURE	**PREPARATION FOR AND MOVEMENT OF UNVENTED DRUMS**	SOP 20-C-918 Area: As Applicable
(Signature On File) Authorization: R.L. Gardner, Facilities & Waste Operations Manager	Supersedes: None	Issue Date: 12-15-92

1.0 **PURPOSE**

NON-CONTROLLED COPY

The purpose of this document is to provide the procedure for safely moving and handling unvented drums containing potentially hydrogen generating material.

2.0 **APPLICATION**

This procedure is applicable to drums containing material that could contain or generate hydrogen and are stored or will be stored at the Fernald Environmental Management Project (FEMP) and are identified in Table 1.

3.0 **RESPONSIBILITIES**

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Training Section, Industrial, Radiological Safety and Training (IRS&T).

3.1.2 Contacting Industrial Hygiene and/or Radiological Safety to determine the appropriate respiratory protection and protective clothing for the process being performed.

3.1.3 Issuing operators the required respiratory protection and protective clothing.

3.1.4 Contacting IRS&T for assistance in establishing an isolation zone around drum handling activities.

3.1.5 Obtaining and posting a "Radiation Work Permit", a "Confined Space Entry Permit", or a contamination survey (if required prior to handling the drums).

3.1.6 Ensuring that spill cleanup and venting supplies are available at the isolation zone per SOP 20-C-606.

3.1.7 Ensuring that equipment, tools, and vehicles are approved by IRS&T.

3.1.8 Contacting Facilities & Materials Evaluation (F&ME) to determine if the drums to be handled contain Resource Conservation and Recovery Act (RCRA), non-RCRA or uncharacterized materials.

3.0 RESPONSIBILITIES (cont.)

3.1.9 Contacting Transportation to arrange for drums to be moved.

3.1.10 Contacting IRS&T for specific drum movement requirements.

3.2 IRS&T shall be responsible for the following:

3.2.1 Approving isolation zones, equipment, and tools used in this procedure.

3.2.2 Providing the appropriate field personnel for this operation.

3.2.3 Providing determination for specific drum movement requirements and directing the supervisors in these requirements.

3.3 All personnel shall be responsible for complying with this Standard Operating Procedure (SOP).

4.0 DEFINITIONS

4.1 Isolation Zone - A safety area isolated by barriers and controlled by supervision to prevent entry by unauthorized personnel.

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Service Document Program"

5.1.2 FEMP Conduct of Operations Manual

5.2 References

5.2.1 PP-0314, "Packaging, On-Site Movement and Off-Site Shipment of Materials"

5.2.2 SOP 20-C-606, "Hazardous Material Spill Cleanup"

5.2.3 SOP 20-C-630, "Receipt Inspection, Storage, and Storage Inspection of Hazardous Waste"

5.2.4 SOP 20-C-910, "Venting Potentially Explosive Drums"

6.0 INDUSTRIAL HEALTH & SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 An isolation zone shall be established around the area while drums are being handled or moved.

6.3 Safety glasses with side shields shall be worn under a full face shield in the isolation zone when handling/monitoring drummed material covered by this procedure.

6.0 INDUSTRIAL HEALTH & SAFETY REQUIREMENTS (cont.)

6.4 Respiratory protection provided by the supervisor shall be worn when required by the supervisor or IRS&T. Full face respirators shall be permitted in lieu of safety glasses and faceshield.

6.5 Hard hats and hearing protection shall be worn in the isolation zone.

6.6 Only personnel involved in the handling or moving of drums shall be permitted within the isolation zone.

6.7 Leather palm gloves shall be worn while handling/moving drums and while handling sharp or abrasive materials.

6.8 A minimum of two METL-X fire extinguishers shall be present within the isolation zone(s) while drums are being handled or moved.

6.9 Forklift operators and the supervisor in charge of drum movement activities shall have communications equipment available.

6.10 Drums must be surveyed and fitted with nylon nets before being moved out of controlled areas.

6.11 Nylon safety nets shall conform to ANSI-A10.11 and OSHA 1926.105.

6.12 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 PROCEDURE

7.1 General

7.1.1 Warnings, Cautions, and Notes precede the step or item to which they apply.

7.1.2 The supervisor shall contact Materials Control and Accountability (MC&A) and obtain the locations and material codes (Refer to Table 1) of drums requiring movement/handling.

7.1.3 The supervisor shall contact F&ME to determine if the drums to be moved contain RCRA, non-RCRA, or uncharacterized materials.

7.1.4 If the F&ME determination confirms the presence of RCRA or uncharacterized materials, the supervisor shall ensure that the material is transferred to a hazardous waste storage unit per SOP 20-C-630.

7.0 **PROCEDURE** (cont.)

7.2 Drum Movement Preparation

> **WARNING**
>
> **Concentrations of hydrogen gas in unvented drums may cause a fire or explosion.**

7.2.1 Establish an Isolation Zone per SOP 20-C-910.

7.2.2 Supervisor contacts IRS&T to determine specific drum movement requirements.

7.2.3 If the pallet of drums to be moved are stacked, notify the supervisor.

> **WARNING 1**
>
> **Nylon safety netting shall be a minimum of 8 feet by 8 feet in size when covering a single drum or single pallet of drums.**
>
> **WARNING 2**
>
> **Ensure that the safety net does not touch drums on adjacent pallets.**
>
> **WARNING 3**
>
> **Personnel shall keep hand and face away from top of drums when handling drums.**

7.2.4 Install safety net as shown in Figure 1 per supervisor's instructions.

7.2.5 If the drum contains nuclear material and is to be moved to another Material Balance Account (MBA), complete a "Nuclear Material Transfer-Receipt-Identification" card packet, Forms FS-F-1990, -2220, and -2221 (See Figure 2). The following steps are required for movement:

7.2.5.1 The supervisor contacts Transportation to arrange for drum transfer to storage.

7.2.5.2 Transportation moves the pallet of drums to an indoor storage or covered storage area per PP-0314.

7.2.5.3 The supervisor notifies Materials Control and Accountability (MC&A) of the location of the drum(s) if the drums were moved to a new location.

7.2.5.4 MC&A documents drum location.

7.2.6 After drum movement activities have been completed, remove the nylon safety net.

7.2.7 Once the nylon safety net has been removed, release the Isolation Zone per SOP 20-C-910.

7.0 **PROCEDURE** (cont.)

7.2.8 Give the card packet and competed Form No. FS-F-3569, Hydrogen Monitoring Record form, to the supervisor for forwarding to MC&A.

8.0 **APPLICABLE FORMS**

8.1 Form No. FS-F-1990, -2220, -2221, "Nuclear Material Transfer-Receipt-Identification Card Packet".

8.2 Form No. FS-F-3569, "Hydrogen Monitoring Record".

TABLE 1

MATERIALS POTENTIALLY CONTAINING FREE REACTIVE METAL AND STORED IN UNVENTED DRUMS THAT REQUIRE THE USE OF A NYLON SAFETY NET.

Material Code	Description
017	Contaminated Graphite-Uncrushed But Broken Into Large Pieces
019	Contaminated Magnesium
021	Drum Decontamination Residues: Wet MgF_2
023	Oily MgF_2
024	Contaminated Graphite-Crushed
034	MgF_2 For Milling or Discard
035	MgF_2 or CaF_2, Good Liner Material
036	MgF_2, - 20 Mesh, High Free Metal For Plant 8 Roasting (Enriched Only)
037	MgF_2, Ground
038	MgF_2, + 20 Mesh, Low U Content, To Be Crushed
057	Wet Crushed Slag From Furnace Pot Blowouts
064	Dust Collector Residues, Pyrophoric, High Fluoride
071	Rockwell Cleanings
077	Dry Crushed Slag From Furnace Pot Blowouts
079	Unfired Reduction Charges Plus MgF_2 From Liner Cave-ins
134	U_3O_8 For Reoxidation
135	Dust Collector Residue, High Fluoride, Greater Than 20% Assay

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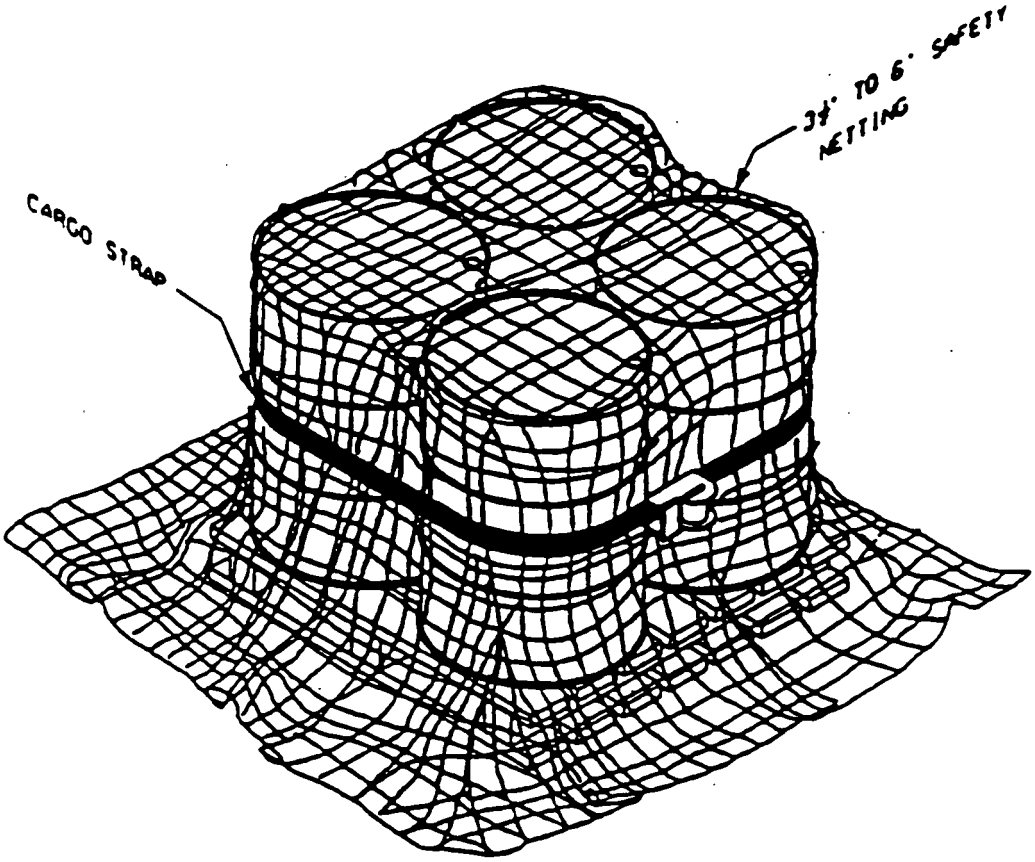

DRUM LID ARRESTING SCHEME
Figure 1

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NUCLEAR MATERIAL TRANSFER RECORD

CARD PL	CARD NO.	NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO.
	68						

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.	SOURCE	MBA (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS	MATERIAL TYPE	MBA (TO)	PLANT	NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		STORAGE LOCATION		GROSS WEIGHT	
MATERIAL DESCRIPTION				TARE WEIGHT	
SHAPE CODE					

SIGNATURES

FS-F-1990 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL	CARD NO.	NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO.
	69						

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.:	SOURCE:	MBA (FROM)	PLANT:	NO. OF CONTAINERS OR	
MATERIAL CLASS	MATERIAL TYPE:	MBA (TO)	PLANT	NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		STORAGE LOCATION		GROSS WEIGHT	
MATERIAL DESCRIPTION				TARE WEIGHT	
SHAPE CODE					

SIGNATURES

FS-F-2220 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

MATERIAL IDENTIFICATION RECORD

CARD PL	CARD NO.	NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO
	" " XX						

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.:	SOURCE	MBA (FROM)	PLANT	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS	MATERIAL TYPE	MBA (TO)	PLANT:	NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		STORAGE LOCATION		GROSS WEIGHT	
MATERIAL DESCRIPTION				TARE WEIGHT	
SHAPE CODE:					

SIGNATURES

FS-F-2221 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL TRANSFER-RECEIPT-IDENTIFICATION CARD PACKET
FORMS FS-F-1990, 2220, AND 2221
Figure 2

FEMP
HYDROGEN MONITORING RECORD

OPERATOR NAME:	LOCATION:	BADGE NUMBER:	DATE:
INSTRUMENT MANUFACTURER:	MODEL:	SERIAL NUMBER:	CALIBRATION DATE:

DRUM NO.	LOT NUMBER	VENTING METHOD		OVERPACK		INITIAL HYDROGEN CONCENTRATION (%LEL)[1][2]			TIME	COMMENTS
		HOLE	PLUG	YES	NO	OPACK 1	OPACK 2	INNER		

[1] A drum may be overpacked more than once.
[2] If the drum was not overpacked, enter N/A in the "Opack" columns, and enter the H concentration in the "Inner" column.

FS-F-3569 (7/9/92)

HYDROGEN MONITORING RECORD
FORM NO. FS-F-3569
Figure 3

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
12-15-92	0	Procedure per Request No. P92-295, initiated by Lyle Hampshire.

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM		Page 1 of 18 Revision No. 2 Revision Date: 03-12-93
REMEDIATION SUPPORT OPERATIONS PROCEDURE	STORAGE OF RADIOACTIVE MATERIAL	SOP 1-C-608 Area: Plant 1
(Signature On File) Authorization: R.L. Gardner, Facilities & Waste Operations Mgr.	Supersedes: None	Issue Date: 08-13-90

NON-CONTROLLED COP

1.0 PURPOSE

The purpose of this document is to provide the procedure for storing radioactive material.

2.0 APPLICABILITY

This procedure shall apply to designated Plant 1 radioactive material storage areas.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Coordinating and notifying support organizations if assistance is required.

3.1.2 Specifying storage location for material in accordance with the"Radiation Control Manual" (FMPC-2084).

3.1.3 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.4 Distributing documentation as required per this SOP.

3.1.5 Performing required inspections of storage facilities.

3.1.6 Ensuring that AEDO is notified of any release to the environment.

3.1.7 Ensuring authorized storage configurations, aisle spacing, material segregation and other storage requirements are maintained per this SOP.

3.1.8 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.9 Issuing the required respiratory protection to operators.

3.1.10 Contacting Radiological Safety to perform a survey prior to storing the radioactive material.

3.1.11 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.2 Solid Waste Compliance shall be responsible for the following:

3.2.1 Performing surveillances of radioactive material storage areas according to regulatory requirements.

3.0 **RESPONSIBILITIES** (cont.)

3.2.2 Assuring proper characterization and classification of FEMP waste streams.

3.2.3 Ensuring applicable regulation requirements are incorporated into this procedure and are being followed at the FMPC.

3.2.4 Performing surveillances of radioactive material storage area records to ensure adequacy and completeness.

3.3 Operators shall be responsible for complying with this SOP.

3.4 Materials Control & Accountability shall be responsible for the following:

3.4.1 Maintaining current radioactive material inventory.

3.4.2 Preparing, maintaining and signing inventory and identification records per this SOP.

4.0 **DEFINITIONS**

4.1 Material Characterization - An evaluation which provides the physical and chemical characteristics and major radiological content and concentration of the material.

4.2 FMPC Lot Marking System - A 15 digit alpha numeric coding system used to identify nuclear material to ensure separation of depleted, normal, and enriched uranium or thorium materials.

4.3 Non-Characterized Material - Radioactive material that is suspected to have constituents on the Environmental Protection Agency Hazardous Waste List.

4.4 Resource Conservation & Recovery Act (RCRA) - The Congressional Act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control and proper management of all hazardous waste.

4.5 Short Term Material - Radioactive material stored only for a maximum of six months.

4.6 Radioactive Material - Material composed of radioactive or radioactively contaminated material in excess of safe limits for unconditional release.

5.0 **APPLICABLE DOCUMENTS**

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 FEMP Conduct of Operations Manual

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5.0 **APPLICABLE DOCUMENTS** (cont.)

5.2 References

5.2.1 SOP 20-C-902, "Liquid Propane Gas (LPG) Powered Handstackers and Tuggers"

5.2.2 SOP 1-C-101, "Sampling Residue and Waste Material"

5.2.3 SOP 1-C-804, "Overpacking Deteriorated Containers"

5.2.4 SOP 20-C-904, "General Nuclear Safety Requirements"

5.2.5 SOP 1-C-604, "Inspection of Containerized and Drummed Residues"

5.2.6 SOP 01-104, "Segregation of Wooden Pallets"

5.2.7 SOP 20-C-601, "Packaging Low Level Radioactive Waste (L- LRW) for Offsite Disposal"

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 A defined safety system is not involved.

6.2 Respiratory protection provided by the supervisor shall be worn when required.

6.3 A HEPA type filter vacuum cleaner or a vacuum system approved by IH&S shall be used during spill cleanup with a current DOP test label properly affixed to vacuum.

6.4 Leather-palm gloves shall be worn when handling drums, operating equipment and when handling rough, sharp-edged or contaminated materials.

6.5 Any release of radioactive material outside of storage container shall be reported to the supervisor immediately.

6.6 Communications devices and emergency response equipment shall be available to personnel performing this procedure.

6.7 Operators shall have reviewed and be familiar with MSDSs for hazardous materials/chemicals that may be used or encountered.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

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6.8 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a Supervisor. The Supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Control Department for evaluation. When the suspect isotope is uranium, the involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow up urine sample. When the suspect isotope is other than uranium, the involved personnel shall report to the Dosimetry Section of the Radiological Control Department for further determination of actions. Employees are responsible for complying with additional requirements as specified by the Radiological Control Section.

6.9 Any situation which could have resulted in the inhalation, ingestion, or absorption of a hazardous material shall immediately be reported to a Supervisor or to the Assistant Emergency Duty Officer (AEDO), who will immediately report the circumstances to Medical and Industrial Hygiene. The involved personnel shall be directed by the Supervisor or AEDO as to when and where to report for medical evaluation, completion of an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the Step or Item to which they apply.

8.0 PROCEDURE

8.1 Preparing Containers for Storage

NOTE: The supervisor shall notify an MC&A representative of requirement for inventory update.

8.1.1 Inform the supervisor of material for storage.

NOTE: An "NM Transfer Record/NM Receipt Record/Material Identification Record" (68/69 card) is not required for radioactive material received from offsite.

8.1.2 Upon delivery of radioactive material to the storage area, inspect container(s) and accompanying paperwork per the "Radioactive Material Pre-Storage Checklist", Form FMPC-REST-3183 (See Figure 1).

8.1.2.1 If an unacceptable item is noted, complete "Corrective Action" and "Date Corrected" section on the "Radioactive Material Pre-Storage Checklist".

8.1.3 Sign the "NM Transfer Record/NM Receipt Record/Material Identification Record", 68/69 card (See Figure 2).

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8.0 **PROCEDURE** (cont.)

8.1.4 Request the Waste Management Supervisor and the Nuclear Materials Reporting Specialist to sign 68/69 card.

8.1.5 If the container was received from offsite, complete the "Nuclear Material Receiving Report," Form FMPC-ADMS-613 (Figure 3) "Offsite Nuclear Materials Receipt Verification and Disposition Report", Form FMPC-ADMS-PRO-1131-1 (Figure 4).

NOTE: Supervisor shall forward Form FMPC-ADMS-613 to MC&A.

8.1.6 Transmit the forms to the supervisor.

CAUTION

Respiratory protection shall be worn while removing rust and/or painting/chipping.

8.1.7 Using a metal brush, remove loose paint or rust before painting.

8.1.8 Paint bare metal, chipped paint areas, or rust areas using the same color of rust inhibiting paint.

8.1.9 Request Nuclear Materials Reporting Specialist to record data for LLRM Inventory database.

8.1.10 Check to ensure a hazardous material warning label (See Figure 5) coated with polyurethane is affixed on the container.

8.1.10.1 If there is no label, notify the supervisor.

8.1.10.2 If label(s) do not have coating, apply polyurethane coating.

8.1.11 Sign the completed "Radioactive Material Pre-Storage Checklist", Form FMPC-REST-3183.

8.1.12 Obtain the other required signatures.

8.1.13 Submit signed form to the supervisor.

NOTE: The supervisor shall notify MC&A of the move and new location.

8.1.14 Notify the supervisor when a container is moved form one location to another location.

8.2 Storage

NOTE: Handstacker shall be inspected and operated per SOP 20-C-902.

8.2.1 Check that the handstacker or forklift has been inspected.

8.2.1.1 If not, perform an inspection.

8.2.2 Using a forklift or handstacker, move radioactive material containers to storage per Table 1.

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8.0 PROCEDURE (cont.)

8.2.3 If additional action is required and the action is not listed in Table 1, notify the supervisor.

8.3 Inspection

8.3.1 Inspect radioactive material containers per Table 2 on a periodic basis as required by the "Drum Management Plan."

8.3.2 Complete the "Radioactive Material Container/Storage Discrepancy Record", Form FMPC-REST- 3182 (See Figure 6) during inspection by recording only the container/storage area discrepancies.

8.3.2.1 If an unacceptable condition is noted on Form FMPC-REST-3182, refer to Tables 1 and 2 for corrective action.

NOTE: The supervisor shall specify corrective action.

8.3.2.2 If other items of concern are noted during inspection, notify the supervisor.

NOTE 1: The inspector and supervisor shall sign the completed form.

NOTE 2: The supervisor shall maintain records of completed remediation.

8.3.3 When inspection is completed, submit Form FMPC-REST- 3182 to the supervisor.

9.0 APPLICABLE FORMS

9.1 Form FMPC-REST-3182, "Radioactive Material Container/Storage Discrepancy Record"

9.2 Form FMPC-REST-3183, "Radioactive Material Container Pre- Storage Checklist"

9.3 Form FMPC-ADMS-613, "Nuclear Material Receiving Report"

9.4 Form FMPC-AC-1990, "NM Transfer Record"

9.5 Form FMPC-AC-2220, "Nuclear Material Receipt Record"

9.6 Form FMPC-AC-2221, "Material Identification Record"

9.7 Form FMPC-ADMS-PRO-1131-1, "Offsite Nuclear Materials Receipt Verification and Disposition Report"

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TABLE 1
STORAGE REQUIREMENTS FOR RADIOACTIVE MATERIAL

STORAGE REQUIREMENT	APPLICABLE RADIOACTIVE MATERIAL			
	CONTAINERIZED		NON-CHARACTERIZED WASTE	NON-CONTAINERIZED FREE-RELEASE MATERIAL
	LONG TERM	SHORT TERM		
1 Stack maximum of three containers high	X	X	X	
2 Group containers per lot number	X	X	X	X
3 Maintain forklift accessibility to rows	X	X	X	X
4 Spacing must be facility dependent	X	X	X	X
5 Store drummed material on pallets	X	X	X	
6 Container markings and labels shall be visible in aisle	X	X	X	
7 Aisles shall be accessible for inspection	X	X	X	
8 May be stored on or off pad				X
9 Nuclear safety requirements apply per SOP 20-C-904	X	X	X	

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TABLE 2
RADIOACTIVE MATERIAL STORAGE INSPECTION

ITEM	INSPECTION ITEM	INSPECTION CRITERIA	CORRECTIVE ACTIO REQUIRED
Container	Hole	An opening in the container including breach, gouge, puncture or leak.	Overpack per SOP 1-C-804.
Container	Dent	A crease, depression or hollow made by blow or pressure; a concave distortion which jeopardizes the integrity of the container. A dent in the top or bottom rim.	Overpack per SOP 1-C-804.
Container	Bulge	A swollen area, a convex distoration, an outward bend which jeopardizes the integrity of the container.	Overpack per SOP 1-C-804.
Container	Corrosion	A container exhibiting exterior rust which is flaking or discoloration and bulging from interior rust.	Overpack per SOP 1-C-804.
Configu-ation	Spacing	Aisle spacing must be three feet between pallets and between rows of pallets for non-characterized material. All ther material must be spaced per supervisor's direction.(1)	Move container(s).
Pallet	Boards	Inspect for broken boards per criteria of SOP 01-104.	Replace or repair pallet.
Container	Labeling	A hazardous material label, FMPC lot marking code, and gross weight must be visible and legible on the container.(2)	Affix label or stencil with enamel paint the required markings in 2 inch letters.

Excluding requirements for nuclear safe masses per SOP 20-C-904.

enriched material shall include labeling requirements of SOP 20-C-904.

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST					
STORAGE AREA:		FMPC INVENTORY NO.:			DATE:
ITEM NO.	INSPECTION ITEM	ACCEPTABLE YES	ACCEPTABLE NO	CORRECTIVE ACTION	DATE CORRECTED
1	Form FMPC-CONT-1945-XX car complete			Complete form per SOP 20-C-601 or 1-C-6040[1].	
2	68/69 card complete			Notify supervisor.	
3	Shipping manifest and waste characterization complete[2]			Notify supervisor.	
4	Container free of spilled/leaked material			Notify supervisor and contain spill/leak per SOP 20-C-606	
5	Container free of damage (i.e. bare metal, hole, dent, bulge, corrosion)			Overpack per SOP 1-C-804.	
6	Container bolt ring secure			Secure or replace bolt ring.	
7	Material sampled/factor assay performed for radionuclides and RCRA determination			Sample per SOP 1-C-101.	
8	FMPC Lot Number complete and stencilled on container			Obtain and stencil lot number per SOP 20-C-601 or 1-C-604[1].	
9	Gross, net, and tare weight complete and stencilled on container			Stencil weights per SOP 20-C-601 or 1-C-604[1].	

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST
FORM NO. FMPC-REST-3183
Figure 1 (Sheet 1 of 2)

10	"POOS" marking stencilled on container, if applicable			Stencil "POOS" marking on container per SOP 20-C-601 or 1-C-604[1].	
11	Gross weight marking correct size (2")			Correct marking per SOP 20-C-601 or 1-C-604[1].	
12	Container markings and labels correctly located per Figure 7[3].				
13	"Hazardous Material Warning Label" affixed to container			Affix label to container.	
14	Other labels affixed to container as applicable (Flammable)			Affix applicable labels per SOP 20-C-601 or 1-C-604 [1].	
15	Pallet free of damage			Replace or repair pallet per SOP 01-104.	
16	Container plastic wrapping secure, if applicable			Secure, rewrap, or container size.	

[1]SOP 20-C-601 is applicable to radioactive waste. SOP 1-C-604 is applicable to residues and refuse material.

[2]Applicable to material received from offsite.

[3]Box markings and labels shall be located as shown in Figure 8.

COMMENTS: _____

MC&A Signature Badge No. Waste Management Signature Date

Inspector's Signature Date

RADIOACTIVE MATERIAL PRE-STORAGE CHECKLIST
FORM NO. FMPC-REST-3183
Figure 1 (Sheet 2 of 2)

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NUCLEAR MATERIAL TRANSFER RECORD

CARD PL. NO. 68

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES:

FS-F-1990 (REV. 3/8/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL. NO. 69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES:

FS-F-2220 (REV. 3/8/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

MATERIAL IDENTIFICATION RECORD

CARD PL. NO. XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS BY BADGE NO.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES.

FS-F-2221 (REV. 3/8/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NM TRANSFER RECORD/NM RECEIPT RECORD/MATERIAL IDENTIFICATION RECORD
FORMS FMPC-AC-1990, 2220, 2221
Figure 2

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Westinghouse Materials Company of Ohio
P O BOX 3[illegible]
CINCINNATI OHIO 45[illegible]

NUCLEAR MATERIAL RECEIVING REPORT

NUCLEAR MATERIAL RECEIVING REPORT NO _____

DATE UNLOADED _____ 19 ____ DATE RECEIVED _____ 19 ____

RECEIVED FROM _____

CARRIER _____ CAR NUMBER _____ SEAL NUMBER _____

FREIGHT BILL NO _____ BILL LADING NO _____

NUMBER OF ITEMS RECEIVED _____ TYPE OF ITEMS RECEIVED _____ GROSS WEIGHT _____

MATERIAL DESCRIPTION AS PER BILLING _____ NLT NO _____

CHECKED BY _____ RECEIVED BY _____

CONSIGNOR'S INFORMATION			DESCRIPTION OF MATERIAL	RECEIVING SECTION INFORMATION			
LOT NUMBER	QUANTITY	WEIGHT		GROSS LBS	TARE LBS	NET LBS	ELEMENT WGT

REMARKS (Relate document numbers for additional material received) _____

INSPECTOR'S NOTES _____

RECEIVER TO MATERIALS CONTROL & ACCOUNTABILITY

NUCLEAR MATERIALS RECEIVING REPORT
FORM FMPC-ADMS-613
Figure 3

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Page ____ of ____ Pages

OFF-SITE NUCLEAR MATERIALS RECEIPT VERIFICATION AND DISPOSITION REPORT

Shipped From _____ Nuclear Mat'l Rec Recom No _____ Date Shipped _____

Date Received _____ SCS Tel No _____

Carrier _____ Shipper's Tally List Received with Shipment ☐ Yes

No. of containers on Nuclear Mat'l Receiving Recom _____ WMT No. _____ ☐ No

PRODUCTION RECEIVING DATA

LINE ITEM	SHIPPER'S ID NO	NO OF CONTAINERS	MATERIAL DESCRIPTION	FMPC GROSS LBS	FMPC TARE LBS	FMPC NET LBS	SHIPPER'S NET WT LBS
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

DISPOSITION

LINE ITEMS INCLUDED	FMPC LOT NO. ASSIGNED	DELIVERED TO (CONSIGNEE)

Condition Received (Remarks & Recommendations).

Disposition By _____

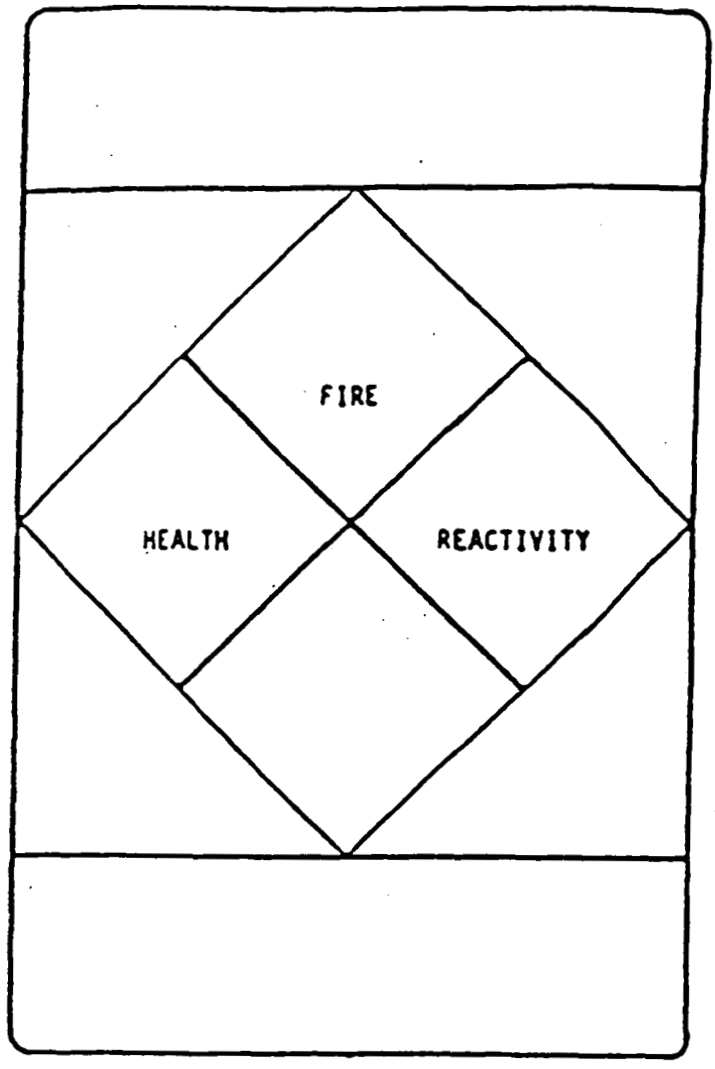
Persons Consulted in Reference to Disposition

NO	DISTRIBUTION OF COPIES
1	MC&A Record Copy
2	Receiving Group - Plant
3	Operations Scheduling & Planning
4	Production Records - Plant
5	Receiving Plant

FMPC-ADMS-PRO-1131-1 (REV 8/90)

OFFSITE NUCLEAR MATERIALS RECEIPT VERIFICATION AND DISPOSITION REPORT
FORM FMPC-ADMS-PRO-1131-1
Figure 4

4554



"HAZARDOUS MATERIAL WARNING LABEL"
Figure 5

747

RADIOACTIVE MATERIAL CONTAINER/STORAGE DISCREPANCY RECORD 4554-

INSPECTOR'S NAME:_____ INSPECTOR'S BADGE NO.:_____

LOCATION:_____ DATE:_____ TIME:_____

FMPC LOT NUMBER	MC&A INVENTORY NUMBER	HOLE		SPACING		BROKEN PALLET BOARD		CORRECT LABELING		LOCATION NO.
		YES	NO	YES	NO	YES	NO	YES	NO	

COMMENTS:_____

INSPECTOR'S SIGNATURE:_____ DATE:_____

SUPERVISOR'S SIGNATURE:_____ DATE:_____

RADIOACTIVE MATERIAL STORAGE INSPECTION
FORM FMPC-REST-3182
Figure 6

4554

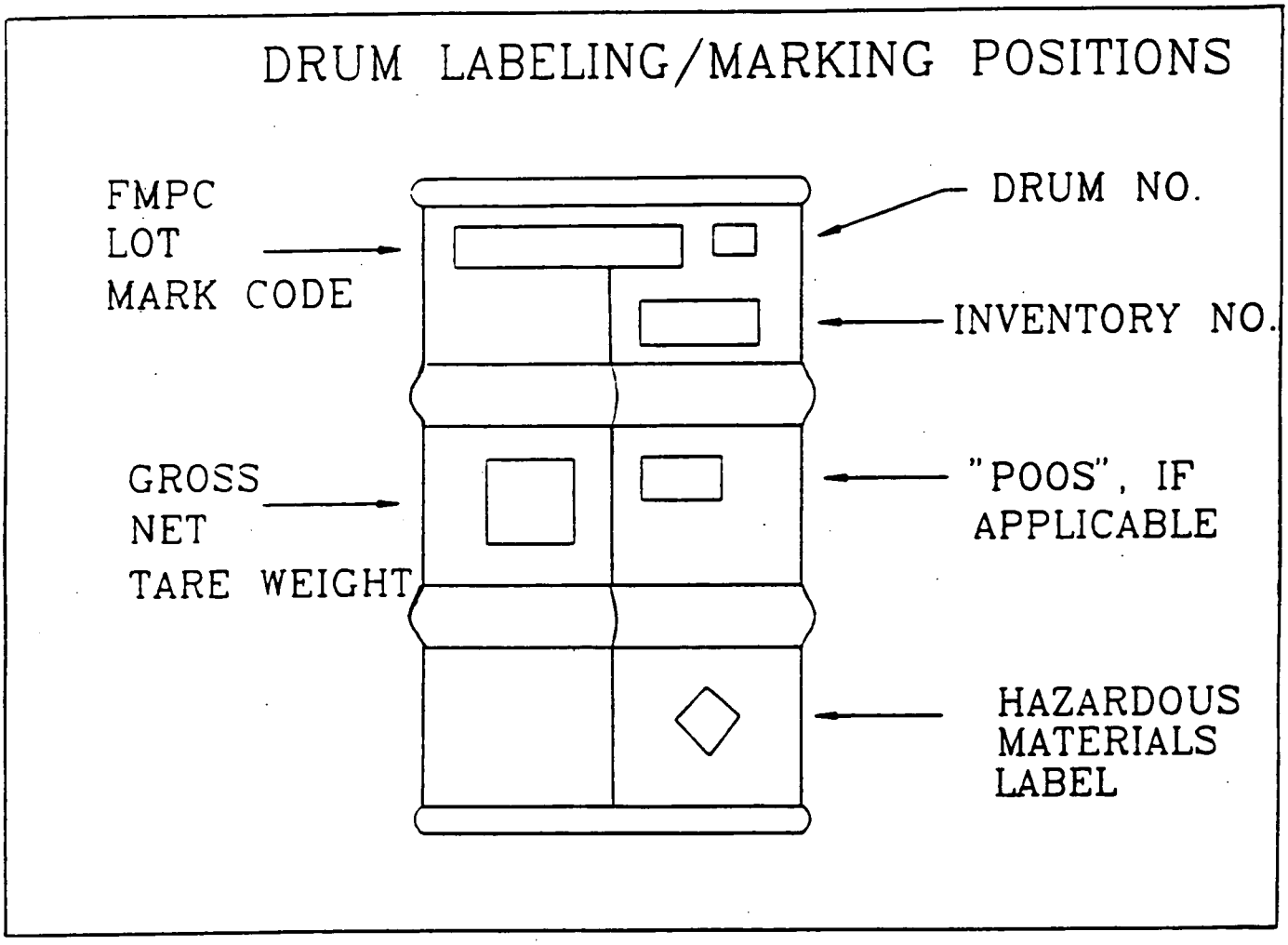


DIAGRAM OF RADIOACTIVE MATERIAL CONTAINER LABELING
Figure 7

4554-

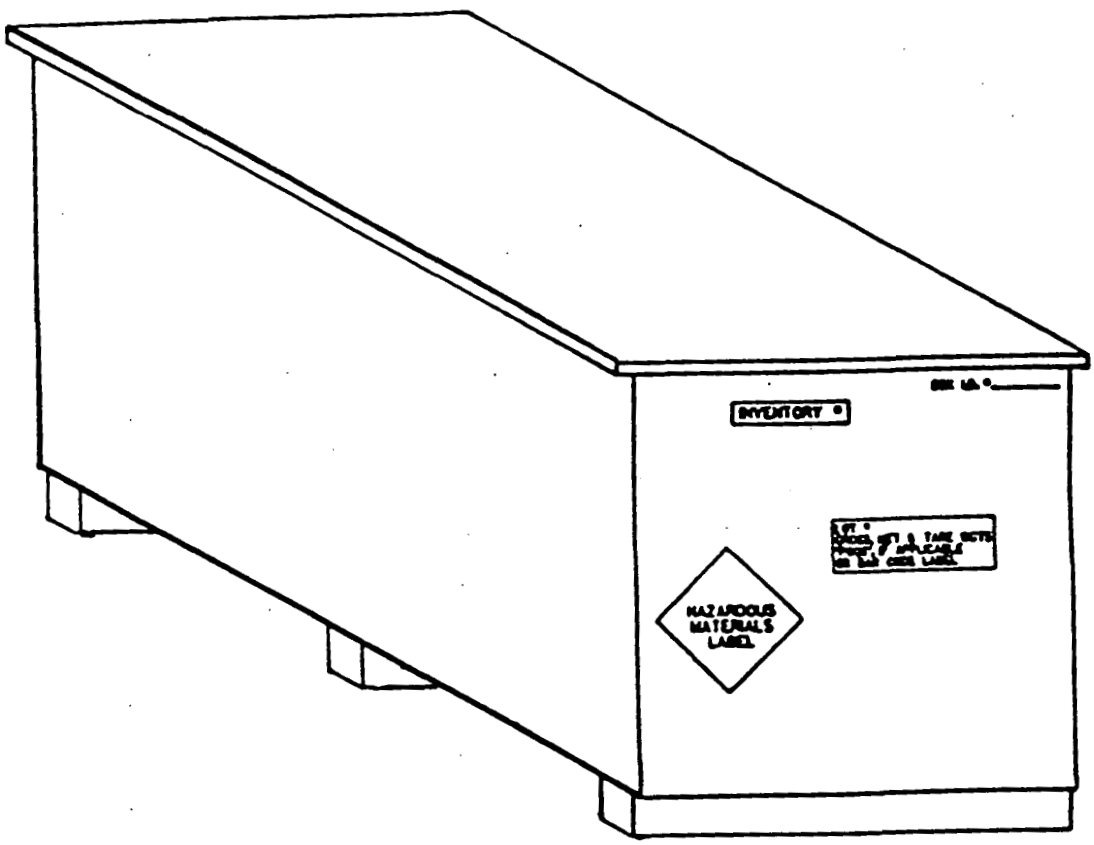


DIAGRAM OF LLRM BOX LABELING
Figure 8

RECORD OF ISSUE/REVISIONS

45542

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
08-13-90	0	Procedure required for storing radioactive material per Request No. P89-448, initiated by K. Dunbar.
12-09-92	1	Revised to incorporate CIOs C92-013 (P92-277), C92-024 (P92-131), and update to current Procedure Program requirements.
03-12-93	2	Revised to correct the 12-09-92 entry under the DESCRIPTION AND AUTHORITY HEADING of the RECORD OF ISSUE/REVISION per Request No. P93-113.

SITE SERVICES PROCEDURE	STORAGE OF ENRICHED MATERIAL	SOP 20-C-801 AREA: As Applicable
Authorization: Per CIO C89-086 R. L. Gardner, Facilities & Warehousing	Supersedes: None	Issue Date: 06-02-1990

NON-CONTROLLED COPY

APR 1993

1.0 PURPOSE

The purpose of this document is to establish the procedure for storing enriched material.

2.0 APPLICABILITY

This procedure is applicable to the designated enriched material storage areas in Plants 2/3, 4 (excluding the Center Bay Area), 5, 6, 8, 9, and the Pilot Plant.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that only trained personnel store enriched material.

3.1.2 Designating the storage area for enriched material.

3.1.3 Ensuring that storage areas are inspected on a weekly basis.

3.1.4 Completing documentation required for storage of enriched material and for forwarding the documentation to MC&A.

3.1.5 Ensuring that required safety equipment is available for operators.

3.1.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.7 Providing operators with the required respiratory protection.

3.1.8 Ensuring that Radiation Detection Alarms (RDAs) are operational and that required inspections and tests have been completed.

3.2 Operators shall be responsible for complying with this SOP.

4.0 DEFINITIONS

4.1 Safe Grouping - A can or drum, or a group of cans or drums, containing material at the same enrichment and having a total mass which is less than the safe limit of that enrichment.

5.0 REFERENCES

5.1 SOP 20-C-904, "General Nuclear Safety Requirements"

5.2 PO-D-013, "Safety and Housekeeping"

5.0 REFERENCES (cont.)

5.3 SOP 20-C-606 "Hazardous Material Spill Clean-up"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses shall be worn unless other eye protection is specified by Safety, the supervisor, or posted signs.

6.3 Leather-palm gloves shall be worn while operating equipment, handling drums, and when handling sharp-edged or abrasive material.

6.4 Respiratory protection provided by the supervisor shall be worn.

6.5 Shielding shall be used when designated by the supervisor.

6.6 Protective equipment specified by the supervisor, Safety, or posted signs shall be worn.

6.7 Spilled material shall be cleaned up per SOP 20-C-606.

6.8 Non-essential combustible material including cleaning rags, tarps, and excess transportation straps, equipment not required for storage operations, and non-nuclear material shall not be stored in the storage area.

6.9 Process operations shall not be conducted in the storage areas.

6.10 Nuclear criticality safety limits for the stored material shall be conspicuously posted near the storage area.

6.11 Containers shall be coded, permanently marked with conflicting markings removed, securely closed, and positioned out of traffic areas.

6.12 Pyrophoric materials shall be put in a safe form prior to storage or stored in containers that prevent spontaneous ignition or dispersal.

6.13 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety for evaluation. The involved employees shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample.

7.0 PROCEDURE

7.1 Receiving Material for Storage

7.1.1 Check to ensure that documentation is complete.

NOTE: Material shall be accompanied by a 68, 69, and XX card packet (Forms FMPC-CONT-1990, CONT-2220, and CONT-2221) (See Figure 1).

7.1.2 Ensure that material is identified per SOP 20-C-904.

7.1.3 Notify the supervisor of material to be stored.

7.1.4 Move the material to the area designated by the supervisor.

7.2 Storing Enriched Material

7.2.1 Place the material in storage per limits listed in Tables 1 through 6 as appropriate for the type of material, and the requirements of SOP 20-C-904.

NOTE: Unless otherwise stated, the spacing restrictions of SOP 20-C-904 are applicable.

7.2.2 Record the location of the material on the "Inventory Location Worksheet".

NOTE: To be done by the operator and MC&A Specialist.

NOTE: The MC&A Specialist shall collect shipping documents.

7.2.3 After material is in place, erect shielding as directed by the supervisor.

7.2.4 Isolate and post the area per SOP 20-C-904.

7.2.5 Complete the required documentation as determined by the supervisor.

7.3 Moving Material Inside the Storage Area

7.3.1 Remove stanchions, chains, and shielding.

7.3.2 Record the location of the material on the "Inventory Location Worksheet".

NOTE: To be done by the Operator and the MC&A Specialist.

7.0 PROCEDURE (cont.)

TABLE 1
NUCLEAR SAFETY MASS AND VOLUME LIMITS
FOR ENRICHED URANIUM COMPOUNDS(1)(2)

% U235	Mass Limit (U lbs)	Volume Limit (Gal)
<1.0	Unlimited	Unlimited
1.0	9000	N/A
1.25	2000	N/A
1.8	357	37
2.0	252	30

(1) Applies to material having a U density less than 200 lbs/ft^3 and less than 10% free uranium by weight.

(2) If the enrichment is between the levels listed, the limits for the higher enrichment shall apply.

TABLE 2
MASS/UNIT AREA LIMITS
FOR 10 GALLON CANS OF UF_4 (1)(2)

Stack Limit	1.25% U235	1.8% U235	2.0% U235
One High	≤ 170 lbs U (≤ 225 lbs UF_4)	≤ 91 lbs U (≤ 120 lbs UF_4)	≤ 68 lbs U (≤ 90 lbs UF_4)
Two High	≤ 85 lbs U (< 112 lbs UF_4)	N/A N/A	≤ 34 lbs U (< 45 lbs UF4)

(1) If an enrichment is between levels listed, the limits for the higher enrichment shall apply.

(2) If the mass limit for 10 gallon cans is observed, an unlimited number of cans, stored 1 high or 2 high, is a safe group.

7.0 PROCEDURE (cont.)

TABLE 3
SAFE LIMITS FOR ENRICHED DERBIES[1][2]

% U-235	Mass (lbs)	Slab (Inches)
.95	Unlimited	Unlimited
1.25	5870	27[3]

[1]Limits are applicable to uranium metal pieces with the smallest dimension of 3.5 inches.

[2]When material is between enrichments listed, the limits for the higher enrichment are applicable.

[3]Stacked two pallets high.

TABLE 4
SAFE LIMITS FOR ENRICHED INGOTS[1]

% U-235	Dimensions[2] (inches)	Mass (lbs)	Slab (Inches)
.95	3.5	Unlimited	Unlimited
1.25	7	14300	77
1.25	8	18200	300
1.25	9	Unlimited	Unlimited

[1]When material is between enrichments listed, the limits for the higher enrichment are applicable.

[2]Smallest dimension of solid piece or wall thickness of hollow cylinder.
Wall thickness = $\frac{(OD-ID)}{2}$

7.0 PROCEDURE (cont.)

TABLE 5
SAFE DENSITY AND CONCENTRATION LIMITS FOR ENRICHED URANIUM RESIDUES (1)(2)

% U235	Maximum Safe U Density & Solution Concentration		
	lb U/ft 3	g U/l	lb U/gal
1.0	31.2	500	4.2
1.25	25	400	3.3
2.0	15.6	250	2.1

(1) Homogenous uranium solutions, compounds, and mixtures having concentrations or densities equal to or less than the values above may be handled and stored in unlimited quantities.

(2) When material is between enrichments listed, the limits for the higher enrichment are applicable.

TABLE 6
MASS LIMITS FOR URANIUM METAL(1) (U-lbs)

% U235	Smallest Dimension (in) (2)						
	< 1	≥ 1	≥ 2	≥ 3	≥ 5	≥ 7	≥ 9
.71	unlimited	unl	unl	unl	unl	unl	unl
.86	5100	n/a	n/a	n/a	unl	unl	unl
.95	2700	3050	12800	200000	unl	unl	unl
1.0	2260	2360	5400	40000	unl	unl	unl
1.1	1430	1600	3400	9100	unl	unl	unl
1.25	805	1040	2250	4350	10400	14300	unl
2.0	170	330	760	1300	2450	3600	4750

TABLE 6 CONTINUED.

7.0 PROCEDURE (cont.)

TABLE 6 (cont.)
MASS LIMITS FOR URANIUM METAL[1] (U-lbs)

[1] When material is between enrichments listed, the limits for the higher enrichment are applicable.

[2] Smallest dimension of solid piece or wall thickness of hollow cylinder.
Wall Thickness = $\frac{(OD - ID)}{2}$

7.3.3 Move the material to the area designated by the supervisor.

NOTE: The supervisor shall complete required documentation and forward the documentation to MC&A.

7.3.4 Erect shielding as directed by the supervisor.

7.3.5 Isolate and post the storage areas per SOP 20-C-904.

8.0 APPLICABLE FORMS

8.1 FMPC-CONT-1990, 2220, 2221, "Nuclear Material Transfer/Receipt/Identification Record" (68, 69, XX card packet)

SITE SERVICES PROCEDURE	STORAGE OF ENRICHED MATERIAL	SOP 20-C-801 AREA: As Applicable
Authorization: Per CIO C89-086 P. L. Gardner, Facilities & Warehousing	Supersedes: None	Issue Date: 06-02-90

NUCLEAR MATERIAL TRANSFER RECORD

CARD PL NO.: 68

NEGATIVE | DATE TRANSFERRED MO. DAY YEAR | SHIFT | TRANS. BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:
SIGNATURES:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS: NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

FS-F-1990 (REV. 3/8/91) SHIPPER | TRANSPORTATION | RECEIVER

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL NO.: 69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE | DATE TRANSFERRED MO. DAY YEAR | SHIFT | TRANS. BY BADGE NO.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:
SIGNATURES:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS: NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

FS-F-2220 (REV. 3/8/91) SHIPPER | TRANSPORTATION | RECEIVER

MATERIAL IDENTIFICATION RECORD

CARD PL NO.: XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE | DATE TRANSFERRED MO. DAY YEAR | SHIFT | TRANS. BY BADGE NO.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:
SIGNATURES:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS: NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

FS-F-2221 (REV. 3/8/91) SHIPPER | TRANSPORTATION | RECEIVER

NUCLEAR MATERIAL TRANSFER/RECEIPT/IDENTIFICATION RECORD
(68, 69, XX CARD PACKET)
FMPC-CONT-1990, CONT-2220, CONT-2221
Figure 1

SITE SERVICES PROCEDURE	STORAGE OF ENRICHED MATERIAL	SOP 20-C-801 AREA: As Applicable
Authorization: Per CIO C89-086 R. L. Gardner, Facilities & Warehousing	Supersedes: None	Issue Date: 06-02-90

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
06-02-90	0	Issued per CIO C89-086 (P90-022).
05-15-91	1	Revised to incorporate CIOs C90-114, C90-115, and C90-116, per Request Nos. P90-709, P90-710, and P90-711.
11-13-91	2	Revised to correct (editorial only) Table 6 per Request No. P91-653, initiated by N. K. Weichold.

REMEDIATION SUPPORT OPERATIONS PROCEDURE	**Moving and Storing Depleted, Normal, and Enriched Uranium Materials <20% and Thorium Metal and Materials**	SOP 20-C-100 Area: As Applicable

(Signature on File) Authorization: R.L. Gardner, Facilities & Waste Operations Mgr.	Supersedes: See Record of Issue/Revision	Issue Date: 02-16-93

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1.0 PURPOSE

The pupose of this document is to provide the procedure for the on-site movement of uranium with an enrichment of less than 20 percent and thorium.

2.0 APPLICABILITY

This procedure is applicable to areas where uranium <20 percent enrichment and thorium materials are received, stored, and/or handled.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.2 Obtaining and posting a "Radiation Work Permit" when necessary.

3.1.3 Contacting Radiological Safety and, if necessary, Industrial Hygiene to determine the required protective equipment, including respirators, for the area where the material is being moved and/or delivered.

3.1.4 Issuing the required protective equipment to operators.

3.1.5 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.1.6 Coordinating with other sections and/or departments to receive and store <20% U235 material and thorium.

3.2 **Materials Control & Accountability (MC&A)** shall be responsible for preparing required documentation.

3.3 **Operators/Drivers** shall be responsible for complying with this procedure.

4.0 DEFINITIONS

None

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 "FEMP Conduct of Operations Manual"

5.2 References

5.2.1 SOP 20-C-904, "General Nuclear Safety Requirements"

5.2.2 SOP 20-C-910, "Venting Potentially Explosive Drums"

5.2.3 SOP 20-C-917, "Hydrogen Monitoring and Removing NUC-FIL Vent Plugs From Drums"

5.2.4 RM-0005, "FEMP Lot Marking and Color Coding System"

6.0 INDUSTRIAL HEALTH SAFETY REQUIREMENTS

6.1 Safety glasses shall be worn unless additional eye/face protection is specified by ES&H, the supervisor, or posted signs.

6.2 Operators shall wear protective equipment specified by ES&H.

6.3 Spills shall be reported and cleaned up promptly to prevent the spread of contamination.

6.4 Loose residues on skids shall be removed before the skids leave the area.

6.5 Corrosive materials shall be placed in containers constructed of, or lined with, corrosion resistant material.

6.6 Repackaging radioactive material shall be approved by Radiological Safety.

6.7 Floor loading limits shall not be exceeded.

6.8 Skid mounted 30- and/or 55-gallon drums (maximum 4 drums/skid) to be stacked shall not contain more than 1000 material pounds per drum.

6.9 Drums of material shall be stacked to the height specified by ES&H.

6.10 Drums of material in long term storage shall be inspected for leakage and deterioration. For outside storage, the inspection shall be daily. For inside storage, the inspection shall be weekly.

6.11 Leaking or significantly deteriorated drums shall be overpacked.

6.12 Skid-loaded solid metal pieces that are uniformly distributed in plane and within nuclear safety limits shall be stacked to the height specified by ES&H.

6.13 Fire lanes shall be marked (stenciled) and kept clear of obstructions.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.14 Equipment shall not be parked in fire lanes.

6.15 Vehicle weight limit or the nuclear safety limit, whichever is most restrictive, shall apply to loaded trucks.

6.16 Hoists to be used shall be checked prior to the first use each day.

6.17 Employees shall have read and be familiar with the MSDSs for chemicals/hazardous material that may be used or encountered.

6.18 Corrosive materials shall be placed in non-corrosive or non-corrosive material lined containers.

6.19 Skids of ingots may be stacked three high provided the ingots are uniformly distributed and within nuclear safety limits.

6.20 Containers of pyrophoric materials shall be handled and stored in accordance with nuclear and fire safety requirements specified in 20-C-910 and 20-C-917.

6.21 A fire lane shall be provided between a maximum of five rows of pyrophoric material.

6.22 Skids of pyrophoric material shall be place in rows in a herringbone pattern.

6.23 Briquettable chips and machining sludges shall be contained in cans or drums not larger than 30-gallon in size.

6.24 Containers of briquettable chips and machining sludges shall not contain more than 2/3 the capacity or a safe mass, whichever is smaller.

6.25 Water/coolant shall not be added to containers of briquettable chips.

6.26 Machining sludges, sawdust, and grinder sludges shall be covered with two inches of water or coolant.

6.27 Uranium bearing sludges covered with water shall be contained in vented drums.

6.28 Drums of sawdust or grinder sludge shall contain a maximum of 75 lbs or a safe mass, whichever is smaller.

6.29 Briquettes shall be packaged in dry, covered, and vented ten-gallon cans and stored inside or under a protective canopy.

6.30 Load limit or nuclear safety limit, whichever is most restrictive, of vehicles shall not be exceeded.

6.31 Containers of pyrophoric material that overheats shall be placed under an overhead water spray, if possible, and cooled and ventilated.

6.32 Drums of uranium metal shall be handled per SOP 20-C-917.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.33 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Safety for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by Radiological Safety.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the Item or Step to which they apply.

8.0 PROCEDURE

8.1 Handling Enriched Uranium Materials Received From Off-Site

8.1.1 When receiving material from off-site, ensure that the load configuration arranged by the shipper has not changed.

NOTE 1: Uranium metal and metal residues $\leq$5.0% U235 shall be handled per the limits of Table 1.

NOTE 2: Regularly shaped uranium metal pieces of graded minimum dimension may be handled per the limits specified by Table 2 or 3 instead of Table 1, if appropriate.

NOTE 3: Uranium compounds of <5.0% U235 with U density <200 lb/ft^3 and free U metal $\leq$10% of material total weight may be stored per limits specified by Table 4.

NOTE 4: Uranium solutions and residues $\leq$10% U235 having U concentrations or densities not exceeding the limits shown in Table 5 may be handled in unlimited quantity.

NOTE 5: Uranium metal, UO_2 pellets, and selected uranium compounds that are >5.0%, <20% U235 shall be handled per the mass limits specified by Table 6.

8.1.2 Store routine shipments per the nuclear safety requirements for mass, slab, volume, concentration, density or mass/unit area limitations, and spacing requirements of the appropriate table.

8.1.3 Notify the supervisor of receipt of enriched uranium material without type and/or enrichment.

8.0 PROCEDURE (cont.)

8.1.4 Transfer enriched uranium material shipped from off-site, without advance notice of type and enrichment, into storage in the load configuration.

NOTE 1: The supervisor shall inform MC&A.

NOTE 2: The material arrangement shall not be changed until MC&A has established the material type and enrichment.

8.1.5 Color-code and identify enriched material per RM-0005.

8.1.6 When type and/or enrichment is known, complete a "Nuclear Materials Receiving Report," Form FMPC-ADMS-613 (See Figure 1).

8.2 Repackaging Materials

8.2.1 Premark and color code receiving containers per RM-0005.

8.2.2 Check that an "RWP" is posted.

8.2.2.1 If not, notify the supervisor.

WARNING

The material shall be in safe configuration at all times.

NOTE: Material in a special container may be limited by mass, slab, cylinder diameter, or volume. Material removed from the container shall, if required, be handled per the limits for the enrichment.

8.2.3 Transfer the material from the container (particularly from a special container such as a birdcage) to a can, drum, skid, or box per the instructions of Nuclear Safety.

8.3 Transferring Enriched Materials On-Site

NOTE: The supervisor shall contact the receiving supervisor, obtain approval, and verify that receiver has adequate procedural coverage to accept material.

8.3.1 Inform the supervisor that material is ready for on-site movement.

8.0 PROCEDURE (cont.)

NOTE: An 1171 form and 1990-2220-2221 form shall be prepared for interplant transfer of mass or geometry restricted enriched material >2.1% U235 and non-routine transfers. For repeat transfers of one type material between plants, an 1171 form is required once each month. An 1171 form is not required for on-site movement if the quantity is less than 1/10 of a safe mass or <2.1%. The 1990-2220-2221 form is required for all transfers.

8.3.2 If material is >2.1% U235 and is mass or geometry restricted, fill out a "Request for Authorization to Ship Nuclear Material", Form FMPC-PM&PI-1171 (See Figure 2).

8.3.2.1 Enter the date, shipper's name and phone number, and complete Sections A and B.

NOTE: ES&H shall ensure that the 1171 form is complete and, if satisfied, will approve the form and send two copies to Transportation by 3:00 P.M. of same day received.

8.3.2.2 Submit three copies of the authorization request to ES&H for approval no later than 2:00 P.M. of the closest working day before the day of movement.

NOTE: The packet shall be completed, for all transfers of uranium regardless of enrichment, except for Transportation and Receiver signatures.

8.3.3 Check that a "Nuclear Material Transfer/Receipt/Identification Record" card packet (68, 69, XX cards), Forms FS-F-1990-2220-2221 (See Figure 3) have been prepared for the transfer.

NOTE: The supervisor shall inform MC&A that documentation is required.

8.3.3.1 If not, notify the supervisor.

8.3.4 Check the material to ensure the following:
(A) was weighed on an NMC scale
(B) was sampled and analysis forms completed, if necessary
(C) meets industrial safety requirements
(D) is color coded and identified per RM-0005

NOTE: The supervisor shall inform personnel loading or storing material of the color coding, nuclear safety, and vehicle gross load limitations.

8.3.5 Determine the material type code, enrichment, nuclear safety limits, and load limits (Refer to RM-0005, SOP 20-C-904, and Tables 1 thru 10).

8.3.6 After the material has been loaded, check that the container count is correct and that the load is within the weight/spacing limits specified by Table 10.

8.0 PROCEDURE (cont.)

8.3.7 Check the card packet (Figure 3) to ensure that the description of the material includes a lot number and is accurate.

8.3.8 Check that the correct destination has been entered in the packet.

NOTE 1: The supervisor and MC&A shall sign the EDP card packet as the shipper.

NOTE 2: The supervisor shall notify Transportation that material is ready for transfer.

NOTE 3: Transportation shall schedule the time of actual movement.

NOTE 4: Material integrity, identification, and nuclear safety configuration shall be maintained until transfer.

8.3.9 Give the cards to the supervisor.

8.4 Moving Enriched Uranium Materials On-Site

NOTE 1: Upon receipt of the approved 1171 form, if required, or when notified by the shipper (depending on the percent enrichnment), the Transportation Supervisor shall schedule the time for shipment and notify the shipper and the receiver.

NOTE 2: If a shipment of uranium material is to be delayed or canceled, the Transportation Supervisor shall inform the shipper, receiver, MC&A, and ES&H (if the shipment is >2.1% uranium enriched material) of the delay and, if appropriate, of the re-scheduled time.

8.4.1 Obtain the shipment documentation from the originating supervisor.

8.4.2 Check the container count, material identification, and trailer number (if material is loaded on a trailer) to ensure that the shipment matches the information on the documentation (1171 form and/or 68/69 card packet).

NOTE: The supervisor shall coordinate with MC&A for resolution of differences and correction of shipment or documentation.

8.4.2.1 Return documentation that does not match the shipment to the supervisor.

8.4.2.2 Notify the Transportation Supervisor of the situation and proceed as directed.

8.4.3 If the shipment and transfer records match, sign the 68/69 card packet in the space designated "Transportation."

8.0 PROCEDURE (cont.)

NOTE 1: The supervisor shall enter the transferring plant's number on the Transfer Record and give the card to the MC&A representative.

NOTE 2: Transportation shall move the material to the receiving location, being careful to maintain the load configuration of enriched materials for nuclear safety.

NOTE 3: Transportation shall deliver the 1171 form and the -69 and -XX cards to the receiver.

8.4.4 Give the "Nuclear Material Transfer Record" (top card of the 68/69 card packet) to the supervisor.

8.4.5 Move the shipment to the specified receiving location.

8.4.6 Give the shipping documentation to the supervisor of the receiving area.

8.5 Receiving Enriched Uranium Materials From On-Site Locations

8.5.1 Using the 1171 form (if used) and/or the -69 and -XX cards, check that the shipment is acceptable and is also in accordance with the information on the documents.

8.5.2 If the material is not acceptable or not as described by the accompanying documentation, proceed as follows:

8.5.2.1 Make a notation on the Receipt Record card to indicate why the shipment is unacceptable.

8.5.2.2 Request Transportation to return the shipment.

8.5.2.3 Send the -69 card bearing the notation and the -XX card to the shipper

8.5.2.4 Notify the supervisor of the situation.

NOTE: The supervisor shall sign the card and then give the card to the MC&A representative.

8.5.3 If the material is acceptable, give the -69 card and -XX card to the supervisor.

8.5.5 Unload the material.

8.6 Storage Requirements

8.6.1 Uranium material shall be stored per the limits of Tables 1 thru 10 and/or SOP 20-C-904 unless otherwise noted.

8.0 PROCEDURE (cont.)

8.6.2 Uranium metal pieces greater than one inch in their smallest dimensions, free of uranium compounds, non-porous, and free of long, narrow protrusions and cups may be stored in amounts up to the maximum weights shown in Table 2 or in horizontal slabs to maximum thicknesses shown in Table 3. Pieces not meeting the limits of Table 2 or 3 shall be stored under the limits in Table 1.

8.6.3 The smallest dimension for hollow, cylindrical pieces ≤0.95% U235 is the combined wall thickness (OD+ID). For higher enrichments the smallest dimension is OD-ID.

8.6.4 Uranium compounds shall be stored according to the maximum limits listed in Table 4. Materials of higher U densities and/or with higher free metal content shall be stored according to limits in Table 1.

8.6.5 Rockwell spills (MDC 070) of 2.1% U235 enriched material shall be stored in an area free of water.

8.6.6 When metal spills (MDC 104) at the 1.25% U235 level do not meet the 805 lb limit (Refer to Table 2) or the 8 inch limit (Refer to Table 3), a maximum charge of 2150 lbs may be stored as a unit until the charge can be cut for disposal.

8.6.7 Chips, turnings, and briquettes (MDCs 107, 111, 112, 252, and 302) shall be stored per Table 7 and the following requirements.

8.6.7.1 Drums/cans may be stored side-by-side.

8.6.7.2 Skids of containers may be stored edge-to-edge in a maximum of five parallel rows.

8.6.7.3 Skids/drums/cans shall not be stacked.

8.6.7.4 Each group of five rows of skids shall be separated by a fire lane.

8.6.8 Piped and porous ingots (MDCs 120, 240, 241, 242, 244 400, 404, and 410) of 0.86 and 0.95 percent U235 enrichment shall be stored under the most restrictive limits of Table 2 or 3. Ingots of 1.25 and 2.1 percent U235 enrichment shall be stored as 1/group.

8.6.9 Derbies (MDCs 129, 220, and 254) graded as code 4 or 5 shall be stored under the most restrictive requirements of Table 2 or 3.

8.6.10 Duds (MDC 308) of 0.86 and 0.95 percent U235 enrichment with voids or projections shall stored under the most restritive limits of Table 2 or 3. Duds of 1.25 and 2.1 percent enrichment shall be stored as 1/group.

8.6.11 Boxed and banded extrusions (MDC 453) may be stored 3 boxes high.

8.6.12 Wet sump/filter cake (MDC 067) may be stored as unlimited at ≤1.25 percent U. The limits of Table 5 apply to other enrichments.

8.0 **PROCEDURE** (cont.)

8.6.13 UNH solutions (MDCs 150 and 204) <2.00 percent U235 enrichment may be stored as unlimited. UNH at 2.1 percent U235 enrichment shall be limited to 238 U g/l.

8.6.14 UNH solids (MDC 207) <2.00 percent U235 enrichment may be stored as unlimited. The limit shall be 215 lbs for 2.1 percent U235 enrichments.

8.6.15 UO3 products (MDCs 072 and 200) that are ≤1.25 percent U235 enrichment shall be stored in drums containing 2000 lbs maximum.

8.6.16 UF4 (MDC 210) between 1.25 and 20 percent U235 enrichment shall be contained in 10-gallon cans (225 lb/can maximum of 170 lb U. The cans may be stored edge-to-edge in a single plane in unlimited array (mass/unit area control).

8.6.17 UO3 and UF4 product that is 2.00 percent U235 enrichment may be stored in 30-gallon drums on skids with a maximum of two drums per skid. There shall be at least 20 inches separating the drums on the skid and 24 inches separation from drums on adjacent skids.

8.6.18 Pots of UF4 (MDC 216) that are 2.0 or 2.1 percent U235 enrichment shall be stored one pot/group.

9.0 **APPLICABLE FORMS**

9.1 FMPC-ADM-613, "Nuclear Materials Receiving Report"

9.2 FMPC-PM&PI-1171, "Request for Authorization to Ship Nuclear Materials"

9.3 FS-F-1990-2220-2221, "Nuclear Material Transfer/Receipt/Identification Record"

TABLE 1
SAFE LIMITS FOR CATEGORY 1 MATERIALS[1]

Enrichment (% 235U)	Mass (U lb Max)	Max. Slab Thickness (Inches)	Max. Cyl. Diameter (Inches)	Maximum Volume		Max Mass/ Unit Area (lb/ft^2)
				(Ft^3)	(Gal)	
0.86	5100	20.06	27	26	194	510
0.95	2700	12.5	22	14	105	320
1.0	2260	11.5	20	11	82	270
1.1	1430	10.0	17	6.6	49	210
1.2	950	8.75	16	4.6	34	170
1.25	805	8.0	15	4.0	29	155
1.3	680	7.75	14	3.5	26	140
1.4	500	7.0	13	2.8	21	120
1.5	400	6.5	12	2.4	18	105
1.6	310	6.0	12	2.1	16	92
1.7	260	5.75	11	1.8	13	83
1.8	220	5.5	10	1.6	12	75
1.9	190	5.25	10	1.5	11	68
1.95	182	5.0	9.8	1.4	11	65
2.0	170	5.0	9.7	1.4	10	64
2.1	152	4.75	9.4	1.3	9.6	58
2.5	100	4.25	8.7	1.0	7.6	44
3.0	73	3.75	8.1	0.80	6.0	33
3.5	58	3.5	7.7	0.68	5.1	26
4.0	45	3.5	7.3	0.60	4.5	22
4.5	40	3.25	7.1	0.55	4.2	18
5.0	34	3.25	7.0	0.51	3.8	17

[1] If the minimum piece size (or density or concentration or free metal content) of a material is known, less restrictive limits from another table may be used.

TABLE 2
SAFE MASS LIMITS (u/LB) FOR CATEGORY 2 MATERIALS[1]

	SMALLEST DIMENSION OF PIECE (INCHES)															
235U (%)	Any Size	≥1	≥1.5	≥2	≥2.5	≥3	≥3.5	≥4	≥5	≥6	≥7	≥8	≥9	≥10	≥11	≥12
0.86	5100			∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
0.95	2700	3050	5200	12800	41500	200000	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
1.0	2260	2360	3390	5400	11700	40000	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
1.1	1430	1600	2200	3400	5300	9100	16000	24000	∞	∞	∞	∞	∞	∞	∞	∞
1.2	950	1200	1600	2500	3650	5260	7300	9560	14300	17400	43500	∞	∞	∞	∞	∞
1.25	805	1040	1470	2250	3300	4350	5870	7450	10400	12200	14300	18200	∞	∞	∞	∞
1.3	680	910	1300	2000	2800	3870	4900	6080	8260	10000	11300	13000	14300	∞	∞	∞
1.4	500	730	1080	1600	2260	3000	3800	4650	6080	7390	8700	9780	10800	11700	12400	14300
1.5	400	600	930	1390	1900	2500	3130	3740	4870	6000	6950	7950	8870	9900	10600	11100
1.6	310	520	800	1190	1630	2100	2600	3130	4060	4950	5870	6740	7430	8430	9130	9560
1.7	260	440	700	1040	1400	1800	2260	2700	3470	4260	5040	5740	6520	7400	8000	8600
1.8	220	400	630	930	1260	1600	2000	2340	3040	3740	4390	5130	5700	6520	7130	7650
1.9	190	360	565	830	1130	1430	1780	2080	2700	3300	3950	4520	5130	5780	6430	6900
1.95	182	340	540	790	1070	1350	1670	1990	2600	3170	3740	4345	4870	5565	6174	6565
2.0	170	330	525	760	1020	1300	1600	1870	2450	3020	3600	4170	4750	5320	5900	6470
2.1	152	300	480	695	935	1180	1450	1720	2240	2760	3260	3780	4300	4820	5300	5780
2.5	100	230	360	520	690	870	1070	1270	1650	2040	2430	2820	3200	3630	4040	4780
3.0	73	180	285	410	540	675	830	1000	1300	1600	1900	2200	2520	2850	3150	3470
3.5	58	155	245	350	460	570	700	850	1100	1390	1640	1900	2170	2400	2650	2950
4.0	45	140	225	320	420	510	635	750	980	1220	1450	1670	1900	2130	2340	2600
4.5	40	135	210	300	390	475	585	700	900	1120	1300	1520	1740	1920	2130	2340
5.0	34	130	200	285	375	455	560	655	850	1040	1230	1420	1600	1800	2000	2180

(1) Values may be applied to hollow metal pieces >0.96% ^{235}U by using the wall thickness (OD-ID/2) as the "smallest dimension."

TABLE 3
SAFE SLAB LIMITS (INCHES) FOR CATEGORY 2 MATERIALS[1]

	SMALLEST DIMENSION OF PIECE (INCHES)															
% ^{235}U	Any Size	≥1	≥1.5	≥2	≥2.5	≥3	≥3.5	≥4	≥5	≥6	≥7	≥8	≥9	≥10	≥11	≥12
0.86	20.0	20.0			∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
0.95	12.5	12.5	15.5	22.0	33.5	58.0	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
1.0	11.5	11.5	14.5	20.0	29.0	47.5	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
1.1	10.0	10.0	12.5	16.0	23.0	32.0	46.0	65.0	∞	∞	∞	∞	∞	∞	∞	∞
1.2	8.75	9.0	11.0	13.5	17.5	24.5	30.5	38.5	52.0	71.5	385.0	∞	∞	∞	∞	∞
1.25	8.0	8.5	10.5	13.0	17.0	22.0	27.0	32.0	41.5	55.0	77.0	300.0	∞	∞	∞	∞
1.3	7.75	8.0	10.0	12.0	15.0	20.0	24.5	28.5	36.0	46.0	57.5	72.0	230.0	∞	∞	∞
1.4	7.0	7.5	9.0	11.0	13.5	16.5	19.5	23.0	28.0	34.5	42.0	50.0	54.5	72.0	150.0	14300
1.5	6.5	7.0	8.5	10.0	12.0	14.5	16.5	19.0	23.5	28.5	33.5	39.0	42.0	53.0	58.0	11100
1.6	6.0	6.5	7.5	9.0	11.0	13.0	14.5	16.5	20.0	24.0	28.5	32.0	35.0	43.0	47.0	9560
1.7	5.75	6.0	7.5	8.5	10.0	11.5	13.0	15.0	17.5	21.0	24.5	28.0	30.0	36.5	40.0	8600
1.8	5.50	6.0	7.0	8.0	9.5	10.5	12.0	13.5	16.0	19.0	21.5	24.5	26.5	32.0	35.0	7650
1.9	5.25	5.5	6.5	7.5	8.5	10.0	11.0	12.5	14.5	17.0	20.0	22.0	24.5	29.0	32.0	6900
1.95	5.0	5.5	6.5	7.5	8.5	9.5	11.0	12.0	14.5	16.5	19.0	21.5	23.5	28.5	30.5	6565
2.0	5.0	5.5	6.5	7.5	8.5	9.5	10.5	11.5	14.0	16.0	18.5	20.5	23.0	27.5	29.5	6470
2.1	4.75	5.0	6.0	7.0	8.0	9.0	10.0	11.0	13.0	15.0	17.0	19.0	21.0	25.0	27.5	5780
2.5	4.25	4.5	5.5	6.0	7.0	8.0	8.5	9.5	11.0	12.5	14.5	16.0	17.5	21.5	23.0	4780
3.0	3.75	4.0	5.0	5.5	6.5	7.0	7.5	8.5	10.0	11.5	13.0	14.5	16.0	19.0	20.5	3470
3.5	3.5	4.0	4.5	5.5	6.0	6.5	7.5	8.0	9.5	11.0	12.5	14.0	15.5	18.5	20.0	2950
4.0	3.5	4.0	4.5	5.0	5.5	6.5	7.0	7.5	9.0	10.5	12.0	13.5	15.0	18.0	19.5	2600
4.5	3.25	3.5	4.5	5.0	5.5	6.0	7.0	7.5	9.0	10.5	12.0	13.5	14.5	17.5	19.0	2340
5.0	3.25	3.5	4.0	5.0	5.5	6.0	7.0	7.5	9.0	10.5	12.0	13.0	14.5	17.5	19.0	2180

(1) Values may be applied to hollow metal pieces >0.96% ^{235}U by using the wall thickness (OD-ID/2) as the "smallest dimension."

TABLE 4
SAFE LIMITS FOR CATEGORY 3 MATERIALS

Enrichment (%235U)	Mass (U lb Max)	Max Slab Thickness (Inches)	Max Cyl. Diameter (Inches)	Maximum Volume	
				(Ft^3)	(Gal)
≤0.98	∞	∞	∞	∞	∞
1.0	9000	24.0	39.3	88.0	658
1.1	4960	17.75	28.8	50.0	374
1.2	2700	14.5	24.5	30.0	224
1.25	2000	13.75	23.2	24.0	179
1.3	1550	13.25	22.4	19.0	142
1.4	1000	12.0	20.8	12.5	93
1.5	744	11.25	19.7	9.3	69
1.6	560	10.25	18.9	7.1	53
1.7	420	9.75	18.0	5.9	44
1.8	357	9.5	17.4	5.0	37
1.9	295	9.0	16.8	4.4	33
1.95	271	8.75	16.3	4.1	30
2.0	252	8.75	16.5	3.9	30
2.1	215	8.4	15.7	3.4	26
2.5	132	7.5	14.2	2.4	18
3.0	91	6.75	12.9	1.8	13
3.5	67	6.0	12.1	1.4	10
3.6	64	5.5	11.5	1.2	9
3.7	60	5.5	11.5	1.2	9
3.8	58	5.5	11.5	1.2	9
3.9	55	5.5	11.5	1.2	9
4.0	52	5.5	11.5	1.2	9
4.1	50	5.25	10.9	1.1	7.9
4.2	48	5.25	10.9	1.1	7.9
4.3	46	5.25	10.9	1.1	7.9
4.4	44	5.25	10.9	1.1	7.9
4.5	43	5.25	10.9	1.1	7.9
4.6	41	5.0	10.4	0.95	7.1
4.7	40	5.0	10.4	0.95	7.1
4.8	38	5.0	10.4	0.95	7.1
4.9	37	5.0	10.4	0.95	7.1
5.0	36	5.0	10.4	0.95	7.1

TABLE 5
SAFE LIMITS FOR CATEGORY 4 MATERIALS

% 235U [1]	Density (lb U/ft³)	Concentration [1]	
		(U g/L)	(U lb/gal)
1.0	31.2	500	4.2
1.1	28.3	454	3.8
1.2	26.0	416	3.5
1.25	25.0	400	3.3
1.3	24.0	383	3.2
1.4	22.2	357	3.0
1.5	20.8	333	2.8
1.6	19.5	312	2.6
1.7	18.3	294	2.4
1.8	17.3	277	2.3
1.9	16.4	263	2.2
1.95	16.0	256	2.1
2.0	15.6	250	2.1
2.1	14.8	238	2.0
2.5	12.4	200	1.7
3.0	10.4	166	1.4
3.5	8.92	142	1.2
4.0	7.80	125	1.0
4.5	6.93	111	0.93
5.0	6.24	100	0.83
5.5	5.68	91	0.83
6.0	5.20	83	0.69
6.5	4.80	77	0.64
7.0	4.46	71	0.60
7.5	4.16	67	0.56
8.0	3.90	63	0.52
8.5	3.67	59	0.49
9.0	3.47	56	0.46
9.5	3.29	53	0.44
10.0	3.12	50	0.42

[1] Materials having a 235_U concentration $\leq$5.0 g 235_U/l (0.312 lb/ft³), including discard residues, may be handled in unlimited quantities.

TABLE 6
SAFE LIMITS FOR CATEGORY 5 MATERIALS

Enrichment[1] (% 235U)	Mass (lb U)	Slab Thickness (Inches)	Cylinder Diameter (Inches)	Volume	
				Ft^3	Gal
5.0	36.0	5.0	10.4	0.95	7.1
5.5	31.0	4.5	9.6	0.72	5.4
6.0	27.0	4.5	9.6	0.72	5.4
6.5	24.0	3.9	8.7	0.56	4.2
7.0	22.0	3.9	8.7	0.56	4.2
7.5	19.0	3.9	8.7	0.56	4.2
8.0	18.0	3.9	8.7	0.56	4.2
8.5	16.0	3.6	8.2	0.49	3.7
9.0	15.0	3.6	8.2	0.49	3.7
9.5	14.0	3.6	8.2	0.49	3.7
10.0	13.0	3.6	8.2	0.49	3.7
11.0	10.5	3.4	7.9	0.41	2.9
12.0	8.7	3.4	7.9	0.41	2.9
13.0	7.0	3.0	7.5	0.41	2.9
14.0	6.2	3.0	7.5	0.41	2.9
15.0	5.2	3.0	7.5	0.41	2.9
16.0	4.6	2.8	7.1	0.34	2.5
17.0	4.1	2.8	7.1	0.34	2.5
18.0	3.4	2.8	7.1	0.34	2.5
19.0	3.3	2.6	6.8	0.34	2.5
<20.0	3.0	2.6	6.8	0.34	2.5

[1] The "always safe" limits for enrichments >5.0% but <20.0% 235_U and are applicable to compounds and aqueous solutions.

TABLE 7
STORAGE LIMITS FOR CHIPS, TURNINGS, AND BRIQUETTES

Percent 235U	Chips & Turnings	Briquettes
0.95	550 U lbs/30-gal drum	342 U lbs/10-gal can
1.25	270 U lbs/30-gal drum	166 U lbs/10-gal can
2.1	100 U lbs/30-gal drum	- - - - - - - - -

TABLE 8
NUCLEAR SAFETY LIMITS FOR U COMPOUNDS AND MIXTURES THAT ARE LESS THAN 2.1 PERCENT

%235U	Mass (U lbs)	Volume[1] (Max. Capacity in gal)
≤0.98	Unlimited	Unlimited
≤1.25	2000	179
≤2.0	252	30
≤2.1	215	26

(1) The capacity of a container shall not exceed the listed capacity for a given enrichment.

TABLE 9
NUCLEAR SAFETY REQUIREMENTS FOR CONTAMINATED MATERIALS LESS THAN 2.1 PERCENT

%235U	U LB/FT[3]	U G/L	U LB/GAL
≤0.98	200	3200	26.7
≤1.25	25	400	3.3
≤2.1	14.8	238	2.0

(1) Materials with density equal to, or less than, those listed above may be handled and stored as unlimited.

TABLE 10
NUCLEAR SAFETY LOAD LIMITS ON VEHICLES

Type of Nuclear Safety Control	Spacing Requirements on Vehicle	Maximum Nuclear Safety Load Per Vehicle
Mass restricted material	2 feet between safe masses	2 safe masses
Slab or mass/unit area restricted materials	0 spacing between masses	2 safe masses
Cylinder and volume restricted material	N/A	1 safe volume or 1 safe cylinder
Secured cylinder or volume restricted material	2 feet between units	2 units
Unlimited category material	N/A	Vehicle load limit

4554

Westinghouse Materials Company of Ohio
P. O. BOX 398704
CINCINNATI OHIO 45239

NUCLEAR MATERIAL RECEIVING REPORT

NUCLEAR MATERIAL RECEIVING REPORT NO.: _____

DATE UNLOADED _____ 19 ____ DATE RECEIVED _____ 19 ____

RECEIVED FROM _____

CARRIER _____ CAR NUMBER _____ SEAL NUMBER _____

FREIGHT BILL NO. _____ BILL LADING NO. _____

NUMBER OF ITEMS RECEIVED _____ TYPE OF ITEMS RECEIVED _____ GROSS WEIGHT _____

MATERIAL DESCRIPTION AS PER BILLING _____ NLT. NO. _____

CHECKED BY: _____ RECEIVED BY: _____

NOTE: The following must be completed by the person verifying receipt.

CONSIGNOR'S INFORMATION			DESCRIPTION OF MATERIAL	RECEIVING SECTION INFORMATION			
LOT NUMBER	QUANTITY	WEIGHT (LBS)		GROSS (LBS)	TARE (LBS)	NET (LBS)	ELEMENT WG

REMARKS *(Related document numbers for additional material received)* _____

FMPC-ADMS-613 (REV. 5/22/88)

NUCLEAR MATERIALS RECEIVING REPORT
FMPC-ADMS-613
Figure 1

Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

REQUEST FOR AUTHORIZATION TO SHIP NUCLEAR MATERIAL

DATE	AUTHORIZATION NUMBER	SHIPMENT CLASSIFICATION	MATERIAL CLASSIFICATION
PO NUMBER	TASK NUMBER	SCRAP DECLARATION NUMBER	
SHIPPER			741 NUMBER
REQUESTED SHIPPING DATE	PRODUCTION/TECHNICAL REPRESENTATIVE		
ORGANIZATION			TELEPHONE NUMBER

NUCLEAR MATERIAL CHEMICAL/PHYSICAL DESCRIPTION (INDICATE TYPE AND QUANTITY OF PRECIOUS METALS, IF ANY).

NOTE: PLEASE ATTACH DETAIL INFORMATION DESCRIBING INDIVIDUAL ITEMS INCLUDING NET WEIGHT, SNM VALUE, % ENRICHMENT, ISOTOPIC VALUE AND MATERIAL COMPOSITION.

TYPE AND NUMBER OF OUTER CONTAINERS

METHOD OF PACKAGING (INCLUDE DETAILED INFORMATION ON TYPE OF INNER CONTAINERS AND SPECIAL INSTRUCTIONS FOR OPENING AND UNPACKING MATERIAL, IF REQUIRED)

NM REPRESENTATIVE/ALTERNATE | DATE

WMCO REVIEW AND APPROVAL

REVIEWED BY PRODUCTION/TECHNICAL REPRESENTATIVE

NAME: _____ ORGANIZATION: _____ DATE: _____

REVIEWED BY HEALTH/SAFETY REPRESENTATIVE

NAME: _____ ORGANIZATION: _____ DATE: _____

APPROVED FOR SHIPMENT BY

NM REPRESENTATIVE/ALTERNATE: _____ DATE: _____

FMPC-PM&PI-1171 (5/6/87)

REQUEST FOR AUTHORIZATION TO SHIP NUCLEAR MATERIAL
FMPC-PM&PI-1171
Figure 2

4554

NUCLEAR MATERIAL TRANSFER RECORD

CARD PL.	CARD NO.
1	68

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.:	SOURCE:	MBA: (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS:	MATERIAL TYPE:			NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		MBA: (TO)	PLANT:	GROSS WEIGHT:	
MATERIAL DESCRIPTION		STORAGE LOCATION:		TARE WEIGHT:	
SHAPE CODE:					

SIGNATURES: (SHIPPER) (TRANSPORTATION) (RECEIVER)

FS-F-1990 (REV. 3/9/92)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL.	CARD NO.
1	69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

P.O. NO.:	SOURCE:	MBA: (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS:	MATERIAL TYPE:			NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		MBA: (TO)	PLANT:	GROSS WEIGHT:	
MATERIAL DESCRIPTION		STORAGE LOCATION:		TARE WEIGHT:	
SHAPE CODE:					

SIGNATURES: (SHIPPER) (TRANSPORTATION) (RECEIVER)

FS-F-2220 (REV. 3/9/92)

MATERIAL IDENTIFICATION RECORD

CARD PL.	CARD NO.
1	XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

P.O. NO.:	SOURCE:	MBA: (FROM)	PLANT:	NO. OF CONTAINERS OR ITEMS	
MATERIAL CLASS:	MATERIAL TYPE:			NUMBER	DESCRIPTION
LOT SEQUENCE NO.:		MBA: (TO)	PLANT:	GROSS WEIGHT:	
MATERIAL DESCRIPTION		STORAGE LOCATION:		TARE WEIGHT:	
SHAPE CODE:					

SIGNATURES: (SHIPPER) (TRANSPORTATION) (RECEIVER)

FS-F-2221 (REV. 3/9/92)

NUCLEAR MATERIAL TRANSFER/RECEIPT/IDENTIFICATION RECORD
FS-F-1990-2220-2221
Figure 3

RECORD OF REVISIONS

	REV. NO.	DESCRIPTION AND AUTHORITY
01-12-82	N/A	Minor wording changes.
01-12-82	N/A	Note added under item 7 to require quarterly inspection of drums in long term storage per SOP Change Request No. 650, initiated by D. L. Dunaway.
10-22-82	N/A	Use of six-inch diameter, 15-inch high container for UO_2 pellets <20% 235_U authorized per SOP Change Request No. 760, initiated by D. L. Dunaway.
11-19-84	N/A	Table 2-2 and Table 3 revised to make all FMPC Nuclear Safety procedures consistent per SOP Change Request No. 930, initiated by L. C. Dolan.
07-23-85	N/A	References to ≤20% 235_U changed to <20% 235_U per SOP Change Request No. 1197, initiated by N. K. Weichold.
02-16-93	0	Reissued to update to current Document Program requirements per Request No. P92-302, initiated by L. Moody. SOP 20-C-100 supersedes SOP 20-C-101, and SOP 20-C-102.

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CONTROL NO._____

SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0060
REVISION NO. 3

5 4554-

PACKAGING AND LOADING RADIOACTIVE MATERIAL FOR OFFSITE SHIPMENT

SSOP-0060

NON-CONTROLLED COPY

Effective Date: 03-01-93

AUTHORIZED BY: _____ 2/23/93
N. C. Kaufman, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
04-10-92	0	Procedure for packaging radioactive material for offsite shipment required per Request No. S92-096, initiated by J. W. Ogg.
06-01-92	1	Major revision required to ship 4A material by rail per Request No. S92-140, initiated by J. Ogg.
10-28-92	2	Minor revision required per Request No. S92-191, initiated by J. Ogg. Site Document Change No.s SC92-023, -024,-025, and -026 were incorporated in this revision.
03-01-93	3	Minor revision required to update method for preparing metal boxes per Request No. S92-251, initiated by J. Ogg.

1.0 PURPOSE

This document provides the procedure for preparing radioactive product materials for offsite shipment from the Fernald site.

2.0 SCOPE

This procedure is applicable to FERMCO personnel who perform the packaging and loading methods for shipping uranium product materials off-site. Packaging methods include container/vehicle inspection, container/pallet identification, palletizing containers or loose material, and filling containers with uranium product material. Loading instructions are provided for transporting the material by truck or by railcar.

3.0 DEFINITIONS

Briquette - Uranium material compressed into cylindrical forms.

Container - A container that meets DOT requirements.

Exclusive Use - The sole use of conveyance by a single consignor and for which all initial, intermediate, and final loading and unloading is carried out in accordance with the direction of the consignor or consignee. Any loading or unloading must be performed by personnel having radiological training and resources appropriate for the safe handling of the consignment. Specific instructions for the maintenance of exclusive use shipment controls must be issued in writing, and included with the shipping paper information provided to the carrier by the consignor.

Generator - The person, or FERMCO organization, who initiates an onsite movement or offsite shipment of material.

Gondola - An open-top railroad car.

4A Material - Uranium material designated for army use only.

Offsite - All areas outside the main perimeter security fence that are not controlled at all times by guards and security gates.

Overpack - A container into which one or more smaller containers are placed.

Package - A packaging plus its contents as presented for transportation.

Packaging - The assembly of one or more containers and any other components necessary to ensure compliance with the minimum packaging requirements of 49 CFR.

3.0 **DEFINITIONS** (cont.)

Loader - A piece of equipment utilized in the loading of materials.

Radioactive Material - Any material having a specific activity greater than 0.002 microcuries per gram per 49 CFR.

Resource Conservation and Recovery Act (RCRA) - The Congressional Act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control and proper management of hazardous waste.

Spill Material - Uranium material that is a result of an uncontrolled casting.

Uranium Product Material - Normal, depleted, or enriched uranium which will be in one of several different physical states such as various metal forms, uranium oxide, and residues.

4.0 **RESPONSIBILITIES**

4.1 The **generator/packager** shall comply with this procedure.

4.2 The **supervisor** of the area or packager shall:

- Specify applicable scale check procedures and standard tare weight of packages.
- Ensure packaging materials are available for personnel.
- Ensure that trained personnel package material.
- Determine disposition of material identified in this procedure.
- Ensure that personnel package material for shipment to meet applicable DOE, DOT, and EPA regulations.
- Contact Industrial Hygiene and Radiological Safety to determine the appropriate respiratory protection for the process being performed and the radiological surveys required for materials moving in and out of regulated areas.
- Provide personnel with the required respiratory protection.
- Ensure the lid on an unfilled waste container is secured when no packaging is occurring to prevent additions of unknown materials.
- Ensure packages are weather-protected before, during, and after use to prevent moisture build-up.

4.0 **RESPONSIBILITIES** (cont.)

- Contact Radiological Safety for a radiological work permit or other safety permits and ensure permits are obtained and signed prior to performing work.

4.3 **Logistics Administration** shall specify the required container and provide a placard for the gondola.

4.4 The **Motor Vehicle Operator (MVO)** shall transport packaged material to the applicable staging area and move metal boxes for weighing.

4.5 **Materials Control and Accountability (MC&A)** shall prepare documentation for off-site shipment of the material.

4.6 The **Radiological Safety Technician** shall issue a radiological work permit and perform contamination and radiation surveys.

4.7 **Quality Assurance** shall certify metal boxes for offsite shipment.

4.8 **Transportation** shall provide equipment and resources necessary for the packaging and movement of materials.

4.9 **Facilities and Material Evaluation (F&ME)** shall provide to the generator documentation specifying evaluation results for the material.

5.0 **GENERAL**

5.1 Stencilling shall be 1-1/2 inch (minimum) legible block letters using waterproof ink/paint unless otherwise specified.

5.2 Supplies required to perform the packaging and loading operation shall be obtained as instructed by the supervisor unless otherwise specified.

5.3 On-site movement of material must comply with PP-0314.

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 Safety glasses with side shields shall be worn unless other eye protection is specified.

6.2 Respiratory protection provided by the supervisor shall be worn when required.

6.3 Leather-palm gloves shall be worn when handling containers, operating equipment, and when handling rough, sharp-edged, or contaminated material.

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS** (cont.)

6.4 HEPA type filter vacuum cleaners or a vacuum system approved by IRS&T with a current DOP test label properly affixed to vacuum shall be used for cleaning.

6.5 Personnel shall remain outside of metal boxes.

6.6 Personnel shall stand a minimum of 10 feet away from crane load when loading the gondola car except when inserting or removing lift fixture.

6.7 Generator/Packager shall read and sign safety permits for the task.

6.8 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance or possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit a urine sample. The involved employees shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

Warnings and Cautions shall precede the step to which they apply. Notes follow the applicable step.

7.0 **PROCEDURE**

7.1 MATERIAL EVALUATION

GENERATOR/PACKAGER

1. Ensure a Material Evaluation Form (MEF), FS-F-3252 has been completed determining the material as RCRA/Non-RCRA and additional documentation from Facilities and Material Evaluation (F&ME) has been provided specifying evaluation results for the material.

   NOTE: A sample of the material for Toxic Characteristic Leaching Process (TCLP) may be required as requested by F&ME.

   a. If an MEF has not been generated, obtain a numbered MEF from F&ME and initiate a "Material Evaluation" per SSOP-0002.

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7.1 MATERIAL EVALUATION (cont.)

GENERATOR/PACKAGER

b. If the material is determined to be RCRA, notify the supervisor for disposition.

NOTE: RCRA material shall not be shipped.

c. If the material is Non-RCRA, proceed to 7.1, step 2.

2. If notified by the supervisor a sample is required, obtain a sample of the material per SOP 1-C-101.

7.2 FILLING DRUMS WITH BRIQUETTES (See Figure 1)

GENERATOR/PACKAGER

1. Obtain an empty 55-gallon drum from Transportation and inspect for damage, such as corrosion, dents, holes or other defects (refer to Tables 1, 2, and 3).

2. Obtain 10-gallon cans containing briquettes from storage.

3. Prior to filling the drum, place both containers on herculite, side by side.

4. Manually place a one-inch maximum layer of dicalite into the bottom of the drum.

5. Pour sand evenly into drum until a 3 inch layer is formed on the bottom of drum.

6. Remove lid(s) from 10-gallon can(s) and manually transfer 9 briquettes, positioned side by side, on top of the layer of sand in the drum.

   NOTE: The briquette is cylindrical, approximately 4 inches in diameter and 2 to 4 inches thick. The average weight is 6 to 8 pounds.

7. Pour sand evenly over the 9 briquettes forming a 3 inch layer over the briquettes.

7.2 FILLING DRUMS WITH BRIQUETTES (cont.)

GENERATOR/PACKAGER

8. Continue filling the drum with briquettes and sand in the sequence instructed in section 7.2, steps 5 through 6.

   NOTE: The drum will hold 5 layers of briquettes and 6 layers of sand.

9. Place lid on drum and secure the lid bolt-type lock ring/lever, as applicable.

10. Request Radiological Safety to complete radiation monitoring of the drum.

11. Stencil or label drum and lid with the identification shown in Figure 1 and proceed to Section 7.3, step 6 to prepare drum for loading.

    a. Obtain Item Number (Drum Number) from MC&A.

    b. For Drum Uranium (DU) weight, utilize data from 10-gallon can.

    c. To calculate the Total Weight, add the sand weight (360 lbs) plus DU weight plus the drum tare weight.

    d. Obtain DU activity, Direct Reading (DR)-contact, and DR-1 meter from the Radiation Safety Technician.

12. Dispose of 10 gallon cans and respirable fines as instructed by supervisor.

7.3 PREPARING FILLED DRUMS FOR LOADING

CAUTION: **PRIOR TO PERFORMING THE PACKAGING OPERATION, EACH CONTAINER SHALL BE INSPECTED BY THE GENERATOR/PACKAGER TO ENSURE THE INTEGRITY OF THE CONTAINER.**

GENERATOR/PACKAGER

1. Visually inspect the drum for damage, such as corrosion, dents, holes or other defects (refer to Tables 1, 2 and 3).

   a. If damaged, mark the lid or side of the damaged drum with a red "X" and refer to Tables 1, 2, and 3 for correct action, as applicable.

7.3 PREPARING FILLED DRUMS FOR LOADING (cont.)

GENERATOR/PACKAGER

2. Visually inspect each drum for free-standing liquid.

   a. If liquid is present, remove liquid by either vacuuming or use a nonsparking tool, to place a hole in bottom of container for draining liquid.

   b. If the liquid is water, dispose of water through the waste water treatment system as directed by supervisor.

3. For a drum of uranium material other than 4A material, label or stencil the inventory and the lot and drum number on the drum in accordance with the FEMP Lot Marking and Color-Coding System, RM-0005 (see Figure 2).

4. For a drum of 4A material, stencil or label the center of the drum at drum seam with the name of the 4A material type, "Radioactive-LSA", Yellow II, and Flammable Solid Labels.

   NOTE: Bar-code labels may be used in place of stencilling.

5. Secure the drum lid bolt-type lock ring/lever lock, as applicable.

6. Weigh the drum (excluding drums of 4A material) as instructed by supervisor.

   NOTE: The supervisor shall specify the scale and the method of transporting the drum to the scale. A currently calibrated accountability scale shall be used.

   NOTE: Drums of 4A material shall not be weighed.

7. For drums of 4A material, ensure the weights are identified on the drum. If not, obtain the weight as directed by supervisor.

8. Transport drum to scale as instructed by supervisor.

9. Inspect the scale to be used.

   NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

10. Using forklift, move the container onto the scale.

7.3 PREPARING FILLED DRUMS FOR LOADING (cont.)

GENERATOR/PACKAGER

11. Record weight of drum on "Item Production/Certification/Identification" XX Card, Form FS-F-1945-XX (see Figure 3).

12. Using forklift, remove the container from the scale and move to the loading area.

13. Record the data from the container on the "Item Production/Certification/Identification" XX Card, Form FS-F-1945-XX.

14. Label or stencil the container with the gross weight and net weights using 1-1/2 to 2 inch (minimum) letters in location shown in Figure 2.

    NOTE: This step is not applicable to 4A material.

15. Complete the "Item Production/Certification/Identification" Card, Form FS-F-1945-XX by entering the required weights and transmit card to MC&A.

16. As instructed by the supervisor, overpack the container per SOP 20-C-600.

7.4 SECURING AND PALLETIZING DRUMS

GENERATOR/PACKAGER/MOTOR VEHICLE OPERATOR (MVO)

1. Using the hoist/crane and lifting fixture or equipment specified by supervisor, place the appropriate number of drums per Table 4 with bolt of lock ring facing outward on a pallet.

2. Strap or band the container(s) together and to the pallet.

3. Per the applicable department procedure, move the pallet(s) to the area designated by the supervisor for loading.

7.5 SECURING AND PALLETIZING 4A URANIUM PIECES

GENERATOR/PACKAGER

1. Obtain a pallet and place herculite material over pallet.

2. Place rubber over the herculite material on pallet.

7.5 SECURING AND PALLETIZING 4A URANIUM PIECES (cont.)

GENERATOR/PACKAGER

3. Using a lifting fixture/device, remove large pieces of spill metal from drum.

   a. If large pieces cannot be lifted, use a drum turner within a HEPA filtrated enclosure to invert drum for removal of the material.

4. Place large pieces on pallet, maintaining weight limitation per Table 6.

5. For small pieces, obtain an empty drum and ensure interior is free of water.

   a. If water is present, dispose at nearest sump.

6. Manually remove small pieces of spill metal from drum and place in empty drum or using a drum turner, transfer small pieces to another drum within a HEPA filtrated enclosure.

7. Vacuum any loose residuals from the uranium pieces on pallet and/or in the drum.

8. As applicable, remove drum containing small pieces from HEPA enclosure, secure drum lid (lever-lock ring or bolt-ring closure), and label or stencil material type on the drum.

9. On the pallet, wrap uranium pieces in rubber and/or herculite material.

10. Band wrapped material together on pallet as shown in the applicable Figure 4, 5, or 6, as applicable.

    NOTE: Spill material and duds are jagged, irregular shapes and will either be packaged in drums or banded to skids at the discretion of the supervisor.

11. Shore and band material to pallet as shown in Figure 4, 5, or 6, as applicable.

12. Stencil or label the pallet edge with the identification of "Radioactive - LSA".

7.6 PREPARING AND FILLING METAL BOXES

CAUTION: **METAL BOXES SHALL ONLY BE USED FOR NONPRESSURE BUILDUP MATERIAL UNLESS BOX IS VENTED.**

NOTE: Section 7.6 is not applicable to the preparation of 4A material.

GENERATOR/PACKAGER

CAUTION: **PRIOR TO PERFORMING THE PACKAGING OPERATION, EACH CONTAINER SHALL BE INSPECTED BY THE GENERATOR/PACKAGER TO ENSURE THE INTEGRITY OF THE CONTAINER.**

1. Visually inspect box surfaces for rust, dents, or holes per Tables 1, 2, and 3.

   a. If box is damaged, mark side with a red "X" and complete corrective action per Tables 1, 2, and 3.

   b. If the bottom of the box has a drain plug, ensure plug is securely in place.

SUPERVISOR

2. Specify the scale and the method of transporting the box.

   NOTE: A currently calibrated accountability scale shall be used.

GENERATOR/PACKAGER

3. As instructed by supervisor, move the empty metal box to the staging area.

4. Remove banding and cardboard packing material from the metal box and place in a designated container.

5. Tare weigh each twentieth box to verify standard tare weight as follows:

   a. If scale to be used as specified by the supervisor has not been checked, inspect scale.

      NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

   b. Place box on the scale and obtain tare weight.

7.6 PREPARING AND FILLING METAL BOXES (cont.)

GENERATOR/PACKAGER

6. Record the weight on a "Box Tare Weight Check", Form FMPC-PRO-2867 (see Figure 7).

7. Remove box from the scale.

8. Using a forklift, move box to a designated location for packaging.

9. Remove box lid and place in a designated location to prevent damage.

10. For materials being shipped to the Nevada Test Site (NTS), place a minimum of one bag of dicalite or absorbent material in the bottom of each box.

    CAUTION: USE EXTREME CARE WHEN HANDLING CONTAINERS TO AVOID PINCH POINTS OF THE BODY.

11. Obtain containers to be loaded in metal box.

12. Complete an "Item Production/Certification/Identification Card", Form FS-F-1945-XX per container, including the container lot number and tare weight, and transmit to MC&A.

13. Remove lid from each container and check the material amount in container.

    CAUTION: ANY ADDITION OF URANIUM MATERIAL TO A CONTAINER SHALL BE PERFORMED INSIDE A HEPA FILTRATED ENCLOSURE.

    a. If additional material can be added to the container, complete the following steps.

        1) Perform one of the following actions, as directed by supervisor.

            a) Load containers into metal box (use applicable substep a, b, or c in section 7.6, step 18) and move box into HEPA filtrated enclosure.

            NOTE: Box gross weight shall not exceed 8,000 pounds.

            b) Move container(s) into HEPA filtrated enclosure.

7.6 PREPARING AND FILLING METAL BOXES (cont.)

GENERATOR/PACKAGER

2) Obtain an additional drum containing uranium material.

3) Using a drum turner within the enclosure, invert drum and fill void space in top portion of each container.

4) If necessary, manually remove small pieces of uranium metal from inverted drum and place inside containers.

5) When inverted drum is empty, remove from enclosure.

6) Check top portion of container(s) for remaining void spaces.

a) If void spaces are present, repeat substeps 1 through 5) until spaces are filled.

b) When void spaces are not present, replace lid on container(s) and secure.

7) Remove box or container from enclosure and proceed to step 19.

a) For a loaded metal box, proceed to step 19.

b) To load full container(s) into metal box, proceed to step 14.

b. If the container is full, secure lid and proceed to step 14.

14. Ensure that the hoist/crane to be used has been inspected per applicable SOP for the area.

15. Place lifting device over container.

16. Attach the lifting device specified by the supervisor on each side of the container.

17. Position container over the top of the box.

NOTE: BOX GROSS WEIGHT SHALL NOT EXCEED 8,000 POUNDS.

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7.6 PREPARING AND FILLING METAL BOXES (cont.)

GENERATOR/PACKAGER

18. Lower container into box and remove the lifting device.

    a. If 30-gallon drums are being loaded, lower eight drums into box.

    b. If 55-gallon drums are being loaded, lower six drums in box.

    c. If 10 gallon cans are being loaded, proceed as follows:

        1) Lower 24 cans in the metal box as shown in Figure 8.

            NOTE: The bottom layer will consist of 15 ten-gallon cans in a configuration of three rows of five containers each.

            CAUTION: **A MINIMUM OF TWO PERSONNEL SHALL MOVE PLYWOOD USING PROPER LIFTING TECHNIQUES.**

        2) Place one sheet of 1/2 inch plywood with 2" X 4" lumber shoring material facing upward on top of first layer of containers.

            NOTE: The top layer will consist of nine containers in a configuration of three rows of three containers each. The nine will be spaced one container width from each end of the metal box.

        3) On top row, place one sheet of 1/2 inch plywood with 2" X 4" lumber shoring material facing downward between the cans and the inside edge of the box to prevent shifting as shown in Figure 8.

19. When box is full, place lid on box and notify supervisor box is loaded.

7.6 PREPARING AND FILLING METAL BOXES (cont.)

SUPERVISOR

20. For solid uranium metal packaged in metal boxes, check each end of box exterior to ensure NucFil vent filters (016) with 2" pipe threads have been installed.

    a. If filters have been installed, proceed to step 22.

    b. If filters have not been installed, instruct generator/packager to install filters.

21. Specify the scale to be used.

    NOTE: A currently calibrated accountability scale shall be used.

22. If not already completed, perform scale check according to the applicable SOP in the area of the packaging operation and notify MVO to move box to the scale.

    NOTE: The scale shall be inspected and operated in accordance with the applicable scale procedure for the area of the packaging operation.

MVO

23. Using an 8,000 lb industrial forktruck, move the box on to the scale.

GENERATOR/PACKAGER

24. Weigh the box, including box pins and other hardware, to ensure gross weight does not exceed 8000 lbs for a metal box.

MVO

25. Remove the box from the scale.

7.6 PREPARING AND FILLING METAL BOXES (cont.)

GENERATOR/PACKAGER

26. Record the tabulated gross and tare weights, and contents on the FS-F-1945-XX card.

27. Label or stencil on the box the shipment log number, box identification, and tare, net, and gross weights (see Figure 9).

28. Label or stencil "Radioactive - LSA" on the box as shown in Figure 9.

29. Using white paint, paint over wherever "DOT 7A Type A" appears on the container.

    NOTE: The metal box shall be used as a strong tight container transported in exclusive use vehicle service.

30. Notify supervisor that package is ready for inspection.

SUPERVISOR

31. Notify QA the box is ready for certification.

QUALITY ASSURANCE

32. Inspect the box per the applicable department procedure for certification.

    a. If the box is not certified, complete a DCAR per SSOP-0023, tag the box for correction, and notify the generator/packager.

GENERATOR/PACKAGER

33. Using fabric strapping, secure lid on the box for interplant shipment.

34. Notify the supervisor that boxes are ready to be moved to the staging area.

MVO

35. Using an 8,000 lb industrial forktruck, move box to the staging area.

7.7 SECURING METAL BOX CONTAINER LID (See Figure 10)

NOTE: Section 7.7 is not applicable to the preparation of 4A material.

GENERATOR/PACKAGER

1. Remove the lid edge protector from the container.

2. Position the container lid on edge with the bottom facing out and leaning against the container.

   NOTE: The lid shall be leaning at an angle so that the lid will not fall.

3. Install a neoprene sponge rubber gasket on the lid sealing surface if applicable.

4. Place the lid into position on top of the container.

5. Secure the lid as follows:

   a. Install bolts as shown in Figure 10.

   b. If "L" clips are required, using the tool provided, install "L" clips in sequence on corners, sides, front, and back of the container (see Figure 10).

      NOTE: Four clips shall be in place on each of the two sides of the container, plus three clips in front and three in back, for a total of 14 clips.

      NOTE: The clips are the primary container closing/locking devices.

   c. Using a wide-edged blunt chisel, bend the bottom edge of the clip locking strap inward until the strap is secured.

GENERATOR/PACKAGER

6. Install the lid edge protector on the container.

7. Using 3/8 X 16 hex bolts, washers, and hex head elastic stop nuts, secure the edge protector on the container.

   NOTE: The hex bolts are used to hold the edge protector in place and not for lid security.

7.8 LOADING CONTAINERS/PALLETS ON A TRUCK

GENERATOR/PACKAGER

8. Finger-tighten each hex nut.

9. Using a torque wrench, tighten the hex bolts until a minimum of two threads are visible beyond the nut.

10. Notify supervisor the box is secure and ready for offsite shipment.

NOTE: Section 7.8 is not applicable to 4A material.

GENERATOR/PACKAGER

1. Inspect truck interior for any structural damage.

   a. If truck is damaged, notify supervisor.

      NOTE: Truck will be repaired or rejected.

2. Using a forklift, move containers or pallets from staging area on to truck per Transportation's instructions.

7.9 LOADING PALLETS IN A GONDOLA (See Figure 11)

NOTE: Section 7.9 is applicable to 4A material only.

NOTE: A minimum of two personnel is required to perform Section 7.9.

NOTE: Briquettes shall be loaded in a separate gondola. Briquettes are not to be loaded with other material.

GENERATOR/PACKAGER

1. Inspect gondola interior for structural damage.

   a. If gondola is damaged, notify supervisor.

      NOTE: Gondola will be repaired or rejected.

2. Obtain liner from supervisor.

   NOTE: The liner is not intended to be airtight. It is only intended to protect the material from the weather.

7.9 LOADING PALLETS IN A GONDOLA (See Figure 11) (cont.)

GENERATOR/PACKAGER

3. Carefully remove outer packaging from the liner.

4. Place the liner in the gondola as directed by supervisor.

5. Unroll the liner to the opposite end of the gondola.

6. Walk down the center aisle of the single layer of liner and pick up the hem as marked and place over the side of the gondola. Repeat for the other side of the gondola noting that the liner side marked "toward the loader" is the liner section to be placed over the side where the material loading activity is to be performed.

7. Place the liner end flaps over the ends of the gondola.

   NOTE: There should be a 6 inch minimum overhang over the corners.

8. Check liner for a uniform fit in the gondola and adjust as needed.

9. Lay one plywood sheet, a minimum of 1/4 inch thick, on top of liner.

10. Place 2 inch by 4 inch piece of lumber against inside bottom edge of gondola car.

11. Place one 2 foot by 8 foot plywood piece on each end of car resting on its edge per Figure 12.

12. Using an overhead crane with pallet fork lifting device or other lifting device, place pallet in gondola as follows:

    a. Lift pallet of material and move over the gondola.

    b. Slowly lower and position pallet in the gondola per Table 5, as applicable.

13. Ensure loading of pallet does not drag down the sides of the liner into the gondola.

14. Insert shoring between pallets per Table 5 or band entire load to prevent shifting during transport. The end row material have to be loaded individually.

15. When loading is complete, fold the liner end flaps into the car.

7.9 LOADING PALLETS IN A GONDOLA (See Figure 11) (cont.)

GENERATOR/PACKAGER

16. Remove the coiled ropes, with bungee sections, attached to the one end flap.

17. Uncoil the ropes to the other end.

18. Thread the ropes through the receiver loops provided on the opposite end flap.

19. Pull the ropes snug and tie off the rope to itself.

20. Ensure the bungee sections are not pulled to their limit.

21. Remove the 2 end ropes from the surface of each end flap and temporarily place over the ends of the gondola.

    NOTE: These are the final end tie ropes.

22. Fold the first side flap into the gondola and over the drums or material.

    NOTE: This first side flap is the flap on the loading side.

23. Ensure the flap crests the top of the material.

24. Remove the 8 ropes, with bungee cords, that are taped to the inside of the second flap (opposite of the load side flap).

25. Tie the 8 ropes to the 8 receiver holes of the first flap by threading each through the receiver hole, looping the rope and rethreading the rope back through the receiving hole again. Pull snug and tie the rope back to itself.

26. Untape the ends of the 23 cross ropes affixed to the surface of the bottom flap and temporarily place over the gondola loading side.

27. Fold over the top flap (opposite of load side) and thread the 15 continuous cross ropes with bungee sections (out of 23) through the receiver hole in the hem. Loop and rethread the rope through the receiver holes, pull snug, and tie to the opposite (previously over the end of the gondola) cross ropes end.

7.9 LOADING PALLETS IN A GONDOLA (See Figure 11) (cont.)

GENERATOR/PACKAGER

28. Tie the 8 intermittent ropes (placed temporarily over the end of the car; no bungee sections; no mating rope at the opposite side) through the receiver hole in the hem, loop, rethread through the receiver hole, pull snug, and tie the rope back to itself.

29. Tie each of the final end ropes (2 on each end) to the most convenient of the four crossing ropes near each end of the gondola.

30. Ensure the sections of bungees attached to the 15 continuous cross ropes are not pulled to their limit.

31. Manually install metal tarp supports in each hole located on the sides of the gondola car.

    CAUTION: DO NOT ALLOW TARP TO BE WITHIN TWO INCHES OF SAFETY APPLIANCES (LADDER/BRAKE WHEEL).

32. Cover top of gondola with a tarp if partially or fully loaded.

    NOTE: The gondola shall remain covered at all times except when loading pallets.

33. Using nylon rope, feed rope through weld metal eyelets at each corner of gondola car to tie tarp down.

34. Affix placards, provided by Traffic, on both sides and ends of gondola exterior.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE 1540.1, "Materials Transport and Traffic Control Management"
- DOE 5632.2A, "Physical Protection of Special Nuclear Material and Vital Equipment"
- 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions"

8.2 REFERENCES

- PP-314, "Packaging, On-Site Movement, and Off-Site Shipment of Material"
- SSOP-0002, "Completing the Material Evaluation Form"
- SSOP-0023, "Deviation and Corrective Action Reporting"
- RM-0005, "FEMP Lot Marking and Color-Coding System"
- SOP 20-C-600, "Overpacking Defective Containers"
- SOP 1-C-101, "Sampling Residue and Waste Materials"

9.0 APPLICABLE FORMS

- FS-F-1945-XX, "Item Production/Certification/Identification"
- FMPC-PRO-2867, "Box Tare Weight Check"

10.0 FIGURES

- Figure 1, Example of Briquette Drum Markings and Cut Away View
- Figure 2, Example of Packaging Container Markings/Labels
- Figure 3, Item Production/Certification/Identification Card
- Figure 4, Diagram of Uranium Metal Ingot Arrangement on Pallet
- Figure 5, Diagram of Uranium Metal Billet Arrangement on Pallet
- Figure 6, Diagram of Uranium Duds and Spill Arrangement on Pallet
- Figure 7, Box Tare Weight Check Form
- Figure 8, Diagram of Container Arrangement in Metal Box
- Figure 9, Diagram of Metal Box Identification
- Figure 10, Lid Installation
- Figure 11, Diagram of Loading Pallets in Gondola
- Figure 12, Plywood Positioning

TABLE 1
CORROSION INSPECTION CATEGORIES

CATEGORY	CHARACTERISTIC	COULD CAUSE LOSS OF DRUM INTEGRITY		CORRECTIVE ACTION
		YES	NO	
A	Severe corrosion with deep pitting and/or metal flaking	X		As directed by supervision **NOTE**: Disposition shall be within 24 hours.
B	Corrosion with shallow pitting and/or mild metal flaking		X	As directed by supervision
C	Surface rust with no pitting and mild paint flaking which exposes bare metal		X	Remove rust and flake paint and paint as scheduled by supervisor

TABLE 2
LEAKER INSPECTION CATEGORIES

TYPE	*CHARACTERISTIC*	*CORRECTIVE ACTION*
I	Material flowing from container and accumulation on pallet or pad.	1. Notify supervisor. **NOTE**: Supervisor notifies AEDO. 2. Immediately stop or contain leak. 3. Record on inspection form the container requires mitigation within 24 hours. 4. Complete additional cleanup as necessary. **NOTE**: Supervisor shall initiate an Occurrence Report.
II	Material on drum exterior only; no material on pallet or pad.	1. Record leak on inspection form. 2. Notify supervisor. **NOTE**: Supervisor shall initiate an Occurrence Report. **NOTE**: Supervisor shall review the completed inspection forms to prioritize containers for transfer to overpack staging area and subsequent mitigation.
III	Container exterior discolored/ visible contamination; no material release.	1. Record condition on inspection form. **NOTE**: Supervisor shall schedule container for overpacking. **NOTE**: Supervisor shall initiate an Occurrence Report.

TABLE 3
DENT/BULGE STATUS

TYPE	*CHARACTERISTIC*	*CORRECTIVE ACTION*
1	Dents and/or bulges affect container to degree of potential or actual release	Overpack or transfer to new container
2	Dents and/or bulges not affecting container integrity	Continue to monitor
3	No visible dents and/or bulges on the container	No action necessary

TABLE 4
CRITERIA FOR PALLETIZING DRUMS

MATERIAL TYPE	*DRUM SIZE*	*WEIGHT LIMITATION PER PALLET*
4A Material Top Crops	30-gallon	8,000 pounds gross weight, including skid weight
4A Material Briquettes	55-gallon	8,000 pounds gross weight, including skid weight
4A Material 228 ARF	30-gallon	8,000 pounds gross weight, including skid weight
Uranium Material other than 4A	30 or 55-gallon	8,000 pounds gross weight, including skid weight

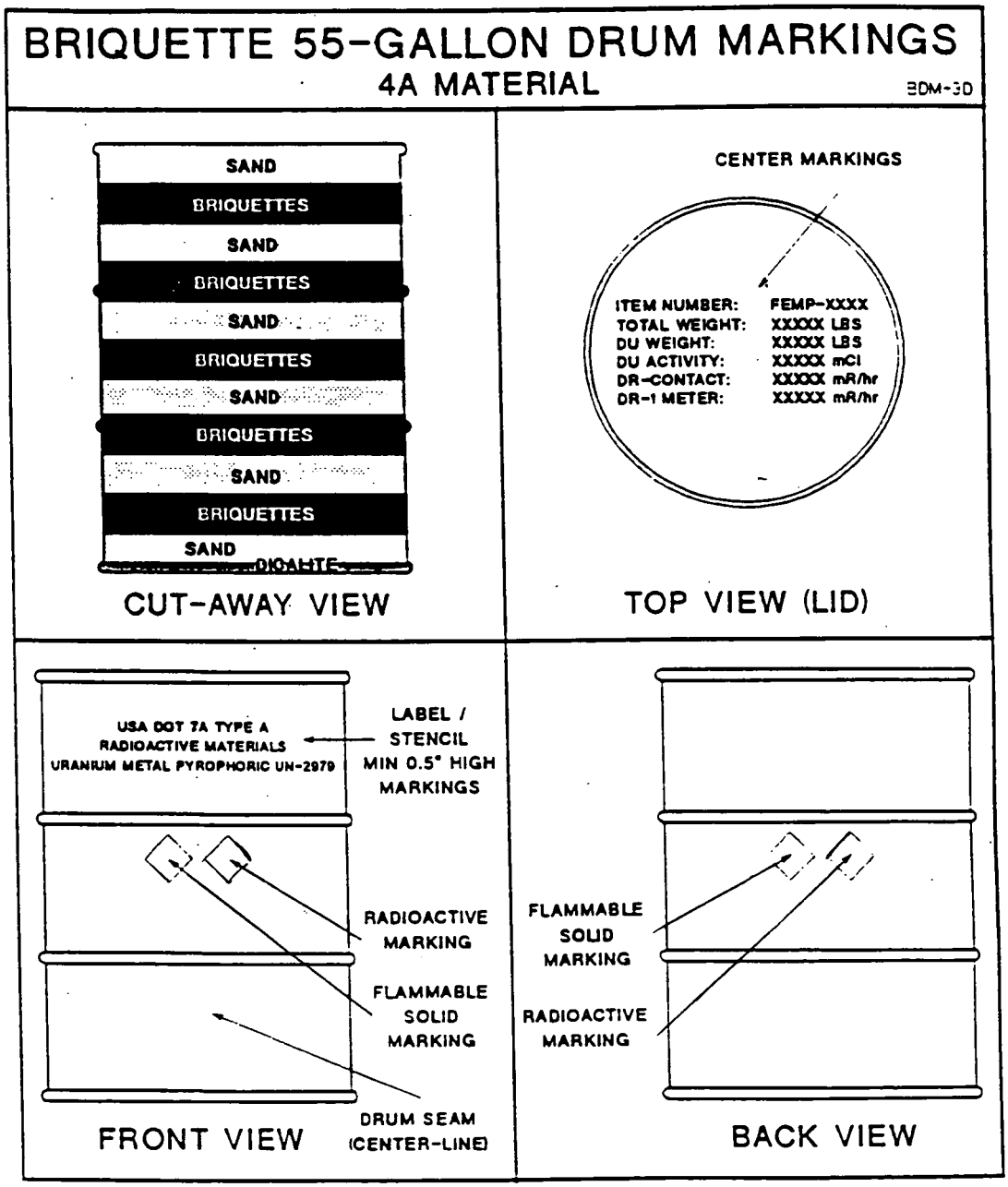
TABLE 5
PALLET ARRANGEMENT AND SHORING REQUIREMENTS

PALLET SIZE	*POSITION REQUIRED*	*SHORING REQUIRED*
48 inch	2 pallets wide and 12 to 13 pallets long in each row	18 inches between each pallet and 6 inches in length[1] or as applicable
36 inch	3 pallets wide and 16 to 17 pallets long in each row	6 inches between each pallet and 18 inches in length[1] or as applicable

[1] Banding of the material may be substituted in place of shoring, as determined by supervisor.

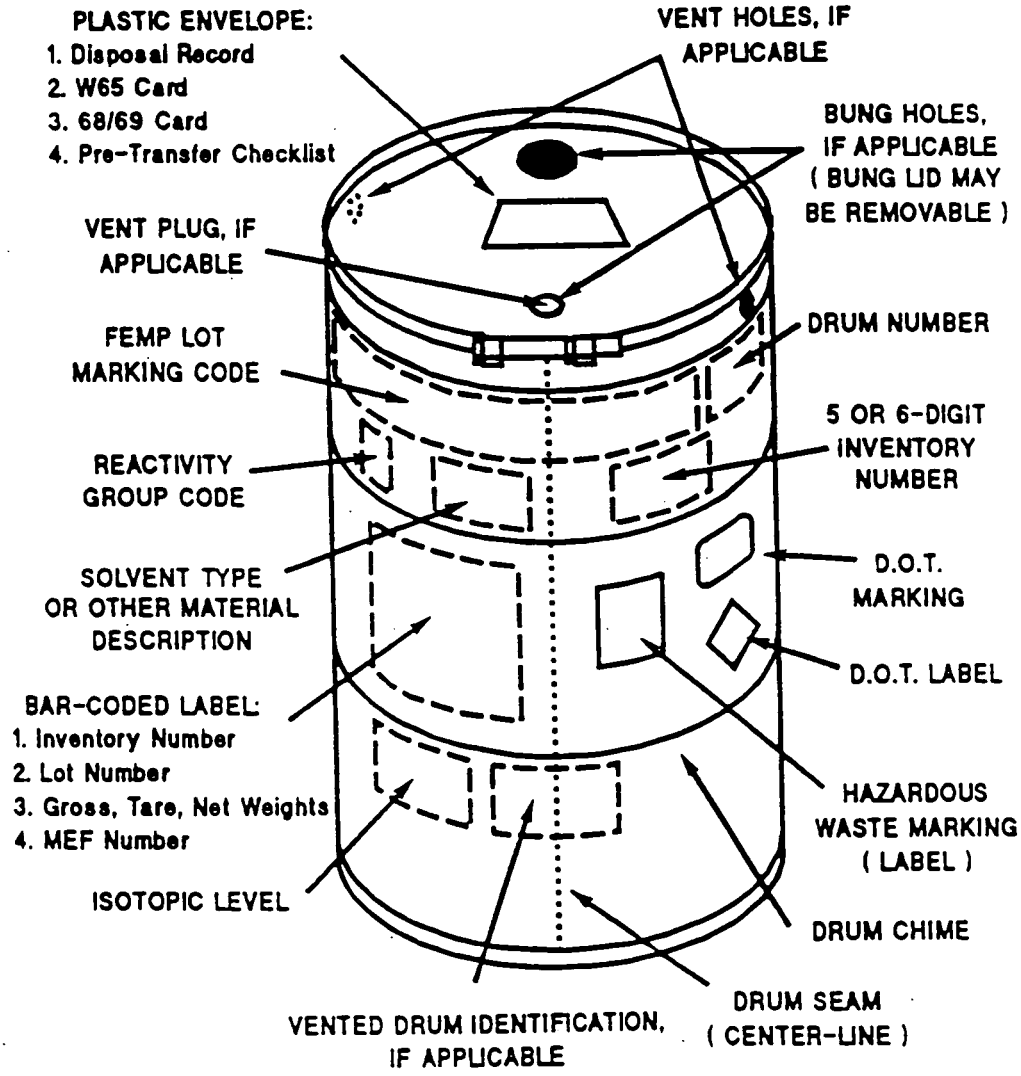
TABLE 6
CRITERIA FOR PALLETIZING LOOSE 4A MATERIAL

MATERIAL DESCRIPTION	*WEIGHT LIMITATION PER PALLET*
Ingots	8,000 pounds gross weight, including skid weight
Billets	8,000 pounds gross weight, including skid weight
Duds and Spills	8,000 pounds gross weight, including skid weight



EXAMPLE OF BRIQUETTE DRUM MARKINGS AND CUT AWAY VIEW
Figure 1

TYPICAL LABELING/STENCILING OF AN OPEN HEAD OR BUNG CONTAINER



EXAMPLE OF PACKAGING CONTAINER MARKINGS/LABELS
Figure 2

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO	DATE (MO / DAY / YEAR)	SHIFT	BADGE NO	PACKAGE NO

SEAL NUMBER	SEAL DATE (MONTH DAY YEAR)	PACKAGE PHYSICAL CERTIFICATION (YES NO)	PLANT	PROD MBA
		EMPTY CONTAINER AT START		
		RUST HOLES OR DENTS	PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS		MATERIAL IS AS CODED		
		PROHIBITED MATERIALS		
PACKAGE TYPE		LIQUIDS IN CONTAINER		
PACKAGE SIZE		MINIMUM OF VOID SPACE		
		PACKAGE SECURED		
		DRAIN PLUG SECURED		

GROSS WEIGHT
TARE WEIGHT
NET WEIGHT

GENERATOR SIGNATURE
FS-F-1945-XX (REV. 3/15/92)

SUPERVISOR SIGNATURE DATE

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE (MO / DAY / YEAR)	SHIFT	BADGE NO.	PACKAGE NO

SEAL NUMBER	SEAL DATE (MONTH DAY YEAR)	PACKAGE PHYSICAL CERTIFICATION (YES NO)	PLANT	PROD MBA
		EMPTY CONTAINER AT START		
		RUST HOLES OR DENTS	PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS		MATERIAL IS AS CODED		
		PROHIBITED MATERIALS		
PACKAGE TYPE		LIQUIDS IN CONTAINER		
PACKAGE SIZE		MINIMUM OF VOID SPACE		
		PACKAGE SECURED		
		DRAIN PLUG SECURED		

GROSS WEIGHT
TARE WEIGHT
NET WEIGHT

GENERATOR SIGNATURE
FS-F-1945-XX (REV. 3/15/92)

SUPERVISOR'S SIGNATURE DATE

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE (MO / DAY / YEAR)	SHIFT	BADGE NO.	PACKAGE NO

SEAL NUMBER	SEAL DATE (MONTH DAY YEAR)	PACKAGE PHYSICAL CERTIFICATION (YES NO)	PLANT	PROD MBA
		EMPTY CONTAINER AT START		
		RUST HOLES OR DENTS	PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS		MATERIAL IS AS CODED		
		PROHIBITED MATERIALS		
PACKAGE TYPE		LIQUIDS IN CONTAINER		
PACKAGE SIZE		MINIMUM OF VOID SPACE		
		PACKAGE SECURED		
		DRAIN PLUG SECURED		

GROSS WEIGHT
TARE WEIGHT
NET WEIGHT

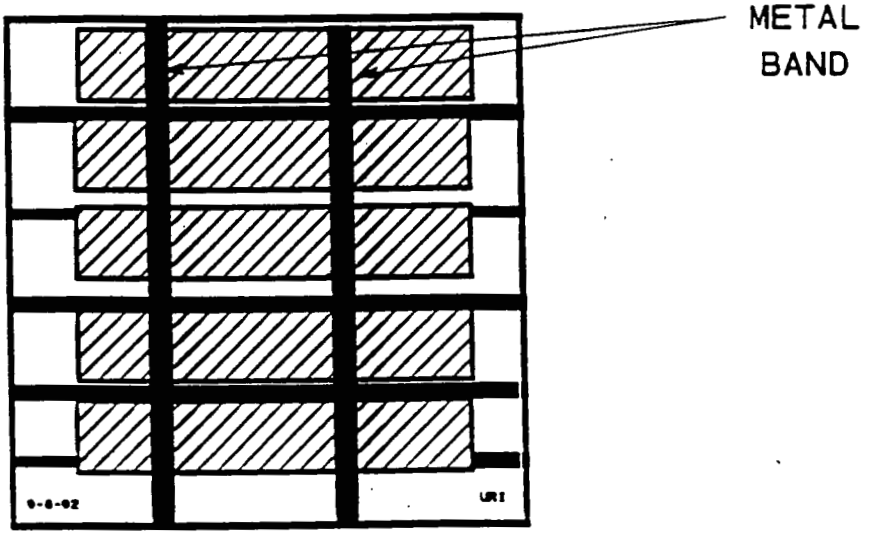
GENERATOR SIGNATURE
FS-F-1945-XX (REV. 3/15/92)

SUPERVISOR'S SIGNATURE DATE

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FORM FS-F-1945-XX
Figure 3

-4554-

URANIUM METAL ROUND INGOTS



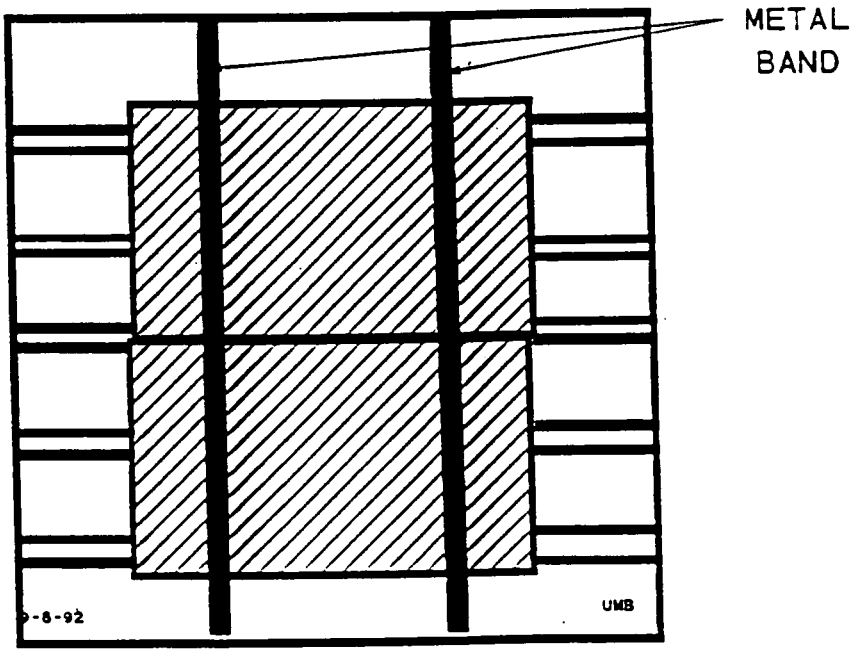
METAL SHALL BE WRAPPED IN RUBBER AND HERCULITE

METAL SHALL BE BANDED TOGETHER AND THEN TO THE PALLET

MAXIMUM GROSS WEIGHT 8000 POUNDS

DIAGRAM OF URANIUM METAL INGOT ARRANGEMENT ON PALLET
Figure 4

URANIUM METAL FLAT BILLETS



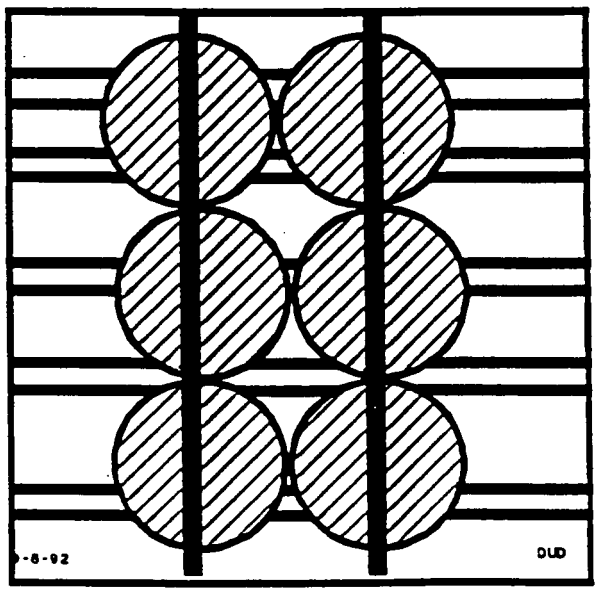
METAL SHALL BE WRAPPED IN RUBBER AND HERCULITE

METAL SHALL BE BANDED TOGETHER AND THEN TO THE PALLET

MAXIMUM GROSS WEIGHT 8000 POUNDS

DIAGRAM OF URANIUM METAL BILLET ARRANGEMENT ON PALLET
Figure 5

DEPLETED URANIUM METAL DUDS



METAL SHALL BE WRAPPED IN RUBBER AND HERCULITE

METAL SHALL BE BANDED TOGETHER AND THEN TO THE SKID

MAXIMUM GROSS WEIGHT 8000 POUNDS

(818

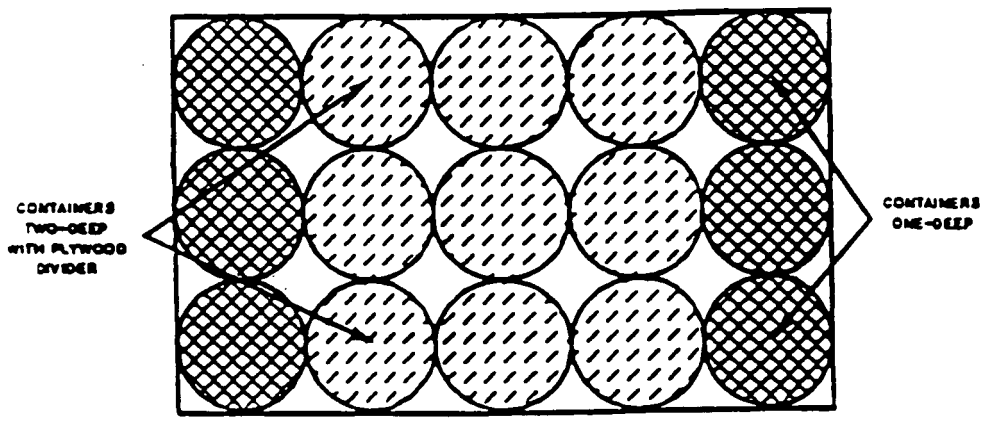
DIAGRAM OF URANIUM DUDS AND SPILL ARRANGEMENT ON PALLET
Figure 6

BOX TARE WEIGHT CHECK

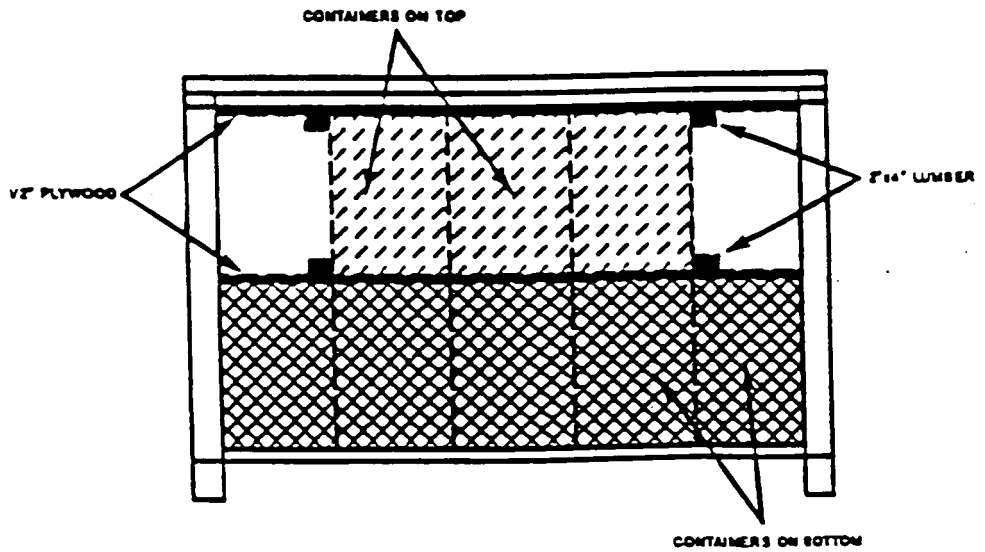
BOX NUMBER	DATE	TARE WEIGHT (LBS.)	BADGE NUMBER

FMPC-PRO-2867 (7-93)

BOX TARE WEIGHT CHECK
FORM FMPC-PRO-2867
Figure 7



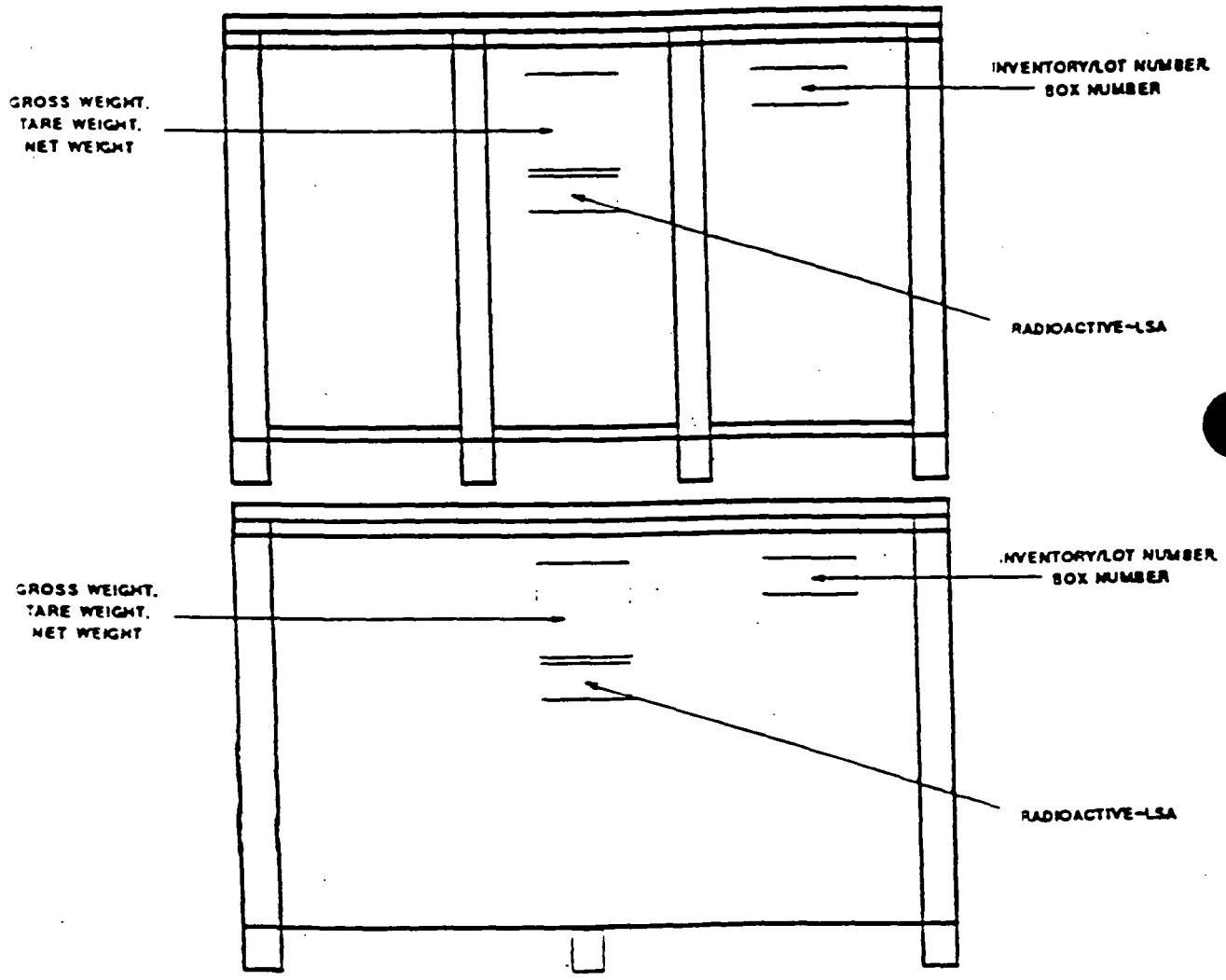
VIEW FROM TOP (WITHOUT WOOD SUPPORTS)



TRANSPARENT VIEW FROM SIDE

DIAGRAM OF CONTAINER ARRANGEMENT IN METAL BOX
Figure 8

TYPICAL METAL BOX MARKINGS FOR OFFSITE SHIPMENT

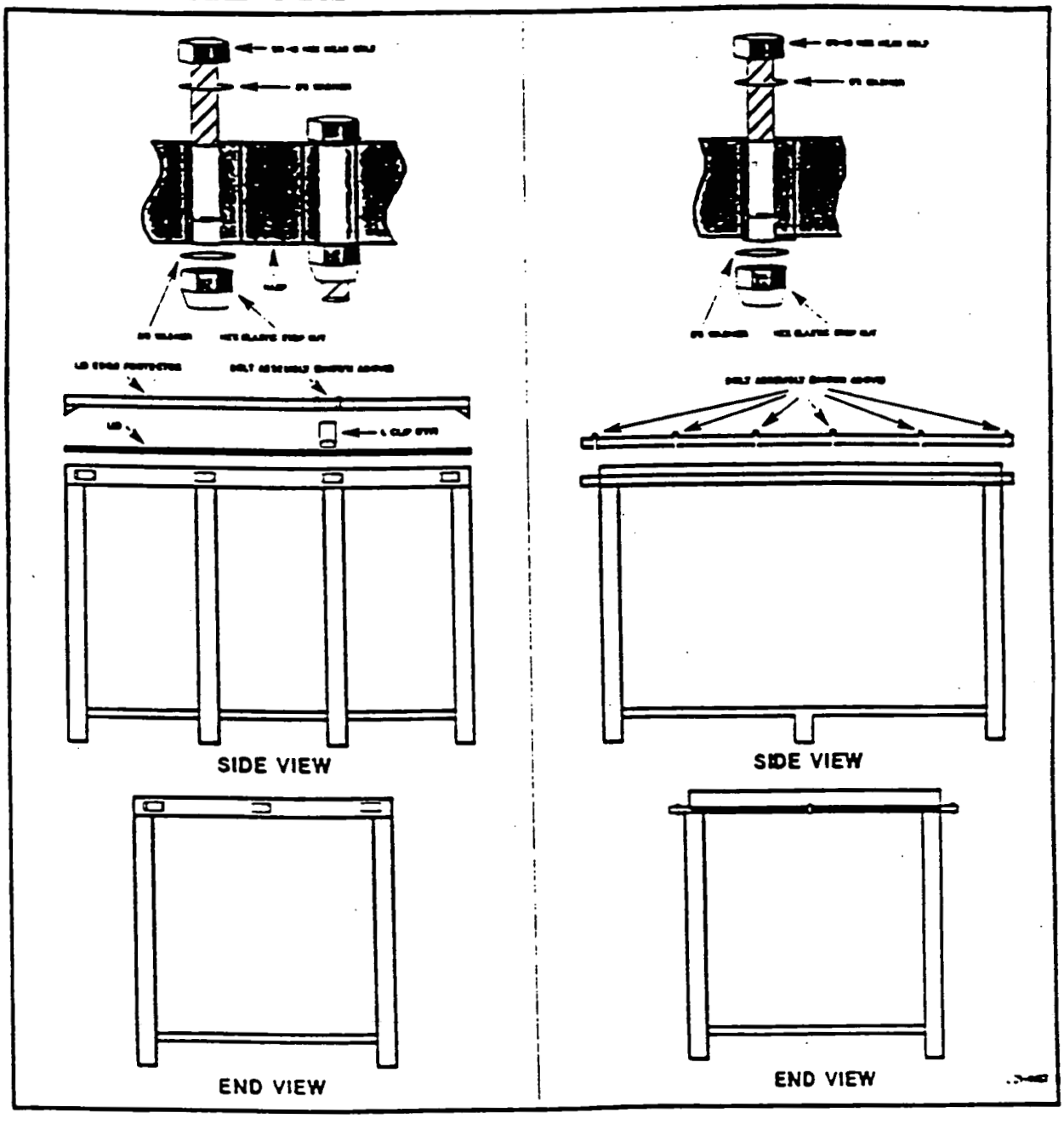


VIEW FROM SIDE

ALL MARKINGS SHALL BE A MINIMUM OF 1.5" TALL UNLESS OTHERWISE SPECIFIED.

DIAGRAM OF METAL BOX IDENTIFICATION
Figure 9

TYPICAL METAL BOX LID INSTALLATION



LID INSTALLATION
Figure 10

LOADING GONDOLA CARS

4A MATERIAL

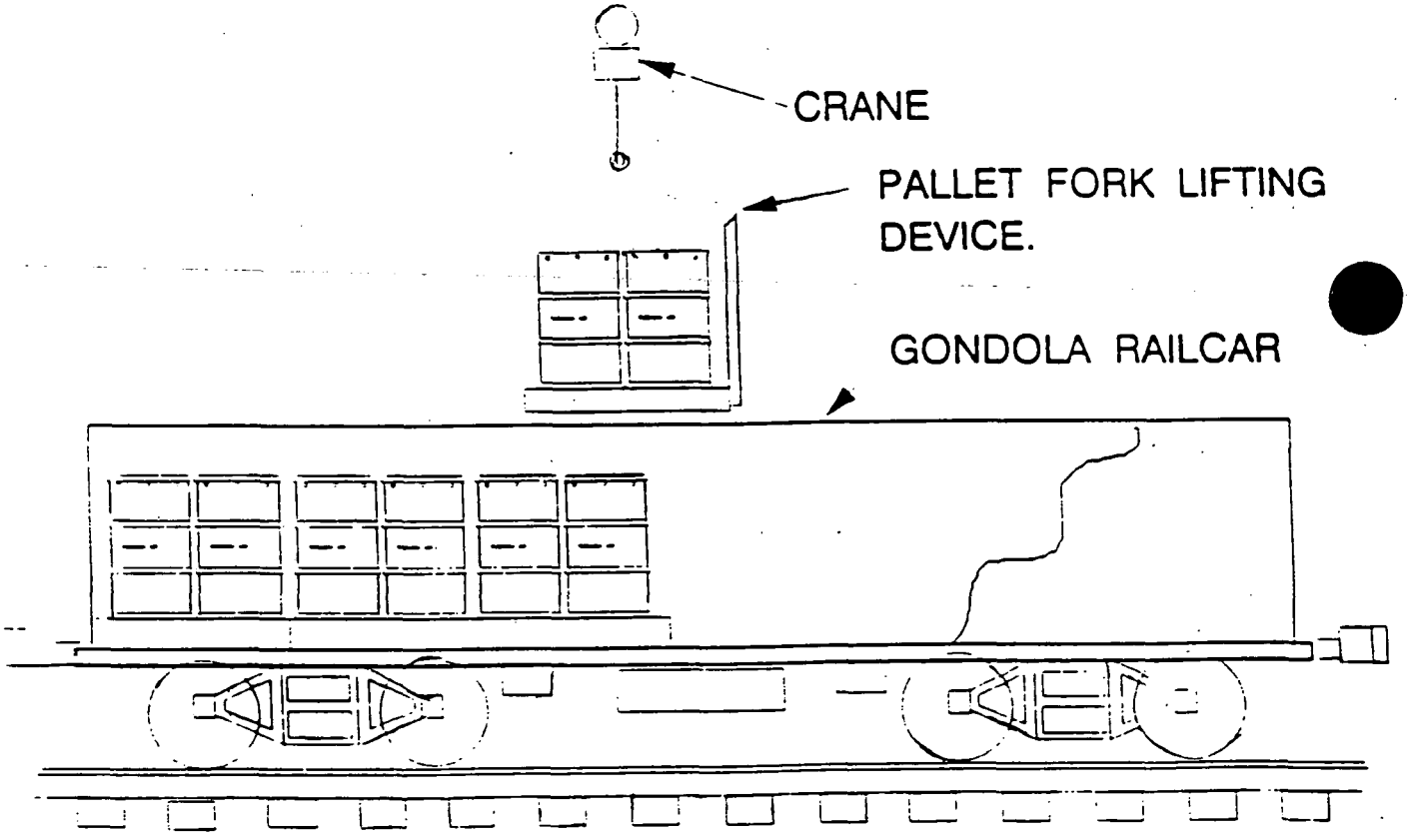
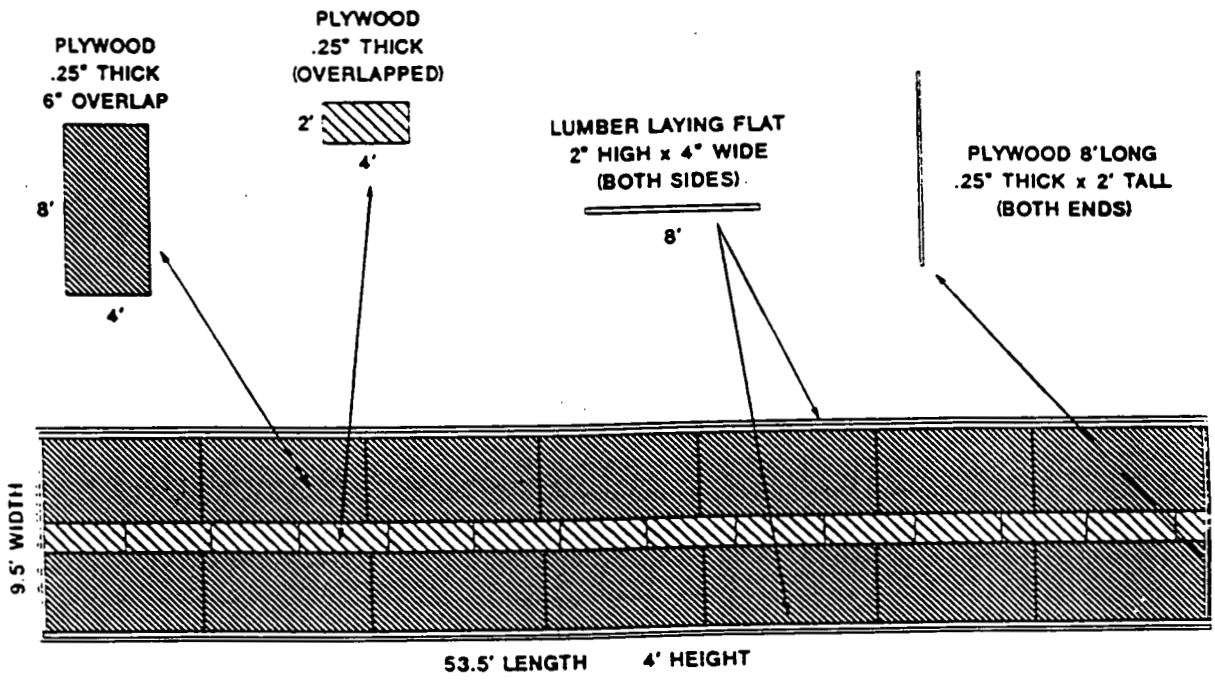


DIAGRAM OF LOADING PALLETS IN GONDOLA
Figure 11



GONDOLA CARS - TOP VIEW

PLYWOOD POSITIONING
Figure 12

REMEDIATION SUPPORT OPERATIONS PROCEDURE	CONTROL AND UTILIZATION OF CONTAMINATED TRASH DUMPSTERS	SOP 20-C-604 Area: As Applicable
(Signature On File) Authorization: R.L. Gardner Facilities & Warehousing Manager	Supersedes: None	Issue Date: 05-24-88

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1.0 **PURPOSE/DESCRIPTION**

The purpose of this document is to provide procedures for filling dumpsters with contaminated trash.

2.0 **APPLICABILITY**

This procedure is applicable to contaminated trash dumpsters.

3.0 **RESPONSIBILITIES**

3.1 **Site Services** shall be responsible for the following:

3.1.1 Providing personnel with training or training material on controlling contaminated trash dumpsters.

3.1.2 Ensuring that designated contaminated trash dumpster access doors remain locked when not in use.

3.2 **Supervisors** shall be responsible for the following:

3.2.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.2.2 Maintaining training records of personnel who are using the dumpsters.

3.2.3 Providing training records to Waste Operations.

3.2.4 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for handling contaminated trash.

3.2.5 Providing operators with the required respiratory protection.

R 3.2.6 Reviewing applicable Material Safety Data Sheets with operators.

3.3 **Waste Generators** shall be responsible for the following:

3.3.1 Ensuring that prohibited items are not placed into contaminated trash dumpsters.

3.3.2 Ensuring that contaminated trash is bagged in plastic prior to being placed in the dumpster.

3.4 **Facility Owners** shall be responsible for ensuring that designated contaminated trash dumpster access doors remain locked when not in use.

4.0 **DEFINITIONS**

R 4.1 Contaminated Material - A substance containing radioactive constituents
R that are above the limit for unrestricted release.

4.2 Contaminated Waste Dumpster - Secured container for the collection of contaminated trash.

4.3 Contaminated Waste Generator - Person filling the contaminated trash dumpster.

R 5.0 **APPLICABLE DOCUMENTS**

R 5.1 Drivers

R 5.1.1 PO-D-026, "Site Services Document Program"

R 5.1.2 FEMP Conduct of Operations Manual

R 5.2 References

R None

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields shall be worn unless other eye protection is specified by ES&H or posted signs.

6.3 Respiratory protection provided by the supervisor shall be worn when required by ES&H.

6.4 Leather-palm gloves shall be worn when handling rough and/or contaminated material.

6.5 Contaminated trash shall not be allowed to accumulate around the dumpsters.

R 6.6 Operators shall have reviewed and be familiar with MSDSs for hazardous
R materials/chemicals that may be used or encountered.

6.7 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 **PROCEDURE**

7.1 General

7.1.1 Warnings, cautions, and notes precede the Item or Step to which they apply.

7.2 Inspection

7.2.1 Examine the trash for prohibited items or categories of waste (Refer to Figure 1).

7.2.1.1 If a suspect item is located and determination is impossible, remove the item.

7.2.1.2 Contact the supervisor and request disposition instructions.

7.2.2 Remove prohibited items from the trash as instructed by supervision.

7.3 Filling Dumpsters

7.3.1 Dispose of small or loose items as follows:

7.3.1.1 Place the small/loose material in clear plastic bags.

7.3.1.2 Gather or twist the open end of the bag until the opening is closed.

7.3.1.3 Using tape, secure the bag.

7.3.2 Contact the person responsible for the dumpster to obtain approval and the door keys.

7.3.3 Unlock dumpster.

7.3.4 Place bulky items (such as oversize pieces of cardboard) directly into the dumpster.

7.3.5 Inspect the trash in the secured clear plastic bag to ensure there are no prohibited items.

NOTE: Do not place unsecured bags or damaged bags into the dumpster.

7.3.6 Inspect the bags for damage.

7.3.6.1 Place damaged bags into undamaged bags.

CAUTION

Piping and pieces of wood over two feet in length shall not be placed in the dumpster.

7.3.7 Place identified contaminated trash excluding items in Figure 1 into the dumpster.

7.0 **PROCEDURE** (cont.)

7.3.8 Lock dumpster.

7.3.9 Return the door key to the responsible person.

8.0 **APPLICABLE FORMS**

None

4554-

LIST OF WASTE TYPES PROHIBITED FROM THE CONTAMINATED TRASH DUMPSTERS

- Any kind of liquid
- * Non-radioactive materials
- Pressurized containers/spray cans
- Explosive materials
- Gaseous radioactive materials
- High-level radioactive waste
- Pyrophoric materials
- Hazardous materials
- Flammable substances
- * Alkaline metals
- Reactive or oxidizing materials
- Ashes, dry powders, or dusts
- Immobilized or ionized waste with pH less than 4.
- * Mixed waste
- Glass

WARNING

If there is any question about whether or not the trash falls into any of the categories above, contact the area supervisor or site services.

PROHIBITED WASTE
Figure 1

54

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
05-24-88	0	New procedure issued from CIO C88- 014 per Request No. P88-056, initiated by J. E. Harmon.
12-27-90	1	Revised procedure to incorporate CIO C90-024 per Request No. P90-255.
01-28-91	2	Revised to incorporate CIO C91-061 per Request No. P92-015.
12-08-92	3	Revised to incorporate CIO C92-015 (P92-284) and update to current procedure program requirements.

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1.0 PURPOSE

The purpose of this document is to establish the procedure for bailing contaminated trash for off-site disposal.

2.0 APPLICABILITY

This procedure applies to the SELCON Trash Baler in the Incinerator Bldg.

3.0 RESPONSIBILITIES

3.1 The supervisor shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.2 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.3 Providing operators with the required respiratory protection.

R 3.1.4 Securing power to the baler per PP-FMPC-0719 prior to repairs, making
R adjustments, or cleaning the baler.

3.2 Operators shall be responsible for complying with this SOP.

4.0 DEFINITIONS

4.1 Platen - Pressure plate of the baler.

5.0 REFERENCES

5.1 SOP 20-C-902, "Liquid Propane Gas (LPG) Powered Handstackers and Tuggers".

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields shall be worn at all times unless other protection is specified by the supervisor, IRS&T, or posted signs.

6.3 Leather-palm gloves shall be worn when loading or conveying trash.

R 6.4 When making adjustments or cleaning the baler, electrical power shall be shut off per the "Energy Control (Lockout and Tagout)", procedure PP-FMPC-0719.

6.5 Respiratory protection provided by the supervisor shall be worn when specified by IRS&T, the supervisor, or posted signs.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.6 Personnel shall move away from the incinerator bin and conveyor while dumpsters are being emptied.

6.7 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

NOTE: Warnings, cautions, and notes precede the Item or Step to which they apply.

7.0 PROCEDURE

7.1 Trash Receiving

7.1.1 After a dumpster has been emptied, check inside to ensure that trash has been deposited in the bin.

7.1.1.1 If trash remains inside the dumpster, use a rake and pull the material from the dumpster and into the bin.

7.1.2 Fill out a "Trash Baler Operation Log", Form FMPC-PRO-2887 (See Figure 1).

7.1.3 Visually inspect the trash to determine if prohibited items or categories of waste (Refer to Table 1) are contained in the trash.

R	WARNING
R	Appropriate protective clothing shall be worn while removing items.

7.1.3.1 If prohibited items are found, remove the items from the trash.

NOTE: Prohibited waste types shall be separated by container (such as paint cans in one, glass in another.

7.1.3.2 Segregate each item in a container or plastic bag designated for that type of waste.

7.1.3.3 Label each bag/container with the waste description.

NOTE 1: The supervisor shall notify the Facility Owner and Waste Operations of prohibited items found.

NOTE 2: Prohibited items shall be returned to the area where the items were picked up.

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7.1.3.4 Notify the supervisor of prohibited items found.

7.0 **PROCEDURE** (cont.)

NOTE: The Trash Baler operator shall sign the 1945-XX Card as "Generator".

7.1.4 Fill out an "Item Production/Certification/Identification card", Form
R FS-F-1945-XX (See Figure 2).

7.1.5 Ensure that the bale removal chain at the rear of the baler is unhooked from the platen (See Figure 3).

NOTE: The Trash Baler will not operate in the automatic mode unless the door is positioned against limit switches and latched.

7.1.6 Ensure that the bale removal door is closed and securely latched.

7.1.7 Check the scaffold for loose items.

7.1.7.1 Remove items, if found, from the scaffold.

7.1.8 Position the scaffold platform against the bale removal door.

7.1.9 Lock the scaffold wheels in place.

7.1.10 Latch scaffolding chain locks onto the baler frame.

7.1.11 Place moveable walkway between the scaffolding and the platform.

7.1.12 Position the south swinging gate between the angle iron and scaffolding.

7.1.13 Chain and lock the north swinging gate to the scaffolding.

7.2 Baler Operation (See Figure 3)

7.2.1 Raise the safety gate.

7.2.2 Cover the bale chamber floor with a large sheet of trash cardboard.

7.2.3 Place trash bags in the bale chamber.

NOTE: The baler will not operate in the automatic mode unless the safety gate is closed and latched.

7.2.4 Pull down the safety gate until the gate is latched.

NOTE: The baler will automatically compact the contents and return to the UP position.

7.2.5 At the control panel, press the DOWN button.

7.2.6 Repeat Steps 7.2.1 and 7.2.3 thru 7.2.5 until the bale is nearly complete.

7.2.7 Before compaction is complete, add a large cardboard sheet to the top of bale.

7.0 PROCEDURE (cont.)

NOTE: When a bale is completed, the indicator at the control panel will light and the baler automatically shut off in the DOWN position.

7.2.8 Repeat Steps 7.2.1 and 7.2.3 thru 7.2.5 and complete the bale.

7.2.9 Record the bale number on the "Trash Baler Operation Log."

7.3 Bale Removal

7.3.1 Check the scaffold to ensure that loose items have been removed from the platform.

7.3.1.1 Remove remaining loose items, if found.

7.3.2 Unlock scaffold platform wheels.

7.3.3 Move the platform away from the bale removal door.

7.3.4 Using the gradual tension release latch, open the Bale Removal Door.

7.3.5 Insert four or more wires through the slots in the floor of the baling chamber.

7.3.6 Wrap the wires around bale and then back through the slots in the ram of the baler.

7.3.7 Insert the end of each wire through the end loop.

7.3.8 Wrap each end of the wire at least four times above the end loop.

7.3.9 At the rear of the baler, hook the bale removal chains onto the platen.

R 7.3.10 Inspect the handstacker or tugger to be used per SOP 20-C-902.

7.3.11 Operate the hand stacker or forklift to be used without a load to ensure safe conditions.

7.3.12 Using the hand stacker or forklift, position a wood skid at bale removal door.

7.3.13 Ensure that the baler safety gate is in the closed position.

NOTE: Only one bale shall be placed on a skid.

7.3.14 On the control panel, press and hold the UP button until the bale rolls out onto the skid.

7.3.15 Using the hand stacker or forklift, move the skid away from the baler.

NOTE: Use bale number "W050-240-P-027-XXXX." The last four numbers shall be in sequence, starting with 0001.

7.3.16 Mark the bale with the date and bale number.

7.0 PROCEDURE (cont.)

7.3.17 Record the bale number on the operation log sheet.

7.3.18 On the baler, close and latch the bale removal door.

7.3.19 At control panel, press and hold the DOWN button.

7.3.20 When the baler platen reaches the lowest position, ensure that bale removal chains automatically unhook from rear of platen.

7.3.21 If chains fail to unhook proceed as follows:

7.3.21.1 Release the DOWN button.

7.3.21.2 Press the EMERGENCY STOP button at the control panel.

7.3.21.3 Manually unhook the chains.

NOTE: The baler cycle shall complete with the baler ram in the UP position.

7.3.21.4 Turn the EMERGENCY STOP button head.

NOTE: The baler shall return to the UP position.

7.3.22 Release the DOWN button.

7.3.23 Complete the "Item Production/Certification Identification" card.

7.3.24 Give the completed 1945-XX card and, when filled-out, the operation log sheet to the supervisor.

7.3.25 Move completed bale to the designated storage area.

NOTE: Dumpsters shall be inspected at the start of the first day shift each month.

7.4 Monthly Inspection

7.4.1 Inspect contaminated trash dumpsters per the "Contaminated Trash Dumpster Monthly Checksheet", Form FMPC-OPR-3258 (See Figure 4).

NOTE: The supervisor shall report problems to the facility owner of the building where the dumpster is located.

7.4.2 Notify the supervisor of discrepancies.

7.4.3 Give the completed checksheet to the supervisor.

7.5 Trouble Shooting

7.5.1 If the baler will not start or stops during operation, proceed per Table 2.

7.0 **PROCEDURE** (cont.)

NOTE: The supervisor shall inform Maintenance that repair is required.

R 7.5.2 If the problem persists or if other problems are encountered, notify the
R supervisor.

8.0 **APPLICABLE FORMS**

8.1 FMPC-PRO-2887, "Trash Baler Operation Log"

8.2 FS-F-1945-XX, "Item Production/Certification/Identification"

8.3 FMPC-OPR-3258, "Contaminated Dumpster Monthly Checksheet"

4554-

TABLE 1
WASTE PROHIBITED FROM CONTAMINATED TRASH DUMPSTERS

Item No.	DESCRIPTION
1	Liquid
2	Non-radioactive materials
3	Pressurized containers/spray cans
4	Explosive materials
5	Gaseous radioactive materials
6	High-level radioactive waste
7	Pyrophoric materials
8	Hazardous waste materials
9	Flammable substances
10	Alkaline metals
11	Reactive or oxidizing materials
12	Ashes, dry powders, or dusts
13	Immobilized or ionized waste with pH less than 4
14	Asbestos containing materials
15	Glass
16	Heavy metal objects
17	Soft drink/juice cans

TABLE 2
BALER TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTIVE ACTION
1. Baler will not start.	A. Bale removal door/latch open. B. Safety Gate Open. C. EMERGENCY STOP Switch activated.	A. Close removal door and latch. B. Close Safety Gate. C. Turn EMERGENCY STOP push button head to release the locking device.
2. Baler Shuts Down	A. Safety gate raised faster than ram. B. Releasing the UP push button during the ejection cycle.	A. Allow ram to move up before activating safety gate. B. Press and hold the UP button.

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FMPC
PRODUCTION OPERATIONS - PLANTS 2/3
TRASH BALER OPERATION LOG
PLANTS 2/3

DATE	SHIFT	DUMPSTER	BALE NUMBER	COMMENTS

FMPC-PRO-2887 (12/23/87)

TRASH BAILER OPERATION LOG
FMPC-PRO-2887
Figure 1

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1945-XX (REV. 3/19/92)

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1945-65 (REV. 3/19/92)

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

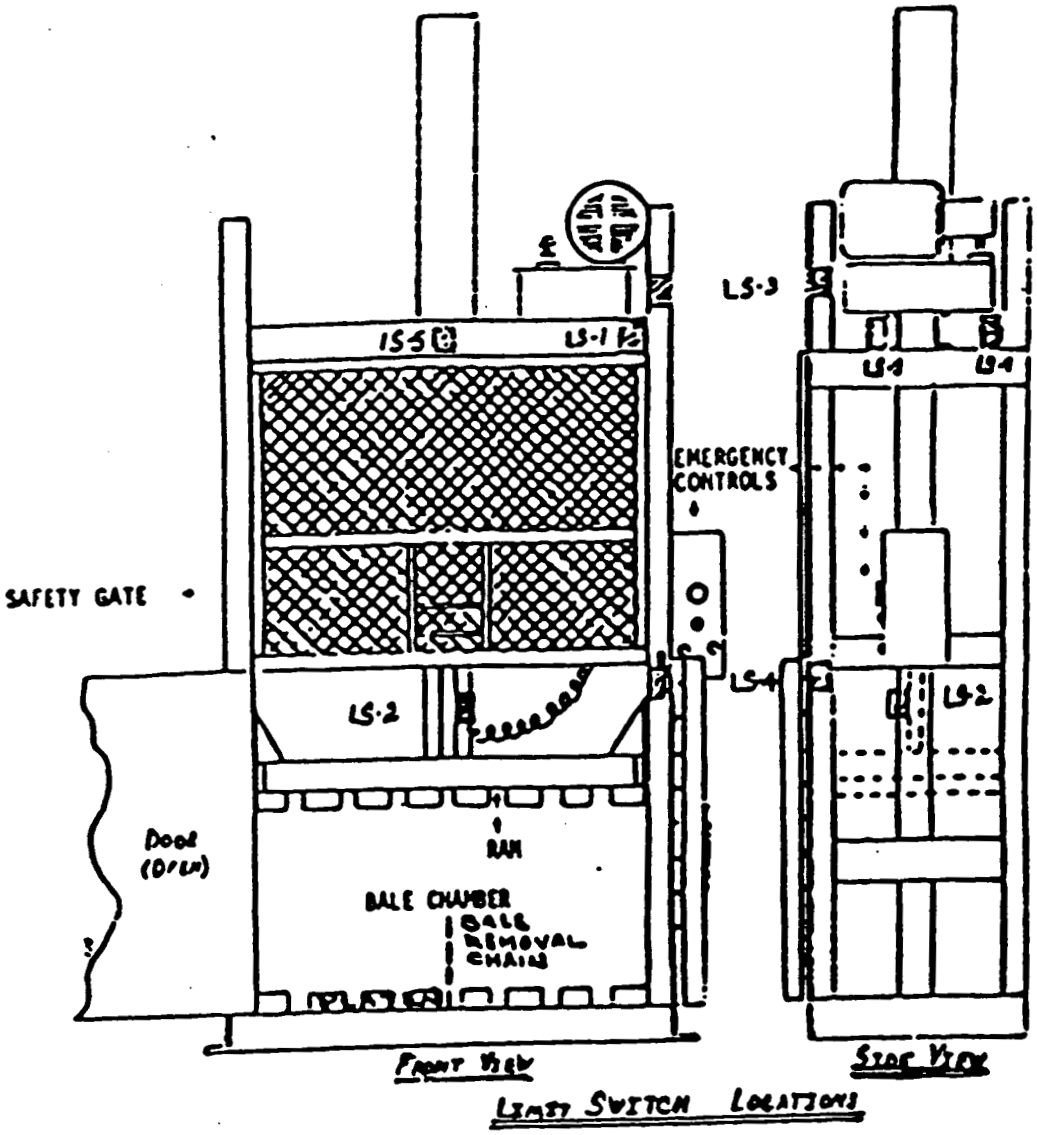
TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1945-66 (REV. 3/19/92)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FS-F-1945-XX
Figure 2



LS-1 - UP STOP
LS-2 - GATE-PLATEN INTERLOCK
LS-3 - GATE CLOSE
LS-4 - BALE CHAMBER DOOR
LS-5 - BALE SIZE

TRASH BALER CONFIGURATION
Figure 3

R

FMPC
CONTAMINATED DUMPSTER MONTHLY CHECKSHEET

Date: _____ Supervisor: _____

DUMPSTER NUMBER AND LOCATION	DUMPSTER CONDITION OK		LOCKS ON BOTH DOORS		PROHIBITED MATERIAL LIST POSTED		DISCHARGE DOOR SEAL INTACT		CHECKED BY		COMMENTS
	YES	NO	YES	NO	YES	NO	YES	NO	NAME	BADGE NO	
1 Plant 4											
2 IRS&T											
3 Tank Farm											
4 Plant 5/ Building 55											
5 Garage											
6 Plant 6 East											
7 Plant 6 Inspection											
8 Laboratory											
9 Plant 5/ Building 55											
10 Instrument Shop											
11 Millwright Shop											
12 Tank Farm											
13 Decontamination											
14 Plant 9											
15 Receiving											
17 Pilot Plant/ Maintenance											
18 Heavy Equipment											
19 Pilot Plant East											
20 Rust/ Building 3045											
21 Service Building											
22 Plant 8 West											
23 Plant 6 South											
24 Building 71											
25 Plant 2/3 South											
26 Boiler Plant											
27 Chemical Warehouse											
38 Plant 1											

FMPC-OPR-3258 (8/26/90)

CONTAMINATED DUMPSTER MONTHLY CHECKSHEET
FMPC-OPR-3258
Figure 4

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
10-21-87	N/A	Preparation of procedure for Baling Trash per Request No. P86-168, initiated by B. Perkins.
06-19-89	N/A	Revised to incorporate C89-002 per Request No. P89-098.
09-01-89	1	Revised to incorporate CIO Nos. C89-065 (P89-352), C89-066 (P89-372), and C89-005 (P89-100). Revision program changed from "Page Revision Date" to "Revision No.".
10-14-91	0	Reissued to update technical content per Request P91-270, initiated by M. Jackson and to incorporate CIOs C90-058, (P91-095) and C90-062 (P91-112).
07-01-92	1	Revised to incorporate CIO C92-014 (P92-137) and update to current procedure program requirements, other than CIO incorporation, no changes were made to technical content.

FEMP WORK REQUEST/ORDER PROCEDURE

SSOP-0061 NON-CONTROLLED COPY

Effective Date: 09-17-92

AUTHORIZED BY: _____ _____
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
09-17-92	0	The procedure is required to meet commitment Nos. QA:89:0204, 0205, 0206, and XC91:0004, per Request No. S92-020, initiated by A. R. Miller.

1.0 PURPOSE

This procedure provides instructions for requesting, approving, and controlling service activities performed by the Maintenance and Support Services section of the Site Services Department at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure describes the requirements and responsibilities for activities requested of, performed by, or controlled by FEMP Maintenance and Support Services. This procedure establishes a system that ensures that maintenance and related activities are performed in an auditable and safe manner consistent with Department of Energy (DOE), other governmental, and FEMP policies. All requests for Custodial Maintenance, Trouble Calls, Preventive Maintenance, Corrective Maintenance, or Alterations performed or controlled by FEMP Maintenance and Support Services are to be initiated and processed in accordance with this procedure.

3.0 DEFINITIONS

Alteration - Any work request causing a change that impacts the form, fit, or function of equipment, systems, processes, or facilities. An Alteration changes the condition of equipment, systems, processes, or facilities. The activity involved will be controlled by a work package.

Alteration Questionnaire - The form used to identify questions and to indicate resolution of questions concerning Alterations with various FEMP organizations.

Capital - A special type of job that may be either Corrective Maintenance or an Alteration. By its nature, it is funded differently from other activities that are normally funded as "expense."

Generally, if the activity is for a new piece of equipment or facility with a useful life of 2 years or more and the estimated cost is $5000 or more, the job is a "Capital" job.

If the equipment or facility does not have a useful life of at least 2 years or cost more than $5000, but makes an existing piece of equipment or facility more useful, durable, or efficient and the existing piece of equipment or facility is of $10,000 or more in value, the job also should be a "Capital" job.

Change Proposal (CP) - The form (FMPC-T-2721) used to change the current reference configuration baseline (see Configuration Management).

3.0 **DEFINITIONS** (cont.)

Corrective Maintenance - The services or repairs to equipment or facilities for maintaining a condition assuring performance of the functions for which they are intended. Corrective Maintenance returns the equipment or facility to an "as was" condition. The activity involved will be controlled by a work package.

Custodial Maintenance - Those routine tasks performed to maintain or enhance FEMP facilities, e.g., ground keeping, minor repairs, furniture relocation or assembly, door or window repairs, and light bulb replacement. These efforts do not require written approval provided the work instructions or methods and materials utilized comply with accepted practices. These tasks shall not include work on process lines or equipment, systems, or subsystems that could impact personnel safety, exposures, or environmental safety.

Davis Bacon - The Davis Bacon Act of Congress (1931) requires that "construction" activities in excess of $2000 be performed by personnel paid at "prevailing" wages as determined by the U. S. Department of Labor. A DOE committee in Oak Ridge makes the final determination on whether an activity at FEMP is covered by this or other related acts.

Design Features for Safety - Items identified in safety analysis documents (Safety Assessments, Safety Analysis Reports, Operational Safety Requirements, etc.) and which passively provide a safety function of preventing or mitigating accidents (see Safety Systems).

FEMP Work Request/Order - The form initiating a request in writing for an activity and used in developing a plan of action to accomplish the activity. This form is not used for Custodial Maintenance or Trouble Calls.

MMICS - Maintenance Management and Inventory Control System, the computer software by which Maintenance and Support Services work requests/orders are tracked, equipment history is kept, and Stores inventory records are kept.

Personnel Safety Item - A condition that immediately impacts the safety of site and subcontractor personnel. Work requests/orders involving Personnel Safety Items are assigned Priority Level 1.

Post-Maintenance Testing - Any required inspection or test performed after the maintenance activity but prior to a complete restoration of the equipment or facility to the facility owner.

3.0 **DEFINITIONS** (cont.)

Predictive Maintenance - Maintenance activities that include the continuous or periodic monitoring and diagnostic activities performed to forecast component degradation such that planned maintenance can be accomplished prior to an equipment or facility failure (see Preventive Maintenance).

Preventive Maintenance (PM) - The computer-generated Maintenance work requests/orders for the inspection and periodic maintenance of various equipment identified by Maintenance, the Facility Owner, IRS&T, Engineering, or others, and which Maintenance management can support with the necessary manpower. The purpose of PM is to identify potential failures before they occur, thus preventing an equipment failure that could impact safety, environmental compliance, or other areas identified by management. Predictive Maintenance activities shall be considered as Preventive Maintenance.

Priority - The urgency by which a work request is processed. Priorities are defined in three levels:

Priority Level 1 - Emergency - A condition that poses an immediate hazard to personnel, facilities or the environment, or a condition that predicts that a serious condition is imminent if corrective action is not taken immediately.

NOTE: All personnel safety items shall have this priority. (CLARIFICATION) A work order to correct an immediate hazard to personnel is a priority 1. As a priority 1, any activity necessary to isolate or eliminate the immediate hazard may be performed without generating a written work request/order. After the hazard has been isolated or eliminated, the priority of a work request for an activity other than the immediate isolation or elimination of a hazard is no longer a priority 1. Maintenance management may choose to adjust the priority at that time.

Priority Level 2 - Urgent - A condition that if not corrected is likely to lead to a more costly repair or a costly loss of equipment service. Safety-related items not posing an immediate danger to personnel. Safety-related items requiring the equipment, process, or area to be shut down until the repairs are completed are also considered to be in this category. Work necessary to meet EPA commitments shall be considered in this category.

NOTE: Activity shall not begin on Priority Level 2 or 3 requests until a characterization survey has been completed and reviewed.

3.0 **DEFINITIONS** (cont.)

Priority Level 3 - Routine - A condition that can be corrected as manpower and material are available.

NOTE: For a number of reasons after a work request is submitted the priority level may change. Any appropriate change can be made by contacting Maintenance. Priority level alone is not an indicator of what work will be done first. Priority level only indicates how serious a condition is. Availability of manpower and material may permit a lower priority job to progress while a higher priority job has not yet started. If a work request/order is submitted as a Personnel Safety Item, but does not address an immediate hazard to personnel, Maintenance may disallow the priority 1 rating.

Quality Level - A designator assigned to a piece of equipment indicating the appropriate management system controls imposed to ensure conformance to applicable quality requirements (per FMPC-711 "Quality Levels"). This level is maintained within the MMICS data base and MMICS automatically assigns the quality level to the work order based on the equipment number.

Request for Engineering Services - The form (FMPC-T-622) used to request engineering services. Those services include design, drawing and specification preparation, cost estimates, feasibility studies, or project generation (per PP-0722 "Requesting Engineering Services".)

Safety System - Any equipment and/or hardware identified in analysis documents that actively provides a safety function of preventing or mitigating accidents (see Design Features for Safety).

Subcontractors - Non-primary contractor personnel who (for the purpose of this procedure) perform activities similar to activities performed by FEMP Maintenance and Support Services personnel.

Trouble Calls - Diagnostic services or adjustments made to mitigate "in service" problems. Trouble calls and minor adjustments to "in service" equipment do not require a written work request/order if no permits, energy isolation, or replacement parts are required, and provided that OSR requirements are not violated. The labor effort required must be approximately one hour or less. These efforts do not require written approval provided the work instructions or methods and materials utilized comply with accepted practices. These tasks shall not include work on process lines or equipment, systems, or subsystems that could impact personnel safety, exposures, or environmental safety.

3.0 **DEFINITIONS** (cont.)

Work Package - The collection of the work request/order and all associated plans, drawings, vendor information, permits, and other pertinent information required to perform the requested activity. This package shall include:

Purpose and scope of planned activity.

Clearly and consistently presented text and illustrations written for use by craftsmen.

Appropriate level of detail, with concise instruction steps and a logical sequence, including validation control hold points.

Identified prerequisites, precautions, limitations, special tools, materials, required manpower, and/or required training.

Clearly indicated steps that indicate a trip, transient, or interruption of a process.

Identified hold points and points requiring independent verification and data to be recorded.

Clearly stated compliance requirements, referencing the procedure, law, administrative guide, etc. (including OSHA 1910.120).

Identified acceptance criteria, post-maintenance testing requirements, and method of restoration.

Guidance as to whom to notify when the activity cannot go as planned.

Plans as to how to minimize and/or dispose of waste generated by the planned activity, including RCRA determination, radiological characterization, and other studies as identified by reviewers.

4.0 **RESPONSIBILITIES**

Controller - Reviews work packages with an estimated cost of $2000 or more to ensure proper funding. If capital, assigns a charge number and opens a charge number within the MMICS data base. The Controller's concurrence is required in the Release Section of work request/order after completion of the review.

4.0 RESPONSIBILITIES (cont.)

Facility Owner - Exercises final authority and responsibility over all activities and actions performed in owner's area. Has knowledge of existing hazards and methods of handling those hazards. Knows what organizations are working on what equipment. Ensures that all impacted organizations are notified. Obtains required approvals for alterations and controls the application of the PP-FMPC-0719 "Energy Control (Lockout and Tagout)." Ensures that all known potential health hazards are identified in writing on the work order. In the performance of these responsibilities, the facility owner may find it necessary to contact other FEMP organizations for information and assistance. The facility owner must ensure that Environmental Compliance has been notified of any activity on or around RCRA storage areas. A comment on the work request/order stating the date and nature of notification to Environmental Compliance should be made.

Industrial, Radiological Safety and Training (IRS&T) - [Safety Engineering & Fire Services; Fire & Systems Safety; Radiological Safety, Fire Protection Engineering, Industrial Hygiene, Safeguards and Security; Training] - Reviews and approves Maintenance work plans, Alteration Questionnaires that could impact safety systems, design features for safety, or other engineered controls for health, safety, or fire protection, including ALARA and OSHA standards.

Maintenance - Ensures that the requested maintenance activity is within the capabilities of the work force and that the request does not violate area rules and regulations. Evaluates work requests and determines actions to be taken. Coordinates with the Facility Owner the activity starting date and the final work inspection to ensure compliance with the work plan. Takes the necessary steps to ensure that the activity is not started until required permits are obtained and that the activity is performed within the time stated on the permits. Ensures the submission of an CP for alterations of items as defined in the site change procedure. Comments on the work request/order stating the date and nature of notification to Environmental Compliance. Ensures compliance with all safety rules, including OSHA 1919.120 & 1926. Manages MMICS to ensure sufficient control documentation of work order system.

Originator - Initiates request for maintenance services and forwards request to the Facility Owner for concurrence as required. Contacts Radiological Safety to perform a characterization survey of the work area.

Quality Assurance (QA) - Reviews the following with QA levels of 1, 2, and 3: work request orders, maintenance work plans, and CP. Verifies that systems are maintained in accordance with OSR requirements, and DOE orders and regulations pertaining to safety and the environment. Provides inspection of maintenance activities as required.

5.0 GENERAL

All maintenance activities are subject to the guidelines of RM-0006, "Industrial Safety Requirements Manual", RM-0009 "Site Radiological Controls Manual", and FMPC-516 "Control of Permits for Accomplishing Hazardous Work". All applicable permits shall be obtained.

In the event of an emergency or urgent activity when a Facility Owner or designee is unavailable, the Utility Engineer shall act as the Facility Owner. No work on any written work request shall note procedure without the written approval of the Facility Owner.

Requested work requiring the services of a subcontractor will be processed by writing a purchase request per FMPC-302 "Request for Purchase" and PP-0314 "Packaging, On-Site Movement and Off-Site Shipment of Material."

If the total scope of the activity is to be performed by the subcontractor, then the work request/order will be cancelled, and the requested activity tracked via the purchase request.

If the scope of the activity is only partially covered by the services of the subcontractor, then the purchase request is entered on the work request/order's bill of material as with other purchases necessary to accomplish the activity. A sufficient explanation shall be provided of the required subcontractor interfacing with Maintenance and Support Services.

Operable Unit Managers and Hazardous Waste Management Unit Managers may require additional notifications that are not covered by this procedure. Those notifications will be documented by signed written comments on the work request/order form.

A copy of the work package shall be forwarded to Radiological Assessment to determine radiological concerns.

Anyone may request an activity to be performed by Maintenance and Support Services; however, since the requested activity may impact others in the facility, the Facility Owner should be made aware of the request. When Maintenance and Support Services has a conflict concerning the requested service, the Facility Owner, normally, is contacted to resolve the conflict.

Any required permits must be stated in "job description".

A copy of the specific equipment plan (if required) for energy isolation must be included in the work package.

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6.0 PREREQUISITES

None

7.0 PROCEDURE

NOTE: See Figure 1, Maintenance Work Request Flow Chart.

7.1 NEED FOR SERVICE

ORIGINATOR

1. Recognize the need for the activity.

2. Determine the type of activity.

7.2 CUSTODIAL MAINTENANCE AND TROUBLE CALLS

ORIGINATOR

1. Verbally contact Maintenance and Support Services to request the activity, supplying as much information about the requested services as possible.

2. Verbally notify the Facility Owner of the request.

MAINTENANCE AND SUPPORT SERVICES

3. Review the request to determine if the activity is Custodial Maintenance or a Trouble Call.

   a. If the activity is neither Custodial Maintenance nor a Trouble Call, contact the originator or Facility Owner, explain why, and request a written work request/order.

   b. If the activity is either Custodial Maintenance or a Trouble Call, schedule and perform the activity.

7.3 PREVENTIVE MAINTENANCE

ORIGINATOR

1. Assemble pertinent information (e.g., equipment manuals, safety requirements, suggested industrial practices, special training or tools required), justify the need for the preventive maintenance (PM), and suggest instructions for performing the PM.

7.3 PREVENTIVE MAINTENANCE (cont.)

ORIGINATOR

2. Write and forward to Facility Owner a written work request/order, and other pertinent information.

   NOTE: No PM will be performed on equipment that is normally allowed to run until it fails.

FACILITY OWNER

3. If not concurring with the need for preventive maintenance, return the Request to the originator.

4. If concurring with the preventive maintenance request, sign the request in the originator section and return the request to the Maintenance and Support Services. (This is the first time a Facility Owner signs the Form.)

MAINTENANCE AND SUPPORT SERVICES

5. Review the work request/order and pertinent information.

6. Determine if activity is a PM and if there is sufficient manpower to support the activity based on existing priorities.

   a. If the activity is neither a PM activity nor is support available, return the work request/order to the originator with an explanation.

   b. If the activity is a PM activity and support is available, create the work instructions, and establish a frequency of occurrence.

      NOTE: Maintenance and Support Services may work with Engineering, IRS&T, the originator, the facility owner, and others in developing the work instructions, and frequency of occurrence. The amount of PM will be based on a graded approach established by Maintenance and based on the Westinghouse Conduct of Maintenance Manual, dated September 1, 1991.

7.3 PREVENTIVE MAINTENANCE (cont.)

QUALITY ASSURANCE

7. Review and concur with the work instructions prior to first use or after a revision if QA level is 1, 2, or 3.

   NOTE: Other organizations also may be requested to review the work instructions based on internal Maintenance and Support Services procedures and specifications of the requested PM. QA, however, reviews all maintenance work instructions.

MAINTENANCE AND SUPPORT SERVICES

8. Establish a starting date and enter data into MMICS.

9. Write, via MMICS, the PM work request/order on the required frequency.

10. Schedule and request release of work site from facility owner.

FACILITY OWNER

11. Review the work request/order, indicate concurrence with the activity by signing and dating the Release Section (PRE-APPROVAL).

    NOTE: The Facility Owner's signature here indicates concurrence with the activity as planned, but does not release the work site to Maintenance and Support Services. (This is the second time that a Facility Owner signs the work request/order form.)

IRS&T (Safety Engineering and Fire Services, Fire & System Safety, Fire Protection Engineering, Radiological Safety, Industrial Hygiene, Training, Safeguards and Security)

12. Review the work request/order, indicate concurrence by signing and dating the Release Section. Sections of IRS&T which review will be determine by originator and other reviewers based on work evolved.

    NOTE: Applicability is determined by referencing the alteration questionnaire attached to the work order.

7.3 PREVENTIVE MAINTENANCE (cont.)

ENVIRONMENTAL COMPLIANCE

13. (If applicable) Review the work request/order, and indicate concurrence by signing and dating the Release Section.

QUALITY ASSURANCE & RADIOLOGICAL SAFETY

14. (If applicable) Review the work request/order, and indicate concurrence by signing and dating the Release Section.

ENGINEERING

15. (If applicable) Review the work request/order, and indicate concurrence by signing and dating the Release Section.

ENVIRONMENTAL MANAGEMENT

16. (If applicable) Review the work request/order, indicate concurrence by signing and dating the release section.

MAINTENANCE (RESPONSIBLE SUPERVISOR)

17. Review the work request/order, and indicate concurrence by signing and dating the Release Section.

    NOTE: When all required reviewers concur, the work request/order is now a work order.

18. If any of the above do not concur, return the work request/order to the Facility Owner, with written reason for the nonconcurrence.

FACILITY OWNER

19. Returns any work order/request, which lacks concurrence to the originator for resolution.

7.3 PREVENTIVE MAINTENANCE (cont.)

FACILITY OWNER

20. Review the work request/order to assure all applicable organizations having concurred, then indicate final concurrence and release the work site to Maintenance and Support Services by signing and dating the Release Section (FINAL RELEASE).

    NOTE: The Facility Owner's signature here indicates concurrence with the activity as planned and releases the work site to Maintenance and Support Services. (This is the third time that a facility owner signs the work request/order form.)

MAINTENANCE AND SUPPORT SERVICES

21. Perform the activity as planned. Notify the Facility Owner when the activity is complete.

22. After a final inspection, the responsible supervisor signs and dates the Completion Section of the work request/order form.

FACILITY OWNER

23. Review the completed activity to ensure that activity has been completed as requested and planned. Resolve any conflicts with the Maintenance Supervisor. Indicate concurrence with the completed activity by signing and dating the Completion Section of the work request/order form. Return the signed form to Maintenance and Support Services.

    NOTE: The Facility Owner's signature indicates concurrence with the completion of the activity. This is the fourth and final time that the Facility Owner signs the work request/order form.

MAINTENANCE AND SUPPORT SERVICES

24. Complete close out of activity by using applicable internal Maintenance and Support Services Procedures.

4554-1

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7.4 CORRECTIVE MAINTENANCE

ORIGINATOR

1. Write a work request/order for the activity, supply all pertinent information (e.g., equipment manuals, safety requirements, suggested industrial practices, special training or tools required) and obtain the Facility Owner's concurrence.

FACILITY OWNER

2. Review the work request/order and pertinent information.

3. Correct or add additional information as needed. Signify concurrence with the need for the activity and the information supplied by signing in the first facility owner box.

   NOTE: The Facility Owner's signature in the first box only signifies concurrence with the need for the activity and the information supplied. The other three facility owner signature boxes are used to signify other actions and should be signed when those actions occur.

MAINTENANCE AND SUPPORT SERVICES

4. Review the work request/order and determine if the activity is for Corrective Maintenance.

   a. If the work request/order is not for Corrective Maintenance, return the work request to the originator with an explanation.

   b. If the work request/order is for Corrective Maintenance, estimate the work and create a work package for completion of the requested activity.

5. Determine if the work request/order is Capital.

   a. If the work request/order is not Capital, proceed to step 7.4.8.

   b. If the work request/order is Capital, mark the work request form "Type of Job" as "C".

7.4 CORRECTIVE MAINTENANCE (cont.)

CONTROLLER

6. Review the work package and signify concurrence by opening a unique capital cost center in MMICS for this activity, change the cost center on the work request/order to this cost center. and initial the work request near this entry.

MAINTENANCE AND SUPPORT SERVICES

7. Change the data in MMICS concerning this work request/order to reflect the new cost center.

   NOTE: A work order may be both Capital and either Corrective Maintenance or an Alteration. If it is both, the Capital designation "C" is used instead of the "M" or "A"; the notation of a Capital job has priority over Corrective Maintenance or Alteration notation.

8. Determine if the activity is covered by the Davis Bacon Act. The primary determining factor is the cost which must exceed $2000.

   a. If the work might be covered by the Davis Bacon Act, the work request/order is submitted to the Davis Bacon Committee in Oak Ridge by the Manager of Maintenance and Support Services.

   b. If the Committee considers this work to be covered (e.g., "Construction"), cancel the work request/order and write a Request for Engineering Services to create an engineering project to complete the activity with subcontractors.

      NOTE: Davis Bacon covered work is considered to be "construction" and the work request/order cannot be performed by FEMP Maintenance due to the Davis Bacon Act.

   c. If the Committee considers this work to not be covered, log the Davis Bacon Determination number on the work request.

9. If materials are needed from outside vendors, release the purchase requisitions.

7.4 CORRECTIVE MAINTENANCE (cont.)

MAINTENANCE AND SUPPORT SERVICES

10. Assemble materials to perform activity. Further processing of the work request/order continues at section 7.3 step 17.

7.5 ALTERATIONS

ORIGINATOR

1. Write a work request/order for the activity, supply all pertinent information and obtain the Facility Owner's concurrence. The Alteration Questionnaire should be filled out and included with the work request.

FACILITY OWNER

2. Review the work request/order, Alteration Questionnaire, and pertinent information.

3. Correct or add information as needed. Signify concurrence with the need for the activity and the information supplied by signing in the first facility owner box.

   NOTE: The Facility Owner's signature in the first box only signifies concurrence with the need for the activity and the information supplied. The other three facility owner signature boxes are used to signify other actions and should be signed when those actions occur.

MAINTENANCE AND SUPPORT SERVICES

4. Review the work request/order and determine if the activity is for an Alteration.

   a. If the work request/order is not for an Alteration, return the work request/order to the facility owner with an explanation.

   b. If the work request/order is for an Alteration, review the work request/order, Alteration Questionnaire, and pertinent information to ensure that the Questionnaire has been properly marked.

      NOTE: The following review and concurrences are not required to be performed in the sequence listed.

7.5 ALTERATIONS (cont.)

ENVIRONMENTAL COMPLIANCE

5. (If Applicable) Review the work request/order and Alteration Questionnaire, indicate concurrence with questions raised by the questionnaire by signing and dating page 2 of the questionnaire.

ENVIRONMENTAL MANAGEMENT

6. (If Applicable) Review the work request/order and Alteration Questionnaire, indicate concurrence with the questions raised by the questionnaire by signing and dating page 2 of the questionnaire.

ENGINEERING

7. (If Applicable) Review the work request/order and Alteration Questionnaire, indicate concurrence with the questions raised by the questionnaire by signing and dating page 2 of the questionnaire.

MAINTENANCE AND SUPPORT SERVICES

8. (If Applicable) Review the work request/order and Alteration Questionnaire, indicate concurrence with the questions raised by the questionnaire by signing and dating page 2 of the questionnaire.

QUALITY ASSURANCE

9. (If Applicable) Review the work request/order and Alteration Questionnaire, indicate concurrence with the questions raised by the questionnaire by signing and dating page 2 of the questionnaire.

CONTROLLER

10. (If Applicable) Review the work request/order and Alteration Questionnaire, indicate concurrence with questions raised by the questionnaire by signing and dating page 2 of the questionnaire.

    NOTE: In addition to those organizations identified on the questionnaire, other organizations also may be identified and asked to indicate concurrence with resolutions to questions raised due to unique situations.

7.5 ALTERATIONS (cont.)

MAINTENANCE AND SUPPORT SERVICES

11. Estimate the work and create a work package for completion of the requested activity. Further processing of the work request/order continues at section 7.4, step 5.

8.0 APPLICABLE DOCUMENTS

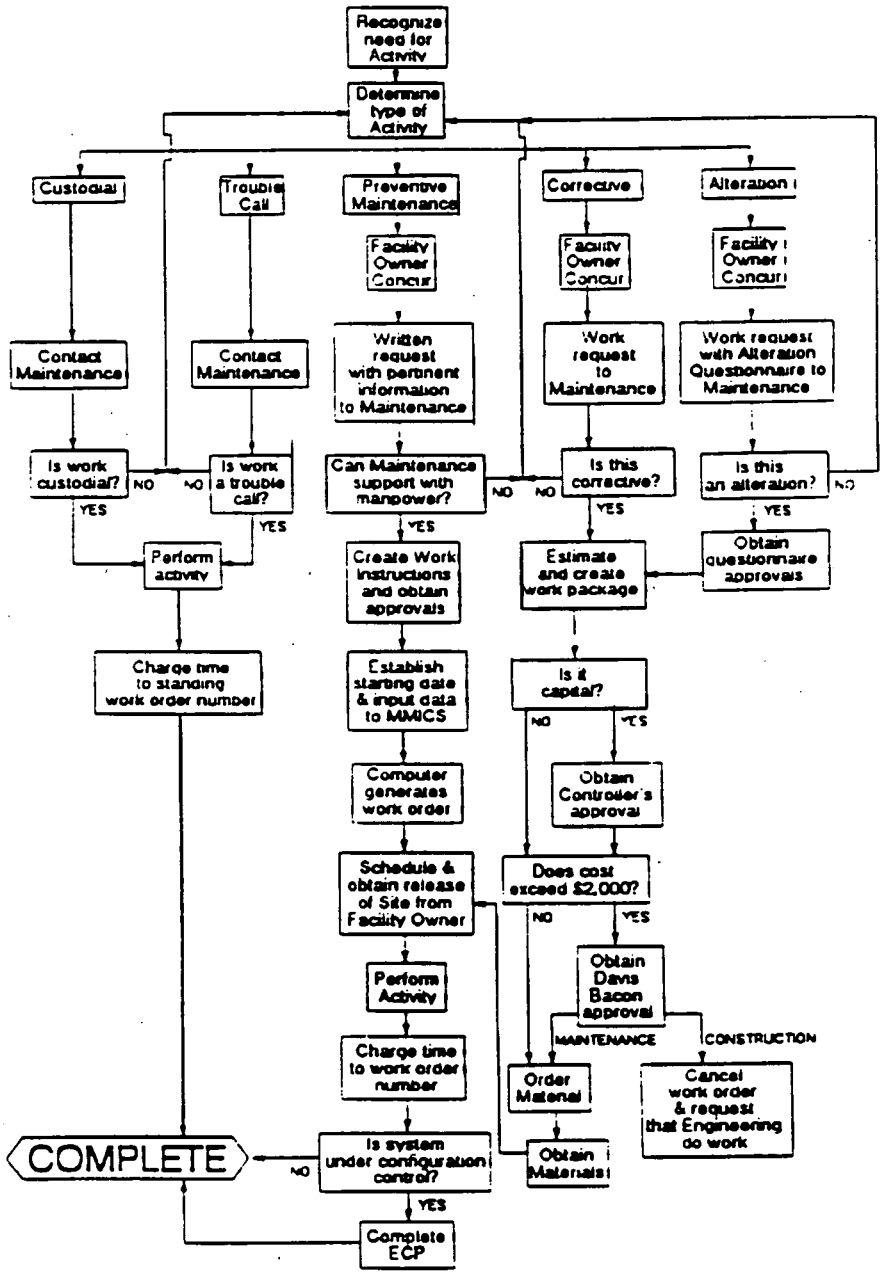
8.1 DRIVERS

- Westinghouse GOCO Cross-Cultivation Committee Conduct of Operations Manual dated July 1, 1991
- Westinghouse GOCO Cross-Cultivation Committee Conduct of Maintenance Manual dated September 1, 1991

8.2 REFERENCES

- PL-3014, "WEMCO Quality Assurance Program Plan"
- FMPC-302, "Request for Purchase"
- PP-0314, "Packaging, On-site Movement and Off-site Shipment of Materials"
- FMPC-512, "Configuration Control of Safety Systems, Design Features for Safety, and OSR-Affected Procedures"
- RM-0009, "Site Radiological Controls Manual"
- FMPC-516, "Control of Permits for Accomplishing Hazardous Work"
- FMPC-711, "Quality Levels"
- PP-FMPC-0719, "Energy Control (Lockout and Tagout)"
- PP-0722, "Requesting Engineering Services"
- RM-0006, "Industrial Safety Requirements Manual"

MAINTENANCE WORK REQUEST FLOW CHART



MAINTENANCE WORK REQUEST FLOW CHART
Figure 1

CONTROL NO. - 4554-

SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0069
REVISION NO. 0

NON-CONTROLLED COPY

FREON MANAGEMENT

SSOP-0069

Effective Date: 07-09-92

AUTHORIZED BY: _____ 7/9/92
H. F. DAUGHERTY, PRESIDENT DATE

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P.O. BOX 398704
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
07-09-92	0	Procedure required for freon recovery, recycling per Request No. S92-115, initiated by C. D. Batchelor.

1.0 PURPOSE

This procedure provides direction for the recovery and recycling of commonly used freons by the Westinghouse Environmental Management Company of Ohio (WEMCO) at the Fernald Environmental Management Project (FEMP). Compliance requirements are in accordance with the Clean Air Act of 1990 and applicable amendments which requires the protection of the stratospheric ozone by regulating the use of ozone depleting substances. (e.g., Freons)

2.0 SCOPE

This procedure applies to any FEMP refrigerants used in either fixed or motor vehicle air conditioning/refrigeration units. The procedure covers all aspects of the freon recovery, reclamation, and recycling process: from the attachment of the freon recovery system to the actual use/disposal of the recovered/recycled freon, associated filtered liquids, and materials. Service to be provided in accordance with all applicable site operational plans and procedures.

3.0 DEFINITIONS

Air Conditioning/Air Conditioning Unit - Usually used in reference to human comfort ventilation.

Class I Substance - Each of the substances listed in Section 602(a) of Title VI of the 1990 Amended Clean Air Act.

Class II Substance - Each of the substances listed in Section 602(b) of Title VI of the 1990 Amended Clean Air Act.

Chlorofluorocarbons (CFCs) - Commonly used CFC refrigerants are CFC-11 and CFC-12 (Freon 12/R-12). They contain chlorine. These refrigerants have a factor of 1 for damaging potential to the earths ozone layer; a production phaseout is set for December 31, 1995.

Desiccant - Material used to remove moisture.

Filter - Portion of the recycling/recovery equipment that does the cleaning of the freon. Removable and replaceable as required for use with different freons and for disposal when it becomes unserviceable.

Freon Disposal - Process taken with freons that can not be reused, recycled, or reclaimed.

3.0 DEFINITIONS (cont.)

Freon Reclamation - Reclamation of a refrigerant means that it is reprocessed and returned to a "new product" specification. Chemical analysis is required to determine that the reclaimed refrigerant has been reclaimed.

Freon Recovery - To remove refrigerant in any condition from a system and stored in a container without testing or processing.

Freon Recycle - Recycling of a refrigerant means to reduce contaminants in a used refrigerant, by single or multiple passes through a device that removes acidity, particulate matter, oils, and reduces moisture. Most recycling of refrigerants is accomplished through a replaceable core filter/drier.

Freon Waste - Freon that is classified as waste that must be sent off-site for disposal or reclamation.

Hazardous Waste Freons - Those freons designated for disposal that have been determined hazardous based on the applicable material evaluation process.

Hydrochlorofluorocarbons (HCFCs) - Commonly used HCFCs include HCFC-22 and HCFC-123. They contain chlorine. These refrigerants are much less damaging to the ozone layer than CFCs. Current law calls for a production phaseout to be completed in 2030.

Hydrofluorocarbons (HFCs) - The most widely used is HFC-134a. They contain no chlorine, and therefore pose no threat to the ozone layer and are not scheduled to be phased out.

NOTE: It may be possible that HFC 134a may be used as an alternate refrigerant in some units. Consult manufacturers specifications for individual units before charging.

Material Evaluation Form Process (MEF) - Material Evaluation Form Process. Onsite document used to initiate characterization process for non-production activities. Used to initiate process of construction media determined to be hazardous.

Maintenance Management and Inventory Control System (MMICS) - The computer software by which the maintenance work requests and work orders are tracked and Stores Inventory records are kept.

Mixed Freon - Freons such as R-12 and R-22 that has been mixed together during the recovery/recycle process or freon whose R rating can not be determined.

3.0 DEFINITIONS (cont.)

Moisture Indicator - A visible indicator on the recovery/recycle equipment that allows the operator to gauge the amount of moisture in the freon.

Non-Hazardous Waste Freons - Those freons designated for disposal that have been determined non-hazardous based on the applicable MEF process.

Refrigeration Unit - Usually used in reference to process, product, or commodity preservation or protection.

Velocity Drop - Oil velocity drop takes place in the lower chamber allowing the entrained materials to separate and collect in the bottom of the shell where it can be measured and removed.

Venting - The process by which a noncondensable gas (air) is released from the tank to attain the proper pressure volume relationship within the tank.

4.0 RESPONSIBILITIES

Material Control and Accountability (MC&A)

- Develops and updates procedures relating to compliance with all Federal, State and local regulations, DOE Orders, directives, notices and regulatory agreements.
- Maintains waste inventory records pertaining to generation, storage, disposal, recovery, and recycling.
- Reviews support documentation, prepares bills of lading and other shipping documentation as required
- Provides guidance on the requirements for packaging, marking labeling, and shipping of nonradioactive hazardous/non-hazardous materials including the coordination with carriers and scheduling of off-site shipments.

Site Services provides Engineering services for maintaining a plan to provide servicing and repair of units using freons.

Maintenance and Site Services

- Provides and maintains a file of MEF's, MEF's on freons, waste, containers, oils, oily rags filters and other materials used or generated by the freon recovery/recycle process.
- Provides maintenance service on refrigeration units.

4.0 RESPONSIBILITIES (cont.)

- Maintains a file and inventory of refrigeration units in the MMICS database.
- Maintains equipment and equipment service file in the MMICS database.
- Provides for the procurement of equipment.
- Maintains record of operator training and certifications.
- Forwards records of generation, storage, recovery, and recycling to MC&A.

Facilities and Warehousing

- Provides for the storage of properly labeled and marked containers.
- Provides RCRA storage area for hazardous freon waste prior to off-site disposal.

Clean Air Program and Environmental Compliance provides guidance and performs surveillance to help achieve compliance to state and federal regulations.

Industrial, Radiological, Safety and Training (IRS&T)

- Provide training for operators per regulatory requirements.
- Tracks and maintains training certifications for operating personnel.

Industrial Health and Safety

- Assures operational and safety requirements.
- Reviews equipment operating manuals.

Quality Assurance (QA) monitors product quality through documentation and assure proper certifications.

5.0 GENERAL

Provisions of the Clean Air Act of 1990 requires that, beginning on 1 July 1992, all HVAC equipment that contain Class I or Class II substances be serviced in such a manner that there be no release of refrigerant to the environment except for deminimus amounts lost through testing and servicing. This part of the act also requires a reduction in freon usage.

5.0 GENERAL (cont.)

WEMCO employees and subcontractors engaged in the servicing of refrigeration systems at the FEMP must have appropriate training on, and be certified in, the use of equipment that will recycle and recover the refrigerant charge. Past practices allowed a small charge of freon to be "dumped" to the atmosphere when servicing equipment. Current policies and procedures require that all refrigerant, contaminated or not, be recovered, recycled or reclaimed. Equipment used for the recovery/recycle must be certified in accordance with regulatory requirements.

Only approved freon recovery/recycle equipment may be used for the servicing of freon units at the FEMP.

Freons inadvertently mixed during recovery, that have been classified as Hazardous Waste per the MEF process, must be managed in a manner concurrent with SOP 20-C-605, and current Clean Air Act requirements.

Freons shipped off-site for the purpose of initiating the recovery process shall be shipped in accordance with SSOP-0003, "Receiving, On-Site Movement and Off-Site Movement of Non-Radioactive Material."

WEMCO shall have a Material Safety Data Sheet (MSDS) for each type of freon product used on the site. Copies of the required MSDS for each freon will be maintained in the workplace "Right-to-Know" workstation.

Non-radioactive hazardous materials shall be staged, stored, loaded and transported on/off-site in accordance with the guideline provided in the DOT Hazardous Materials Segregation/Separation Chart and the requirements of Title 49 CFR, Parts 100-177.

Freons, because of their containment in a closed system are non-radiologically contaminated. The container, however, must be cleared for off-site shipment in accordance with SP-P-35-010, "Unrestricted Release of Material from FMPC," Rev. 2 or most recent revision.

Non-hazardous freon waste, as determined by the applicable MEF, will be stored and managed in accordance with the requirements of the Clean Air Act, until an off-site contract is established for disposal.

6.0 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

Safety glasses with side shields are required to be worn during freon recovery/recycle operations, because liquid freon inadvertently sprayed in the eyes will cause a freezing burn as it evaporates.

Protective gloves are required to be worn when handling freons.

6.0 **INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS** (cont.)

Ventilate area where work is being accomplished in an appropriate manner, especially in low areas where vapor may collect. Additional ventilation is required in areas where there is less than 4 air changes per hour. Work Permits for confined entry will determine the requirement for ventilation.

Employees generating and storing freons shall have reviewed and be familiar with the information contained in the Material Safety Data Sheets (MSDSs) and 20-C-605 SAA requirements for the chemicals/hazardous materials being used.

Employees shall be aware of the location of safety showers and eyewash stations in their assigned work area.

Observe all posted instructions and requirements relative to the work area. A defined safety system is not required.

When equipment is in operation all non-essential personnel shall evacuate the work area.

Any circumstance that could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 **PROCEDURE**

7.1 SERVICING UNITS

1. Acquire work request/order for the unit being serviced.

2. Ensure that the correct tank, proper labeling, and filter for the freon being removed from the unit is in place on the equipment. See table 1.

7.0 **PROCEDURE** (cont.)

TABLE 1. Tank/Container Color Coding

Type	Tank/Container Label	Marking	Labeling
11	Orange	"MAX GROSS WT.__ LB."	*
12	White	"Dirty Refrigerant DO NOT USE"	*
12	White	Clean/Site Reusable	*
22	Green	"Dirty Refrigerant DO NOT USE"	*
22	Green	Clean/Site reusable	*

*1/4" high letters with retest requirement for 5 years from mfg or recovery date

3. Attach equipment to unit being serviced as required by the appropriate equipment manual.

4. Monitor the freon recovery equipment during servicing operation.

7.2 FILTER REPLACEMENT

1. Monitor filter condition as displayed by appropriate equipment monitor.

2. Replace filter as prescribed in the appropriate equipment manual.

3. Store and dispose of filters, freons, oils, and oily rags if determined by the applicable MEF process as hazardous in accordance with SOP 20-C-605. See table 2.

4. Store and dispose of filters and oils per site procedures, if determined, by applicable MEF process, as non-hazardous non-contaminated media.

Table 3 - MEF Designator

Material	MEF Number
Filters	1588
Freons 12/22	TBD/TBD
Oils	1767/1768
Oily Rags	1765/1766

7.0 **PROCEDURE** (cont.)

7.3 RECOVERED FREON MANAGEMENT

1. Remove tank/container containing freon, when it is determined to be full, from equipment and place in storage in accordance with this procedure.

2. Replace freon in unit as required after recycling, according to equipment manual for freon conditioning, to remove impurities has been completed. Consult manufacturers specifications for individual units before servicing.

7.4 FREON STORAGE

1. Store recovered, reclaimed, or recycled freon in areas determined and established by the facilities and warehousing and maintenance departments.

2. Store recovered freon that is classified as hazardous in accordance with SOP 20-C-605 until transferred to facilities and warehousing.

7.5 EMPTY FREON CONTAINER DISPOSAL

1. Ensure freon containers of R-12 or R-22 are empty by totally evacuating them to vacuum using the freon recovery/recycle equipment (usually demonstrated by removal of the container valve or fill plug after the container has been evacuated).

> **CAUTION**
>
> **INTENTIONAL VENTING OF NON-EMPTY FREON CONTAINERS TO MEET THE EMPTY CONTAINER CRITERIA IS A VIOLATION OF THE CLEAN AIR ACT.**

2. Dispose of empty R-12 and R-22 freon containers (those being at atmospheric pressure) as non-hazardous solid waste or low-level waste as appropriate in accordance with SP-P-35-010.

7.6 OIL DISPOSAL - Dispose of oil and oily rags collected in the recovery/recycle unit as hazardous waste as determined by the MEF process in accordance with SOP 20-C-605 and in accordance with this SSOP if non-hazardous.

7.0 **PROCEDURE** (cont.)

7.7 RECORD KEEPING - Fill out the Freon Recovery/Recycling Inventory form, included as Figure 1, and enter equipment number of unit serviced in MMICS.

FREON RECOVERY/RECYCLING INVENTORY FORM	
Date of Servicing	_____
Type of Unit Serviced/MMICS #	____1____
Type of Freon Recovered/Recycled	_____
Amount Recovered	_____
Amount Recycled	_____

Complete this form for each refrigerant unit serviced and return it to EC&QA, MS-31, Ext. 6783

Figure 1 - Freon Recovery/Recycling Inventory Form

8.0 **APPLICABLE DOCUMENTS**

8.1 DRIVERS

40 CFR, Part 82, Clean Air Act - 1990, Class I and II Ozone Depleting Substances amendments.

40 CFR Part 265, 40 CFR 262.34, and 40 CFR 261.

SOP 20-C-605, "Establishing and Maintaining Satellite Accumulation Areas."

SP-P-35-010, "Unrestricted Release of Material from FMPC," Rev. 2.

8.2 REFERENCE

Snap-On, ACT 3000, Operators Manual

Westinghouse Materials Company of Ohio — FMPC	NUMBER: SSOP-0014	REVISION: 0	ISSUE DATE: 06-03-91
SITE STANDARD OPERATING PROCEDURE	TITLE: DOCUMENTATION OF A SUBJECT MATTER EXPERT (SME) -4554-		
	APPROVED BY: W. H. Britton, President		

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to establish the procedure for documenting a subject matter expert (SME) when required by procedures such that information is provided in a consistent and auditable form.

2.0 SCOPE

This procedure applies to the documentation of subject matter experts (SMEs) as needed for such activities as: the development or implementation of materials used for training activities; and any other activities at the FMPC that require the documentation of individuals as SMEs.

3.0 DEFINITIONS

Each definition is followed by its source in parentheses, unless this document is its source.

3.1 Candidate SME is an individual to be designated as a subject matter expert upon approval of the cognizant department manager.

3.2 Cognizant Department Manager is: the Vice-President of IRS&T for training-related usage; the Requestor's Department Manager for non-training-related usage.

3.3 Cognizant Manager is: the Manager of Centralized Training for training-related usage; the Requestor's or the candidate SME's immediate manager for non-training-related usage.

3.4 Company Affiliation specifies the candidate's employer; i.e. WMCO, DOE, RUST, subcontractor, vendor, specific consulting firm, or educational institution.

3.5 Documented SME is an individual who has been documented as an SME and who may function as an SME upon approval of their supervisor.

3.6 Education is the successful completion of the requirements established by an accredited educational institution. (DOE Order 5480.20, issued 2/20/91)

3.7 Job Analysis is a systematic method used in obtaining a detailed listing of the tasks of a specific job. (DOE Order 5480.20)

3.0 DEFINITIONS (cont.)

3.8 Qualifications are the combination of an individual's experience, physical attributes, and technical, academic, and supervisory knowledge and skills developed through training, education, and demonstrated on-the-job performance. (DOE Order 5480.18, issued 11/2/89, TAP-1, Definitions)

3.9 Qualified means the satisfactory completion of a training program that is based on the knowledge, skills, and abilities that have been identified by a position job analysis. (DOE Order 5480.18, issued 11/2/89, TAP-1, Definitions)

3.10 Subject Matter Expert (SME) is an individual qualified, or previously qualified, and experienced in performing a particular task. (DOE Order 5480.18, issued 11/2/89)

3.11 Training is instruction designed to develop or improve job performance. (DOE Order 5480.20, issued 2/20/91)

4.0 RESPONSIBILITIES

4.1 Cognizant Department Manager is responsible for the approval or denial of requests for the designation of individuals as Subject Matter Experts (SMEs). For all training-related requests, the applicable manager is the Vice President of IRS&T. For non-training-related requests, the applicable management is the Manager of the requestor's Department.

4.2 Cognizant Manager is responsible for assuring that the request form information and the attached documentation provide the information necessary for adequate documentation of a candidate's qualifications for SME status.

4.3 Manager Centralized Training (CT) is responsible for the maintenance of the approved requests and the list of documented SMEs.

4.4 Requestor is responsible to assure, to the best of his/her knowledge, that the candidate meets the definition of an SME in the subject matter area(s) or specific task area(s) for which the SME status is requested. Additionally, that the form is initiated and routed to the appropriate managers until either approved or denied. If approved, ensuring that SME is properly recorded by Centralized Training. If denied, Requester and candidate SME understand the reasons for denial.

4.5 Candidate SME is responsible for providing accurate and complete information concerning his/her qualifications which pertain to the subject matter area(s) or specific tasks for which the SME status is being requested.

5.0 GENERAL

5.1 The "Request Designation of Subject Matter Expert (SME)" form is used to designate a Subject Matter Expert (SME) for any activity at the FMPC.

5.2 Documenting an individual as an SME does not authorize their scheduled time for an activity. Only the SME's immediate manager can schedule the SME's time.

5.3 Figure 1 is a flowchart of this procedure.

6.0 PROCEDURE

6.1 Initiate Request

REQUESTOR

6.1.1 Obtain copy of form FMPC-IRS&T-3297, "Request Designation of Subject Matter Expert (SME)," from Stores (See Figure 2).

6.1.2 Complete Sections I & II of FMPC-IRS&T-3297, "Request Designation of Subject Matter Expert (SME)" form, henceforth referred to as "Form(s)".

NOTE: Consult the candidate SME as needed.

NOTE: Attach any additional documentation as required.

6.1.2.1 "REQUESTOR'S NAME"; "POSITION/TITLE".

6.1.2.2 Fill in the "CANDIDATE SME's NAME"; "BADGE NUMBER"; "POSITION/TITLE"; "COMPANY AFFILIATION" of the individual for whom the SME designation is being requested.

6.1.2.3 "SPECIFIC SUBJECT MATTER AREA(S):" List subject matter area(s) for which the SME designation is being requested.

6.1.2.4 "SPECIFIC SKILL(S) AREA(S)": List the specific skill(s) for which the SME designation is being requested.

6.1.2.5 List the "SPECIFIC EDUCATION, EXPERIENCE, AND/OR TRAINING WHICH QUALIFIES THE INDIVIDUAL TO BE AN SME:".

6.1.2.6 "REASON FOR WHICH THE DESIGNATION IS NEEDED": Give the reason or circumstances for which the designation is needed.

6.1.2.7 "TIME LIMITATION (IF ANY) ON THIS DESIGNATION": Give the limitations, if any, on the length of time the designation is in force, or the application(s) for which the designation can be used. If none, enter "NONE".

6.0 PROCEDURE (cont.)

6.1.3 Submit form and attached documentation, if any, to the Applicable Cognizant Manager: (To the Manager of Centralized Training for training-related usage).

6.2 Review Request for Concurrence

APPLICABLE COGNIZANT MANAGER

6.2.1 Review form and assure that all necessary information is provided.

6.2.2 Complete Section III, "CONCURRENCE SIGNATURE" AND "DATE" indicating either concurrence or non-concurrence with the request.

6.2.2.1 If concurrence, transmit to the Applicable Cognizant Department Manager; the Vice-President of IRS&T for training-related usage; the Requestor's Department Manager for non-training-related usage.

6.2.2.2 If non-concurrence, return form and reasons for non-concurrence to Requestor.

REQUESTOR

6.2.3 Notify candidate (SME).

6.3 Approval or Denial of Request

APPLICABLE COGNIZANT DEPARTMENT MANAGER

6.3.1 Review form and determine approval or denial.

6.3.2 Complete Section IV:

6.3.2.1 Mark either: "I approve the request" or "I deny the request".

6.3.2.2 "SIGNATURE, COGNIZANT DEPARTMENT MANAGER" & "DATE": Sign and date whether approved or denied.

6.3.2.3 "PRINTED NAME"; Cognizant department manager's name printed

6.3.2.4 "TITLE"; Cognizant department manager's title.

6.3.2.5 If denied, prepare a written statement of reasons for denial and attach to the request form.

6.3.2.6 Return form with attachments to the Manager of Centralized Training.

6.0 PROCEDURE (cont.)

6.4 Disposition of Approved Requests

MANAGER OF CENTRALIZED TRAINING

6.4.1 Transmit copies of the approved form without attachments to the requestor.

REQUESTOR

6.4.2 Notify candidate.

MANAGER OF CENTRALIZED TRAINING

6.4.3 For training-related usage, file the approved form with the training activity Training Plan to which it pertains in the Official Training Record.

6.4.4 Add the name of the SME to the master list of approved SMEs.

6.4.5 Track and review any time limitations and the limitations of the approved subject matter area(s) or specific task(s).

6.4.5.1 If limit is reached, notify Requestor.

6.4.6 Maintain forms and documentation in the appropriate sensitive information file.

REQUESTOR

6.4.7 Takes corrective action when limit is reached.

6.5 Disposition of Denied Requests

MANAGER OF CENTRALIZED TRAINING

6.5.1 Transmit original denial package, including the reason(s) for denial, to the requestor.

REQUESTOR

6.5.2 Notify candidate.

7.0 APPLICABLE DOCUMENTS

7.1 Drivers

7.1.1 FMPC-102 Rev. 1, "Training" (01/16/91).

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7.0 **APPLICABLE DOCUMENTS** (cont.)

7.2 Reference Documents

None

8.0 **APPLICABLE FORMS**

8.1 FMPC-IRS&T-3297, "Request Designation of Subject Matter Expert (SME)"

9.0 **ATTACHMENTS**

None

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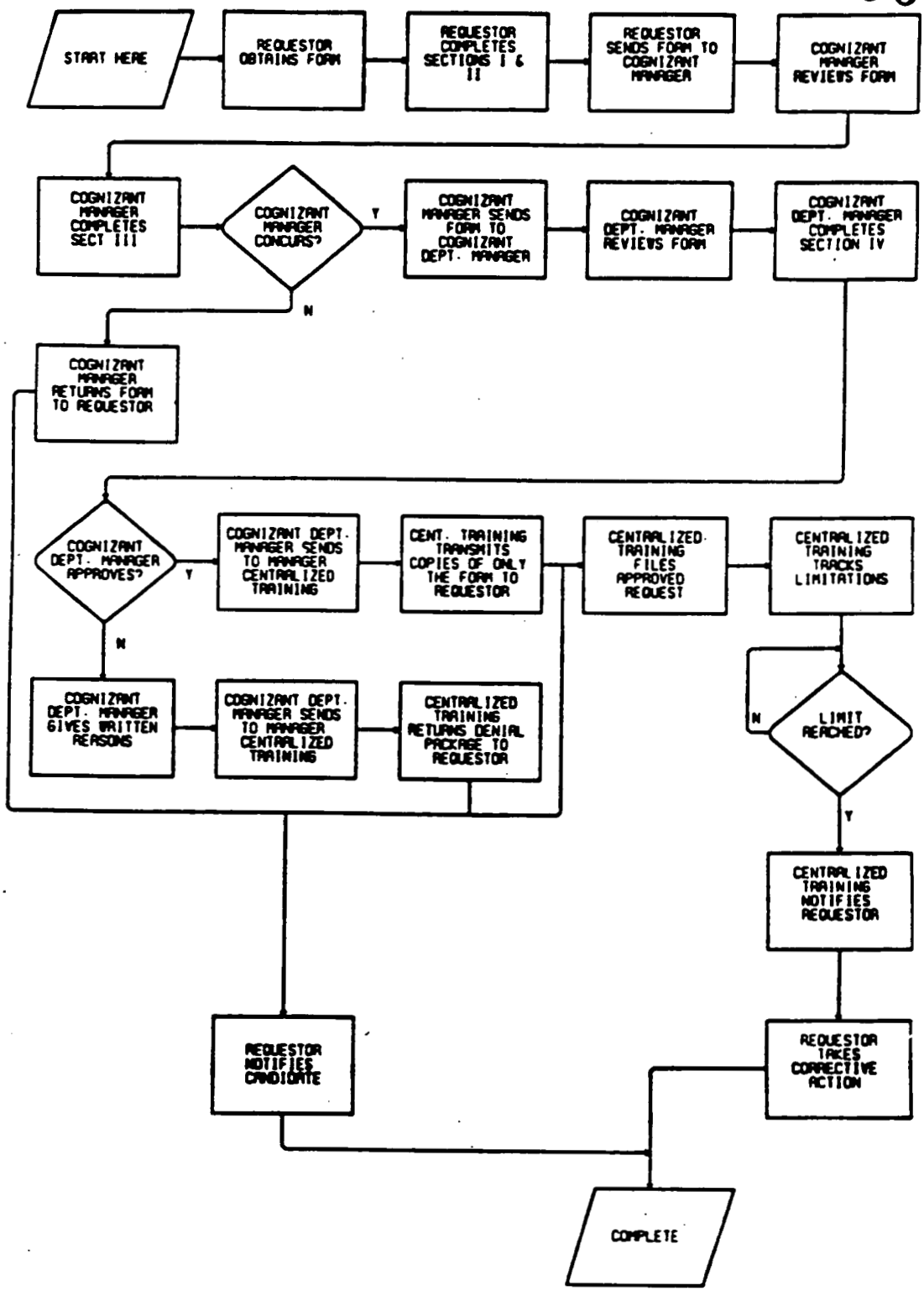

FLOWCHART FOR SSOP-DESIGNATION OF AN SME
Figure 1

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FMPC

REQUEST DESIGNATION OF SUBJECT MATTER EXPERT (SME)

SECTION I: This section is completed by the requestor.
Requestor's Name is the name of the person initiating the request.

REQUESTOR'S NAME:	POSITION/TITLE:

SECTION II: Candidate SME Information
- *Ensure that the information in this section is specific and complete for each subject matter area in which designation is requested.*
- *Only one candidate subject matter expert (SME) may be listed on a form. If request for more than one SME is desired, a separate form for each is required.*
- *Reasons for the request for designation must be included and/or attached to this form.*

CANDIDATE SME'S NAME:	BADGE NUMBER:

POSITION/TITLE:

COMPANY AFFILIATION:

SPECIFIC SUBJECT MATTER AREA(S):

SPECIFIC SKILL(S) AREA(S):

SPECIFIC EDUCATION, EXPERIENCE, AND/OR TRAINING WHICH QUALIFIES THE INDIVIDUAL TO BE AN SME:

REASON FOR WHICH THE DESIGNATION IS NEEDED:

TIME LIMITATION (IF ANY) ON THIS DESIGNATION:

SECTION III: Applicable cognizant manager: ☐ CONCUR ☐ DO NOT CONCUR

SIGNATURE:	DATE:

SECTION IV: Approval/Denial - This section is completed by the applicable department manager.
- *For training-related usage, this is VP of IRS&T.*
- *For non-training-related usage, the requestor's department manager.*

☐ I approve the request ☐ I deny the request

If denied, documentation of the reason(s) shall be attached to this request.

SIGNATURE, COGNIZANT DEPARTMENT MANAGER:	DATE:

PRINTED NAME:	TITLE:

FMPC-IRS&T-3297
Request Documentatiion of Subject Matter Expert (SME) form
Figure 2

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
06-03-91	0	Procedure for documenting a Subject Matter Expert (SME) required per Request No P91-167, initiated by V. E. Werner.

SAFE SHUTDOWN PROGRAM
SAFE SHUTDOWN HEALTH & SAFETY PLAN

HEALTH & SAFETY PLAN

FOR

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT
COMPANY OF OHIO

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

TASK ORDER 2-15521-016

SEPTEMBER 1992

PREPARED BY:

EBASCO ENVIRONMENTAL
6120 S. GILMORE ROAD, SUITE 155
FAIRFIELD, OHIO 45014

PROJECT SPECIFIC HEALTH AND SAFETY PLAN

FOR THE SAFE SHUTDOWN PROGRAM

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD, OHIO

SEPTEMBER 1992

APPROVAL:

9/29/92

E. Schonegg, Manager
Safe Shutdown Program
Westinghouse Environmental Management Company
of Ohio

Date

CONCURRENCE:

9/29/92

D. A. Fleming
Industrial, Radiological Safety & Training
Westinghouse Environmental Management Company
of Ohio

Date

Note: This plan and associated permits shall be reviewed with each worker and be posted at the work site at all times. 'eview of all the listed sections is required prior to work start.

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1.0 INTRODUCTION

1.1 APPLICABILITY

This health and safety plan has been prepared in accordance with the Westinghouse Environmental Management Company of Ohio (WEMCO) Fernald Environmental Management Project (FEMP) Site Health and Safety Plan and FEMP Health and Safety Program. It addresses those activities associated with the Safe Shutdown Program at the FEMP site. This plan will be implemented during all safe shutdown activities, tasks and operations. All WEMCO and WEMCO subcontractors participating in the Safe Shutdown Program activities are required to comply with this Safe Shutdown Health and Safety Plan.

1.2 SITE HISTORY

The FEMP is located in southwestern Ohio, approximately twenty miles northwest of downtown Cincinnati near the communities of Miamitown and Ross, Ohio. Of the total site area of 1050 acres, 850 are in Crosby Townships of Hamilton County and 200 are in Ross and Morgan Townships of Butler County, Ohio. The FEMP is owned by the U.S. Department of Energy (DOE) and operated by the WEMCO.

The FEMP was built in 1950 and full operation started in 1953. The purpose of the facility was to establish an in-house integrated production complex for processing uranium and its compounds from natural uranium ore concentrates for use in government defense programs. A wide variety of chemical and metallurgical process steps were utilized to support the production of uranium metal products. The initial mission of the 37-year old facility was to produce uranium metal from a variety of feed materials. The mission is now focused on environmental restoration and remediation.

A detailed description of the site history is contained in the FEMP Site Health and Safety Plan.

1.3 SAFE SHUTDOWN BACKGROUND

In July 1991, the FEMP initiated the Safe Shutdown Program to provide planning, engineering, and program control for the proper disposition of all uranium product and in-process residue materials, excess supplies, chemicals, and associated process equipment. The program will also assure the proper characterization, emptying, and deenergization of all existing previously-operated production-related equipment with consideration for DOE, U.S. EPA, and Ohio EPA requirements and regulations.

Although the cessation of production-related operations occurred in July 1989, much of the equipment was scheduled for restart in order to prepare for continued production and to produce intermediate products for future DOE use in programs at other sites. The official termination of the FEMP production mission took place in June 1991, without the restart of the production processes or the stabilization of intermediate products.

In May 1991, the U.S. EPA, the Ohio EPA, and the U.S. Department of Energy entered into negotiations concerning a possible modification to the 1990 Consent Agreement pertaining to the Fernald Environmental Management Project (FEMP), formerly known as Feed Materials Production Center (FMPC). Consistent with arrangements made during these negotiations, all parties involved agreed that activities performed within the scope of the Safe Shutdown Program would constitute a Removal Action consistent with Section IX of the Consent Agreement and the provisions of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Removal Action will be designated as number twelve (No. 12), termed Safe Shutdown, under the amended Consent Agreement.

One of the major objectives of the Safe Shutdown Program involved the transfer of materials from existing previously-related equipment. After confirmation of characterization, these materials will be transferred to appropriate containers and either stored at approved locations awaiting final disposition under OU-3, or disposed of consistent with criteria and requirements of Removal Action #9, Removal of Waste Inventories. All applicable energy sources related to a given piece of equipment will be physically isolated to render that piece of equipment non-operational. With the transfer of material to storage containers, the potential for an incident or insult to the environment is significantly reduced.

2.0 RESPONSIBILITIES

The health and safety of the WEMCO and WEMCO subcontractor personnel are the responsibility of the Safe Shutdown Field Coordinator and Task Supervisor. It is their responsibility to comply with applicable government regulations and WEMCO policies pertaining to occupational health and safety. It is also their obligation to obtain the advice and recommendations of radiation, health and safety staff regarding safe shutdown activities. This section describes the responsibilities of the health, radiation and safety personnel assigned to the Safe Shutdown Program tasks. The individuals assigned to these roles will be identified on the Task Specific Hazard Analysis Form (Appendix A).

2.1 TASK INDUSTRIAL HYGIENIST

An Industrial Hygienist (IH) will be assigned to oversee the industrial hygiene aspects of the task, by the Manager, Industrial Hygiene. The Task IH will oversee the Task IH Technician to ensure that the industrial hygiene requirements of this HSP and the task specific hazard analysis form are complied with. The Task IH's responsibilities include:

- Assist the Task Safety Engineer, and Task Radiological Safety Engineer and Task Fire Protection Engineer with:

  - Conducting a hazard identification survey of work area for the task
  - Determining the size of the exclusion zones
  - Determining the relevance
  - Determining the appropriate PPE, based upon hazards
  - Determining decontamination process

- Assist in conducting the daily task safety briefings
- Determine the real-time monitoring locations for each work area under the task
- Establish action levels for characterized materials, if appropriate
- Establish perimeter monitoring action levels
- Specify additional real-time instrumentation for toxic substances
- Determine the compounds and appropriate sampling methods for personnel air monitoring
- Approval of substitute PPE
- Specify frequency of work area inspections in consultation with Task Safety Engineer

2.2 TASK RADIATION SAFETY ENGINEER

A Radiation Safety Engineer will be assigned, by the Manager, Radiological Safet Engineer, to oversee the implementation of the radiation aspects of the Safe Shutdow task. The Task Radiation Safety Engineer will oversee the Task Radiation Technicia to ensure that the radiological requirements of this HSP and the task specific hazar analysis form are complied with. The Task Radiation Safety Engineer's responsibilitie include:

- Assist the Task IH, Task Safety Engineer and Task Fire Protectio Engineer with conducting:

  - A hazard identification survey of the task work area
  - Determining the size and boundaries of the exclusion zone(s)
  - Determining the appropriate PPE based upon task hazards
  - Determining the decontamination processes
  - Determining the adequacy and relevance of required training

- Prescribing radiological decontamination procedures for task personne and equipment.
- Determining the proper procedure and spacing requirements for the movement of radiological containers
- Review the radiological monitoring and dosimetry results
- Assist in conducting the daily safety briefings

2.3 TASK SAFETY ENGINEER

A Safety Engineer will be assigned by the Manager, Safety Engineering and Fire Services, to oversee the safety aspects of the safe shutdown task. The Safety Engineer will work with the Task IH Technician with the day to day implementation of this HSP and the task specific hazard assessment form. The Task Safety Engineer's responsibilities include:

- Assist the Task IH, Task Radiation Safety Engineer and Task Fire Protection Engineer with conducting:

  - A hazard identification survey of the task work area
  - Determining the size and boundaries of the exclusion zone(s)
  - Determining the appropriate PPE based upon task hazards
  - Determining the decontamination processes
  - Determining the adequacy and relevance of required training

- Ensuring that safety hazards, such as lockout/tagout, overhead obstructions, vehicle and equipment operation, electrical, excavations,

requirements are implemented during task operation.

- Assisting in conducting the daily safety briefings
- Performing a survey of existing emergency equipment within and adjacent to proposed task work area and prescribed additional emergency equipment that is not readily available.
- Specifying inspection frequency of emergency equipment
- Identifying the appropriate tornado shelter for each task work area, as identified by Emergency Preparedness, prior to the start of task operations
- Reviewing task health and safety reports and completed forms for thoroughness and accuracy

2.4 TASK FIRE PROTECTION ENGINEER

A Fire Protection Engineer will be assigned by the Manager, Emergency Preparedness l& Fire Protection Engineering, to oversee the fire protection aspects of the safe shutdown task. The Fire Protection Engineer will work with the Task IH, Safety and Radiation personnel with the day to day implementation of this HSP and task specific hazard assessment form. The Task Fire Protection Engineer's responsibilities include:

- Assist the Task IH, Task Safety Engineer and Task Radiation Safety Engineer with conducting:

  - A hazard identification survey of the task work area.
  - Determining the site and boundaries of the exclusion zone(s)
  - Determining the appropriate PPE based upon task hazards
  - Determining the decontamination process
  - Determining the adequacy and relevance of required training

- Identify potential fire and/or explosion hazards

- Identify any Life Safety Code deficiencies

- Ensuring that the appropriate manual fire suppression equipment is provided at the task site

- Assist in conducting the daily safety briefings

2.5 TASK INDUSTRIAL HYGIENE TECHNICIAN

For each task conducted as part of the Safe Shutdown Program at FEMP, an Industrial Hygiene (IH) Technician will be assigned to the Task. The Task IH Technician will be responsible for ensuring that the health and safety requirements specified by this HSP and the task hazard assessment are implemented on a day to day basis. The Task IH Technician's daily responsibilities include:

- Conducting air monitoring (personal and area)
- Conducting and documenting daily safety briefings with assistance from Task IH, Task Safety Engineer, Task Radiological Safety Engineer, Task Fire Protection Engineer or Task Radiation Technician
- Calibrating air monitoring instruments
- Conducting noise, and temperature measurements
- Determine upgrades or downgrades in levels of protection based upon monitoring results
- Ensuring that emergency equipment is maintained in proper working condition and performing periodic inspections of the equipment
- Ensuring that task workers perform the decontamination process as specified by the task hazard analysis form and that decontamination supplies are readily available
- Assisting Task IH, Task Radiation Safety Engineer and Task Radiation Technician with establishing emergency decontamination during emergency situation

2.6 TASK RADIATION TECHNICIAN

For each task or activity conducted as part of the Safe Shutdown Program at FEMP, a Radiation Technician will be assigned to the Task. The Task Radiation Technician will be present during all work activities of the task. The Task Radiation Technician is responsible for ensuring that the radiation protection requirements specified by this HSP and the task specific hazard analysis form. The Task Radiation Technician's daily responsibilities include:

- Conducting and documenting radiation monitoring
- Ensuring that monitoring instruments are fully charged and operating properly
- Ensuring that workers are properly wearing their TLD badges and/or pocket or other dosimeters
- Ensuring that task employees completed bioassay and in vivo testing as necessary
- Assisting task workers with initial radiation decontamination efforts
- Working with Task IH, Task Radiological Safety Engineer and Task IH Technician to establish emergency decontamination process in emergency situations.
- Implementing FEMP Site Procedures, should personal radiation contamination occur
- Assist in conducting the daily safety briefings

3.0 HAZARD ASSESSMENTS

This section addresses the risks to WEMCO employees and WEMCO subcontractors that will perform safe shutdown activities conducted under the Safe Shutdown Program. Potential risks to workers may originate from the chemical, physical, biological and safety hazards present at the FEMP site. Specific hazards for each separate safe shutdown activity will be identified and noted on the Safe Shutdown Hazard Analysis Form (Appendix A). The Hazard Analysis Form is to be initiated by the Task Supervisor and forwarded to the Task IH, Task Safety Engineer and Task Radiological Safety Engineer for technical input. The Hazard Analysis Form will specify the task specific health and safety requirements under the guidelines of this HSP and identify the potential chemicals, protective clothing and equipment, decontamination procedures and work permits to be used while conducting activities.

3.1 CHEMICAL HAZARDS

The following chemicals have been characterized on the FEMP site and could potentially be involved in a safe shutdown activity.

- Ammonia
- Asbestos Containing Materials
- Caustic Soda
- Copper
- Graphite
- Hydrofluoric Acid
- Kerosene
- Lime (Calcium Hydroxide)
- Lithium Carbonate
- Magnesium Fluoride
- Magnesium Oxide
- Nitric Acid
- Potassium Carbonate
- Potassium Chloride
- Sodium Chloride
- Sodium Sulfide
- Sulfuric Acid
- Thorium
- Thorium Nitrate
- Uranium Dioxide
- Uranium Octoxide
- Uranium Tetrafluoride
- Uranium Trioxide
- Uranyl Nitrate

- Zirconium Oxide

In addition to these specific chemicals, several other types of chemicals have been identified including:

- Vacuum oil
- Coolants
- Various types of paints (lead)
- DAAP

The specific potential chemicals which may be encountered during a proposed safe shutdown activity will be listed on the Safe Shutdown Hazard Analysis Form. For each potential chemical listed on the Hazard Analysis Form, a material safety data sheet (MSDS) for that specific chemical must be made available to task personnel.

The MSDS will contain specific information concerning the routes of exposure and the acute (short-term) and chronic (long-term) health effects associated with exposure to the chemical. A summary of the hazards associated with each chemical will be included in the Hazard Analysis Form.

3.2 PHYSICAL HAZARDS

Because of the diverse activities that may be conducted in the safe shutdown tasks, the range of potential physical hazards is also diverse. The primary physical hazard associated with the FEMP site is the presence of ionizing radiation. In addition to ionizing radiation, cold and heat stress, and noise may also be associated with safe shutdown activities.

3.2.1 Ionizing Radiation

As described in Section 3.1 of the FEMP Site Health and Safety Plan, the FEMP has been a uranium processing facility since the early 1950s. Uranium and uranium-bearing materials are stored or have been processed in almost all parts of the FEMP Production Area and Waste Management Area and the laboratory building. Thorium materials are also stored and have been processed at the FEMP. The principal radioactive materials present are uranium and thorium and their daughter products, although other radionuclides have been identified. The uranium and natural thorium and daughter products present an external radiation from beta and gamma. The K-65 Storage Tanks in the Waste Management area contain significant quantities of material contaminated with radium-226. The external radiation hazard from this material and its daughter products (including radon) must be considered and appropriate precautions taken when working in this vicinity.

The main radiation hazard is alpha radiation from internal exposure (inhalation.

(902

ingestion, injection). Contamination of surfaces or equipment with radioactive materials may be encountered in the production plants or other facilities. Control zones with special requirements have been established to control these hazards. Soils in the Production Area and Waste Management Area also have the potential to have above background contamination with radioactivity. Inhalation of these materials can occur when contaminated surfaces or soils are disturbed and the radionuclides made airborne unless proper precautions are observed.

Ingestion of these materials can also occur if proper precautions are not observed with regard to eating, drinking, smoking and personal hygiene. Injection or other internal deposition of radioactivity is unlikely although possible during an injury or through open cuts or sores.

The third hazard connected with radioactivity is criticality. Because of the low level of U-235 at the FEMP, this is a remote possibility, however, strict controls which include drum color coding and storage requirements are in effect to further reduce this potential.

3.2.2 Cold Stress

Safe Shutdown activities will be conducted when temperatures could present a potential cold stress hazard. Personnel shall become aware of symptoms of cold stress for themselves and be able to recognize these symptoms in other field team members as well. The Task IH Technician shall review cold stress at regularly scheduled task briefings, with particular emphasis on the work/warmup regime (recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)), Threshold Limit Values (TLV) and Biological Exposure Indices (BEI). More detailed information on cold stress is contained in Appendix B.

3.2.3 Heat Stress

Safe Shutdown activities will also be conducted during periods when temperature may pose a heat stress hazard. Heat stress may occur at lower temperatures and in less time when protective clothing is being worn. All individuals working on safe shutdown activities shall be trained in heat stress symptoms and prevention prior to working on a task. Work environment temperatures will be evaluated during the specific tasks. More detailed information and work/rest regimes are contained in Appendix C.

3.2.4 Noise

Operations being performed during safe shutdown activities may be a potential noise hazard. Excessive noise may occur during operations involving heavy equipment, pneumatic tools, generators and other machinery. Noise exposures will be evaluated by the Task IH Technician during the specific tasks.

3.2.5 Fire and Explosion

The potential for fires and explosions may occur during safe shutdown activities. Conditions may occur when handling metals, dust, chemicals, and compressed gases.

Uranium and thorium metal can be pyrophoric in certain physical states. Moist uranium chips, turnings and fines react slowly with water to form hydrogen. Hydrogen presents a dangerous fire and explosion hazard if precautions are not taken to eliminate ignition sources and proper venting is not provided. Uranium and thorium chips, turnings and fines are subject to spontaneous ignition. Magnesium metal, formerly used in uranium reduction, may generate hydrogen if wet with water. Some dust collection systems handling fine, dry material (e.g., the Plant 1 collector handling magnesium fluoride contaminated with particles of uranium metal) and other process equipment, when in use, have the potential for fire or explosion if not properly controlled. A propane storage facility and various gasoline storage tanks and dispensing facilities are located at the FEMP along with natural gas supply lines all of which have fire and explosion risks associated with them. Other flammable or oxidizable materials are also stored at the FEMP. NFPA-704 hazard warning labels are used to identify such stored materials as appropriate. Compressed gas cylinders are also used for a variety of materials, some of which may pose fire along with explosion hazards.

3.2.6 Life Safety

Appropriate means of egress from a structure is essential at all times and could become critical during an emergency within the structure.

The required number of exits must be maintained. Exit access must be of required width, clear and free of obstructions along its entire length. The common path of travel shall not exceed specified length. Dead ends, if permitted, shall not exceed specified length. Lighting shall be adequate and emergency power provided in some cases. Exits shall be easily identified. The occupancy load shall be determined.

3.3 BIOLOGICAL HAZARDS

Depending on the type of operations being performed, certain types of biological hazards may be present. Biological agents may cause injury or disease when encountered. Potential biological hazards that may be encountered include:

- Bird Droppings
- Poisonous Plants
- Insects

3.3.1 Bird Droppings

Accumulated droppings produced by birds roosting in various portions of the site structures pose a potential hazard from various infectious organisms such as the mold Histoplasma Capsulatum which may grow in the droppings and be contacted when these are disturbed and become airborne. Histoplasma Capsulatum is an inhalation and a contact hazard. While infection is common, overt clinical disease is not, making up only 5% of the disease picture. However, since this organism is endemic to the soils of the Ohio Valley area, any work which would disturb accumulations of bird droppings or soils heavily contaminated by droppings must be properly controlled. Such work would include cleanup of droppings, movement of items heavily contaminated with droppings; removal of transite siding from the exterior or interior of buildings, disturbance or excavation of soil in former or current bird roosting areas. The Medical Services Section has instituted a screening procedure, the Worker Selection Protocol, as an additional safeguard to those asked to work where the potential for exposure is high.

3.3.2 Poisonous Plants

Poisonous Plants such as poison ivy, oak and sumac are common in this area. Contact with these plants should be avoided where possible. Workers should be instructed on the identification and first aid treatment if accidental contact occurs.

3.3.3 Insects

Tick bites may result in the transmission of Lyme disease. Employees shall perform self searches after working outside to check for ticks. Precautionary measures to avoid tick bites will be taken such as arranging personal protective equipment (PPE) and clothing to keep ticks on the outside of clothing, and insect repellents may be issued.

In addition to ticks, bees and wasps may be a nuisance and employees may be stung while working. Properly trained site personnel will administer First Aid should such an incident occur.

3.4 SAFETY HAZARDS

The Safe Shutdown Program will involve a variety of different types of operations. Each operation will potentially have multiple safety hazards or concerns. Listed within this section are some of the anticipated or potential hazards or concerns that may be encountered. During the completion of the tasks additional concerns or hazards may be recognized.

3.4.1 Confined Space

Confined spaces such as tanks, pits, enclosures, manholes, etc., are present at the FEMP.

These spaces may contain safety hazards, but pose additional risk due to the potential for containment of hazardous agents and the inherent difficulty in exiting. An oxygen deficiency is a potential hazard in a confined space along with a concentration of gases or vapors of a chemical which may be present. As such special precautions and permits are required.

3.4.2 Electrical

Make sure all electric work is in compliance with the National Electric Code and other applicable safety codes. Treat all electrical circuits as if they are energized. Consider all wires live until checked and locked out. Avoid driving over extension cords. Check extension cords and wiring regularly for damage and report electrical troubles to supervisors immediately. Extension cords used with portable electric tools and appliances shall be the three (3) wire type. All receptacles and temporary circuits shall be grounded properly. All temporary light bulbs used for general illumination shall be protected from accidental contact by the use of suitable fixture or lamp holder with a guard. All temporary wiring shall be elevated at least eight (8) feet above the floor or ground level. All energized equipment exposed to contact shall be guarded (for example, energized electrical boxes). 15- and 20-ampere receptacle outlets on single-phase, 120-volt circuits for construction sites shall have Ground Fault Circuit Interrupters (GFCI) or the implementation of an Assured Equipment Grounding Program (AEGP). 110- and 220-volt receptacles shall be designed so that attachment plugs on the circuits are not interchangeable.

3.4.3 Excavations

All excavations and trenches must be clearly designated by the use of barricades or other means to alert all individuals of their existence. The walls and faces of excavations and trenches must be guarded by a shoring system, sloping of the ground, or some other equivalent means to protect employees from the dangers of moving ground and cave-ins.

Excavated materials, other materials or portable equipment will be placed at least two (2) feet from the top edge of the trench of excavation depending on conditions at the site. This is a precaution to prevent materials from sliding back into the trench or excavation resulting in additional safety hazards.

When employees are required to enter trenches more than four (4) feet deep, not only will they have to obtain a confined space entry permit, but means of exit, such as ladders or steps, must be installed. The ladders or steps must be located so an employee does not have to travel more than twenty five (25) feet to exit the trench.

3.4.4 Heavy Equipment

Certain safe shutdown tasks may require the use of heavy equipment. Heavy equipment

includes cranes, track hoes, back hoes, industrial trucks, and other types of equipment. In order for the equipment to operate in a safe manner, the equipment must be maintained and in good operating condition, as required by FEMP site procedures. In addition, the operator must be properly trained in the use of the equipment.

3.4.5 Welding and Cutting

Welding and cutting operations are also referred to as hot work. A Hot Work preventative procedure is designed to reduce the potential for equipment that could create a spark or other means of ignition causing a fire or explosion by evaluating the work environment prior to, during, and after the operation involving the equipment. Prior to conducting a "hot work" procedure, a permit shall be issued. The purpose of the Hot Work Permit Procedure is to establish guidelines by which the use of any flame or spark producing equipment, including gasoline and electric powered equipment, may be safely used in field project work. The use of this equipment is especially critical during project work in or around flammable liquid storage areas, tank farms, flammable or combustible waste, or where flammable or combustible vapors may be present.

3.4.6 Lifting

Lifting is the most common task associated with low back pain. Other injuries, such as disk lesions and hernias, can occur. Many of the injuries do not result from a single incident, but develop over a period of time. This type of injury may result from repetitive lifting, such as bending over and lifting objects.

Know your lifting limits. The weight carried by each worker should be limited by factors such as; the route and distance to be traveled, the amount of time required and the center of gravity necessary to handle the load safely.

In instances where manual lifting is necessary, remember to:

- Get help with heavy or awkward loads
- Check for nails and sharp bindings
- Face the load - don't twist
- Take a normal breath and hold it when lifting; air acts as a cushion for abdominal walls
- Keep the load close to your body and carry it at knuckle height
- Keep your path constantly in view
- Beware of turns, blind corners, ramps, sills, steps and other potential tripping hazards
- Pace your lifting tasks

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3.4.7 Lockout/Tagout

During safe shutdown activities if energized equipment or utility lines are encountered the equipment or lines must be disconnected, blanked, or other means utilized to prevent accidental or unexpected flow activation or equipment operation. Prior to the initiation of field activities, the Task Safety Engineer will identify situations which could result in injury due to electric shock, mechanical movement, or release of materials. The electrical circuits, material lines or equipment identified will then be locked out by the use of a lock, physically disconnected, or other appropriate means and tagged to indicate the reason for disconnection. Lockouts will be coordinated with the WEMCO Task Safety Engineer.

3.4.8 Overhead Obstructions

Drilling, construction or hoisting equipment cannot operate within 10 feet of energized electrical overhead lines. Before any activity is to take place, all overhead obstructions must be identified. Where possible the activity site should be moved away from the overhead lines. If site cannot be moved, then the overhead lines should be moved, de-energized, or guarded as to protect against contact.

The WEMCO Task Safety Engineer will determine the appropriate protective action to ensure worker's protection when working around overhead hazards. Additionally, no person is permitted to walk under loads handled by a back hoe, track hoe, or crane. Persons should stand clear of all machines during use.

3.4.9 Scaffolding

Scaffolding may be used during a safe shutdown procedure to allow workers to access an area. Fixed scaffolds shall be erected on sound, rigid footing and be capable of carrying the maximum intended load without settling or displacement. Scaffolds and their components shall be capable of supporting, without failure, at least four (4) times the maximum intended load. Scaffolds four (4) feet or more in height with a width of less than forty five (45) inches shall have standard guardrail installed on all open sides of the platform. All scaffolds ten (10) feet or more in height shall have standard guardrail installed on all open sides of their platform. All planking shall be scaffold grade or equivalent. Scaffold planking shall be overlapped a minimum of twelve (12) inches or secured from movement. Scaffold planks shall extend over their end supports not less than six (6) inches nor more than twelve (12) inches. All scaffolding and accessories shall have any defective parts immediately replaced or repaired. Inspect all scaffolds prior to each use. Scaffolds shall be properly braced by diagonal braces so the scaffold is always square, plumb and level. An access ladder or equivalent safe access shall be provided. Scaffolds shall not be erected or used in the immediate vicinity of power lines or electric conductors until the lines and conductors are insulated, de-energized or otherwise rendered safe against accidental contact.

Manually propelled mobile scaffold platforms shall be tightly planked for the full width of the scaffold. Platforms shall be secured in place. Casters or wheels shall be provided with a locking device to hold the scaffold in position. Do not ride rolling scaffolds. Do not extend adjusting screws on rolling scaffolds more than 12 inches. Remove all material and equipment from the platform or secure it before moving the scaffold. Do not attempt to move a rolling scaffold without sufficient help. Watch out for openings in the floor, overhead obstructions and electrical conductors. Rolling towers must be used only on level surfaces. Move rolling towers by pushing at the base level only. Do not pull from the top. Work only within the platform area. Do not try to extend the overhead work area by reaching out over the guardrailing. Freestanding scaffold towers with a height-to-base ratio of more than three to one shall be restrained from tipping by installing outriggers or securing by other means.

3.4.10 Underground Installations

Utility companies, municipally owned utilities and WEMCO officials must be contacted and advised of proposed work prior to the start of work. Prior to safe shutdown tasks, efforts must be made to determine whether underground installations, i.e. sewer, telephone, water, fire water, fuel, electric lines, etc., will be encountered and, if so, where such underground installations are located. If no underground lines are noted, care must still be employed while subsurface activities are being conducted. Underground lines have been found in areas where they were not anticipated.

3.4.11 Walking/Working Surfaces

Always walk where you have a firm footing, taking short steps in slippery places. Avoid carrying anything bulky that will obstruct your vision. Look for falling, slipping and tripping hazards, such as cluttered traffic areas, unguarded openings and manholes, defective ladders, damaged ropes and slings, unsteady or snow- and ice-covered platforms, loose materials underfoot, tools hidden in the grass, and slippery, wet, oily or worn walkways. Climbing over equipment to get other items and falling off ladders, chairs, boxes and down steep slopes and stairs can cause serious and sometimes fatal accidents.

3.4.12 Self Propelled-Elevated Work Platforms Aerial Lifts

Read the manufacturer's operating instructions. Never exceed the manufacturer's recommended load. All accessories must be installed and used in accordance with the manufacturer's recommended procedures. Perform daily maintenance inspections according to the manufacturer's specifications and make a visual inspection of the vehicle and surrounding area to be sure both are clear of other personnel and obstructions (including overhead obstructions). Employees should be familiarized and trained in the use and operations of scaffolds. The manufacturer's operation manual should be made available with the scaffold. Do not use machines without guardrail.

Do not stand on the guardrail to gain extra reach. Do not use guardrail to carry materials unless the guardrail are designed for this purpose, and do not allow excessive overhang of materials when elevating the platform. A safety belt with a lanyard, or a body belt and safety straps must be attached to the basket or boom of an extendable or boom platform. Do not lean out over platform railings to perform work. Do not use ladders or makeshift devices on the platforms to obtain greater height. All personnel must remain clear of pinch points and shear points while the equipment is in use. Do not climb up or down extendable, articulating or scissor arms. Outriggers (where provided and when required for specific conditions) must be used in accordance with manufacturer's recommendations. Do not operate equipment near electrical power lines. Care must be taken to prevent ropes, electric cords, hoses and other gear from becoming entangled in equipment when the platform is being elevated or equipment moved. Do not alter equipment or override safety devices in any way.

3.4.13 Hand and Power Tools

Proper eye and face protection shall be provided and worn while using all hand and power tools. Inspect all tools before using. Do not use defective tools. Use tools only for the application for which they were designed. Every tool has a purpose. Do not use tools with mushroomed heads, sloppy connections or broken handles. Use the proper strength tool for each job. The use of handle extensions or cheater bars, is prohibited.

When using electric powered hand tools, plug into a circuit that has GFCI protection. Make sure the tool is grounded with a three (3) prong grounded plug or is double insulated. Disconnect tools and machines from their power source before making adjustments or attachment changes. Do not remove guards or safety devices. They are there for your protection. Shut off all fuel-powered tools before refueling. Ensure that blade guards are in place and working properly. Air-powered tools must have safety clips or retainers on all hose connections. Do not exceed manufacturer's safe operating pressure for all fittings.

4.0 SAFE WORK PRACTICES

4.1 STANDARD OPERATING WORK PRACTICES

Because of the wide variation in activities and the potential for hazardous situations that may be encountered during a safe shutdown task, the following standard operating procedures shall apply prior to and during the performance of any safe shutdown task.

- All personnel working within the Exclusion Zone (EZ) or area shall become well acquainted with the chemical, physical and radiological hazards associated with the task or operation.

- During task activities, only authorized personnel shall be allowed in the EZ. All unauthorized persons must remain a safe distance outside the EZ during the task activities in order to prevent exposure to potential hazards. The number of authorized personnel within the EZ shall be minimized.

- Some means of communications (ex. radio, sight) between all personnel within each work area shall be maintained.

- The buddy system and line of sight shall be mandatory at all times for personnel working in the EZ. This may be accomplished by having several people working in the EZ who are performing different activities as long as some means of communication is maintained.

- The size and location of the exclusion area around each work area shall be determined by the Task IH, Task Safety Engineer, and Task Radiological Safety Engineer in consultation with the Task Supervisor. The area shall be large enough to easily accommodate the task operation, members of the shutdown team and emergency equipment.

- Well defined primary and secondary exit route from each work zone location shall be established and all team member will be familiar with these routes.

- Fire extinguisher and other emergency equipment will be conspicuously located inside or adjacent to the EZ as stipulated on the Hazard Analysis Form.

- Immediate access to a source of water with sufficient volume, flow rate and pressure to be used for drenching in cases of emergency will be available in or adjacent to each work area as stipulated on the Hazard Analysis Form.

- All movement of drums or other heavy containers shall be accomplished by mechanical means. Empty drums may be manually rolled only to be placed in the use work area. The empty drums will be delivered to task or activity area by mechanical means.

- Proper absorbent material will be readily available and will be used promptly in areas where spills, leaks, or ruptures of drums or other containers may occur. The location of spill equipment will be maintained in an accessible location adjacent to the immediate work area.

- Instrumentation used to monitor the work area shall be fully charged, and properly calibrated before members of the shutdown team may enter the EZ and proceed with work.

4.2 SPECIFIC SAFE SHUTDOWN WORK PRACTICES

The performance of a safe shutdown task may expose the task workers to a variety of safety, health and radiological hazards. To minimize the hazards, a thorough hazard identification survey shall be conducted prior to the beginning of the task. The following steps must be completed prior to the start of field work:

- Determine if materials involved in the safe shutdown task have been characterized. The documentation of characterization must be based upon factual or substantiated information that can be confirmed. Characterization information based upon past practices or personnel recollection which is not considered factual or substantiated may not be classified as reliable.

- If materials have not been characterized or information is considered unreliable, then materials should be sampled. Sampling procedures should follow the established WEMCO material sampling procedure.

- Define the area or boundaries of the safe shutdown activities within the task scope of work. Are there going to be separate work areas, or are the activities close enough for one work area? The answers to these questions shall be considered when defining the work area.

- Determine the chemical, physical, biological, safety, fire and radiological hazards that will exist or could potential occur during the activities. The determination should be conducted through a walk around of the work areas by the Task IH, Task Safety Engineer, and/or Task Radiological Safety Engineer and the Task Fire Protection Engineer.

Based upon the present and potential hazards, additional personnel support may be required to determine the extent or additional hazards. Additional personnel support may include:

- Asbestos Inspector
- Fire and Safety Inspector
- Electrical Engineer
- Utilities Engineer
- Structural Engineer

5.0 EDUCATION AND TRAINING

Individuals assigned to perform any task/project associated with The Safe Shutdown Program activities shall not engage in any work until they have been trained to a level commensurate with their job function, responsibilities, and with the degree of anticipated hazards in accordance with the FEMP Site Health and Safety Plan and this document. The training requirements listed in this section apply to all WEMCO and WEMCO subcontractor personnel assigned to safe shutdown activities/tasks.

5.1 GENERAL SITE TRAINING

In accordance with the FEMP Site Health and Safety Plan, all WEMCO and WEMCO subcontractor personnel will meet, at a minimum, the following general site training requirements:

- 40-hour OSHA 1910.120 Hazardous Waste Operations training
- 8-hour OSHA 1910.120 Hazardous Waste Operations annual refresher training*
- 8-hour OSHA 1910.120 Hazardous Waste Supervisory training (if applicable)
- 24-hour Hazardous Waste Operation supervised field experience
- WEMCO Radiation Safety**
- WEMCO Nuclear Criticality**
- WEMCO Respirator Training and Fit Test*
- WEMCO General Safety*
- WEMCO Portable Fire Extinguisher*
- WEMCO You and OSHA*

* Each individual must attend, at a minimum, on an annual basis
** Each individual must attend every two years

5.2 SAFE SHUTDOWN SPECIFIC TRAINING

All WEMCO and WEMCO subcontractor personnel working on safe shutdown activities/tasks will be required to attend the WEMCO FEMP training classes pertinent for the site specific activities. Training classes may include:

- Confined Space Entry
- Lockout/tagout
- Hazard Communication
- Hot Work
- Establishment and Control of Satellite Accumulation Areas
- Sampling Waste
- Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area
- Control and Utilization of Contaminated Trash Dumpsters

- Moving and Storing Nuclear Materials at FEMP
- Emptying Liquid Hazardous Waste Storage Containers
- Storage, Repackaging and Off-Site Transfer of Radioactive Material
- Baghouse type dust control removal/replacement (if required by specific task)
- Control of Permits for accomplishing hazardous work
- Packaging LLRW for off-site disposal
- Storage of enriched material
- Nuclear safety for receiving, storing, repackaging, and moving enriched uranium materials L20% U235
- Inspection and operation of Nilfisk Portable Vacuum Units
- Guidelines for the prevention of Uranium Metal Fires
- Movement of Hazardous Waste
- Norclean Portable Vacuum Operation
- Operation of Spencer and Hoffman Portable Dust Control System
- Facility Evacuation Plan and Accountability

5.3 TASK/PROJECT SPECIFIC TRAINING

All WEMCO and WEMCO subcontractor personnel assigned to a specific safe shutdown task/project will attend the task/project specific training prior to performing work on the specific task/project. The training will be based upon the task Hazard Analysis Form and will include, at a minimum, the following items:

- Expected Activities
- Procedures
- Potential Hazards
- Air Monitoring
- Equipment
- Emergency Procedures
- Decontamination
- Waste Materials

5.4 SPECIALIZED TRAINING

If the specific safe shutdown task/project will involve an activity or procedure that is not covered or was not covered in sufficient detail as determined by the Field Coordinator, Task Supervisor, Task Radiation Safety Engineer, Task Safety Engineer or Task Industrial Hygienist, all WEMCO and WEMCO subcontractor personnel involved with that activity or procedure will receive additional specialized training. The training will be conducted prior to the initiation of the activity or procedure.

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5.5 DAILY TASK/PROJECT SPECIFIC SAFETY BRIEFINGS

All WEMCO and WEMCO subcontractor personnel will need to attend safety briefings conducted by the Task Safety Engineer, Task Industrial Hygienist or Task IH Technician assigned to the task/project. These briefings will address any new operations, activities or procedures that are to be conducted or changes in work practice that will be implemented due to new information. Briefings will also be given to facilitate compliance with prescribed safety and health practices when performance deficiencies are identified during daily activities or as a result of safety audits.

5.6 TRAINING REQUIREMENTS

All training conducted as specified by this health and safety plan shall be in accordance with the requirements WEMCO FEMP Centralized Training Program Manual.

6.0 MEDICAL SURVEILLANCE

6.1 WORKER SELECTION

Each individual performing a safe shutdown task will be required to have successfully completed a medical surveillance examination consistent with the requirements of 29 CFR 1910.120 (f). The examination will be based upon the evaluation by a qualified licensed physician to determine the individual's ability to work with hazardous materials, to work under biothermal stress conditions, to wear respiratory protection equipment (air purifying and supplied air), and any other required personal protective equipment.

6.2 MEDICAL MONITORING PROGRAM

In accordance with 29 CFR 1910.120, all WEMCO and WEMCO subcontractor personnel assigned to an FEMP project and performing actual tasks are required to participate in a medical monitoring program. The subcontractor can elect to have the examination performed by WEMCO medical personnel or by a licensed qualified physician familiar with occupational medicine. If examination is conducted by medical personnel other than WEMCO personnel, the examination protocol must include at a minimum:

- SMAC 18 Blood Chemistry
- CBC
- Urinalysis, including microscopic examination
- Chest X-ray (one view)
- Pulmonary function
- Audiometric Testing
- Vision Screening
- Electrocardiogram
- Medical and Occupational History
- Physician Physical Examination

Medical surveillance exams will be conducted based upon the following frequency:

- Pre-assignment (baseline)
- Annual (within one year of previous physical)
- After incidents, potential exposures, or physician recommendation
- Exit (termination)

6.3 RADIATION SURVEILLANCE

All individuals who are required to work in the process or controlled areas at the FEMP facility will be required to participate in the WEMCO radiation in-vivo and bioassay surveillance programs. The radiation surveillance must be conducted according to the following frequency:

- Baseline (site work)
- Periodic
  - monthly - bioassay
  - yearly - in vivo
- Following an incident
- Upon an individual's request
- Exit (end of project or termination)

6.4 SUBMITTAL OF NAMES

Prior to the initiation of actual work on or for WEMCO at the FEMP site, the WEMCO subcontractor shall submit the names of all personnel who may be involved in the performance of the project/task and medical surveillance documentation (if performed off-site) to the WEMCO Director of Medical Services.

7.0 MONITORING

It is the policy of the FEMP to maintain radiation exposures, and exposures to toxic substances and combustible gases As Low As Reasonably Achievable (ALARA). As appropriate, real-time monitoring instruments will be used to monitor on-site concentrations of total organic vapor, dust concentrations, oxygen and combustible atmospheres, ionizing radiation and noise levels. Monitoring shall be conducted for each active work area. Air monitoring will be conducted in order to determine the proper level of protection for each work area. In addition to real-time monitoring of work zones, perimeter and personnel monitoring will be conducted to ensure the adequacy of action levels.

7.1 REAL-TIME AIR MONITORING

An organic vapor meter equipped with a photoionization detector (PID) or flame ionization detector (FID) will be used to monitor the employees' breathing zone and the work areas. A combustible gas indicator (CGI) and oxygen meter will be used to monitor the work areas for the presence of combustible gases by monitoring the lower explosive limits (LEL) of vapors and percent of oxygen in the air. Monitoring will take place at each work location as determined by the Task IH. Periodic monitoring shall take place in the Contamination Reduction and Support Zones. Perimeter monitoring of each EZ may be required depending on the real-time monitoring results. The Task IH shall determine, based on the hazards of the tasks, the frequency of the monitoring which will be noted on the hazard analysis form.

Action levels for real-time monitoring instruments are based on monitoring in the worker's breathing zone (BZ) for unknown or uncharacterized compounds:

TABLE 7.1
AIR MONITORING ACTION LEVELS

Instrument	Action Levels	Level of Respiratory Protection	Action
PID/FID	0.0 to 0.2 ppm (above background in BZ)	Level D	None
PID/FID	0.2 to 10 ppm (above background in BZ)	Level C	None

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Instrument	Action Levels	Level of Respiratory Protection	Action
PID/FID	10 to 25 ppm (above background in BZ)	Level B	Implement perimeter monitoring program
PID/FID	> 25 ppm		Withdraw from work area
CGI	0 - 10% LEL		Proceed normally
CGI	greater than 10% LEL		Stop work, evacuate work area and allow to vent
Dust Monitor	Background to .5 mg/m^3	Level D	None
Dust Monitor	.5 mg/m^3 to 5.0 mg/m^3	Level C	None
Oxygen Meter	< 20.5% O_2	Level B	Evaluate the area. Monitor wearing SCBA or supplied air respirator. NOTE: Combustible gas readings may not be valid in atmospheres with < 19.5% O_2.
Oxygen Meter	20.5 - 21.5% O_2		Continue investigation with caution. O_2 levels > 21% require extreme caution - levels other than normal may be due to the presence of other substances.
Oxygen Meter	> 21.5% O_2		Stop work and consult with Task IH and Safety Engineer. Withdraw from work area.

Instrument	Action Levels	Level of Respiratory Protection	Action
Hydrogen Sulfide	> 3 ppm		Withdraw from work area.
Carbon Monoxide	> 10 ppm		Withdraw from work area.
Sound Level Meter	> 85 dBA		Hearing protection required.

Upgrading action levels is based on maintaining the upper limit of the action level for 15-minute durations or at the discretion of the Task IH Technician.

7.1.1 Volatile Organics

If compounds or materials have been characterized, then the Task IH may revise the action levels for volatile organics as measured by the FID or PID instrumentation. The action levels will be based upon the current OSHA permissible exposure limit (PEL), ACGIH threshold limit values (TLV) or other established exposure limits. The action levels must also include a "safety factor" to take into consideration interferences and limitations inherent to the measuring instrumentation.

7.1.2 Dust

The Task IH may also revise the dust action levels to reflect characterized materials. The Task IH may specify the particular type of instrumentation, (such as a fibrous aerosol monitor or miniram), because of the type of dust that may be generated by the safe shutdown activities.

7.1.3 Toxic Compounds

The Safe Shutdown Task IH may establish additional action levels and specify real-time instrumentation for specific compounds when the materials involved with the task have been characterized or may be generated by the task operations. Some specific compounds, such as carbon monoxide and hydrogen sulfide, have real-time monitoring instrumentation specific for those compounds.

7.2 PERIMETER MONITORING

Perimeter monitoring shall take place around the perimeter of the safe shutdown activity to ensure that materials or compounds involved or generated by the activity are not migrating outside of the activity area. The action levels for perimeter monitoring will be based upon the real-time instrumentation measurements. The perimeter monitoring action levels will be established by the Task IH and will initiate material or compound control measures on a task or work area basis.

7.3 PERSONNEL AIR MONITORING

During the performance of the safe shutdown tasks, personnel air monitoring shall be conducted. The intent of the personnel air monitoring program is to monitor the task workers' exposures to determine the relationship to current OSHA and ACGIH exposure limits. The personnel air monitoring results may also be used to evaluate the effectiveness of the real-time air monitoring action levels. The personnel who will be monitored shall include at lease one member of the task team. The task members who will be handling the materials or compounds will have the greatest potential exposures and typically be monitored. Materials or compounds to be monitored, frequency of monitoring and the sampling method will be determined by the Task IH and conducted by the Task IH Technician.

7.4 RADIATION MONITORING

Due to the previous mission of the FEMP site, radiological contamination is present. To protect individuals while working on the safe shutdown tasks, both surface and personnel monitoring shall be conducted to access radiation exposure.

7.4.1 Action Levels

TABLE 7.2
RADIATION ACTION LEVELS

Instrument	Action Level	Level of Respiratory Protection	Action
Alpha Probe	100 ccpm	Level C	
Alpha Probe	500 ccpm	Level B	
Beta/Gamma Probe	1000 ccpm	Level C	
Beta Gamma Probe	5000 ccpm	Level B	
External Radiation	>2.5 mR/hr	Health Physics Review	

Instrument	Action Level	Level of Respiratory Protection	Action
Radon & WL Monitor	0.075 - 1.65 WL	Level C	
Radon & WL Monitor	1.65 - 33 WL	Level B	
Radon & WL Monitor	<33 WL		Evacuate Area
Airborne Radioactivity (long lived) U-238	25% DAC* 5.0 E-12 uCi/mL	Level C	
Airborne Radioactivity	25X DAC*		Evacuate Area

* DAC - Derived air concentrations for radionuclide of interest.
Areas at 10% of the DAC will be posted as "AIRBORNE RADIOACTIVITY AREA". At 25% of the DAC respiratory protection shall be required to obtain 10% DAC inside the respirator facepiece. Special evaluation may be provided by Task Radiological Officer to identify reasonable respiratory protection consistent with dosimetry requirements if this goal cannot be met. Air sample results which indicate that individuals may have been exposed to 40 DAC-hours or more per week shall trigger internal dosimetry assessment. For additional DACs, refer to FEMP Safety Procedures, NO. SP-P-35-016, Radiation Work Permits.

7.4.2 Internal Radiation Hazard

Internal dose evaluation programs (including the routine bioassay program) shall be adequate to demonstrate compliance with radiation protection standards.

7.4.3 External Radiation Hazard

Personnel dosimetry programs shall be adequate to demonstrate compliance with the radiation protection standards and will be performed by the Dosimetry Department personnel. Personnel dosimetry shall be routinely calibrated and maintained.

Dosimeters are to be kept clean and unobstructed, and worn on the outside of clothing on the trunk of the body during all task activities.

8.0 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

8.1 PERSONAL PROTECTIVE EQUIPMENT

The level of protection to be worn by field personnel involved with safe shutdown activities will be defined on a task basis. The selection of personal protective equipment (PPE) shall be made based on the materials or compounds that will be encountered or generated by the activities. The PPE ensemble worn will be chosen by the Task IH, Task Safety Engineer and Task Radiological Safety Engineer. The Task IH Technician and Task Radiation Technician shall perform work area inspections to determine if the PPE is being worn correctly and properly maintained. Should PPE be found to be incorrectly worn, or improperly maintained, the Task IH Technician or Task Radiation Technician will inform worker, Task Supervisor, Task IH, Task Safety Engineer, and Task Radiation Safety Engineer and discuss at daily safety meetings. If situation or condition continues, then disciplinary actions according to the FEMP site procedures may be utilized. The Task Supervisor will be responsible for ensuring that all personnel are wearing required PPE properly. Modification to the protective equipment ensembles may be necessary for specific operations or when unexpected conditions arise. In these cases, changes will be made based on review of specific hazards, weather, or work conditions, operating requirements, and air monitoring at the work area. Respiratory protection may be upgraded or downgraded, as deemed appropriate by the Task IH Technician, within the constraints of this HSP and the task specific Hazard Analysis Form, using real-time monitoring equipment in accordance with the specified action levels. With the approval of the Task IH, it may be possible to substitute some PPE items for those originally specified.

8.2 RESPIRATORY EQUIPMENT

Respiratory equipment, full face air purifying respirators (APR), airline and self-contained breathing apparatus (SCBA) units, shall be issued and used according to the WEMCO Respiratory Protection Manual (FMPC 2152). This manual stipulates that a respirator may be used for a maximum of one shift. Each individual shall be quantitatively fit-tested prior to the commencement of field activities. All individuals selected for respiratory equipment use shall have a medical consultant approval current within one year of the date the respiratory equipment is to be worn.

8.3 EMERGENCY SAFETY EQUIPMENT

Emergency safety equipment such as: emergency eye wash facilities, and fire extinguishers shall be made immediately available to each work area. The Task IH Task Safety Engineer and Task Fire Protection Engineer shall perform an inspection of the work area prior to be beginning of task operations to determine what emergency equipment is already available adjacent to the work area and what equipment will have

to be supplied by the task. The Safe Shutdown Task Supervisor will be responsible for ensuring that the emergency equipment is accessible and maintained in proper working condition, and conducting periodic inspection of the equipment (as specified by the Task IH, Task Safety Engineer and Task Fire Protection Engineer). The locations of the emergency safety equipment shall be known to the entire task team.

8.4 COMMUNICATIONS

Communications shall be maintained by task members during the entire task in the form of direct line of sight, hand signals or two way radios. Hand signals must be standardized to prevent misinterpretation. All task team members will be instructed in the correct use of hand signals. Hand signals to be used during task activities will be:

SIGNAL	MEANING
Hand gripping throat	Out of air, cannot breathe
Grip partner's wrist or place both hands around arm	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	OK, I'm all right
Thumbs down	No, negative

9.0 SITE CONTROL AND DECONTAMINATION

9.1 TASK WORK

Each task work zone will employ a three zone approach to site operations to control the potential spread of contamination. These zones are shown in Figure 9-1. The three zones are:

- the Exclusion Zone (EZ)
- the Contamination Reduction Zone (CRZ)
- the Support Zone (SZ)

9.1.1 Exclusion Zone

The area(s) which contain, or are suspected to contain, hazardous materials are considered the EZ. This zone will be clearly delineated by a "hotline". The Task IH and Task Radiological Safety Engineer may establish more than one restricted area within the EZ where different levels of protection may be employed or different hazards exist (i.e., multiple crews, different operations). Personnel are not allowed in the EZ without:

- A buddy (by means of some form of communication)
- Appropriate personal protective equipment
- Medical authorization
- Training certification

All areas where work activities occur will be considered to be an EZ. For heavy equipment operations, the EZ will be established with a minimum 30 foot radius around the equipment.

9.1.2 Contamination Reduction Zone

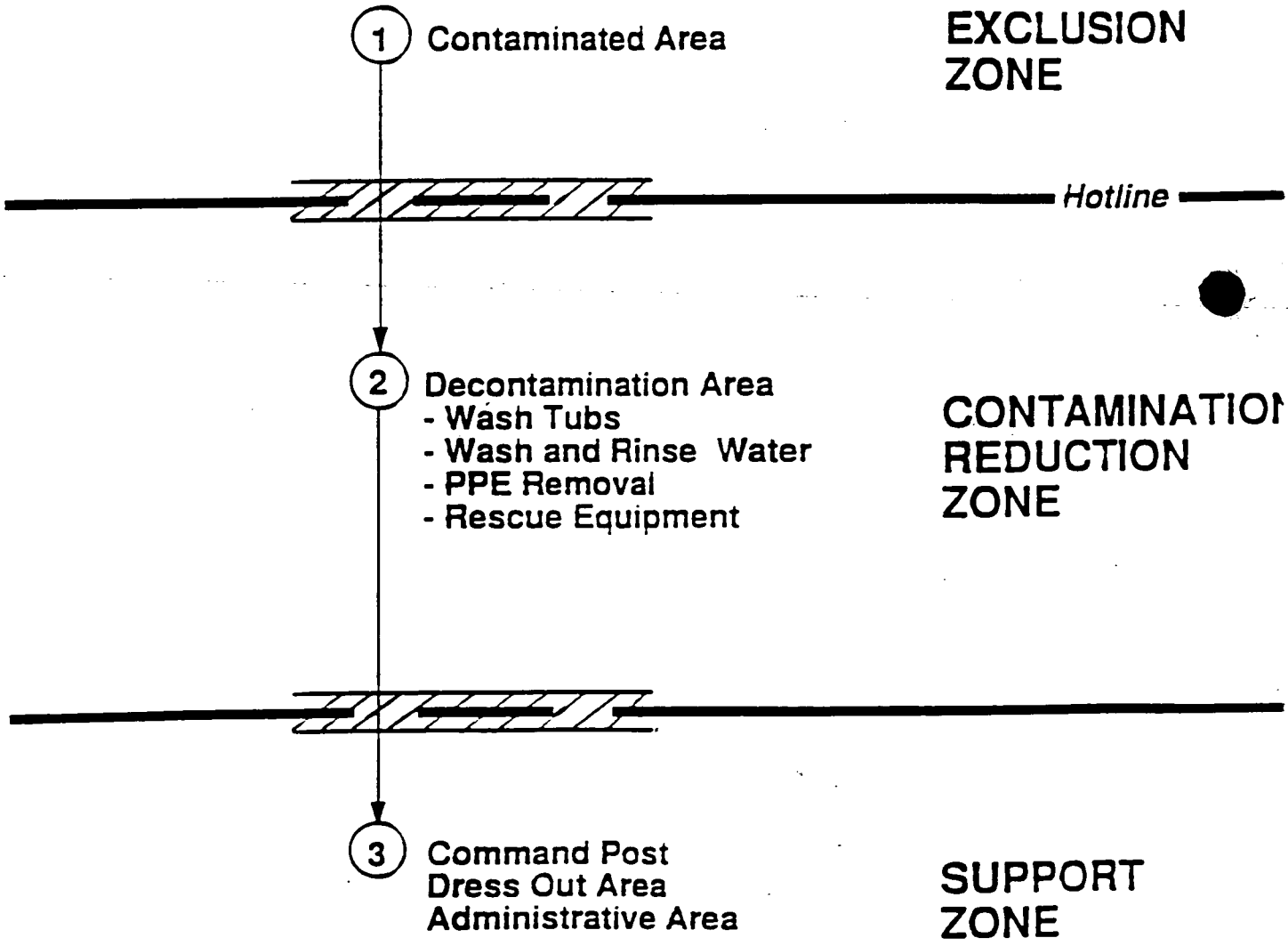
A CRZ is established between the EZ and the SZ as indicated on Figure 9-1. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable equipment. The CRZ will be used for general site entry and egress in addition to access for heavy equipment. The CRZ will also contain appropriate safety and emergency equipment such as an emergency eyewash and fire extinguisher.

9.1.3 Support Zone

Figure 9-1 indicates the SZ which is considered the uncontaminated area, or outside of the task work area, and separated from the CRZ by the "Contamination Control Line". Appropriate sanitary facilities, and safety and support equipment will be located in this zone. The majority of site operations will be controlled from this location. Potentially

Figure 9-1

Field Investigation Zones



contaminated personnel or materials are not allowed in this zone except appropriately packaged/decontaminated and labeled materials. Meteorological conditions (such as tornadoes or lightening) will be observed and noted that may effect the on-going work being conducted in the EZ, as well as those factors pertinent to heat stress.

9.2 DECONTAMINATION

Decontamination involves physically removing contaminants and/or converting them chemically into harmless materials. The level of decontamination required depends on the nature of the contaminants, the planned task activities, and the level of protective equipment worn with safe work practices. The Task IH, Task Safety Engineer and the Task Radiation Safety Engineer will determine the level of decontamination required prior to the start of task activities based upon evaluation of the specific work activities and conditions. Should radiation contamination occur, the Task Radiation Technician will follow the FEMP Site Procedures. Task specific requirements will be listed on the Hazard Analysis Form.

9.3 RADIATION DECONTAMINATION

Whole body frisking, as specified by the Task Radiological Safety Engineer, is required when leaving a radiological contaminated area. Personal monitoring will be performed using portable survey instruments equipped with either a GM (beta/gamma) detector when background count levels are less than 300 counts per minute or a Zinc Sulfide Scintillation (alpha) detector when the background count levels are greater than 300 counts per minute. The GM detector is to be held within 1/2 inch of the surface to be frisked and the survey is performed at the rate of 2 to 3 inches per second. The Zinc Sulfide Scintillation detector is to be held as near to the surface as possible without contact and the survey performed at the rate of 1 to 2 inches per second. When activity is detected, the probe should be held in place for 10 seconds to determine the activity level.

If personal contamination occurs and cannot be removed with one attempt at cleaning to background levels, the Task Radiation Technician will contact the Radiological Safety Engineering Department immediately. Specific task decontamination procedures will be listed on the Hazard Analysis Form.

All vehicles, tools, and equipment used in any radiological controlled area must be monitored (and wrapped to take to the decontamination area, if necessary) before leaving the restricted radiological controlled area (exclusion zone) to a nonrestricted area (support zone).

The Task Radiation Technician will perform the monitoring and the Radiological Safety Engineering Department will make all calculations and determinations as to the results of the monitoring.

9.4 CHEMICAL DECONTAMINATION

9.4.1 Personnel Decontamination

All personnel working in the Exclusion Zone (EZ) will be required to proceed through a decontamination process upon exiting the EZ. Figures 9-2, 9-3 and 9-4 illustrate the general decontamination procedures for personnel for levels B, C, and D. Personnel decontamination lines will be set up at each separate work area. All personnel working in the EZ will be required to shower at the end of their work shift. All personnel will be required to thoroughly wash their hands and face prior to eating, drinking, or using tobacco products. The Task IH and Task Radiological Safety Engineer will be responsible for determining the necessary decontamination steps, as listed on the Hazard Analysis Form, for the particular work areas. The Task IH Technician and Task Radiation Technician will be responsible for observing the individuals working on the task to determine the compliance with the decontamination process. The Safe Shutdown Task Supervisor will also be responsible for making sure that the supplies and equipment necessary for decontamination are readily available at the work location.

9.4.2 Heavy Equipment

Heavy equipment may be used in safe shutdown tasks. When the heavy equipment is used inside of the work area EZ, the equipment will require surface decontamination. A gross decontamination station will be established within the contaminant reduction zone of the work area. After gross decontamination, the equipment will then be required to proceed to a centralized vehicle decontamination pad. The equipment will then be decontaminated using a steam cleaning operation or other approved methods. The decontamination pad should have sufficient capacity to accommodate the wash water generated by the steam cleaning. All equipment shall be steam cleaned in a manner to minimize the quantity of waste water generated. If small equipment cannot be steam cleaned, then a high pressure wash with low phosphate detergent wash will be used followed by a clean water rinse. All associated waste generated by the decontamination process will be containerized and stored according to FEMP site procedure.

9.4.3 Monitoring and Personal Protective Equipment

Monitoring equipment shall be decontaminated prior to being removed from the EZ. The monitoring equipment should be wrapped in a plastic bag before being allowed in the EZ and the bag should be removed on exiting to reduce the potential for internal contamination. If the monitoring instruments are not wrapped in plastic, the instrument should be wiped down with an alcohol wipe. The wipe and/or plastic should be discarded as contaminated waste.

All boots and gloves will be decontaminated using soap and water solution and scrub

brushes or will be removed and disposed of. When Level B or C protective equipment has been used, the protective suit will be subject to a gross wash and rinse using a spray applied soap and water solution or will be removed and disposed. All respiratory equipment will be decontaminated according to the FEMP site procedures.

9.5 CONTAMINATION PREVENTION

One of the most important aspects of decontamination is the prevention of contamination. Good contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel:

- Know and understand the limitations of all personnel protective equipment being used.
- Avoid direct contact with contaminated materials whenever possible.
- Walk around pools of liquids, discolored areas or any area that shows obvious evidence of contamination.
- Do not sit or lean on contaminated surfaces.
- Do no walk through areas of obvious or known contamination.
- Prior to donning, make sure that all PPE is free of cuts or tears.
- Fasten all closures on suits, covering with tape if necessary.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of airborne contaminants.
- Minimize the time spent in contaminated areas - only enter if you are required to.

Sampling/Monitoring Equipment:

- Cover instruments with clear plastic, leaving openings for sampling ports and sensor ports.
- Sample containers shall be bagged after being filled with sample material.

Figure 9-2

Decontamination Station
Level B

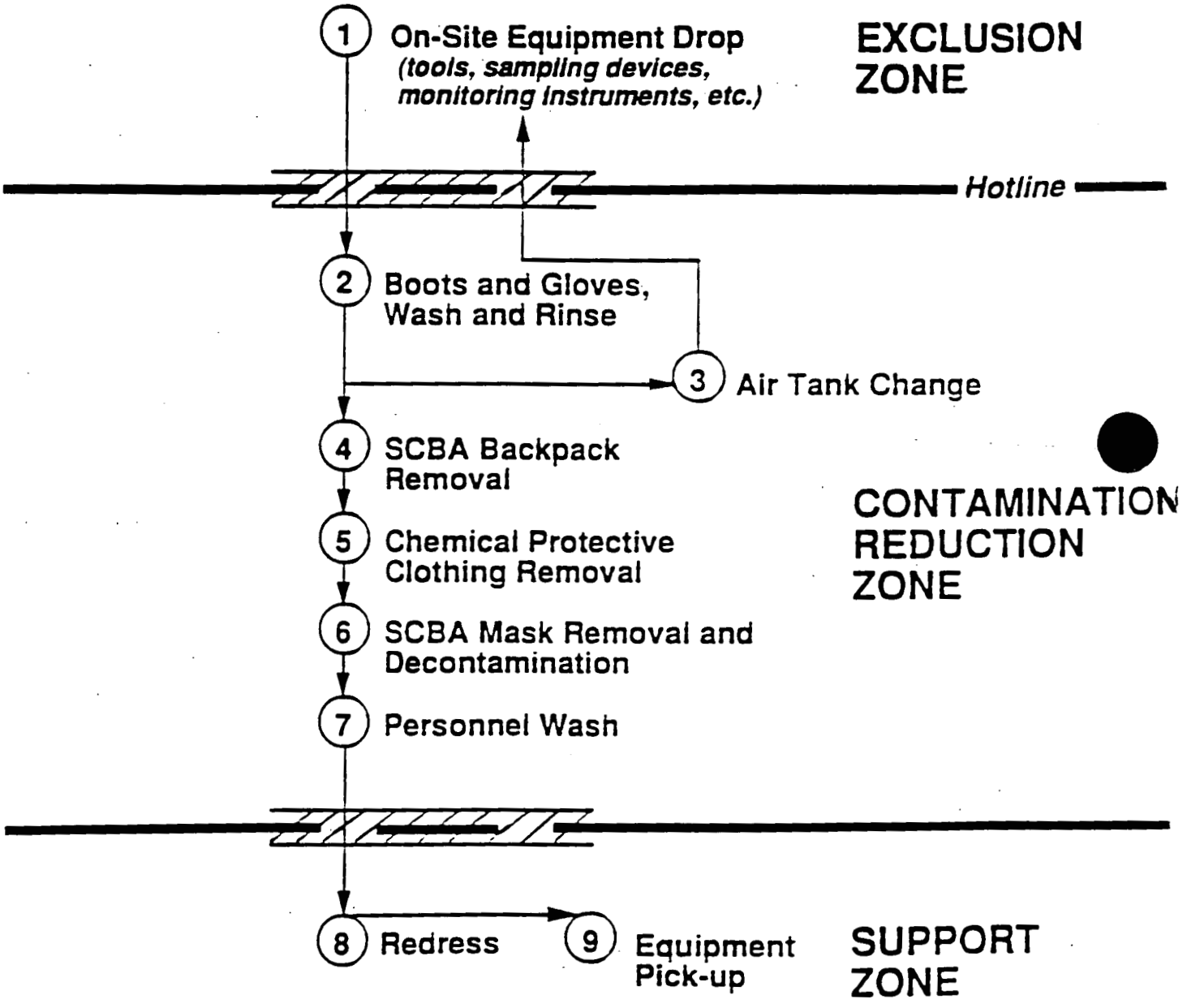


Figure 9-3

Decontaminatic Station
Level C

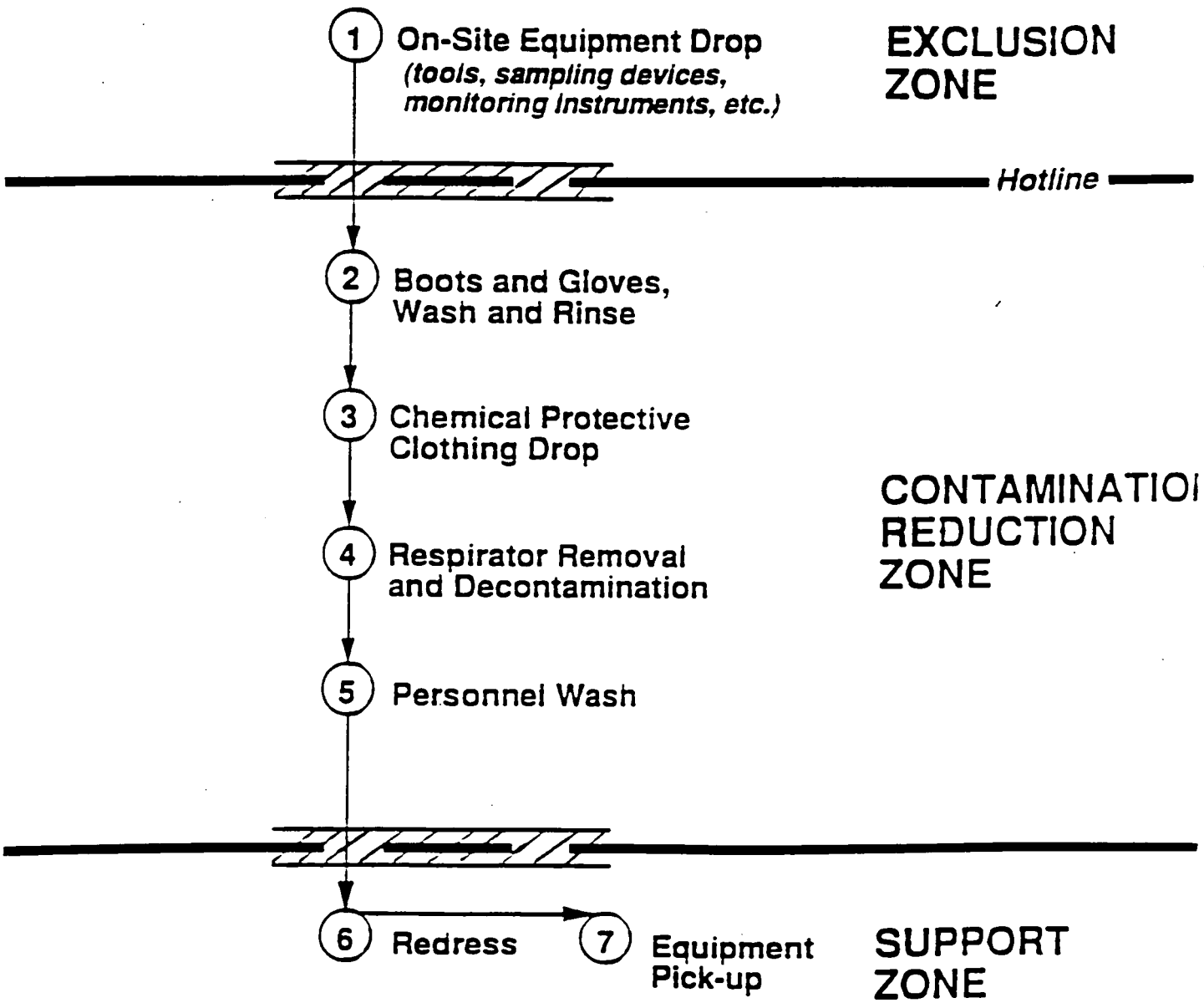
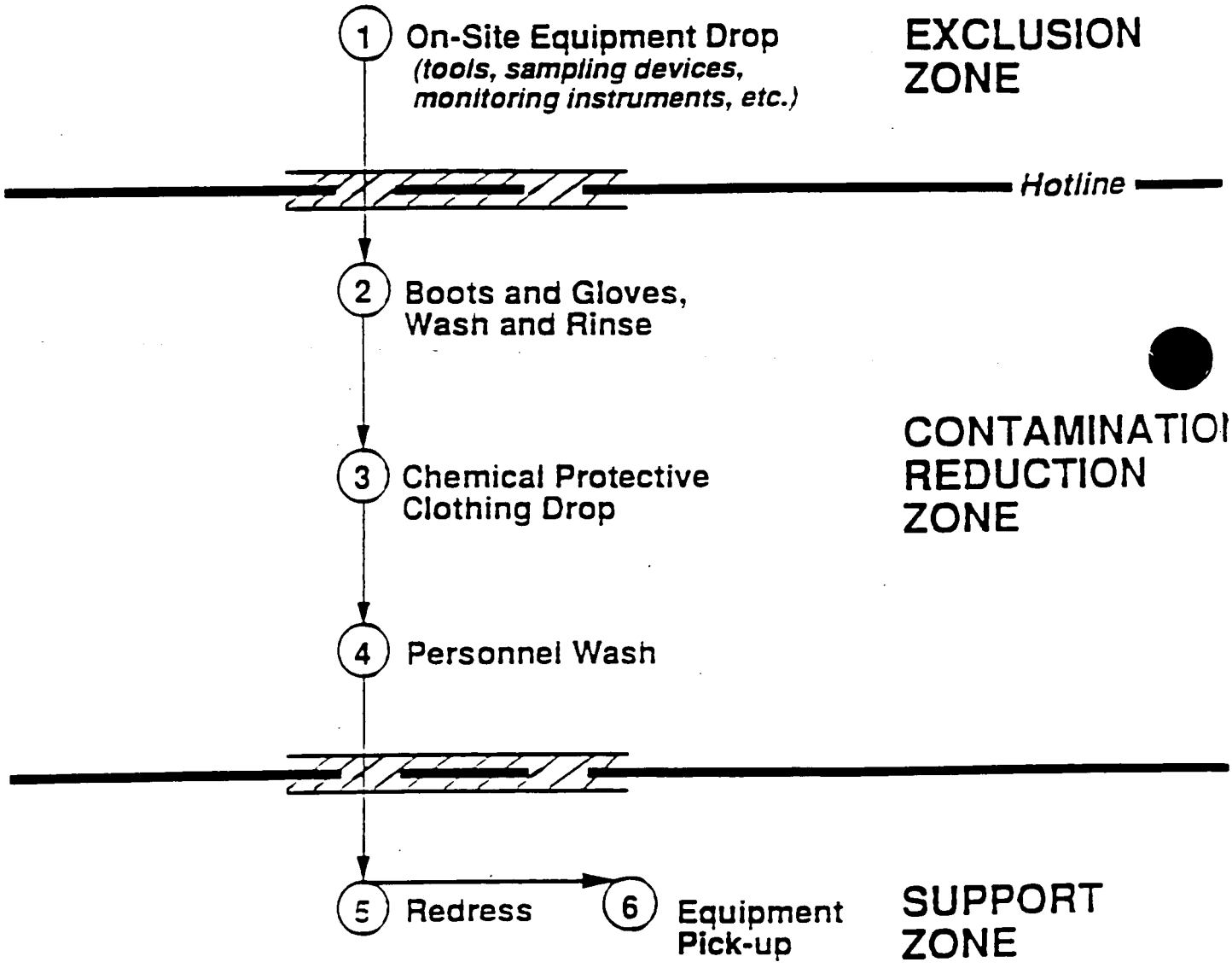


Figure 9-4

Decontamination Station
Level D



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10.0 DISPOSAL PROCEDURES

All discarded materials, waste materials, or other objects will be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or allowing litter to be left on-site. All potentially contaminated disposal materials, e.g. gloves and protective suits, will be drummed, labeled and segregated according to the FEMP site procedures. All non-contaminated materials must be collected for appropriate disposal according to FEMP site procedures.

11.0 EMERGENCY AND CONTINGENCY PLANS

The following emergency/contingency plan has been prepared for tasks or activities associated with the Safe Shutdown Program at FEMP. The following work practices are developed in accordance with the FEMP Site Health and Safety Plan. This Safe Shutdown Health and Safety Plan was developed to prevent accidents and injuries form occurring during the completion of safe shutdown tasks and activities. Even though this document has outlined preventative measures to be identified, the hazards and potential hazards associated with each task or operation, emergency/contingency plans must be developed to reduce, control and minimize the affects of an accident or incident.

11.1 INJURIES

According to the FEMP Site Health and Safety Plan, in the event of an injury, site personnel will try to reduce or eliminate the causes whenever possible. The process of determining what is appropriate requires that each situation be evaluated on a case-by-case basis.

11.1.1 Reporting Injuries

All injuries, no matter how minor, shall be reported immediately to WEMCO Medical for evaluation or treatment. The employee's supervisor shall be notified as soon as possible after the injury has been reported to WEMCO Medical.

11.1.2 Types of Injuries

The following types of injuries and their responses are addressed in Section 12 of the FEMP Site Health and Safety Plan.

- Minor Injuries
- Serious Injuries
- Injuries Complicated by Contamination
- Chemical/Radiation Releases
- Chemical Splashes (Eye and Skin)

11.2 EVACUATIONS

11.2.1 Site Evacuations

Should a situation require an emergency evacuation of the site, all equipment shall be turned off and left in place. Personnel will not go through the normal decontamination process at the work site, but would assemble at the nearest rally point where the Task IH Technician, and /or Task Radiation Technician will establish a modified decontamination process in coordination with Task IH and Task Radiological Safety Engineer. Figure 11-1 indicates the locations of the rally points.

11.2.2 Work Area Evacuation

Should a situation require an emergency evacuation of the work area, all equipment shall be turned off (if possible) and left in place. All personnel within the work area shall follow the instructions of the Task IH Technician or Task Radiation Technician as to the appropriate decontamination steps to be taken. Personnel will be instructed to assemble at a predetermined rally point a safe distance away from the work area. The rally point shall be selected based upon wind direction and type of emergency situation.

11.3 EMERGENCY NOTIFICATION

In the event of fire or medical emergency, the event shall be reported immediately by radio or by phone (extension 6511) to the FEMP Communications Center. The person responding to the radio or phone who will notify Fire, Safety and Medical. The person making the notification shall stand by to direct the FEMP Emergency Response Team to the scene of the emergency.

11.4 HOSPITALS

The FEMP Medical Facility is staffed and equipped to handle most types of medical emergencies that would occur during a safe shutdown task. The medical facility is staffed with Emergency Medical Technicians (EMT) and is equipped with an ambulance to transport the injured person to the nearest off-site hospital should extended or specialized treatment be necessary. Figure 11-2 indicates the location of the FEMP Medical Facility.

11.5 ADVERSE WEATHER CONDITIONS

In the advent of adverse weather conditions, the communications center will instruct over the loud speaker system. As part of the task briefing, the Task Safety Engineer should identify the location of the tornado shelter(s) for each work area as established by FEMP Emergency Preparedness.

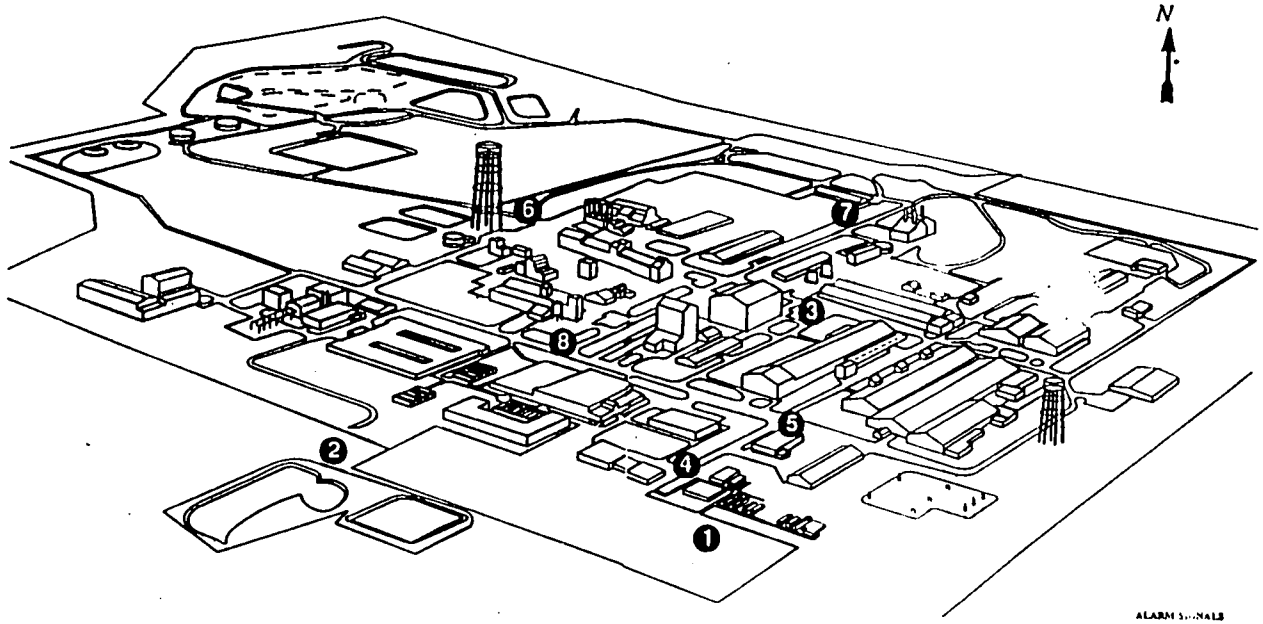
11.6 EMERGENCY TELEPHONE NUMBERS

	Phone
EMERGENCY	6511
AMBULANCE	6511
FEMP Medical Facility	6511
FEMP Fire	6511
Communication Center	6511
Utility Engineer (AEDO)	6431 (Radio 202)
Industrial Hygiene	6207
Radiation Safety	6889
Fire and Safety	6235
Bioassay	6224
Dosimetry	6215

AEDO - Assistant Emergency Duty Officer

(For task specific telephone and radio numbers see Section 5.0 of the Hazard Analysis Form)

Fernald Environmental Management Project



Rally Points

1. Administration
2. Alternate Administration
3. Building 12
4. Security & Garage
5. Plant 5
6. Waste Pit Area & Plant 1
7. Boiler Plant
8. Plant 8

ALARM SIGNALS

EMERGENCY SIGNALS ARE TRANSMITTED VIA ALARM HORNS AND SIRENS, AND INSTRUCTIONS ARE TRANSMITTED VIA THE EMERGENCY MESSAGE SYSTEM. THE ALARM SIGNALS ARE:

ALARM

3.2.2.2 AMBULANCE, FIRE, SECURITY EVENT

Radio message to Emergency Response Team (ERT)
Emergency Message System (EMS) message follows with general information.

3.3.3.3 SUPERVISOR ALERT

Emergency Message System (EMS) and radio message follows, and may include weather information, all clear, evacuation, test (every Monday at 3 p.m.), or other announcements.

In case of: Tornado
- Take immediate cover
- In FMPC buildings, go to the lowest floor or designated shelter area. Avoid glassed areas, large roof spans, windward sides of buildings, and load-bearing walls.
- In open country, lie face down in the nearest depression, such as a ditch, and protect your head with your arms.
- Await all clear announcement.

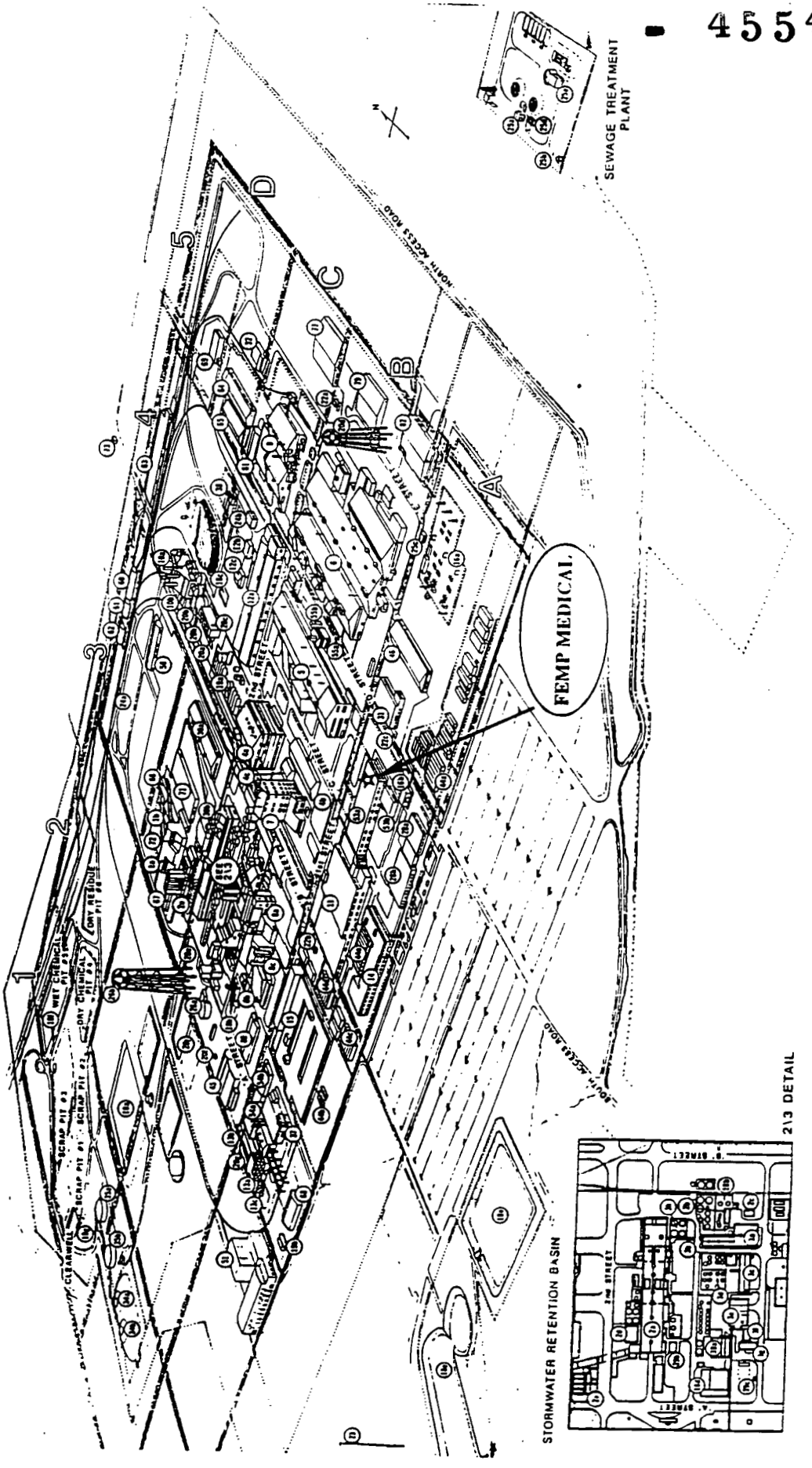
Evacuation
- Park vehicle along the side of the road.
- Go to the nearest rally point (see map below).

4.1.4.1. AIRLINE RESPIRATOR CARBON MONOXIDE ALERT

All persons using an airline respirator are to disconnect using plant breathing air systems.

Figure 11-1

Figure 11-2


Fernald Environmental Management Project
FEMP MEDICAL
SEWAGE TREATMENT PLANT
NORTH ACCESS ROAD
SOUTH ACCESS ROAD
STORMWATER RETENTION BASIN
213 DETAIL
1
2
3
4
5
A
B
C
D

12.0 HEALTH AND SAFETY REPORTS AND FORMS

12.1 HEALTH AND SAFETY PLAN AND HAZARD ANALYSIS FORM REVIEW

According to the FEMP Site Health and Safety Plan, each individual is required to read the project health and safety plan prior to working on the project. This requirement is of utmost importance in the safe shutdown activities. The review is to inform the individuals working on the activities about the specific requirements of the activities. Each person must sign the forms documenting that they have review and understand the requirements of the Safe Shutdown Health and Safety Plan and the specific completed Hazard Analysis Form for the particular task that they will be working on. The Safe Shutdown Task Supervisor is responsible for ensuring that the forms are completed before task work or activities are initiated.

APPENDIX A

HAZARD ANALYSIS FORM

SAFE SHUTDOWN
HEALTH AND SAFETY
HAZARD ANALYSIS FORM

1.0 TASK NAME: _____

Proposed Start Date: _____

Estimated Completion Time: _____

Hazard Analysis Form Prepared By: _____

Date: _____

2.0 APPROVALS:
(For completed Hazard Analysis Form)

Printed Name:	Signature:	Date:
Safe Shutdown Project Coordinator		
Safe Shutdown Manager		
Safety Engineering and Fire Services		
Industrial Hygiene		
Radiological Safety Engineer		
Fire Protection Engineer		

3.0 TASK INFORMATION

Task Name: _____

Task Scope of Work:

_____

_____

_____

_____

_____

_____

_____

_____

Task Location:

_____

_____

_____

Task Activities:

_____

_____

_____

_____

4.0 REQUIRED PERMITS

	N/A	YES	OPERATIONS/LOCATIONS WHERE REQUIRED
Confined Space			
Welding/Cutting			
Hazardous Work			
Radiological			
Other:			

5.0 HAZARD IDENTIFICATION:

___ Chemical
___ Radiological
___ Fire/Explosion
___ Heat/Cold Stress
___ Electrical
___ Machinery/Mechanical Equipment
___ Confined Space
___ Cutting and Welding
___ Noise
___ Other - Describe below:

___ Trips, Slips, Falls
___ Trenching/Shoring
___ Heavy Equipment/Vehicular Traffic
___ Overhead Hazards
___ Unstable/Uneven Terrain
___ Underground Hazards
___ Lockouts
___ Elevated Work Platforms
___ Asbestos

5.1 Chemical Hazards

Chemical Hazards (list all chemicals, materials and compounds - present, generated or necessary for task completion). For each chemical or substance listed below, additional information is to be compiled on the Chemical Inventory Worksheet and the Chemical Hazard Worksheet, attached to this form.

Substance Name	Manufacturer	MSDS On File

Radiological Hazards:

Substance	Radiation Type

6.0 PROPOSED HEALTH AND SAFETY TEAM

Position	*Person*	*Telephone Number*	*Radio*	*Pager*
Industrial Hygienist				
Safety Engineer				
Radiation Safety Engineer				
Industrial Hygienist Technician				
Radiation Technician				
Fire Protection Engineer				

7.0 MONITORING

Instrument	Monitoring Frequency
6.1 CHEMICAL	
PID (Hnu,OVM) w/____ ev Lamp	
FID (OVA)	
Combustible Gas (CGI)	
Oxygen	
H_2S	
Dust	
Colorimetric Detector Tubes	
Other:	
6.2 PHYSICAL	
Noise	
Heat Stress	
Cold Stress	
6.3 RADIOLOGICAL	
Alpha probe	
Beta/Gamma probe	
External Radiation	
Radon & Working Level Monitor	

7.4 PERSONAL MONITORING

7.4.1 Chemical

____ Passive Dosimeter ____ Personal Air Sampling ____ Other _____

Description/Other:

7.4.2 Radiation

____ TLD ____ Pocket Dosimeter ____ Other _____

7.5 BIOLOGICAL MONITORING/MEDICAL SURVEILLANCE

____ This project requires medical surveillance or biological monitoring procedures beyond the provisions of the routine medical surveillance program (see description below).

Description:

8.0 ACTION LEVELS

The following action levels are for the materials classified as characterized materials. Where materials are classified as uncharacterized, use the action levels listed in the HSP.

Instrument	*Contaminant*	*Action Level*	*Specific Action*

9.0 PERSONAL PROTECTIVE EQUIPMENT

9.1 LEVELS OF PROTECTION/PROTECTIVE CLOTHING

Task	Level	Suit	Outer Gloves	Inner Gloves	Boot Covers	Safety Shoes	Hard Hat	Safety Glasses	Hearing Protection	Other
	B									
	C									
	D									
	B									
	C									
	D									
	B									
	C									
	D									
	B									
	C									
	D									
	B									
	C									
	D									
	B									
	C									
	D									

9.2 Respiratory Protection (to be used or available at work area):

Level B

_____ Pressure demand airline with escape provisions
_____ Pressure demand SCBA

Level C

_____ Full face air purifying respirator

Respirator Cartridge Type: _____

_____

10.0 DECONTAMINATION

10.1 PERSONNEL

Personnel and equipment leaving the Exclusion Zone shall proceed through the following decontamination stations and procedures:

Station	Procedure
LEVEL B	
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.
11.	11.
12.	12.
LEVEL C	
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Station	Procedure
LEVEL D	
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.

10.2 EQUIPMENT

EQUIPMENT DECONTAMINATION

Station	Procedure

12.0 EMERGENCY/CONTINGENCY PLANS

WORK AREA	RALLY POINT	TORNADO SHELTER

The following decontamination equipment is required:

11.0 EMERGENCY/SAFETY EQUIPMENT

Equipment	Quantity	Existing in Work Area	Need to be Provided
Eye Wash			
Shower (Emergency)			
Fire Extinguisher			
2-Way Radio's			
Telephone			
First Aid Kit			
Spill Control Kit			
Flammable Storage Area			
Other: (Specify)			

APPENDIX B

COLD STRESS

These Threshold Limit Values (TLVs) are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposure to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body core temperature from falling below 36°C and to prevent cold injury to body extremities. Deep body temperature is the core temperature of the body as determined by rectal temperature measurements. For a single, occasional exposure to a cold environment a drop in core temperature to no lower than 35°C should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and rapid cooling of the body to less than 35°C; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities, and; 5) death.

Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36°C (96.8°F); lower body temperatures will very like result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 35°C (95°F). This must be taken as a sign of danger to the workers and exposure to cold should be immediately terminated for any workers when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

Since prolonged exposure to cold air, or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided.

1) Adequate insulating clothing to maintain core temperatures above 36°C must be provided to workers if work is performed in air temperature below 4°C (40°F). Wind chill factor or the cooling power of the air is a critical factor. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required. An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in Wind Chill Chart. The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.

2) Unless there are unusual or extenuating circumstances, cold injury to other than hands, feet, and head is likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special

precautions that should be considered. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

3) Employees shall be excluded from work in cold at -1°C (30°F) or below if they are suffering from diseases or taking medication that interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -24°C (-10°F) with wind speeds less than five miles per hour, or air temperatures below -18°C (0°F) with wind speeds above five miles per hour should be medically certified as suitable for such exposures.

   Trauma sustained in freezing or subzero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment.

In cold environments, wind-chill temperature is a better description of thermal conditions than the ambient temperature alone. The wind adds to the rate of cooling and it is the combination of wind speed and air temperature that is most important. In the wind-chill chart, arbitrary risks of frostbite are given for short exposure periods. For example, at a wind-chill temperature of -25°F (from 5°F temperature and 15 MPH wind) exposed flesh may freeze within one minute. However, fingers, toes, nose tips, ears, or cheeks may become frostbitten at ambient temperatures as high as 32°F with high winds. This is approximately the freezing point of skin in the absence of subcooling.

Hypothermia (general lowering of body temperature) can occur from exposure to conditions well above freezing. The lethal deep body temperature is placed at about 78°F. This condition can occur when a worker is immersed in cold water (divers), is exposed to cool, high winds, is in a state of physical exhaustion, or has insufficient food. Alcohol should not be consumed in cold environments because the resultant dilation of blood vessels can permit a rapid loss of body heat increasing the risk of hypothermia. For warming purposes, liquid intake should be hot nonalcoholic beverages or soup.

Frostbite

1) Frost nip or incipient frostbite. The condition is characterized by sudden blanching or whitening of skin.
2) Superficial frostbite. Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
3) Deep frostbite. Tissues are cold, pale, and solid; extremely serious injury.

Frostbite may be either superficial, involving only the skin, or deep, extending below the skin. Frostbite may be considered to be superficial if exposure time was short. Otherwise

assume the injury to be deep and, therefore, serious, in which case it should be treated at a hospital rather than in the field. Superficial frostbite can be treated by:

1) Covering the cheeks with warm hands until pain returns

2) Placing uncovered frostbitten fingers under the opposing armpit next to the skin

3) Placing bare frostbitten feet under the clothing against the skin of a companion

4) Never rewarm a frostbitten part by massage, exposure to open fire, cold water soaks, or rubbing with snow. Gradual rewarming against the skin is always preferred. It is important to know that pain will occur when thawing has occurred.

5) Where deep frostbite exists, it is essential to get the patient to the hospital as quickly as possible. Frozen parts should be protected from additional cold injury but no attempts should be made to thaw them in the field. The patient should also be kept warm.

For work practices at or below -12°C (10°F) Equivalent Chill Temperature (ECT) the following shall apply:

1) The worker shall be under constant protective observation (buddy system or supervision).

2) The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods must be taken in heated shelters and opportunity for changing into dry clothing shall be provided.

3) New employees shall not be required to work full-time in cold in the first days until they become accustomed to the working conditions and required protective clothing.

4) The weight and bulkiness of clothing shall be included in estimating the required work performance and weight to be lifted by the worker.

5) The work shall be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats shall not be used. The worker should be protected from drafts to the greatest extent possible.

6) The workers shall be instructed in safety and health procedures. The training program shall include as a minimum instruction in:

   a) Proper rewarming procedures and appropriate first aid treatment

b) Proper clothing practices

c) Proper eating and drinking habits

d) Recognition of impending frostbite

e) Recognition signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur

f) Safe work practices

Special caution shall be exercised when working with toxic substances and when workers are exposed to vibration. Cold exposure may require reduced exposure limits.

Eye protection for workers employed out-of-doors in a snow and/or ice-covered terrain shall be supplied. Special safety goggles to protect against ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) and blowing ice crystals are required when there is an expanse of snow coverage causing a potential eye exposure hazard.

Workplace monitoring is required as follows:

Suitable thermometry should be arranged at any workplace where the environmental temperature is below 16°C (60°F) to enable overall compliance with the requirements of the TLV to be maintained.

In outdoor situations, the windspeed should be measured and recorded at least every 4 hours, together with the air temperature whenever the air temperature is below -1°C (30°F).

For exposed skin, continuous exposure should not be permitted when the air speed results in an equivalent chill temperature of -32°C (-25°F). Superficial or deep local tissue freezing will occur at temperatures below -1°C regardless of wind speed.

Work-Warming Regimen

If work is performed continuously in the cold at an ECT of below -7°C (20°F) heated warming shelters (tents, cabins, rest rooms, etc.) shall be made available nearby and the workers should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation or a change of dry work clothing provided. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may

increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of a diuretic and circulatory effect.

Protective Clothing

1) Clothing for both cold-wet (moderately cold weather above 14°F) and cold-dry (temperatures below 14°F) should be available.

2) Clothing worn loosely and in layers provides maximum protection because the trapped layers of warm air are more effective insulators than the cloth itself.

3) Clothing must be kept dry. If not, the exposure to cold must be altered with periods of rewarming and drying of clothes.

4) Moisture should be kept off clothes by brushing or shaking snow from it prior to entering heated shelters.

5) Means of evaporating perspiration should be encouraged by opening the neck, waist, arm sleeves, and ankle fasteners as needed to provide periodic fresh air circulation.

6) During severe wind-chill conditions, a cold weather mask or wool scarf should also be worn.

7) When wearing face protectors, they should be removed periodically to check for frostbite.

8) Skin on the hands can freeze easily, therefore, cold metal should never be touched with bare hands. Special protection of the hands is required to maintain manual dexterity for the prevention accidents. If the air temperature is -17.5°C (0°F), the hands should be protected by mittens.

9) Pants should be tucked in and lapped over boot tops to prevent the entry of snow and cold water into the boot.

10) The foot wear for outdoor work in wet snow should be waterproof and reach well up on the leg. The soles and upper part of the boot should provide good insulation as well. A combination of working boots and rubber overboots provides this insulation.

11) Socks should be fairly heavy and reach well up on the leg to encourage wicking and evaporation of sweat.

Other Precautions:

Balanced meals and adequate liquid intake are essential to body heat production and the prevention of dehydration. Dehydration is as prevalent in cold regions as it is in hot, dry areas. Warm liquids (hot soup or tea) are obviously preferable since they do not have to be warmed by the body after consumption. Cold foods and drinks should only be eaten as a matter of necessity. Hair should be cut and beards shaved or clipped closely. Long hair or a beard add very little in insulation value and natural hair oils soil the clothing. In the open, a beard serves as a base for ice build up and will mask the appearance of frostbite. Electric razors are preferable since they do not remove protective oils from the face.

APPENDIX C

HEAT STRESS

Heat stress is a significant potential hazard, especially for workers wearing protective clothing. The same protective materials that shield the body from chemical exposure also limit the dissipation of body heat and moisture. Heat stress manifests itself as one of three conditions: Heat cramps, heat exhaustion, or heat stroke.

Heat cramps are brought about by long exposure to heat. As the individual sweats, water and salts are lost by the body bringing on painful muscle cramps. The signs and symptoms are as follows:

- Severe muscle cramps, usually in the legs and the abdomen
- Exhaustion, often to the point of collapse
- Dizziness or periods of faintness

First aid treatment includes shade, rest, and fluid replacement. The individual should recover within half an hour.

Heat exhaustion usually occurs in a healthy individual who has been exposed to excessive heat while working or exercising. The circulatory system of the individual begins to fail as blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms are as follows:

- Rapid and shallow breathing
- Weak pulse
- Cold and clammy skin, with heavy perspiration
- Skin appears pale
- Fatigue and weakness
- Dizziness
- Elevated body temperature

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids. If the individual is not better within half an hour, the individual should be transported to the hospital for medical attention.

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is a <u>medical emergency</u>, requiring the cooling of the patient and transport to a medical facility immediately. The signs and symptoms are as follows:

- Dry, hot, red skin
- Body temperature approaching or above 105°F
- Dilated (large) pupils
- Loss of consciousness - the individual may go into a coma

First aid treatment includes cooling the patient and transporting to a medical facility immediately.

Heat stress is a significant hazard associated with using protective equipment in hot weather environments. Local weather conditions may produce conditions which will require restricted work schedules in order to protect employees. A Wet Bulb Globe Temperature (WBGT) Index will be used to establish a work/rest cycle.

To ensure operational and personal safety of workers wearing personal protective equipment (PPE), the following table should be used as a guideline for establishing a work/rest cycle:

TABLE C-1
Permissible Heat Exposure Threshold Limit Values
Values are given in degrees Fahrenheit (°F) Wet Bulb Globe
Temperature Index (WBGT)

	Workload		
Work/Rest Regimen	Light	Moderate	Heavy
Continuous work	86.0	80.1	77.0
75% work - 25% rest, each hour		87.1	82.4
50% work - 50% rest, each hour		88.5	84.9
25% work - 75% rest, each hour		90.0	88.0

- When workers are wearing semipermeable or impermeable clothing, add 10°F to the measured WBGT Index for comparison to the chart.
- Rest means minimal physical activity. Rest should be accomplished in the shade. Any activity requiring only minimal physical activity can be performed during rest periods.

The Task IH Technician will observe the field crew looking for potential symptoms of heat stress. These measures and training on heat stress symptoms for all workers should help prevent any heat stress illnesses from occurring.

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Control Number _____

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Safety Procedures	Title: Radiation Work Permits	SP-P-35-016
		Department: ES&H Section: RC
Authorization:		Supersedes: NONE Revision Date: 12/16/92

1.0 PURPOSE

To assign responsibilities and establish the procedure for initiation, utilization, and termination of Radiation Work Permits (RWP).

2.0 SCOPE

This procedure establishes the method to be used to establish and subsequently identify RWP requirements necessary to accomplish a specific work task.

3.0 DEFINITIONS

3.1 CLOSED WINDOW READING - Instrument reading with beta shield in place. Equivalent to whole body dose rate.

3.2 CONTINUOUS COVERAGE - One or more Radiological Control Technicians (RCT) assigned full time responsibility to cover a job. Continuous coverage shall be required when:

3.2.1 Entering or working in areas with > 100 mr/hr penetrating radiation, or > 1000 mr/hr skin dose.

3.2.2 Working in an area where airborne concentrations can exceed 10 times the DAC stated in Attachment 1 of DOE Order 5480.11.

3.2.3 Work in an area with loose surface contamination > 100 times the values specified in Attachment 2 of 5480.11.

3.2.4 Whenever there is a high potential for an environmental release.

3.0 DEFINITIONS (continued)

3.2.5 Whenever the scope of work could cause changes in the work environment such that any of the above are met.

3.3 CORRECTION FACTOR - The number used to correct beta radiation field measurements to actual beta dose rate levels, related to the RO3C Ion chamber. A correction factor of 3 should be applied for distances 1 inch from the source and greater.

3.4 EXTREMITY DOSE - The dose to the hands and arms below the elbow and feet and legs below the knee (measured at a distance of 1 inch from the source.)

3.5 SKIN DOSE - The dose to the skin at a density thickness of 7 mg/cm^2 (when applicable, measured at a distance of 30 cm from the source or approximately 1 ft).

3.6 WHOLE BODY DOSE - The dose to all tissue beyond the density thickness of 1000 mg/cm^2 (when applicable, measured at a distance of 30 cm from the source or approximately 1 ft.).

3.7 OPEN WINDOW READING - Instrument reading with beta shield removed.

3.8 REQUESTING SUPERVISOR - Supervisor who initiates a RWP.

4.0 RESPONSIBILITIES

4.1 Radiological Control Technician (RCT) shall be responsible for performing pre-job radiation/contamination surveys, calculating the maximum worker stay-time for the RWP, and specifying additional safety equipment requirements on the RWP.

4.2 Radiological Control Technician Supervisor (RCTS) or designee, shall attend job/task pre-planning sessions and schedule RCT coverage and RWP issuance, based on these sessions. The RCTS shall review and approve all RWPs by signing in section III of Attachment A. In the event a RCTS is not on site, the approval can be granted by telephone and so designated on the RWP by the RCT.

4.0 RESPONSIBILITIES (continued)

4.3 Radiological Control Engineers (RCE) shall review and approve RWPs when the conditions for continuous radiological coverage are met, or when nuclides other than uranium are the concern. The RCE shall be responsible for identifying special work requirements for continuous coverage jobs, notifying the cognizant RCTS when special work requirements are applicable, and setting radiological safety guidelines and limitations specific to the work to be performed. The RCE and the RCTS shall concurrently approve the RWP by signing in section III.

4.4 Radiological Assessment Manager shall be responsible for specifying the criteria to be used by Radiological Assessment for assigning work place restrictions on an RWP.

4.5 The Manager(s) of personnel required to perform work per this procedure shall ensure that affected personnel are informed or trained to the extent necessary, prior to the initiation of that work.

5.0 GENERAL

5.1 The RWP serves as the administrative record used to set work controls and maintain personnel radiation dose As Low As Reasonably Achievable (ALARA) at the FEMP.

5.2 Jobs or tasks involving the breaching of potentially contaminated systems, exposure to elevated levels of radiation (> 2 mrem/hour), or exhibit the potential for personnel contamination exceeding Attachment 2 (5480.11) guidelines shall require an RWP.

5.3 A job-specific RWP shall be used to control nonroutine operations or work in areas with changing radiological conditions. The job-specific RWP shall remain in effect only for the duration of the job.

5.4 Standing RWPs may be used to control routine or repetitive activities, such as tours and inspections or minor work activities, in areas with well characterized and stable radiological conditions. Standing RWPs shall not be approved for periods longer than 1 year.

5.5 The Requesting Supervisor will initiate the issuance of a RWP by contacting cognizant RCTS. Job/task pre-planning with a Radiological Control representative (and other affected personnel) shall result in a detailed description of the work to be performed, with an estimate of MAN-HOURS required to complete the work.

5.0 GENERAL (continued)

5.5.1 The RC representative should assist the Requesting Supervisor in the completion of section I of the RWP form.

5.5.2 The RCT completes section II of the RWP form with pre-job survey information. Pre-job surveys should include evaluation for hot spots, opening or breaching of systems, disturbing inaccessible surfaces, and the potential consequence of actions such as welding or grinding.

5.6 The worker(s) involved with the job will acknowledge reading the RWP and complying with RWP requirements by signing in section IV of the RWP form.

6.0 PROCEDURE

6.1 Upon completion of Parts 1-3 of section I of the RWP, the RCT shall complete section II of the RWP. Section II covers radiation exposure measurements, stay-time limits, area contamination levels, collected air sample data, and therequired protective equipment. Special radiological safety instructions and requirements shall be listed in part 16 of section II on the RWP form. Guidance, requirements, and steps for completing and issuing the RWP are as follows in steps 6.2 thru 6.15. Refer to Attachment A for these steps.

6.2 Necessary documentation shall be provided. This will include the following:

6.2.1 A Task specific Health and Safety Plan (HASP) - required only for activities associated with characterization of hazardous waste sites and cleanup operations involving hazardous substances and wastes. Required under 29 CFR 1910.120 and the Site Health and Safety Plan.

6.2.2 An initial pre-job/task planning session with all personnel involved with the work should be held. A detailed description of work to be performed should be the result of this pre-job/task planning session. Refer to applicable Task Specific Health and Safety Plan, Standard Operating Procedure, or Maintenance Work Order.

6.2.3 FMPC Work Permit (as required).

6.3 The RCT shall perform a pre-job radiation and contamination survey in the area where the work is to be performed, and record the survey results in section II of the RWP form.

6.3.1 If one location is surveyed the average reading where the majority of the work will be performed shall be used for the stay time calculations.

6.0 PROCEDURE (continued)

6.3.2 If several locations are surveyed, the one location where the majority of the work will be performed shall be used in determining a stay time.

6.3.3 If no specific location requires a majority of work, the dose rate shall be averaged over the entire area, and a survey map shall be attached to the RWP.

6.3.4 To the extent practical, shielding should be used to reduce external exposure from stored radioactive materials or from nearby contaminated equipment.

6.4 Dose rates shall be recorded in section II in the following manner: Open Window (Column 6 of the form); Closed Window (Column 7 of the form); Open Window (contact, Column 8 of the form). The RCT shall also record the location of measurement. Ambient background near the survey location shall be recorded in part 10 of the RWP form.

6.5 A stay time limit for work performed under the RWP shall be established by one of the following methods:

6.5.1 Weekly dose control values shall be used to establish work permit time limits: 150 mrem whole body penetrating; 1000 mrem skin; 1000 mrem for extremities.

6.5.2 The time limit for the RWP shall be set by the most limiting dose rate, i.e., the dose which requires the shortest work time.

6.5.3 The time limit for whole body dose control is obtained by dividing the weekly dose control value by the measured (closed window) dose rate.

6.5.4 The beta dose rate for skin or extremity dose control is obtained by subtracting the closed window reading from the open window reading and multiplying the result by the correction factor, so that (ow-cw) x CF = actual (skin or extremity) dose rate for beta. The closed window reading is then added back to the corrected reading for total skin. The weekly dose control value for skin/extremities is then divided by the total skin or extremity dose rate. This calculation determines the job/task time limit due to skin or extremity exposure.

6.5.5 An alternative to assigning a stay time, in cases where gamma radiation is limiting (> 5 mrem/hour) or where the gamma dose rate is variable, is to issue a Self Reading dosimeter and instruct the individual to exit at a preset dose value. based on prior weekly exposure.

6.0 PROCEDURE (continued)

NOTE: The instructions given the worker should include when to exit and how often to read the dosimeter.

6.6 If loose contamination is present in the work area, the RCT shall instruct the Requesting Supervisor to have the immediate area cleaned/vacuumed to remove the contamination. An RWP shall be issued by the RCT for personnel to perform this task in the affected area(s). If per the Requesting Supervisor it is unfeasible to clean the area, post in accordance with SP-P-35-025, Radiological Posting, and contact Radiological Assessment.

6.7 Airborne radioactivity levels shall (as is practical) be determined in the work area prior to the start of work and monitored periodically through the duration of the work. The DAC for U-238 class Y (2.0E-11) shall be used unless otherwise specified; if in doubt, consult with Radiological Engineering. Initial monitoring can be performed with the GA (General Area) samplers running in the work area or by HI-VOL grabs collected in the work area. During the performance of the work, breathing zone samples and/or high volume grab samples shall be taken as appropriate to monitor airborne radioactivity in personnel occupied work area(s). Work site boundary/perimeter airborne levels (when applicable) shall be considered as well. If the job is of short duration (less than 30 minutes), is not expected to resuspend loose radioactive material or cause airborne radioactivity, this requirement may be deleted.

6.7.1 Portable HEPA ventilation or total containment should be used where the potential to exceed 10% of the DAC exists, if removable contamination (uranium) in the immediate work area exceeds 50,000 dpm/100 cm^2 alpha or 100,000 dpm/100 cm^2 beta-gamma (only when resuspension is possible), or for welding or cutting jobs where total (fixed plus removable) surface contamination (uranium) exceeds 5,000 dpm alpha or beta-gamma.

6.7.2 When the sources of airborne contamination cannot be eliminated, or the potential for airborne contamination exists, minimum respiratory protection shall be required in accordance with the guidelines in Attachment C.

6.8 The table in Attachment C provides guidance for minimum required respiratory protection. The guidance given in Attachment C is intended for light work activities performed in areas contaminated primarily with uranium. Light work is defined as inspection tours or minor maintenance that does not involve breaching a system.

6.8.1 In areas where work is being performed, or areas where uranium is not the nuclide of concern, respiratory protection shall be assigned based on the potential for airborne radioactivity, and the DAC for the nuclide of concern.

6.0 PROCEDURE (continued)

6.9 All restrictions, anti-contamination clothing or apparatus, or specified instructions relative to the job and work area, shall be listed in Part 15 of the RWP form. The requirements set forth shall be based on inspections, pre-job survey data, scope of work to be performed, and preliminary job pre-planning sessions/documentation.

6.10 The RCT shall forward the RWP to the RCTS or RCE if the conditions outlined in Section 4.0 of this procedure are met. Additional RC instructions and requirements will be identified in part 16 of section II as required.

6.11 Prior to the start of actual work, the workers identified on the RWP shall attend a pre-job/task briefing with the RCT involved. This briefing shall include discussions of the following:

6.11.1 The detailed description and scope of work to be performed, based on the initial pre-job/task planning session. This detailed description should be identified in section I of the completed RWP Form.

6.11.2 Area radiological conditions and special instructions relative to the scope of work (6.11.3 thru 6.11.6). Ensure that area radiological conditions have not changed.

6.11.3 Area dose rates

6.11.4 Area contamination and airborne radioactivity level

6.11.5 Protective equipment required

6.11.6 Stay times and ALARA considerations

6.11.7 After the briefing, the workers shall sign the RWP in section IV and indicate their qualifications and badge number. If more than 6 workers are required to sign in section IV, attach a RWP signature continuation page (Attachment B) for the additional workers.

6.12 After all required signatures are on the RWP Form, the RCT shall complete the RWP per the following:

6.12.1 Record the time of issuance stated in 24 hr notation.

6.12.2 Sign at the bottom in section II, part 16.

6.13 After completion of the RWP form, the RCT shall forward the original to the requesting supervisor for conspicuous posting at the work location.

6.0 PROCEDURE (continued)

6.13.1 A copy shall be filed by the Radiological Control Section.

6.13.2 A copy shall be sent to the cognizant RCE for evaluation and record retention, if the RWP involved a Radiological Engineering review per requirements defined in Section 4.3 of this procedure.

6.14 The RWP shall remain in force for the duration of the job, as long as conditions are not adversely changed, i.e.. all materials, equipment, shielding and structures that were present when the pre-job survey was performed have not been adjusted or moved during the performance of work in such a way as to adversely change the conditions of the original permit.

6.14.1 If area conditions or job scope have changed, a new RWP shall be initiated.

6.15 The RCT should conduct follow up inspections of work areas which are under an RWP at least once within the shift it is issued to ensure the requirements of the RWP are being complied with and conditions of the area have not changed as to effect the RWP requirements. Areas where RWPs are in force for longer than a 24 hour period shall be inspected at least daily, for as long as the job continues, by the RST.

7.0 APPLICABLE DOCUMENTS

7.1 SP-P-35-025 Radiological Posting.

7.2 SP-P-35-023 Radiological Contamination Surveys.

7.3 SP-P-35-026 Occupational Air Sampling For Radioactivity.

7.4 SP-P-35-048 Radiation Surveys.

7.5 SP-P-35-046 Counting Smears with Field Survey Instruments.

8.0 FORMS USED

8.1 Radiation Work Permit Form FS-F-1372.

9.0 ATTACHMENTS

9.1 Attachment A, Radiation Work Permit Form.

9.2 Attachment B, Radiation Work Permit Signature Continuation Page

9.3 Attachment C, Respiratory Protection Guidelines.

ATTACHMENT A

RADIATION WORK PERMIT FORM

RADIATION WORK PERMIT

No.: _____

SECTION I: *To be completed by the job supervisor*

(1) JOB LOCATION: BUILDING. DATE	(2) ISSUE DATE:	(3) SHIFT:	(4) EXPIRATION DATE: (Maximum 7 days from issuance)
JOB DESCRIPTION:			
MAN-HOURS:	REQUESTING SUPERVISOR'S SIGNATURE:		EXTENSION

SECTION II: *TO BE COMPLETED BY RWT*

(5) RADIATION LOCATION	INSTRUMENT READING (6) OPEN WINDOW (OW) mRad/hr	(7) CLOSED WINDOW (CW) mRad/hr	EXTREMETIES (8) OPEN WINDOW mRad/hr
1.			
2.			
3.			
4.			

(9) STAY TIME CALCULATIONS	SKIN	EXTREMITY
BETA+GAMMA DOSE RATE	1000	1000
CORRECTION FACTOR (OW-CW)eF + CW = mrem/hr	WHOLE BODY	TIME LIMIT
	150	
CP Ion Chamber F = 3 mrem/hr		

INSTRUMENT TYPE	SERIAL NUMBER	CALIBRATION DUE DATE

(10) AMBIENT BACKGROUND β/γ mRad/hr

(11) RADIOLOGICAL SURVEY FORM ATTACHED ☐ YES ☐ NO

(12) SURVEY MAP ATTACHED ☐ YES ☐ NO

MAXIMUM CONTAMINATION LEVEL		MAXIMUM AIRBORNE RADIOACTIVITY LEVEL	
ALPHA:	BETA:	ALPHA:	BETA:

(13) COVERAGE REQUIREMENTS

- ☐ At start of job
- ☐ Intermittent
- ☐ Continuous (RSE Review Req.)
- ☐ On completion of job

(14) DOSIMETRY REQUIREMENTS** *(TLD required for all radiation work)*

- ☐ Direct reading dosimeter
- ☐ Ring dosimeter
- ☐ Other _____

(15) PROTECTIVE EQUIPMENT

WHOLE BODY	RESPIRATOR REQUIREMENTS	HEAD
☐ None	☐ Half face respirator	☐ Safety glasses
☐ Cloth coveralls	☐ Full face respirator	☐ Goggles
☐ Disposable coveralls	☐ Airline respirator	☐ Face shield
☐ Lab coat	☐ Airline hood	☐ Cap
☐ Tape openings	☐ SCBA	☐ Hood
☐ Other _____	☐ Other _____	

HANDS (GLOVES)	SHIELDING	FEET AND LEGS
☐ Cotton inserts	☐ Rubber Mat	☐ Latex shoe covers
☐ Rubberized	☐ Aluminum	☐ Disposable shoe covers
☐ Surgical	☐ Plywood	☐ Safety shoes
☐ Leather	☐ Other _____	☐ Safety boots
☐ Other _____		☐ Other _____

(16) SPECIAL RADIOLOGICAL SAFETY INSTRUCTIONS AND REQUIREMENTS

RST SIGNATURE:	DATE:	TIME ISSUED:

SECTION III: *APPROVAL SIGNATURES*

SECTION IV: *TO BE COMPLETED BY EMPLOYEES ****

(17) NAME(S) OF EMPLOYEE(S) (SIGNATURE)	(18) BADGE NUMBER	(19) RESPIRATOR FIT TEST	(20) RADIATION WORKER TRAINING
1.		☐ YES ☐ NO	☐ YES ☐ NO
2.		☐ YES ☐ NO	☐ YES ☐ NO
3.		☐ YES ☐ NO	☐ YES ☐ NO
4.		☐ YES ☐ NO	☐ YES ☐ NO
5.		☐ YES ☐ NO	☐ YES ☐ NO
6		☐ YES ☐ NO	☐ YES ☐ NO

*** *Signature indicates employee has read this RWP.*

NO.	DISTRIBUTION OF COPIES
1	Posting
2	Radiological Safety Supervisor
3	Radiological Assessment

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ATTACHMENT B

RADIATION WORK PERMIT FORM SIGNATURE CONTINUATION PAGE

Page ____ of ____

RADIATION WORK PERMIT - SIGNATURE CONTINUATION

No.: ____________

SECTION IA: *To be completed by the job supervisor*	(1) JOB LOCATION: BUILDING. DATE:	(2) ISSUE DATE:	(3) SHIFT:	(4) EXPIRATION DATE: *(Maximum 7 days from issuance)*
	JOB DESCRIPTION:			
	MAN-HOURS:	REQUESTING SUPERVISOR'S SIGNATURE:		EXTENSION:

SECTION IVA: *TO BE COMPLETED BY EMPLOYEES ****

(17) NAME(S) OF EMPLOYEE(S) *(SIGNATURE)*	(18) BADGE NUMBER	(19) RESPIRATOR FIT TEST	(20) RADIATION WORKER TRAINING
		☐ YES ☐ NO	☐ YES ☐ NO
		☐ YES ☐ NO	☐ YES ☐ NO
		☐ YES ☐ NO	☐ YES ☐ NO
		☐ YES ☐ NO	☐ YES ☐ NO
		☐ YES ☐ NO	☐ YES ☐ NO
		☐ YES ☐ NO	☐ YES ☐ NO
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		☐ YES ☐ NO	☐ YES ☐ NO
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**** Signature indicates employee has read this RWP.*

NO.	DISTRIBUTION OF COPIES
1	Posting
2	Radiological Safety Supervisor
3	Radiological Assessment

FS-F-1372-1 (5/20/92)

ATTACHMENT C

RESPIRATORY PROTECTION GUIDELINES

Long-lived:

Contamination Level:	Airborne Level:	Respiratory Protection Required:
> 50 X *	> 25% DAC	FULL FACE AIR PURIFYING RESPIRATOR
< 100 X *	> 1 DAC	FULL FACE AIR PURIFYING RESPIRATOR WITH HOOD
> 100 X *	> 5 DAC	HOODED AIR-SUPPLIED RESPIRATOR
> 150 X *	> 10 DAC	REASSESS CONDITIONS: CONTACT RADIOLOGICAL ENGINEERING FOR ADDITIONAL REQUIREMENTS.

*: Refer to Attachment 2, DOE Order 5480.11

Radon/Thoron:

Rn-220 daughters:	< 0.25 WL	NONE
	0.25 - 5.0 WL	FULL FACE AIR PURIFYING RESPIRATOR (HOOD REC.)
	> 5.0 WL	HOODED AIR SUPPLIED RESPIRATOR
Rn-222 daughters:	< 0.075 WL	NONE
	0.075 - 1.65 WL	FULL FACE AIR PURIFYING RESPIRATOR (HOOD R
	1.65 - 33 WL	HOODED AIR SUPPLIED RESPIRATOR
	> 33WL	SCBA AND AIR SUPPLIED BUBBLE SUIT

NOTE: Assigning respiratory protection or posting areas, based on these levels, should be based on the collection of multiple samples, continuous time-weighted measurements, or available historical data for the area.

Derived Air Concentrations (DAC):

**RADIO-NUCLIDE	1 DAC (uCi/mL)	10% DAC (uCi/mL)	25% DAC (uCi/mL)
Th-230	3 E-12	3 E-13	7.5 E-13
Th-232	5 E-13	5 E-14	1.25 E-13
U-238	2 E-11	2 E-12	5.0 E-12
Rn-220	8 E-09***	0.1 WL	0.25 WL
Rn-222	3 E-08***	0.033 WL	0.0825 WL

**The DA(listed here given for radioisotop of concern (5480.11).

** Assumes 100% equilibrium with radon daughter products. If air sampling is performed for radon daughter concentrations (i.e., Working Level measurements), the DACs are:

Rn-220 (thoron) daughter activity: 1.0 WL
Rn-222 (radon) daughter activity: 0.33 WL

ISSUE AND REVISION RECORD

DATE OF CHANGE	REVISION NUMBER	AFFECTED PAGES	REASON FOR REVISION
7/22/87	0	ALL	Original issue of procedure
10/25/88	1	ALL	Update Organization and form design changes.
4/10/92	2	ALL	Incorporate changes with DOE Orders and organization structure.
12/16/92	3	ALL	Incorporate changes with DOE Orders and organization Structure.

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 13
Title: CONTROLLING PORTABLE VENTILATION DEVICES AND VACUUM CLEANERS		DOCUMENT NO: SSOP-0028 REVISION NO. 0
Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 12-20-91

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of the document is to establish the procedure for assigning ownership and controlling the movement of HEPA filter equipped portable vacuum cleaners and portable ventilation (negative air) devices used at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure is applicable to all portable HEPA filter equipped vacuum cleaners and ventilation devices that are used by FEMP and subcontractor personnel.

3.0 DEFINITIONS

3.1 Vacuum Cleaner (Portable Dust Collector) - A portable device that utilizes suction to collect residues and then filters the suction air stream to remove hazardous particles before the suction air is exhausted to the environment.

3.2 Portable Ventilation (Negative Air) Device/Machine - A device that prevents the escape of hazardous particles from an enclosed area (such as a room, enclosure, or glove box) by creating negative air pressure in the area and filtering the air being exhausted.

3.3 Project Coordinator - The Site Services Supervisor responsible for coordinating the portable vacuum cleaner/ventilation device control program.

3.4 Unit Owner - The individual or organization that is assigned a vacuum cleaner and/or ventilation device. May be used interchangeably with Facility Owner/Supervisor.

4.0 RESPONSIBILITIES

4.1 Site Services shall be responsible for the following:

4.1.1 Ensuring that the requirements of this procedure are enforced.

4.1.2 Assigning portable vacuum cleaners/ventilation devices as required.

4.1.3 Acting as primary liaison when maintenance is required on units assigned to the General Use Pool.

4.0 RESPONSIBILITIES (cont.)

4.2 Facility Owners/Supervisors (unit owners) assigned portable HEPA filtered vacuums or ventilation units shall be responsible for the following:

4.2.1 Controlling the use and movement of the unit(s) within their area.

4.2.2 Ensuring that units are available for preventive maintenance (PM) and HEPA filter testing.

4.2.3 Returning units to Site Storage under Project Coordinator control within three days of completion of work requiring use of a portable vacuum/ventilation device.

4.3 Project Management and Acquisition shall be responsible for the following:

4.3.1 Coordinating the purchase of vacuum/ventilation units with Clean Air Programs.

4.3.2 Ensuring that subcontractors assigned vacuum cleaners and/or ventilation devices control the use and movement of the units.

4.4 Environmental Management shall be responsible for the following:

4.4.1 Ensuring that HEPA filtered vacuum/ventilation units that are to be purchased for use at the FEMP meet established functional, safety, and environmental requirements.

4.4.2 Ensuring that new units are equipped with a tested, certified HEPA filter.

5.0 GENERAL

5.1 Vacuum cleaners currently in use at the FEMP are HOFFMAN, SPENCER, NILFISK, HAKO, PULLMAN-HOLT, and NORCLEAN (Power Products).

5.2 Ventilation devices being used are GENERAL DYNAMICS, BARTLETT NUCLEAR, AIR SYSTEMS (Fibertrap), and CRITICAL SYSTEMS.

5.3 Vacuum cleaners consist of a flexible hose for residue pickup, a canister to contain residues, internal cloth and/or paper filters for removing particles from the air stream, a motor driven fan that provides a negative pressure to create the required suction, and a high efficiency particle air (HEPA) filter installed in the air exhaust stream.

5.0 GENERAL (cont.)

5.4 Ventilation devices are similar to a vacuum cleaner except that the intake (or suction) hose is a larger diameter and residue particles are collected on a filter instead of in a canister.

5.5 Ventilation devices shall be used for removing airborne contamination, not for bulk quantity removal. The HEPA Filter will fail when overloaded.

5.6 The Program Coordinator will be an individual appointed by the Facilities and Warehousing Manager.

5.7 Personnel using portable vacuum/ventilation units shall move and use the devices in accordance with this procedure and all applicable Standard Operating Procedures (SOPs).

5.8 Unit owners or unit owner representatives shall be a supervisor or higher management.

5.9 Personnel and equipment shall be frisked prior to leaving a control zone and before moving from one building to another.

5.10 Approval shall be obtained on the "Portable Dust Collector and Ventilation Device Check Out/Check In Log," Form FMPC-SS-3378 (See Figure 1) before a unit is moved from the assigned building or area for use in another building or area.

5.11 Portable vacuum cleaners/ventilation devices assigned to a unit owner shall be stored in a lockable area when not in use. Each building shall have only one designated storage area.

5.12 Portable vacuum/ventilation devices being used in a control zone may remain in the zone until work is completed.

5.13 The unit, from issue to return to Site Storage, is the responsibility of the unit owner. Responsibility includes safe storage of the unit and assumption of costs incurred due to damage or loss.

6.0 PROCEDURE

6.1 Obtaining a Portable Vacuum/Ventilation Unit

REQUESTOR - SUPERVISOR/FACILITY OWNER

6.1.1 Fill out a "Portable Vacuum/Ventilation Device Request and Evaluation," Form FMPC-SS-3379 (See Figure 2) for the desired unit.

6.0 PROCEDURE (cont.)

REQUESTOR - SUPERVISOR/FACILITY OWNER

6.1.2 Submit the request form to the Project Coordinator.

PROJECT COORDINATOR

6.1.3 Evaluate the request per the Request and Evaluation form.

6.1.4 If a vacuum/ventilation device is available, fill out the applicable portions of a "Portable Dust Collector and Ventilating Device Check Out/Check In Log," Form FMPC-SS-3378 (See Figure 1).

6.1.5 Inform the Requestor that vacuum/ventilation device assignment is approved or disapproved as applicable.

REQUESTOR - FACILITY OWNER/SUPERVISOR

6.1.6 Upon notification that the unit issuance has been approved, contact the Project Coordinator and arrange for unit pickup.

6.1.7 Complete the applicable portions of the Check Out/Check In Log and sign the log.

PROJECT COORDINATOR

6.1.8 Sign the Check Out/Check In Log

REQUESTOR - FACILITY OWNER/SUPERVISOR

6.1.9 Affix a Hazard Communication (NFPA) Label (See Figure 3) to the unit.

6.1.9.1 Enter, on the label, the hazard level the unit is approved for, unit owner, and the assigned location of use.

6.2 Moving Assigned Vacuum/Ventilation Devices from the Designated Use Area

UNIT OWNER

6.2.1 If the unit is assigned to the Laboratory, proceed per Item 6.4.

6.2.2 Fill out a "Portable Vacuum/Ventilation Device Request and Evaluation," Form FMPC-SS-3379 (See Figure 2) for moving the desired unit.

6.2.3 Submit the request form to the Project Coordinator.

6.0 PROCEDURE (cont.)

PROJECT COORDINATOR

6.2.4 Evaluate the movement request per the Request and Evaluation form.

6.2.5 Approve or disapprove the movement request.

6.2.6 Inform the unit owner and prospective unit owner of approval (if granted).

PROSPECTIVE UNIT OWNER

6.2.7 Upon notification that unit movement has been approved, contact the Project Coordinator.

6.2.8 Complete the applicable portions of the Check Out/Check In Log and sign the log.

PROJECT COORDINATOR

6.2.9 Sign the Check Out/Check In Log

NEW UNIT OWNER

6.2.10 Check the unit to ensure that the unit is clean.

6.2.11 Contact IRS&T and request that the unit be frisked.

6.2.12 At the direction of IRS&T, repeat cleaning or wrap the unit.

6.2.13 Move the unit to the new location of use.

6.2.14 Check the hazard label on the unit.

6.2.14.1 If the material and/or hazard level is different, affix a new Hazard Communication (NFPA) Label to the unit.

6.2.14.2 Enter, on the label, the hazard level the unit is approved for, unit owner, and the assigned location of use.

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6.0 PROCEDURE (cont.)

6.3 Returning Portable Vacuum/Ventilation Devices to Site Storage

FACILITY OWNER/SUPERVISOR

6.3.1 Ensure that the unit has been cleaned per the applicable SOP and frisked.

6.3.2 Ensure that all prefilters on portable ventilation devices have been replaced.

6.3.2.1 If not, direct operators to replace prefilters per the applicable standard operating procedure for the unit being returned.

6.3.3 Ensure that the differential pressure on the unit HEPA filter is less than 3.0 inches.

6.3.3.1 If not, have the HEPA filter replaced and then DOP tested.

6.3.4 Notify the Project Coordinator that the unit is being returned.

PROJECT COORDINATOR

6.3.5 Inspect the unit.

6.3.6 Notify the unit owner of discrepancies or grant permission to return the unit, depending on the unit condition.

NOTE: Damaged or lost units shall be repaired or replaced, utilizing funds from the unit owner/user cost center, with an equivalent unit.

NOTE: Unit ownership is not officially transferred until the Project Coordinator signs the Check Out/Check In Log.

PROJECT COORDINATOR

6.3.7 Sign the Check Out/Check In Log to acknowledge receipt of the unit.

6.0 PROCEDURE (cont.)

6.4 Moving Portable Vacuum/Ventilation Devices Within the Laboratory

FACILITY OWNER

NOTE: After being assigned a unit, the Laboratory Facility Owner may transfer ownership of portable vacuum/ventilation devices to personnel in the Laboratory.

6.4.1 Fill out the applicable portions of a new "Portable Dust Collector and Ventilation Device Check Out/Check In Log," Form FMPC-SS-3378 (See Figure 1).

6.4.2 Transfer the unit to the designee.

DESIGNATED OWNER

6.4.3 Sign the Check Out/Check In Log.

6.4.4 Inspect the unit condition and storage weekly.

DESIGNATED OWNER

6.4.5 If the unit is to be moved to another room, proceed as follows:

NOTE: Units issued to the laboratory and are designated for use in a specific room shall not be used in another room unless the unit is reassigned.

6.4.5.1 Notify the Facility Owner of transfer.

FACILITY OWNER

6.4.5.2 Inspect the unit to ensure the unit is clean and undamaged.

6.4.5.3 Sign the new Check Out/Check In Log for the new designated owner.

6.4.5.4 Issue the unit to the new designated owner.

DESIGNATED OWNER

6.4.5.5 Sign the Check Out/Check In Log.

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7.0 APPLICABLE FORMS

7.1 FMPC-SS-3378, "Portable Dust Collector/Ventilation Device Check Out/Check In Log"

7.2 FMPC-SS-3379, "Portable Vacuum/Ventilation Device Request"

8.0 DRIVERS

8.1 INPO 88-20, "Use of Vacuum Cleaners in Radiologically Controlled Areas"

FMPC
PORTABLE DUST COLLECTORS & VENTILATING DEVICES
CHECK IN/CHECK OUT LOG

MMICS NUMBER:	SERIAL NUMBER:	MANUFACTURER:	MODEL NUMBER:	AIRFLOW (CFM):

RESPONSIBLE SUPERVISOR	BUILDING ASSIGNMENT	RESIDUE MATERIAL	DATE OUT	DATE DUE IN[1]	CONTROLLING SUPERVISOR APPROVAL	RECEIVED BY

[1] The Date Due In shall be the date that the PM is due, or six (6) months, which ever comes first.

COMMENTS: _____

FMPC-SS-3378 (8-10-91)

PORTABLE DUST COLLECTOR AND VENTILATION DEVICE CHECK OUT/CHECK IN LOG
FMPC-SS-3378
Figure 1

4554

FMPC
PORTABLE VACUUM/VENTILATION DEVICE
REQUEST AND EVALUATION

SECTION I - REQUESTOR

DATE OF REQUEST:	DATE UNIT REQUIRED:
REQUESTOR'S NAME:	TITLE:
BADGE NUMBER:	PHONE EXTENSION:
TYPE OF UNIT REQUIRED: ☐ Vacuum ☐ Ventilation	UNIT WILL BE USED: ☐ Inside ☐ Outside

Unit approved for outside use _____ Date _____
Radiological Safety

Unit approved for outside use _____ Date _____
Industrial Hygiene

Unit approved for outside use _____ Date _____
Fire & Safety

Unit approved for outside use _____ Date _____
Statutory Compliance

KIND OF MATERIAL TO BE VACUUMED: ☐ Powder ☐ Liquid ☐ Damp Residue	MATERIAL IS: ☐ Radioactive ☐ Hazardous ☐ Neither
ESTIMATE LENGTH OF USE: ☐ Days _____ ☐ Months _____	UNIT IS CURRENTLY IN MY POSSESSION: ☐ Yes ☐ No

TYPE OF MATERIAL TO BE VACUUMED:
☐ Asbestos ☐ Radionuclide ☐ RCRA

RCRA Material _____

Other _____

UNIT OPERATORS	BADGE NUMBER

PROPOSED LOCATION(S) OF USE:

(Continued on Reverse)

FMPC-SS-3379 (8/10/91) Side 1

PORTABLE VACUUM/VENTILATION DEVICE REQUEST AND EVALUATION
FMPC-SS-3379
Figure 2 (Sheet 1 of 2)

SECTION II - PROJECT COORDINATOR

DATE:	TIME:
EVALUATED BY:	BADGE NUMBER:
OPERATOR QUALIFICATIONS VERIFIED: ☐ Yes ☐ No	UNIT AVAILABLE: ☐ Yes ☐ No
UNIT ASSIGNED: ☐ Yes ☐ No	SERIAL NUMBER: Model _____ Make _____
DATE UNIT ASSIGNED:	DATE OF UNIT'S NEXT PM:

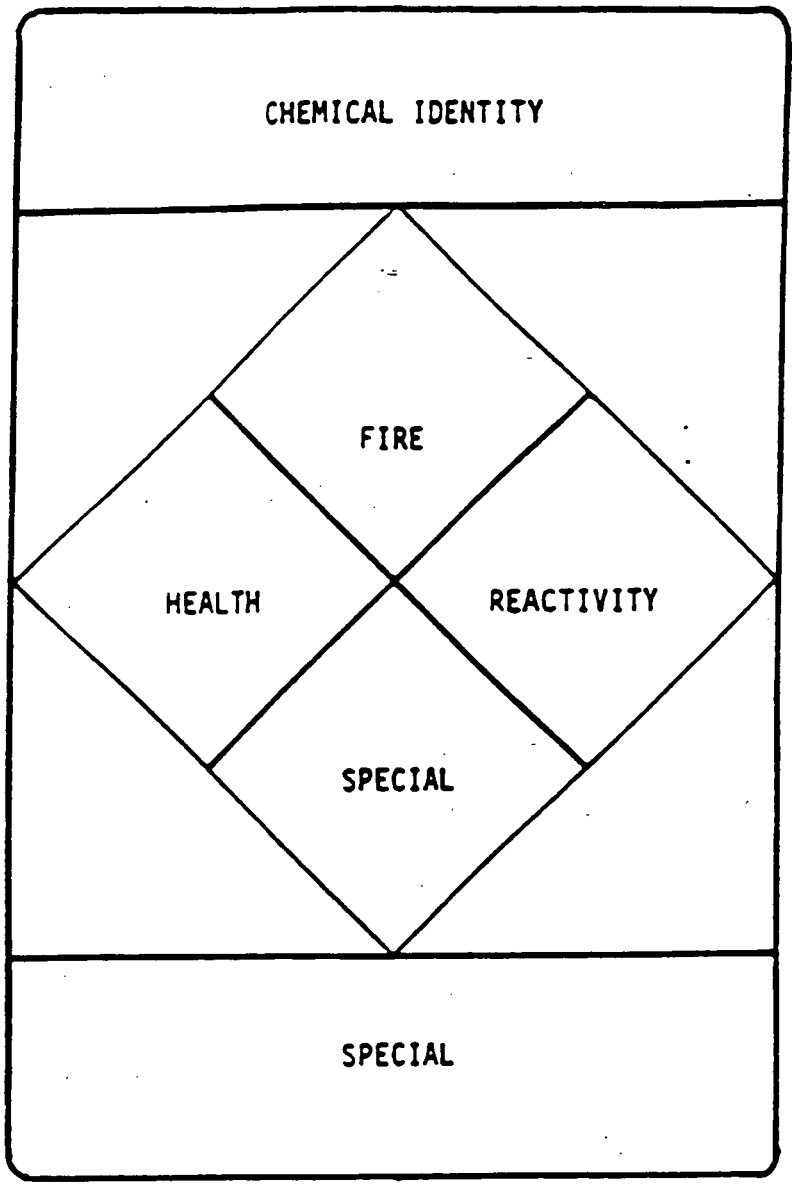
COMMENTS _____

☐ Approved ☐ Disapproved	PROJECT COORDINATOR'S SIGNATURE:	DATE:

FMPC-SS-3379 (8/10/91)

PORTABLE VACUUM/VENTILATION DEVICE REQUEST AND EVALUATION
FMPC-SS-3379
Figure 2 (Sheet 2 of 2)

4554-



HAZARD COMMUNICATION (NFPA) LABEL
Figure 3

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
12-20-91	0	Procedure required or control of portable vacuum cleaners and ventilation devices per Request No. P91-148, initiated by C. R. Palmer.

NON-CONTROLLED COPY - 4554-

ACCUMULATING HAZARDOUS WASTE IN SATELLITE ACCUMULATION AREAS AND INTERIM CONTAINERS

SSOP-0035

Effective Date: 10-26-92

AUTHORIZED BY: _____ 10/14/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

1.0 PURPOSE

This procedure provides the instructions for establishing and maintaining a Satellite Accumulation Area (SAA), accumulating hazardous waste in SAA containers and interim containers, and preparing SAA containers and interim containers for transfer to storage at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure outlines the steps for (1) identifying the need for a SAA container or interim container; (2) establishing a SAA; (3) accumulating hazardous waste in an accumulation container; (4) preparing containers for transfer to storage; and (5) inspecting a SAA.

This procedure is applicable to FEMP personnel responsible for establishing and maintaining SAAs and interim containers for hazardous waste containment in any area of the FEMP site. The procedure also applies to personnel who prepare accumulation containers for transfer to storage.

3.0 DEFINITIONS

Accumulation Container - A container, usually a drum, that is approved by RCRA Program and Logistics Administration to be compatible with the waste to be accumulated.

Accumulation Start Date - A date indicating when the container is declared full which is the start date for the "Three Day Rule."

Authorized Personnel - Individuals who have successfully completed all FEMP training requirements to perform work related to this procedure.

Bung Drum - Container used to hold liquid materials.

Corrosive - RCRA term referring to aqueous wastes with a pH $\leq$ 2 or $\geq$ 12.5.

D.O.T. Proper Shipping Name - The name of a hazardous material as specified in the D.O.T. Regulations 49 CFR 172.101.

D.O.T. UN or NA Number - D.O.T. identification number prefixes for hazardous materials as specified in the D.O.T. Regulations 49 CFR 172.101 and 172.102. "UN" denotes materials recognized for international and domestic shipments. "NA" denotes materials recognized for domestic shipments and shipments to and from Canada, but not for other international shipments.

3.0 DEFINITIONS (cont.)

U.S. EPA Identification Number (EPA ID. No.) - The twelve (12) digit code assigned to the FEMP as a generator and storage facility of hazardous waste (OH6890008976).

EPA Hazardous Waste Number (EPA WASTE NO.) - The four (4) digit alpha-numeric code that categorizes a hazardous waste and is specific for the waste in a particular container.

FEMP Lot Marking and Color Coding System - A system which assigns 15 digit alpha-numeric codes and a color code to identify nuclear materials ensuring complete separation of depleted, normal, and enriched uranium or thorium materials.

Hazardous Waste - A discarded material listed in the Environmental Protection Agency Hazardous Waste List which poses a threat to human health and/or the environment and which exhibits any of the following four characteristics: ignitability, corrosivity, reactivity or Toxicity Characteristic Leaching Procedure (TCLP) toxicity. Both "listed" and "characteristic" wastes are regulated under RCRA.

Ignitable - RCRA term referring to liquid wastes with closed-cup flash points <60°C (140°F), or non-liquid wastes capable of causing fire through friction, absorption of moisture, or spontaneous chemical changes.

Incompatible Materials - Materials of differing enrichments or materials which, when placed near each other, produce undesirable chemical effects.

Interim Container - A container used for collecting hazardous waste within 72 hours for transfer to an approved storage area.

Mixed Waste - Waste containing both radioactive and hazardous components.

Open-head Drum - Container used to hold material mixtures of solids and liquids.

Reactive - A RCRA term referring to wastes which exhibit properties such as reacting violently, forming potentially explosive mixtures or generating toxic gases with water, generating toxic gases (cyanide or sulfide) at pH between 2 and 12.5, or detonating or exploding at standard temperature and pressure or when heated under confinement.

Reactivity Group Code (RGC) System - An identification system for hazardous waste designed to ensure that no incompatible materials are accumulated or stored adjacently.

3.0 **DEFINITIONS** (cont.)

Resource Conservation and Recovery Act (RCRA) - The Congressional Act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control and proper management of hazardous waste.

SAA Generator - A person authorized to deposit hazardous waste in an accumulation drum/container.

Satellite Accumulation Area (SAA) - An area approved to accumulate characterized hazardous waste for an extended period of time (over 72 hours) at or near the waste generation point under control of the supervisor managing the operation generating waste.

Spill Accumulation Container (SAC) - Portable polyethylene container designed to hold one 55 gallon drum of material to contain possible leaks. All accumulation containers shall stand in SACs.

Spill - Any unplanned event involving spilling, leaking, pumping, pouring, injecting, escaping, emitting, emptying, leaching, releasing, dumping, discharging, or disposing of hazardous waste onto the ground, into water, or into the air, within or beyond the boundaries of the FEMP.

Three Day Rule - A RCRA regulation requiring transfer of all containers in an accumulation area not to exceed the 55 gallon limit (one container per waste stream) to an approved storage facility within three days from the date the container of hazardous waste is declared full per a signed, dated, and time recorded Hazardous Waste Disposal Record.

Toxicity Characteristic Leaching Procedure (TCLP) - A RCRA term referring to wastes, the extracts from which contain the contaminants listed in Table 1 of 40 CFR 261.24, at a concentration equal to or greater than the respective value given in the table.

4.0 **RESPONSIBILITIES**

Supervisor/Facility Owner responsible for each waste generation area/ Satellite Accumulation Area

- Initiates a Material Evaluation Form (MEF) as required.
- Determines if a SAA is required.
- Establishes a SAA as determined from the results of a material evaluation and notifies RCRA Program for assistance in establishing the SAA.

4.0 **RESPONSIBILITIES** (cont.)

- Determines the location of the SAA.
- Coordinates and notifies support organizations of assistance required per this procedure.
- Ensures compliance with "Radiological Controls Manual", RM-0009.
- Coordinates the filling of accumulation containers and ensures only authorized personnel access the areas and make additions of hazardous waste to the accumulation containers.
- Ensures applicable documentation, signs, and labels are located in the SAA and the required documentation is completed, signed, and transferred with the drum to storage.
- Ensures inspections are performed within seven calendar days of previous inspection.
- Ensures labeling of accumulated waste is in accordance with the FEMP Lot Marking and Color-Coding System, Reactivity Group Code (RGC) system, and DOT standards.
- Ensures no incompatible materials are accumulated in adjacent accumulation containers within a SAA in accordance with the RGC system.
- Supplies necessary tools.
- Contacts Industrial Hygiene and Radiological Safety to determine the appropriate respiratory protection.
- Provides SAA generators with the required respiratory protection.
- Ensures lever lock rings are replaced with bolt lock rings on 30 and 55 gallon accumulation containers declared full prior to movement from the SAA.
- Maintains a list of personnel authorized to perform this procedure.

SAA Generators

- Deposits hazardous waste in an accumulation container per this procedure.
- Reports any unusual condition to the supervisor, or in the supervisor's absence, the Assistant Emergency Duty Officer (AEDO).

4.0 **RESPONSIBILITIES** (cont.)

RCRA Program, Environmental Management Department

- Supplies EPA Waste Numbers to categorize waste streams determined as RCRA.
- Provides analytical data and waste stream process knowledge to Environmental Engineering for determining RGC(s).
- Maintains a current list of SAAs.

Environmental Compliance

- Ensures applicable regulatory requirements, including those defined by the EPA, Department of Energy, Department of Transportation, and the FEMP are incorporated in this procedure and are followed at the site.
- Assists in the designation and establishment of an SAA.

Quality Assurance performs an independent oversight check on accumulation containers to ensure compliance with this procedure prior to transferring any material to storage.

Industrial, Radiological Safety and Training (IRS&T)

- Determines appropriate respiratory equipment and any other personal protective equipment required for each SAA.
- Supports establishment of SAAs.
- Provides training to users of this procedure.

Environmental Engineering provides the supervisor of the SAA with the appropriate RGC(s), based on material evaluation data.

Industrial Truck Operator/Motor Vehicle Operator (ITO/MVO)

- Obtains an accumulation container as specified by immediate supervisor in accordance with DOT regulations.
- Transports approved empty containers to the accumulation area.
- Transports full accumulation containers from SAAs to RCRA Storage Facilities.

4.0 **RESPONSIBILITIES** (cont.)

Materials Control and Accountability (MC&A)

- Assigns the three digit source identification number for the SAA.
- Prepares and maintains nuclear material generation and transfer records when containers are filled.
- Verifies drum identification in accordance with material evaluation results.
- Designates storage area destination of an accumulation container declared full with assistance from Waste Management.

Toxic & Solid Waste Programs (TSWP) provides the DOT proper shipping name.

IRS&T, EC, and RCRA approve the SAA location.

5.0 **GENERAL**

Within 7.0, Procedure section, Warnings and Cautions precede the step/ item to which they apply. Notes follow the step/item to which they apply.

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 A defined safety system is not involved.

6.2 Safety glasses shall be worn unless other eye protection is specified by IRS&T. Goggles or face shields shall be worn when handling caustic, acids, or any other chemical which could cause immediate skin damage upon contact.

6.3 Respiratory protection provided by the supervisor shall be worn when required.

6.4 Leather-palm gloves shall be worn when handling drums, operating equipment, and when handling rough, sharp-edged, or contaminated material.

6.5 Neoprene rubber gloves shall be worn when handling hazardous chemical substances where skin contact is possible.

6.6 A rubber apron shall be worn when handling caustic, acids, or any other chemical which could cause immediate skin damage upon contact.

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS** (cont.)

6.7 HEPA type filter vacuum cleaners or a vacuum system approved by the IRS&T Department with a current DOP test label properly affixed to vacuum shall be used for spill cleanup.

6.8 Any release of hazardous waste shall be reported immediately to the supervisor or, in the supervisor's absence, the AEDO.

6.9 Two way communication devices and emergency response equipment shall be available to personnel performing this procedure.

6.10 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FS-F-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 **PROCEDURE**

7.1 Determining if a Satellite Accumulation Container or Interim Container is Needed

7.1.1 For material that can be accumulated within 72 hours, set up an interim container per 7.4.

7.1.2 For material that cannot be accumulated within 72 hours, establish a SAA.

7.2 Establishing a Satellite Accumulation Area

NOTE: Each SAA shall contain only one approved container and SAC per hazardous waste stream. More than one waste stream may be accumulated in an SAA.

SUPERVISOR/FACILITY OWNER

7.2.1 Determine the location of the SAA ensuring the SAA is located at or near the generation area of the waste.

7.2.2 Notify RCRA Program for assistance in establishing the SAA.

7.0 **PROCEDURE** (cont.)

SUPERVISOR/FACILITY OWNER

7.2.3 Initiate a Material Evaluation Form (MEF) per SSOP-0002 for the waste streams to be accumulated.

7.2.4 Ensure that two-way communication devices and emergency response equipment are accessible.

7.2.5 Contact IRS&T, EC, and RCRA Program for approval that the SAA requirements, protective equipment, postings, and location are in compliance with regulatory requirements.

7.2.6 When approval is received from IRS&T, EC, and RCRA Program, contact MC&A for assignment of a unique identification number to the SAA which will be used on applicable forms to identify the SAA location.

7.2.7 Notify RCRA Program to update the SAA Data List with information on the establishment of the new SAA.

7.2.8 For 55 gallon accumulation containers, identify and establish the SAA per Figure 1.

7.2.9 For 5 and 10 gallon containers, identify and establish the SAA per Figure 2.

NOTE: A SAC is not required for less than 10 gallons.

7.2.10 Notify ITO/MVO to deliver an accumulation container and SAC (as applicable) for the waste to be accumulated and stored per a completed Material Evaluation Form.

ITO/MVO

7.2.11 Select the accumulation container according to the waste to be accumulated and stored per a completed Material Evaluation Form.

NOTE: A black open-head drum or black bung drum, as applicable, shall be used as the accumulation container unless a different container type is specified for compatibility reasons.

NOTE: Material placed in containers other than black drums prior to 7-1-91 shall not require repackaging.

7.2.12 Transport container to SAA per applicable department procedure.

7.0 **PROCEDURE** (cont.)

7.3 Preparing the SAA Container

NOTE: The identification of the accumulation drum shall be placed or marked in relation to the drum side seam as shown in Figure 3 or Figure 4. The drum labeling arrangement in Figure 3 is effective 11-16-90. Drums labeled prior to 11-16-90 shall not require relabeling.

NOTE: Information stencilled on 5 to 10 gallon accumulation containers shall be one inch in height.

NOTE: Information stencilled on an accumulation container >10 gallons shall be 1-1/2 to 2 inches in height.

SAA GENERATOR

7.3.1 Using criteria in Tables 1, 2, and 3, ensure the drum and SAC for accumulating waste are free of damage and free of debris prior to use in the SAA.

7.3.2 Check Table 4 to see if waste to be accumulated requires a vented drum.

7.3.2.1 If the drum needs to be vented, notify supervisor of the Material Type Code (MTC) and Source Code (SRC) for the waste to be accumulated.

7.3.2.2 As directed by supervisor, vent drum per SOP 20-C-910.

7.3.3 Stencil the FEMP Lot Marking Code on the side of the 55 gallon drum/5 or 10 gallon container with the "P.O. No., Source, Material Class, and Material Type" per Figure 3 or Figure 4, as applicable.

NOTE: The sequence number is recorded when the drum is declared full.

NOTE: The FEMP Lot Marking Code shall be determined by using the FEMP Lot Marking and Color-Coding System, RM-0005 or contacting Materials Control and Accountability.

7.3.4 Ensure the scale to be used has been tested per the applicable scale SOP.

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.3.5 Tare weigh the accumulation drum and the SAC separately.

NOTE: A tare weight is not required for containers less than 10 gallons.

7.3.6 Stencil the tare weight on the side of the accumulation drum and SAC per Figure 3.

7.3.7 Stencil the Reactivity Group Code (RGC), as specified by supervisor, on the container.

NOTE: The RGC will be provided to the supervisor by Environmental Engineering.

7.3.7.1 If the material to be accumulated is a solvent, stencil the solvent name on the container.

7.3.8 Affix a clear, weather-resistant envelope to the top of the container.

7.3.9 Fill out a "Hazardous Waste Disposal Record" (See Figure 6), completing the SAA number, waste material type, and the DOT Proper Shipping Name, and insert in the envelope on the drum lid.

7.3.10 Fill out an "Item Production/Certification/Identification", 65 Card (See Figure 7) per 7.3.10.1 through 7.3.10.5.

7.3.10.1 Record the FEMP Lot Marking Code in the areas titled "P.O. No.," "Source," "Material Class," and "Material Type".

7.3.10.2 Record a general description of the waste in the area titled "Waste Description and Comments".

NOTE: The "Sequence Number" is recorded when the drum is declared full.

7.3.10.3 Record the type of container in the area titled "Package Type".

7.3.10.4 Record the size or volume of the container in the area titled "Package Size".

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.3.10.5 Complete all the required package checks of the container in the section titled "Package Physical Certification".

NOTE: Other information shall be added to the card after the container is declared full (refer to Item 7.6.16).

7.3.11 Insert the 65 Card into the envelope on the drum lid.

7.3.12 If the "Hazardous Waste Marking" label (see Figure 3) is not preprinted, use a black waterproof permanent marker and fill in the following information:

NOTE: No other information is required on the "Hazardous Waste Marking" label until the container is declared full.

7.3.12.1 Record the "Name, Address, City, State, and Zip" as follows:

DOE/FEMP
7400 Willey Rd.
Fernald, OH 45030

7.3.12.2 Record the "EPA Identification Number".

NOTE: The EPA Identification Number is "OH6890008976".

7.3.12.3 Record the "DOT Proper Shipping Name".

NOTE: Transportation Regulatory Compliance shall provide this information.

7.3.12.4 Record the "EPA Waste Number" provided by the supervisor.

NOTE: Environmental Management shall provide the EPA waste number.

7.3.12.5 Record the "Phone Number" as (513)738-6200.

7.3.12.6 Identify either UN or NA and record the appropriate UN or NA Number.

7.3.13 Affix the "Hazardous Waste Marking" label and appropriate DOT Marking and/or DOT label on the drum.

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.3.14 Inspect the container to ensure the stenciling, marking, and labeling have been placed correctly on the drum/container (See Figure 3 or 4, as applicable).

7.3.15 Place a SAC in the SAA ensuring tare weight is visible.

NOTE: A SAC is not required for containers less than 10 gallons.

7.3.16 Place the accumulation drum into the SAC with the drum seam facing the front of the SAA.

7.4 Accumulating Waste In an Interim Container

SUPERVISOR

7.4.1 Ensure a Material Evaluation Form (MEF) has been completed.

7.4.1.1 If a MEF has not been completed for the material, initiate a form per SSOP-0002.

7.4.2 Contact ITO/MVO to deliver a compatible container.

ITO/MVO

7.4.3 Select the accumulation container per the completed MEF.

7.4.4 Transport empty accumulation container to specified area.

GENERATOR

7.4.5 Label or stencil "Hazardous Waste" and material name on the container.

NOTE: Waterproof ink or paint and stencil set shall be used for stencilling.

7.4.6 As specified by supervisor, place waste in interim container within 72 hours.

7.4.6.1 If the interim container is required to accumulate material for more than 72 hours, establish a SAA per 7.2.

7.4.7 Secure container as instructed by supervisor.

7.0 **PROCEDURE** (cont.)

GENERATOR

7.4.8 Fill out an "Item Production/Certification/Identification" (65 card), Form FS-F-1945-XX (see Figure 7), excluding weights per 7.4.8.1 through 7.4.8.7.

7.4.8.1 Record the FEMP Lot Marking Code in the areas titled "P.O. No.," "Source," "Material Class," and "Material Type".

7.4.8.2 Record a general description of the waste in the area titled "Waste Description and Comments".

7.4.8.3 Record the type of container in the area titled "Package Type".

7.4.8.4 Record the size or volume of the container in the area titled "Package Size".

7.4.8.5 Complete all the required package checks of the container in the section titled "Package Physical Certification".

7.4.8.6 Determine lot sequence number in accordance with RM-0005 and record number in the area titled "Sequence Number".

7.4.8.7 Sign the area provided for generator's signature on the 65 card.

7.4.9 Notify supervisor the interim container is ready for transfer to storage.

7.4.10 Submit 65 card to supervisor.

SUPERVISOR

7.4.11 Sign the 65 card and obtain completed "NM Transfer Record/NM Receipt Record/Material Identification Record", 68/69 card (see Figure 9) from the Nuclear Materials Reporting Specialist (NMR).

7.4.12 Sign 68/69 card and return to NMR.

7.4.13 Contact ITO/MVO to move container to storage.

7.4.14 Ensure a copy of the 65 and 68/69 cards accompany the container when transferred to storage.

7.0 **PROCEDURE** (cont.)

7.5 Accumulating Waste In a SAA Container

NOTE: Spills and/or unsafe conditions shall be reported immediately to the supervisor or the AEDO.

SAA GENERATOR

> **WARNING: NEVER MIX WASTE MATERIAL TYPES.**

7.5.1 Select the accumulation container designated to receive the waste type requiring disposition.

NOTE: A five-gallon foot lever container (see Figure 5) may be used for solid materials being collected.

7.5.2 Remove the container lid and visually check the volume in the accumulation container containing waste.

7.5.2.1 If the waste is a solid material, ensure the material is approximately three inches or more below the top of the container.

7.5.2.2 If the container is nearly full of liquid waste, notify supervisor.

NOTE: Environmental Engineering shall specify full container capacity for liquid material.

> **WARNING: ONLY AUTHORIZED PERSONNEL SHALL HANDLE HAZARDOUS WASTE.**

7.5.3 If the container has adequate capacity, carefully add the waste to the container.

7.5.3.1 If the container does not have adequate capacity, proceed to 7.6.

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.5.4 Secure the lid or bung on the drum once the additions are completed.

NOTE: The container of hazardous waste shall be closed at all times except while adding, inspecting, or sampling the waste.

NOTE: A lever lock ring may be used for containers greater than 10 gallons while located in the SAA. Bolt-type rings are required when transporting and storing these containers.

7.5.5 Record addition of waste material to the accumulation container on the "Hazardous Waste Disposal Record" (see Figure 6) by completing steps 7.5.5.1 thru 7.5.5.4.

7.5.5.1 Remove the disposal record from the plastic envelope attached to the accumulation area collection drum lid.

7.5.5.2 Record the date of the waste addition in the appropriate column.

7.5.5.3 Record badge number in the column labeled "Operator's Badge Number."

7.5.5.4 If conditions exist which are not defined by this procedure or anything unusual is noticed, note in comment column of the disposal record and notify supervisor immediately.

7.5.6 Return the disposal record to the plastic envelope on the drum lid.

7.6 Preparing a Full SAA Container for Transfer to Storage

NOTE: Spills and/or unsafe conditions shall be reported immediately to the supervisor or the AEDO.

SAA GENERATOR

7.6.1 Check with supervisor for maximum weight limits.

NOTE: For 55 gallon drums being shipped off site within the next two years (prior to January 1, 1996), the maximum weight is 1200 lbs.

NOTE: For 55 gallon drums to be shipped after December 31,1995, the maximum weight is 883 lbs.

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.6.2 When the material is approximately three inches from the top of container, complete steps 7.6.3 through 7.6.28 immediately.

7.6.3 Notify supervisor of Satellite Accumulation Area to verify the container is full.

NOTE: Once a drum/container of hazardous waste is declared full, it must be transferred to an approved RCRA storage area within three calendar days.

NOTE: A Deviation Report (DR) must be completed for containers not transferred within three calendar days.

SUPERVISOR

7.6.4 Check the disposal record (see Figure 6) to ensure only authorized personnel made additions to the container and the waste specified was disposed in the container.

7.6.5 Record the date and time the container is declared full and sign the "Hazardous Waste Disposal Record".

SAA GENERATOR

7.6.6 As applicable, install a lid and bolt-type lock ring on an open head drum, or install a threaded bung plug on a bung head drum, and secure as follows:

7.6.6.1 Check gasket placement and condition of drum lid (for open head drums). Replace damaged gaskets.

7.6.6.2 Seat lid evenly on open head drum or using a bung wrench, screw bung plug into bung hole tightly and evenly, as applicable.

7.6.6.3 Place locking bolt ring no more than six inches from the seam of the drum on lid of open head drum ensuring the flanges point downward from lock ring (see Figure 8).

7.6.6.4 Install locking bolt shaft through unthreaded flange, locking nut, and then threaded flange (see Figure 8) so that the bolt head rests against unthreaded flange.

7.6.6.5 Using a breakaway torque wrench, torque bolt to 45 ft/lbs.

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.6.6.6 Manually tighten the locking nut against the threaded flange. Then using a wrench, tighten the nut against the flange an additional 1/4 turn.

7.6.7 Specify the scale to be used.

7.6.7.1 If a scale is not available at the SAA area, notify Facilities & Warehousing.

NOTE: The drum/container may be transferred and weighed at an approved RCRA Storage Area.

ITO/MVO

7.6.8 Inspect the forklift, as applicable.

7.6.9 Using forklift, move the SAC containing the full accumulation container to the area for weighing.

SAA GENERATOR

7.6.10 Inspect the scale to be used if not previously completed.

NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

7.6.11 Using the forklift, move the SAC containing the full accumulation container on to the scale.

NOTE: Containers shall not to be removed from SAC.

7.6.12 Obtain the gross weight of the container by subtracting the tare weight of the SAC (indicated on the side) from the weight indicated on the scale.

7.6.13 If the container is within the specified weight limit, proceed to Step 7.6.15.

7.6.14 If the 55 gallon drum is over the specified weight limit, move the drum back to the SAA and transfer the excess material to another accumulation drum by completing steps 7.6.13.1 through 7.6.13.3.

NOTE: Step 7.6.13 is applicable to 55 gallon drums only.

7.0 PROCEDURE (cont.)

SAA GENERATOR

7.6.14.1 Remove lock ring and lid or bung head from the drum.

7.6.14.2 Using scoop or approved removal device, remove material from the drum and place in an accumulation drum (within a SAC) in the SAA until the drum weight is within limits.

NOTE: The removed material may be either included in an unweighed, underfilled drum of the same lot, or placed in a new drum of the same lot according to Sections 7.3 and 7.5.

7.6.14.3 Install a lid and bolt-type lock ring on an open head drum, or install a threaded bung plug on a bung head drum, and secure by completing substeps 7.6.6.1 through 7.6.6.6.

7.6.15 Using the forklift, move the SAC containing the accumulation drum on to the scale and complete steps 7.6.12 through 7.6.14.3 until the drum weight is within limits.

7.6.16 Using the forklift, remove the SAC with accumulation drum from the scale.

7.6.17 Remove the 65 card from the envelope on drum and record gross weight, net weight, lot sequence number, and badge number.

7.6.18 Stencil the gross weight, net weight, lot sequence number, and drum number on the container (see Figure 3 or 4, as applicable).

7.6.19 Sign the area provided for generator's signature on the 65 Card.

SUPERVISOR

7.6.20 Record the date and time the container is declared full on the 65 card, sign the 65 card, and obtain completed "NM Transfer Record/NM Receipt Record/ Material Identification Record", 68/69 card (see Figure 9) from MC&A.

SUPERVISOR/SAA GENERATOR

7.6.21 Complete a "Hazardous Waste Container Pre-Transfer Checklist" (see Figure 10), including the drum number and lot mark code.

7.6.22 After the 68/69 card is completed, sign the area indicated for the shipper's signature.

7.0 **PROCEDURE** (cont.)

MC&A

7.6.23 Sign the 68/69 card.

7.6.24 Verify container identification per the MEF.

SAA GENERATOR

7.6.25 Upon receipt of the signed forms, insert the completed 65 Card and the 68/69 Card into the plastic envelope on the lid of the container.

NOTE: The area titled "Manifest Document Number" shall not be completed until the waste is ready for shipping off-site.

7.6.26 Using a black waterproof permanent marker, record the date that the container was declared full in the area titled "Accumulation Start Date" on the "Hazardous Waste Marking" label (Figure 3).

7.6.27 Insert completed "Hazardous Waste Container Pre-Transfer Checklist" into plastic envelope.

7.6.28 Notify the supervisor that the drum and SAC are ready for transport to the storage area and a replacement drum and SAC are required.

NOTE: The three day rule must be followed when a container is ready for shipment to storage.

SUPERVISOR

7.6.29 Contact Quality to perform an independent check.

NOTE: No container shall be released to ITO/MVO for transfer to storage until approval has been received from Quality.

QA

7.6.30 Perform an independent check of the hazardous waste container per the applicable department procedure and complete an "Accumulation Area Ready to Ship Checklist", Form FS-F-3479 (see Figure 11).

SUPERVISOR

7.6.31 Correct any noted deficiencies and insert form and copy of MEF into the plastic envelope on the lid of the container.

7.0 PROCEDURE (cont.)

SUPERVISOR

7.6.32 Ensure the full accumulation drum is weighed prior to transferring the drum to an approved RCRA Storage Area.

7.6.33 Notify ITO/MVO and Waste Management that a drum of hazardous waste is ready for shipment to storage and a replacement drum and SAC are required.

ITO/MVO

7.6.34 Deliver replacement container and SAC to SAA.

7.6.35 Transport full container to storage per the applicable department procedure.

SUPERVISOR

7.6.36 For containers ≤10 gallons, transport to the appropriate RCRA warehouse.

NOTE: Site Services shall transfer the material into the applicable waste stream drum.

7.6.37 Return empty ≤ 10 gallon container to the originating SAA Generator to collect same waste stream.

7.7 Inspecting a SAA

CAUTION: A SPILL OR UNSAFE CONDITION SHALL BE REPORTED TO THE SUPERVISOR, OR IN THE SUPERVISOR'S ABSENCE, THE AEDO.

SAA GENERATOR

7.7.1 Inspect the SAA within seven calendar days of previous inspection and complete the "Hazardous Waste Satellite Accumulation Area Inspection Log", Form FS-F-3136 (see Figure 12).

7.0 **PROCEDURE** (cont.)

SAA GENERATOR

7.7.1.1 If a defective container is found during inspection, proceed per Tables 1, 2, and 3 prior to completing the inspection form.

NOTE: Overpacking shall be completed per SOP 20-C-600, as required.

NOTE: Both the inspector and supervisor shall sign and record the date and time the inspection was performed.

NOTE: Supervisor shall immediately correct deficiencies on Form FS-F-3136 found during inspection.

7.7.2 Transmit completed inspection form to supervisor of the SAA.

8.0 **APPLICABLE DOCUMENTS**

8.1 Drivers

40 CFR 265, "Interim Status Standards of Hazardous Waste Treatment, Storage, and Disposal Facilities"

40 CFR 262, "Standards Applicable to Generators of Hazardous Waste"

8.2 Reference Documents

RM-0005, "FEMP Lot Marking and Color-Coding System"

RM-0009, "Radiological Controls"

SOP 20-C-600, "Overpacking Deteriorated Drums"

SOP 20-C-910, "Venting Potentially Explosive Drums"

SSOP-0002, "Completing the Material Evaluation Form"

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TABLE 1
CORROSION INSPECTION CATEGORIES

CATEGORY	*CHARACTERISTIC*	*COULD CAUSE LOSS OF DRUM INTEGRITY*		*CORRECTIVE ACTION*
		YES	NO	
A	Severe corrosion with deep pitting and/or metal flaking	X		1. Notify supervisor. **NOTE**: The drum requires disposition as directed by supervision within 24 hours.
B	Corrosion with shallow pitting and/or mild metal flaking		X	1. Notify supervisor. **NOTE**: Disposition shall be determined by the supervisor following review of completed inspection form.
C	Surface rust with no pitting and mild paint flaking which exposes bare metal		X	1. Notify supervisor. **NOTE**: Repainting shall be scheduled by supervisor.

TABLE 2
LEAKER INSPECTION CATEGORIES

TYPE	CHARACTERISTIC	CORRECTIVE ACTION
I	Material flowing from container and accumulation on pallet or pad.	1. Notify supervisor. **NOTE**: Supervisor notifies AEDO. 2. Immediately stop or contain leak. 3. Record on inspection form that the container requires mitigation within 24 hours. 4. Complete additional cleanup as necessary. **NOTE**: Supervisor shall initiate an Occurrence Report.
II	Material on drum exterior only; no material on pallet or pad.	1. Record leak on inspection form. 2. Notify supervisor. **NOTE**: Supervisor shall initiate an Occurrence Report. **NOTE**: Supervisor shall review the completion inspection forms to prioritize containers for transfer to overpack staging area and subsequent mitigation.
III	Container exterior discolored/visible contamination; no material release.	1. Record condition on inspection form. **NOTE**: Supervisor shall schedule container for overpacking. **NOTE**: Supervisor shall initiate an Occurrence Report.

TABLE 3
DENT/BULGE CRITERIA

TYPE	CHARACTERISTIC	CORRECTIVE ACTION
1	Dents and/or bulges affect container to degree of potential or actual release	Overpack or transfer to new container.
2	Dents and/or bulges not affecting container integrity	Continue to monitor.
3	No visible dents and/or bulges on the container	No action necessary.

TABLE 4
MATERIAL REQUIRING VENTING

MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC	MTC
039[1]	040	041	042	046	055	056	070	075	076	080
081	084	098	103	104	107	109	110	111	112	113
114	118	119	120	124	125	128	129	130	131	136
137	141	153	161	218	219	220	221	222	223	224
225	227	228	229	230	231	232	233	234	235	236
237	238	239	240	241	242	243	244	245	246	251
252	254	260	261	262	263	300 and above				

(1) Material Type Code (MTC) 039 with source codes 655-659 do not require vented drums and can be moved without restrictions.

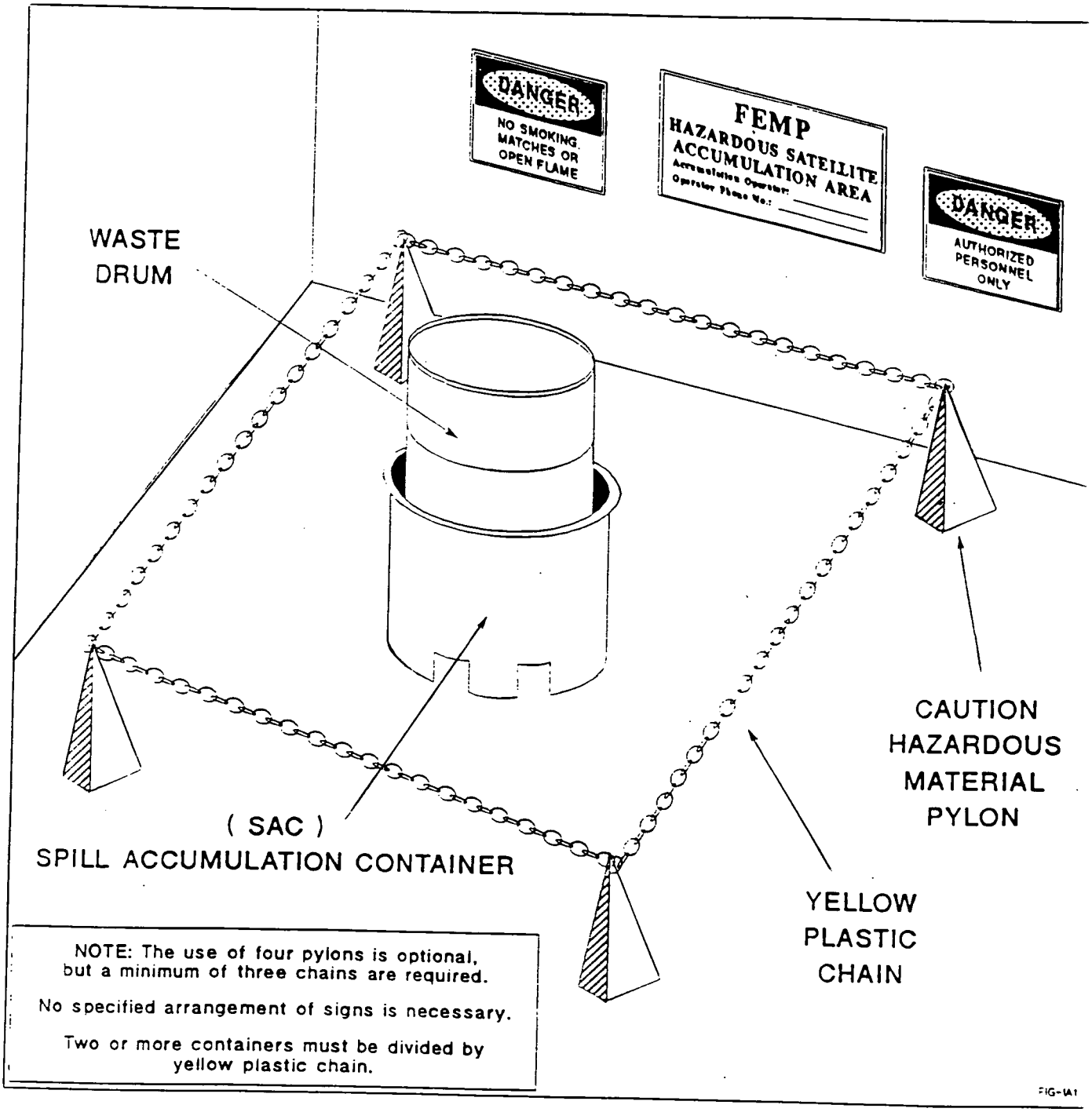


DIAGRAM OF SAA FOR 55 GALLON CONTAINERS
Figure 1

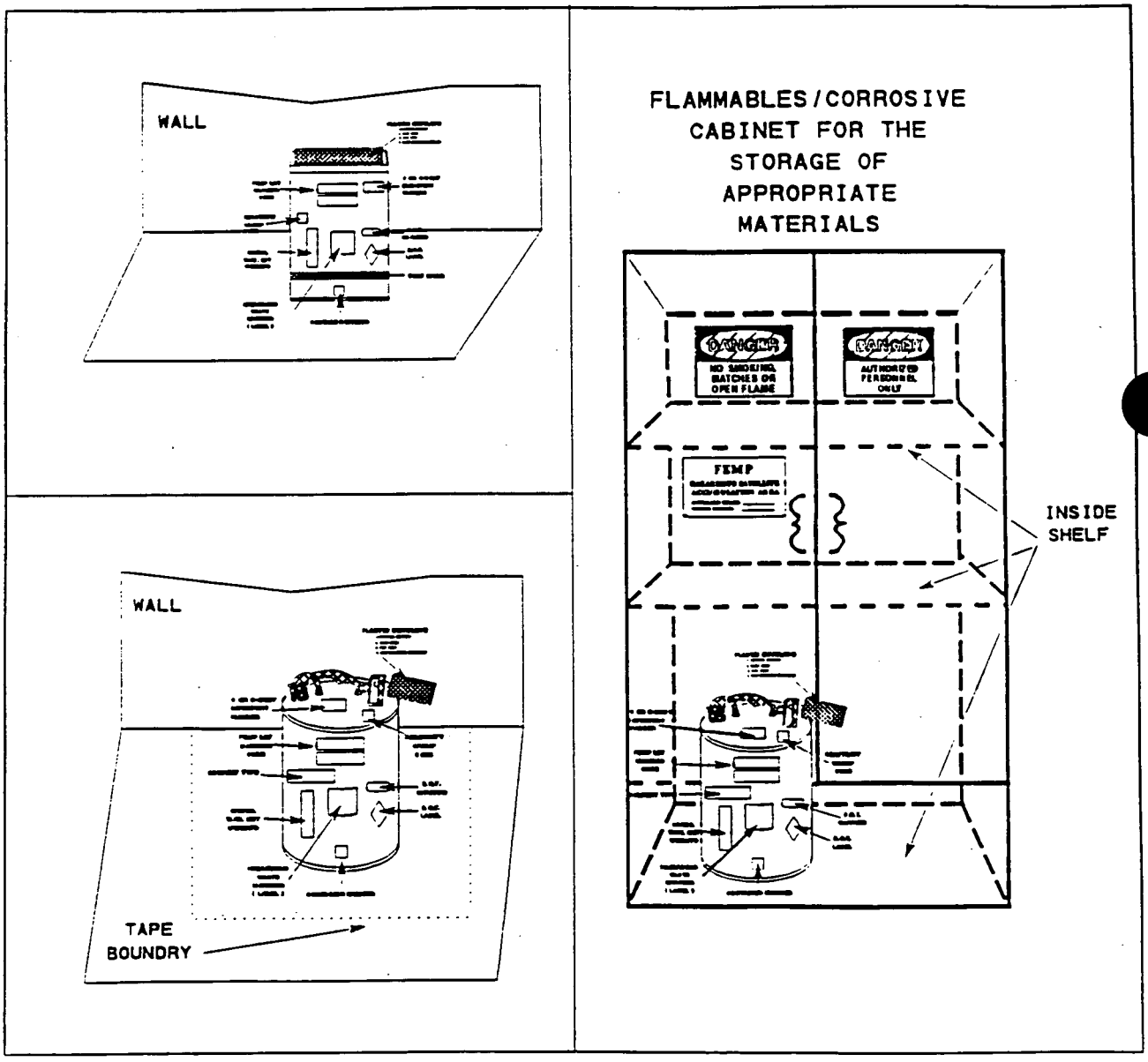


DIAGRAM OF SAA FOR 5 AND 10 GALLON CONTAINERS
Figure 2

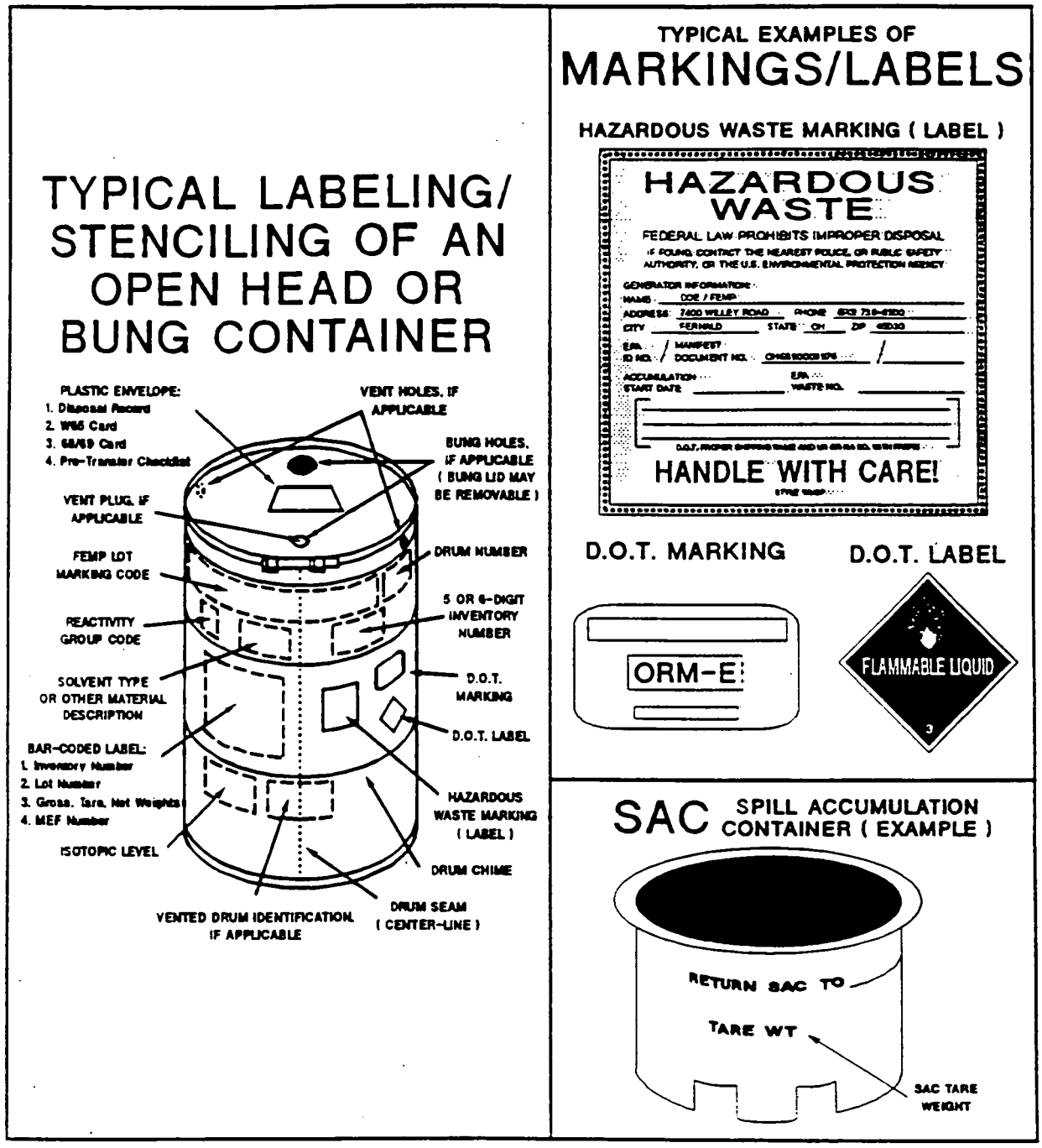
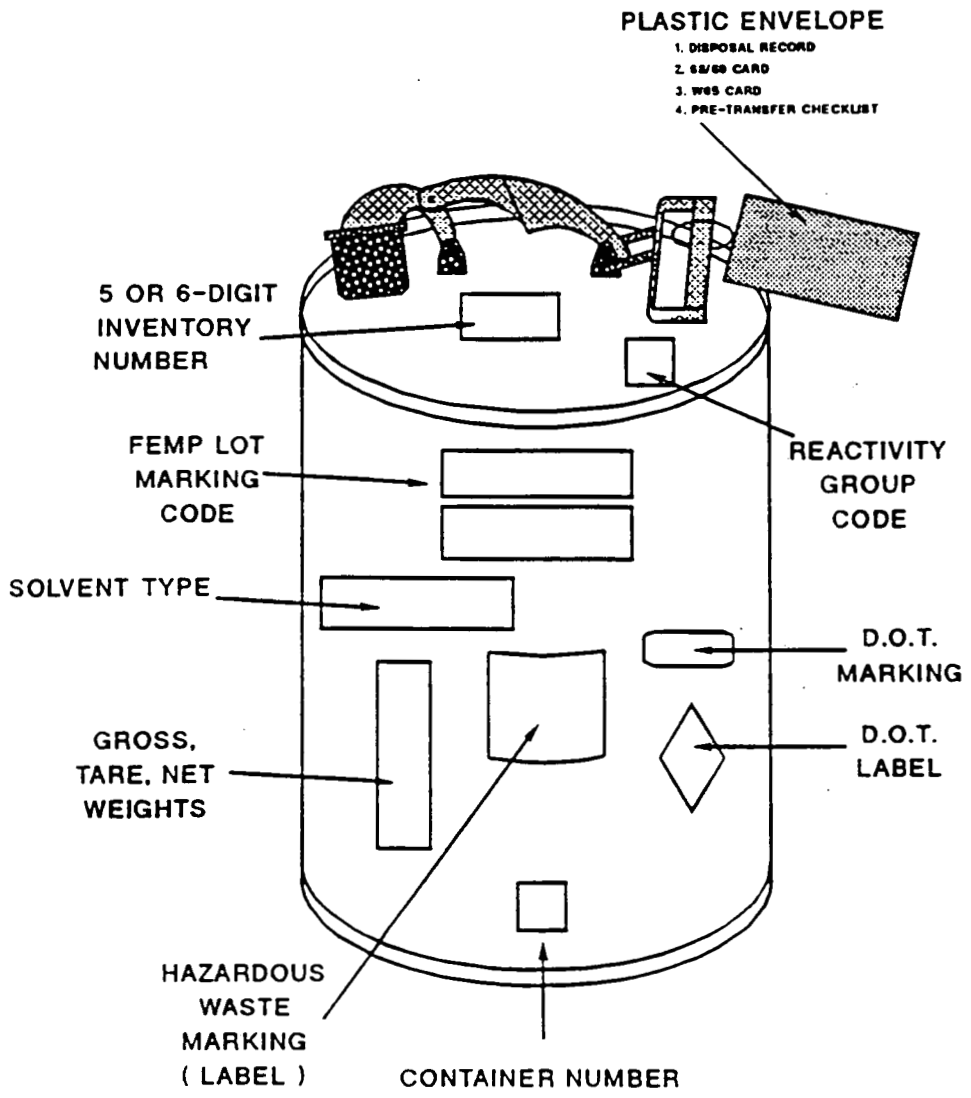


DIAGRAM OF 55 GALLON DRUM IDENTIFICATION
Figure 3

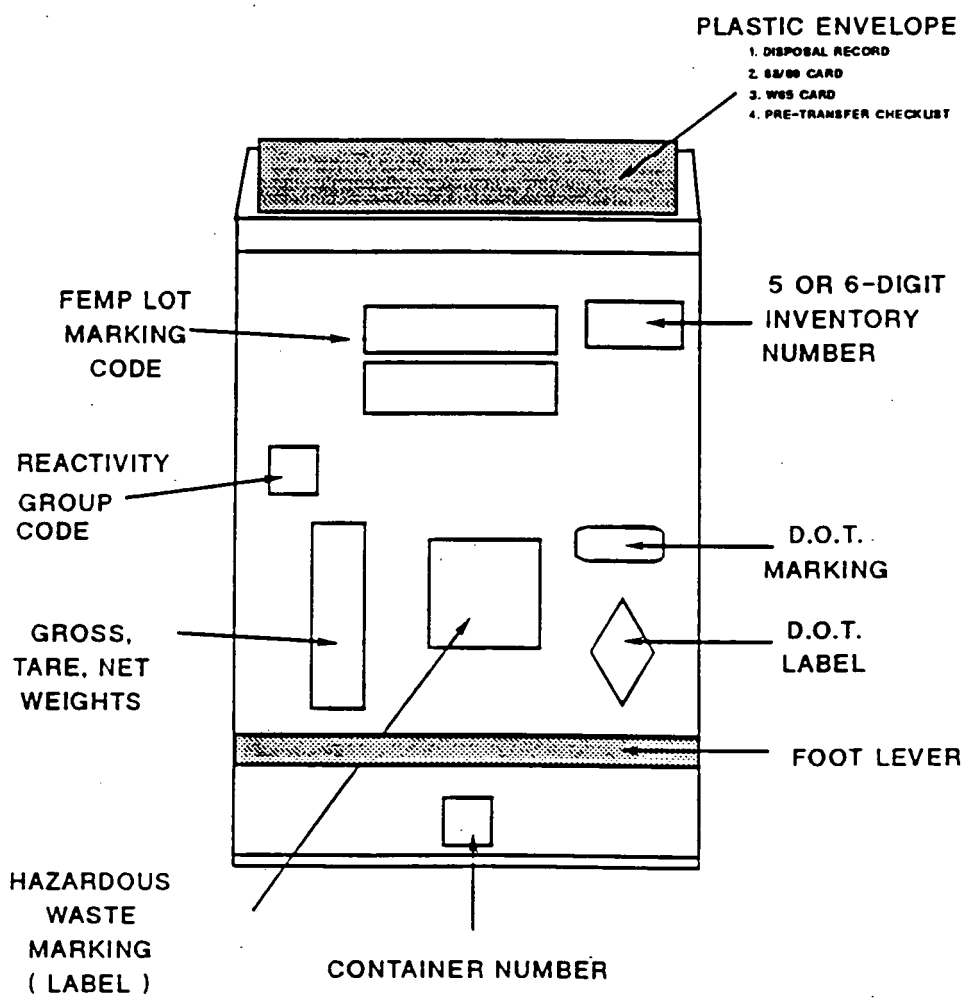
TYPICAL EXAMPLE OF RCRA WASTE CONTAINER LABELING/MARKING



1-8-92 CAN-2Z

DIAGRAM OF 5 OR 10 GALLON CONTAINER IDENTIFICATION
Figure 4

TYPICAL EXAMPLE OF RCRA WASTE CONTAINER LABELING/MARKING



1-8-92 CAN-3Z

DIAGRAM OF FIVE GALLON FOOT LEVER CONTAINER
Figure 5

FEMP
SITE SERVICES
HAZARDOUS WASTE DISPOSAL RECORD

SATELLITE ACCUMULATION AREA NUMBER	DOT PROPER SHIPPING NAME	WASTE MATERIAL IN DRUM

DATE	OPERATOR'S BADGE NO.	COMMENTS

Supervisor Signature: _____

Container Declared Full: _____ / _____
DATE TIME

FS-F-3064 (REV 3/19/92)

HAZARDOUS WASTE DISPOSAL RECORD
FORM FS-F-3064
Figure 6

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD. MBA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS			PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS				MATERIAL IS AS CODED				
				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1945-XX (REV. 3/18/92)

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD. MBA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS			PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS				MATERIAL IS AS CODED				
				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1945-65 (REV. 3/18/92)

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR	PACKAGE PHYSICAL CERTIFICATION	YES	NO	PLANT	PROD. MBA
				EMPTY CONTAINER AT START				
				RUST HOLES OR DENTS			PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS				MATERIAL IS AS CODED				
				PROHIBITED MATERIALS				
				LIQUIDS IN CONTAINER				
PACKAGE TYPE				MINIMUM OF VOID SPACE				
PACKAGE SIZE				PACKAGE SECURED				
				DRAIN PLUG SECURED				

GROSS WEIGHT

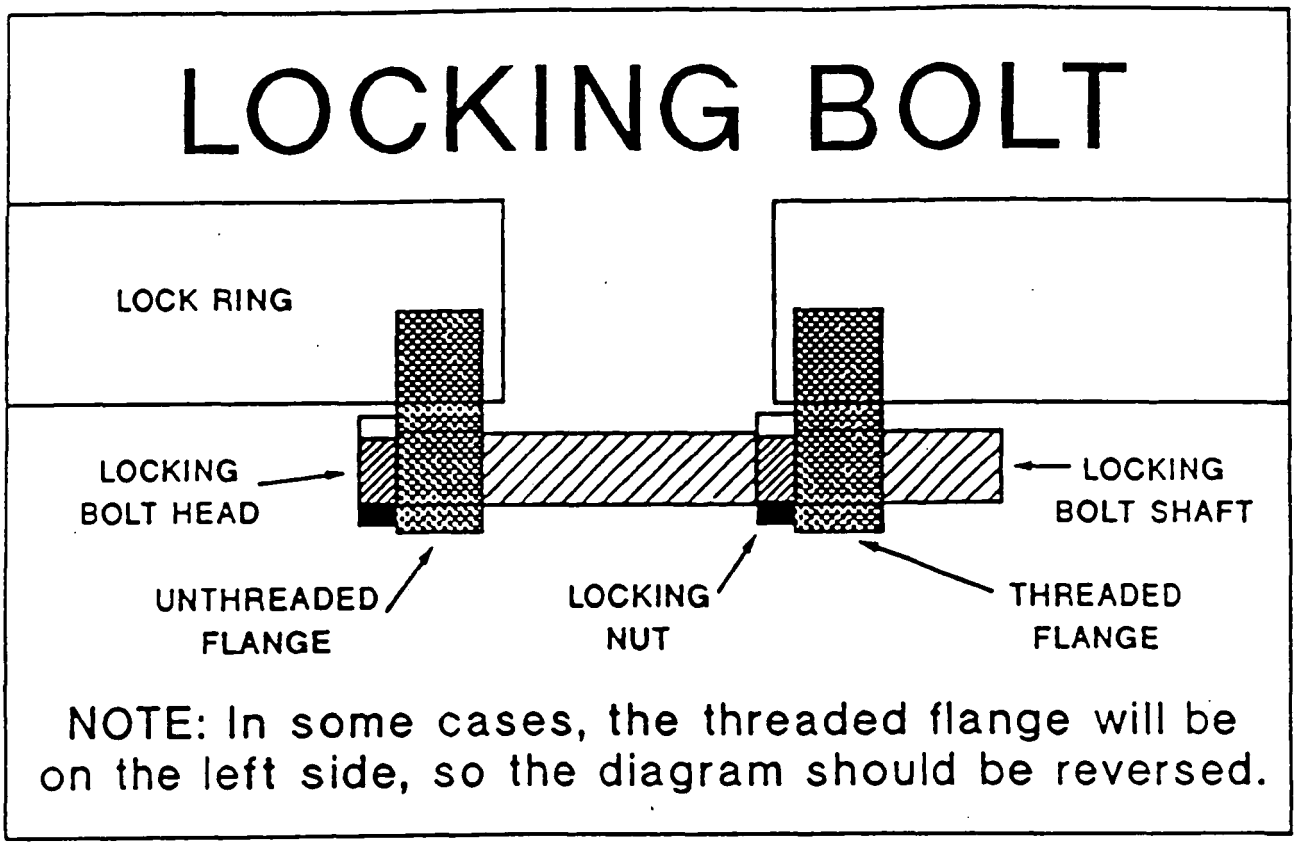
TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1945-66 (REV. 3/18/92)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION (65 CARD)
FORM FS-F-1945-XX
Figure 7



INSTALLATION OF BOLT-TYPE LOCKING RING
Figure 8

Fernald Site

HAZARDOUS WASTE CONTAINER PRE-TRANSFER CHECK LIST

INSPECTOR NAME:			INSPECTOR BADGE NO.:	
ACCUMULATION AREA:	LOCATION:		DATE:	TIME:

ITEM NO.	INSPECTION ITEM	ACCEPTABLE YES	ACCEPTABLE NO	CORRECTIVE ACTION & DATE CORRECTED
1	Verify that container label arrangement is correct as per 20-C-605			
2	Verify that locking ring and lock bolt are secure on drum (+/- 6" from drum seam)			
3	Ensure the FEMP Lot Marking Code, Drum Number, and Reactivity Code are applied			
4	Record the weights minus the tare SAC weight on the XX Card (1200 lbs. max)			
5	Ensure that weights are correctly stenciled on drum			
6	Completed XX (65 Card) to NMC clerk and assist in Transfer Record			
7	Ensure that the 68/69 Card and the Transfer Record is in envelope			
8	Ensure that Generator and Supervisor or Alternate has signed XX (65) Card and that card is in envelope			
* 9	Record the drum full date on the Hazardous Waste Label as Start Date *(see Note 1)*			
10	Check the EPA Waste Number on Hazardous Waste Label			
11	Check the UN or NA Number on Hazardous Waste Label			
12	Check the drum exterior per SOP 20-C-605 criteria			
13	Check the drum exterior and SAC container for leaks, making sure they are clean			
** 14	Examine Hazardous Waste Label to ensure that it is complete *(see Note 2)*			
15	Ensure that the Hazardous Waste Disposal Record is complete and in envelope			
16	Ensure that the Material Evaluation Form (MEF) is in envelope			
17	Sign this check list and place it into the envelope			
18	Verify SAC and container are ready for transfer/storage			
19	Notify Waste Management and ITO/MVO that container is ready for storage/transfer			

* *NOTE 1: Date should be the same date appearing on Hazardous Waste Disposal Record sheet.*
** *NOTE 2: Should include Generator's name/address, EPA ID No., DOT Shipping Name, and should be written in waterproof ink.*

COMMENTS: _____

INSPECTOR'S SIGNATURE:	DATE:	SUPERVISOR'S SIGNATURE:	DATE:

FS-F-3133 (REV 3/25/92)

HAZARDOUS WASTE CONTAINER PRE-TRANSFER CHECKLIST
FORM FS-F-3133
Figure 10

NUCLEAR MATERIAL TRANSFER RECORD

CARD PL.	CARD NO.
	68

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES:
FS-F-1990 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL.	CARD NO.
	69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES:
FS-F-2220 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

MATERIAL IDENTIFICATION RECORD

CARD PL.	CARD NO.
	XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES.
FS-F-2221 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NUCLEAR MATERIAL TRANSFER RECORD (68/69 CARD)
FORM FS-F-1990
Figure 9

Fernald Site

ACCUMULATION AREA READY TO SHIP CHECKLIST

LOCATION	LOT MARKING NUMBER		DATE
RCRA CHARACTERIZATION SHEET OR MEF NUMBER	ACCUMULATION AREA	NON-ACCUMULATION AREA	DRUM/CAN NUMBER

NO.	DESCRIPTION	ACCEPT	REJECT	COMMENTS
1	Label arrangement per 20- C-605 or ANL-01-0053			
2	FEMP Lot Marking			
3	Reactivity Codes			
4	Drum/Can Number			
5	Gross, Tare, Net Weights			
6	Closure Type (Bung/Bolt)/Safety Can			
7	Bolt Centered with Seam (±6 inches)			
8	Drum/Can Condition (Rust/Dents/Holes/Bulges)			
9	Dent greater than 1/4-inch deep in ring seal			
10	W-65 Card Complete in envelope			
11	68/69 Card Complete in envelope			
12	Hazardous Waste Disposal Record Complete in envelope			
13	Pre-Transfer Checklist			
14	Drum/Can containing liquids in SAC			
15	Hazardous Waste Label: Generator Name/Address			
16	EPA ID Number (OH6890008976)			
17	EPA Waste Number			
18	UN or NA plus 4 Digits			
19	DOT Shipping Name			
20	Accumulation Start Date			
21	Waterproof Ink used			
22	DOT Label present			
23	Pallet is sturdy and clean			
24				
25				

Acceptable for transfer to storage _____ Quality Personnel Signature _____ Date

FS-F-3479 (10/25/91)

ACCUMULATION AREA READY TO SHIP CHECKLIST
FORM FS-F-3479
Figure 11

FEMP

HAZARDOUS WASTE SATELLITE ACCUMULATION AREA INSPECTION LOG

ACCUMULATION AREA:	LOCATION:	DATE:	TIME:

ITEM NO.	INSPECTION ITEM	ACCEPTABLE YES	ACCEPTABLE NO	CORRECTIVE ACTION & DATE CORRECTED
1	"Danger—No Smoking, Matches, or Open Flame" sign posted			
2	"Danger—Authorized Personnel Only" sign posted			
3	"FEMP Hazardous Waste Satellite Accumulation Area" sign posted including facility owner name and phone number			
4	SAA floor free of spilled/leaked waste			
5	SAA identified and accessible			
6	SAC container free of spilled/leaked waste			
7	SAC container exterior clean			
8	Container compatible with waste accumulated			
9	Drum Exterior—no dents, chipped paint, corrosion			
10	Drum Condition—no leakage, particularly at seams			
11	FEMP Lot Marking complete, stenciled, and located on the upper third of the drum side			
12	SAC Container Tare Weight Marking complete, Stenciled and located properly			
13	Form FS-F-3064 initiated, inside envelope, located on top of drum			
14	Form FS-F-1945-XX initiated with Lot No., Container Type, and Size recorded			
15	Form FS-F-1945-XX inside envelope			
16	"Hazardous Waste Label" complete and affixed to drum, middle right side of drum seam			
17	Lid secure on drum (Lock ring on drum, Lid down on funnel)			
18	*Container waste level (3" from the top is full)			
19	Accessibility to spill control and emergency response equipment			
20	Accessibility to two-way communication devices			

* *Record the approximate waste level of container in the "COMMENTS" section.*

COMMENTS: _____

INSPECTOR'S SIGNATURE:	DATE:	SUPERVISOR'S SIGNATURE:	DATE:

FS-F-3136 (REV 3/18/92)

HAZARDOUS WASTE SATELLITE ACCUMULATION AREA INSPECTION LOG
FORM FS-F-3136
Figure 12

NON-CONTROLLED COPY

PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW) IN DRUMS FOR OFFSITE SHIPMENT

SSOP-0075

Effective Date: 12-14-92

AUTHORIZED BY: _____ 11/30/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

REMEDIATION SUPPORT OPERATIONS PROCEDURE	OPERATION OF SPENCER AND HOFFMAN PORTABLE DUST COLLECTORS	SOP 20-C-701 Area: As applicable

(Signature On File) Authorization: R. L.Gardner, Facilities & Wastes Operations Mgr.	Supersedes: 20-C-701 Dated: 09-19-86	Issue Date: 07-05-89

1.0 **PURPOSE**

The purpose of this document is to establish the procedure for operating Spencer and Hoffman Portable Dust Collectors.

NON-CONTROLLED COPY

2.0 **APPLICABILITY**

This procedure is applicable to the Spencer and Hoffman Portable Dust Collectors at the FEMP.

3.0 **RESPONSIBILITIES**

3.1 Supervisors shall be responsible for the following:

3.1.1 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.2 Providing operators with the required respiratory protection.

3.1.3 Ensuring that personnel are qualified per the established training requirements identified by the Department or Section Manager.

3.1.4 Authorizing the removal of the dust collector from the assigned Plant.

3.1.5 Signing the appropriate spaces of the "Portable Dust Collector Sign-Out Sheet", Form FMPC-PRO-2631 when a collector is checked out, received, and/or returned.

3.1.6 Obtaining and posting a "Radiation Work Permit" (RWP) before opening a collector.

R 3.1.7 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.2 Operators shall be responsible for complying with this SOP.

4.0 **DEFINITIONS**

None

R 5.0 **APPLICABLE DOCUMENTS**

R 5.1 Drivers

R 5.1.1 PO-D-026, "Site Services Document Program"

R 5.1.2 FEMP Conduct of Operations Manual

5.0 APPLICABLE DOCUMENTS (cont.)

5.2 References

5.2.1 SOP 20-C-101, "Moving and Storing Materials On-Site at the FMPC"R

5.2.2 SOP 20-C-102, "Nuclear Safety for Receiving, Storing, Repackaging, and Moving Enriched Uranium Materials <20% ^{235}U"

5.2.3 SOP 20-C-904, "General Nuclear Safety Requirements"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Nuclear safety requirements of the SOP or MS for the applicable area shall be observed for the material removed from the dust collector.

6.3 Safety glasses shall be worn unless additional eye/face protection is specified by ES&H, the supervisor, or posted signs.

6.4 Respiratory protection provided by the supervisor shall be worn when the dust collector is open, while replacing dust bags, when operating the shaker mechanism, and when dusty conditions exist.

6.5 Leather-palm gloves shall be worn when handling drums and when operating the dust collector.

6.6 Material removed from the dust collector shall be moved and stored per SOP 20-C-101 or SOP 20-C-102 and 20-C-904.

6.7 When working in dusty conditions, nuclear material shall be vacuumed from exterior of clothing before removing respirator.

6.8 Access door shall remain closed at all times except while conducting inspection or performing maintenance.

6.9 Pre-start checks shall be completed before operating the collector.

6.10 Process and safety clothing shall be worn and be completing buttoned when the dust collector access door is open.

6.11 Start/stop switch shall be OFF before power cord is plugged into or removed from an electrical receptacle. If the receptacle is controlled by an ON/OFF switch, the receptacle switch shall also be off.

6.12 The power cord shall not be plugged in, or the unit shall not be operated, in areas of standing water.

6.13 The unit shall not be used to vacuum excessively wet material or liquid unless the unit is equipped with a vendor supplied/recommended water separator device.

6.14 The unit shall not be used to vacuum asbestos material or material classified as a biological hazard.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.15 Prior to emptying the unit, changing filters, or cleaning the baghouse, the unit shall be moved to an area that has been approved by Radiological Safety and a "Contamination Control Zone" (Zone 3) established.

6.16 When inspecting the baghouse or collection hopper, a vacuum source shall be available to pickup any material that is spilled.

6.17 Spills shall be vacuumed as soon as the spill occurs and Radiological Safety notified.

6.18 After installation, HEPA filters shall be DOP tested.

6.19 Units without HEPA filtration certification shall not be used, except for units assigned to, and operated in, the Boiler Plant.

R 6.20 Two-way communications devices and emergency response equipment shall be
R available to personnel performing this procedure.

R 6.21 Operators shall have reviewed and be familiar with MSDSs for hazardous
R materials/chemicals that may be used or encountered.

6.22 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Safety for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by Radiological Safety.

7.0 PROCEDURE

R 7.1 General

7.1.1 Warnings, cautions, and notes precede the Item or Step to which they apply.

NOTE: The pre-start checks shall be performed on the dust collectors listed in Table 1 at the start of each shift of use.

7.2 Pre-start Checks

7.2.1 Check the area to make sure that a "Radiation Work Permit" (RWP) is posted.

7.2.1.1 If not, notify the supervisor.

7.0 PROCEDURE (cont.)

NOTE: The vacuum shall be used to pick up spills that may occur when opening the unit, checking the bags, and inspecting the dust level in the separator.

NOTE: If a dust collection system is not available, a second HEPA filtered and approved portable dust collector shall be used to pick up spills.

7.2.2 Check that the dust collector that furnishes vacuum for the area is operating.

7.2.2.1 If not, start and operate the unit per the applicable SOP.

7.2.3 Using a light source, visually inspect the bags per the "Portable Dust Collector Operating Log", Form FMPC-PRO-2630, (See Figure 2).

7.2.4 If material is spilled proceed as follows:

NOTE: The supervisor shall notify Radiological Safety.

7.2.4.1 Notify the supervisor.

7.2.4.2 Using the vacuum, remove the material.

7.2.5 Check level of dust accumulation in the separator.

R 7.2.5.1 Empty the separator if required due to the dust level.

7.2.6 Check the HEPA Filter Label.

7.2.6.1 If the label is damaged or the expiration date has past, notify the supervisor and proceed as directed.

7.2.6.2 Record check results in the "Comment" section of the operating log.

NOTE: Do not attempt to repair or reattach bags. Maintenance is responsible for changing bags.

7.2.7 Report any unusual condition (such as torn or loose bags) to the supervisor.

R	WARNING
R	Do not insert the vacuum electrical plug into a power outlet that does not
R	match the electrical requirements of the unit.

7.2.8 Check that the electrical power supply at the location where unit is to be used matches the motor requirements on the motor name plate.

7.2.8.1 If the power source and power requirements do not match, notify the supervisor.

7.0 PROCEDURE (cont.)

CAUTION

Do not use cut, worn, or frayed cords or cords with bare wires showing through the insulation.

7.2.9 Inspect the power cord for damage.

7.2.9.1 Replace worn/damaged cords.

WARNING

Do not insert the plug in the receptacle if there is water on the floor.

7.2.10 Check the floor for water.

7.2.10.1 If the floor is wet or there is standing water, notify the supervisor.

7.2.11 If there is an ON/OFF switch at location of receptacle, ensure that the switch is in the OFF position.

7.2.12 Ensure that the unit switch is OFF.

7.2.13 Insert the plug in the receptacles, if the unit is not already plugged in.

7.2.14 Ensure that access door is tightly closed and the dust hopper is secured.

NOTE: Inspection is required at the start of the shift or before the first use on the shift.

7.2.15 Check the unit to ensure all inspections required by Form FMPC-PRO-2630 have been completed (Refer to Step 7.2.3).

R 7.2.15.1 Perform inspection items not previously accomplished.

CAUTION

Residue removal shall be performed in an area approved by Radiological Safety and a contamination control zone established.

7.3 Removal of Residues from the Collection Hopper

7.3.1 Check that a "Radiation Work Permit" is posted.

7.3.1.1 If not, notify the supervisor.

NOTE: Use the vacuum to pick up spills that may occur while emptying the collection hopper.

7.3.2 Check that the dust collector that furnishes vacuum for the area is operating.

7.0 PROCEDURE (cont.)

7.3.2.1 If not, start and operate the unit per the applicable SOP.

7.3.3 For Hoffman Models P3F-002 and 030, lower the dust hopper by lifting the bar in front of the hopper.

7.3.4 For Hoffman Models HVA150 and 75 and Spencer Model P- 190, crank the handle on the side to lower the hopper.

7.3.5 When cleaning the unit, vacuum the container using a Plant Hi-Vac or another portable collector with a knock-out drum attachment.

NOTE: Self-locating guides position the container correctly.

7.3.6 When finished, pull down the bar or crank the lever to raise the hopper from the floor and to seal the hopper against the rubber gasket.

7.4 Operation of Dust Collector

WARNING

Do not operate the unit if there is an accumulation of water on floor.

7.4.1 Check the floor for water.

7.4.1.1 If water is present, notify the supervisor.

7.4.2 Press the START button.

7.4.3 Check the pressure across the HEPA filter.

7.4.3.1 If the reading is above the requirements on the HEPA label, shut off the unit.

7.4.3.2 Notify the supervisor.

WARNING

Do not vacuum any type of liquid, asbestos, or biologically hazardous material.

CAUTION

Overfilling the hopper could cause HEPA filter failure.

7.4.4 Connect a knockout drum to the dust collector inlet (See Figure 1).

7.4.5 If dust is observed in the exhaust during operation, proceed as follows:

7.4.5.1 Shut down the unit immediately.

7.4.5.2 Notify the supervisor.

7.0 PROCEDURE (cont.)

7.4.6 While operating the unit, check for the following:

7.4.6.1 Loss of vacuum.

7.4.6.2 Unusual differential pressure reading which would indicate that the bags or HEPA filter (when equipped) are restricted.

7.4.6.3 Unusual noises from the motor, fan, or filter housing.

7.4.7 If the unit is equipped with a shaker mechanism, after each use or once a day, operate the shaker to remove dust from the tubular bag filters.

7.4.8 For each shift of use, record on "Portable Dust Collector Operating Log", Form FMPC-PRO-2630 (See Figure 2) the type of material vacuumed, including enrichment level.

7.5 Shutdown

7.5.1 Press the STOP button.

7.6 Emergency Shutdown

WARNING

Do not stand in water to operate switch or remove plug.

7.6.1 For emergency shutdown, the dust collector may be stopped by turning off the power at the plug receptacles if necessary.

7.7 Troubleshooting

7.7.1 Troubleshoot the collector per Table 2.

8.0 APPLICABLE FORMS

8.1 FMPC-PRO-2630, "Portable Dust Collector Operating Log"

TABLE I

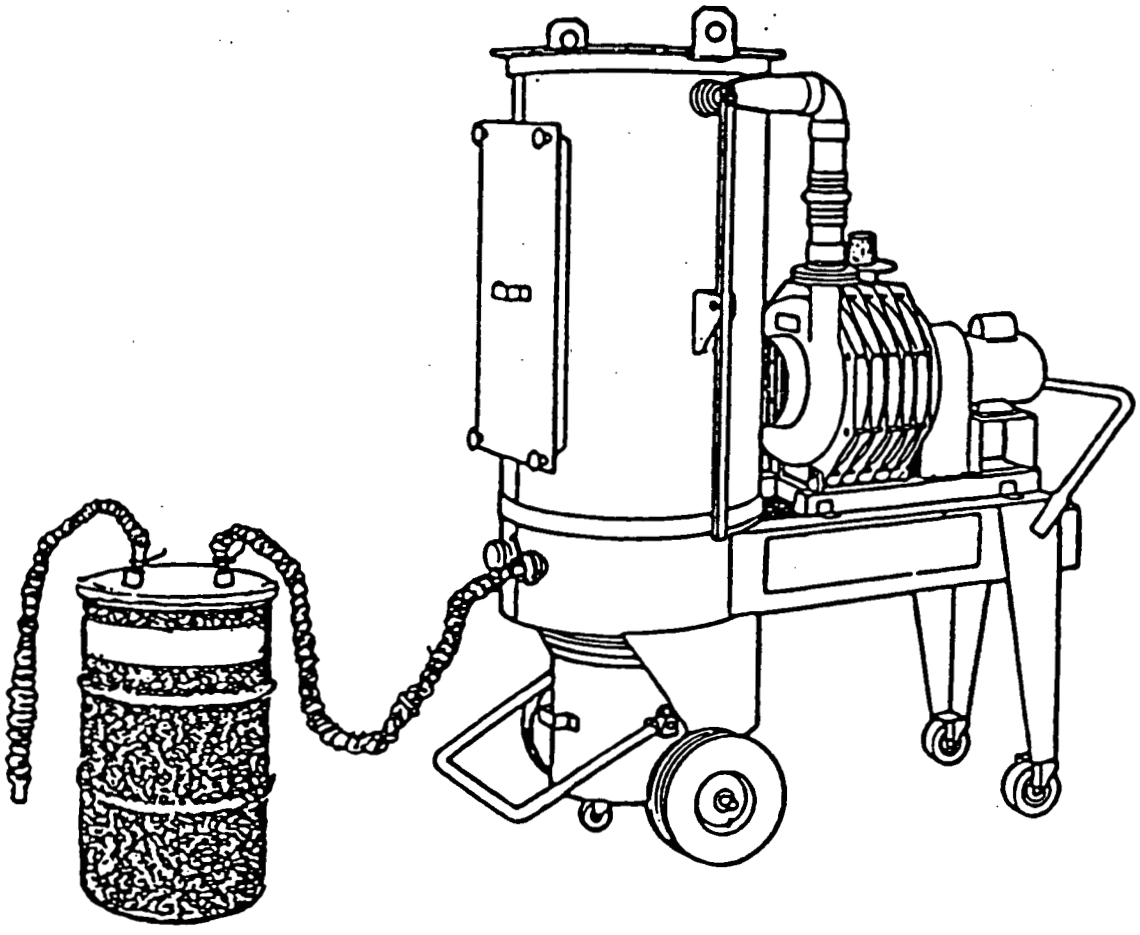
Portable Dust Collectors.

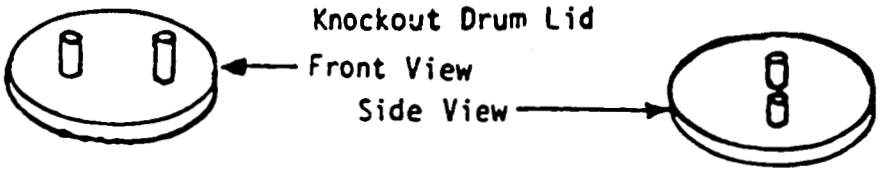
Collector Number	Model Number	Assigned Location	Type
P1-001	P-190	Plant 1	Spencer
P1-002	HVP 150 B4	Plant 1	Hoffman
P2-001	075	Plant 2/3	Hoffman
P2-002	HVP 150 B4	Plant 2/3	Hoffman
P4-001	075	Plant 4	Hoffman
P4-002	075	Plant 4	Hoffman
P4-003	HVP 150 B4	Boiler Plant	Hoffman
P5-002	075	Plant 5	Hoffman
P5-003	075	Plant 5	Hoffman
P5-004	P3F-002	Plant 5	Hoffman
P5-005	P3F-002	Plant 5	Hoffman
P6-003	P-190	Plant 6	Spencer
P6-004	P3F-002	Plant 6	Hoffman
P6-004	075	Plant 6	Hoffman
P6-005	P3F-002	Plant 6	Hoffman
P6-007	P3F-002	Plant 6	Hoffman
P6-008	P3F-002	Final Inspection	Hoffman
P6-009	P3F-002	Final Inspection	Hoffman
P8-001	075	Plant 8	Hoffman
P9-001	P3F-002	Plant 9	Hoffman
P9-003	075	Plant 9	Hoffman
P12-001	030	Building 12	Hoffman
P13-004	075	Pilot Plant	Hoffman

TABLE 2

SPENCER PORTABLE DUST COLLECTOR TROUBLESHOOTING GUIDE

Item No.	Problem	Condition	Corrective Action
1.	Vibration or Noise	Twisting or bending of the unit base to shaft due to uneven floor.	Check and relocate dust collector to a level floor area.
		Surge[1]	Check pick up hose for restriction, damaged, or leaking hose.
		CAUTION	
		Do not operate units in shutoff or surge condition since additional heat and thrust pulsations may cause unit failure.	
2.	Motor Overheating	Overload	Reduce Load
3.	Lack of Vacuum	Slow Speed	Check motor name plate data and electrical circuits for proper connections, voltage and frequency.
		Vacuum Line Leakage	Check all piping separators, sleeves, discharge valves, plugs, inlet valves.
		Dirty dust bag	Inspect and if found dirty, notify supervisor.
		Clogged HEPA filter (when equipped)	Notify supervisor.
		Blocked lines	With approval of the supervisor, remove clean out plug in piping line momentarily to insure that air is entering the system.
4.	High Differential Pressure Across HEPA filter (when equipped)	Clogged HEPA filter (when equipped)	Notify the supervisor.
5.	Exhauster Overheating	Low air volume	Increase air volume. Check for blocked or restricted lines.
		Internal obstruction	Notify supervisor.





VACUUM WITH KNOCKOUT DRUM ATTACHMENT
Figure 1

FMPC
MANUFACTURING

PORTABLE DUST COLLECTOR OPERATING LOG

FACILITY OWNER: _____ COLLECTOR NUMBER: _____ MONTH: _____

DATE	OPERATOR BADGE NUMBER	SHIFT	MATERIAL TYPE [1]	FILTER AGE [2]	BAGHOUSE HOUSING [3]	DUST HOPPER LEVEL [4]	POWER CORD [5]	MATERIAL LABEL [6]	PRESSURE GAUGE [7]	GAUGE TUBING [8]	GAUGE READING [9]	HEPA HOUSING [10]	HEPA TEST LABEL [11]

NOTE: Refer to list on back of this form when performing inspection of portable dust collector.

(OVER)

PORTABLE DUST COLLECTOR OPERATING LOG
Form No. FMPC-PRO-2630
Figure 2 (Page 1 of 2)

4554

INSTRUCTIONS
1. The items listed in Table I shall be checked prior to turning on the portable dust collector referenced each day the collector is operated.
2. Denote with an "S" all satisfactory findings, and "N" unsatisfactory findings and "DNA" where items listed that do not apply.
3. At the beginning of each month, issue a new operating log for the referenced collector.

TABLE I

ITEM	ITEM NAME	INSPECTION	CONDITION	CORRECTIVE ACTION
1	MATERIAL TYPE	MATERIAL TO BE VACUUMED (ALL)		Ensure unit is compatible with residue to be collected. Record material to be collected in space provided
2	FILTER BAGS	INTERIOR OF BAGHOUSE (HOFFMAN/SPENCER)	Filters dirty	Contact supervisor. Proceed as directed
3	BAGHOUSE HOUSING	OUTER CIRCUMFERENCE/ FRAME/WHEELS (ALL)	Dents	Notify supervisor. Proceed as directed.
			Hole(s), loose/missing rivets or clips or knobs or bolts	REMOVE FROM SERVICE. Notify supervisor
			Shaker arm boot missing or torn	REMOVE FROM SERVICE. Notify supervisor
4	DUST HOPPER LEVEL	DUST HOPPER (HOFFMAN/SPENCER)	Hopper more than half full	Remove residue from hopper
5	POWER CORD	CORD (ALL)	Frayed, not exposing wires	DO NOT USE. Notify supervisor to have repaired
			Frayed, exposing wires	DO NOT USE. Notify supervisor to have repaired
			Worn/damaged	Notify supervisor. Proceed as directed.
		CONNECTIONS (ALL)	Cracked, broken, contact bent	DO NOT USE. Notify supervisor to have repaired
			Excessive wear	Notify supervisor. Proceed as directed
6	MATERIAL LABEL	HEPA LABEL (ALL)	Label missing	Contact supervisor and identify material than label unit. DO NOT USE without label affixed
			Listed material on label not compatible	Contact IH Section. If material is not compatible a different vacuum unit must be selected
7	PRESSURE GAUGE	GO/NO GO MANOMETER/ MAGNEHELIC GAUGE (ALL BUT GS-80 & -81)	Gauge missing	DO NOT OPERATE. Notify supervisor to replace
			Out-of-calibration	Notify supervisor to have gauge calibrated
			Gauge damaged	Notify supervisor and proceed as directed
8	GAUGE TUBING	TAPS, TAP CONNECTORS, TUBING, GAUGE CONNECTORS (HOFFMAN/SPENCER)	Connector/tubing damaged	DO NOT OPERATE. Notify supervisor.
			Tubing kinked/missing	DO NOT OPERATE. Notify supervisor
9	GAUGE READING	GO/NO GO GAUGE/ MAGNEHELIC GAUGE (ALL BUT GS-80 & -81)	Gauge in high green or red (GS-82 & -83)	Replace spent disposal bag and clean clean filter. Recheck gauge reading when done
			Reading greater than 3 (Hoffman/Spencer)	Change HEPA. Check to see if bags need to be changed
10	HEPA HOUSING	OUTER CIRCUMFERENCE (ALL)	Dents, holes, loose clips/clamps	REMOVE FROM SERVICE. Have unit in-place tested
11	HEPA LABEL	CERTIFICATION LABEL (ALL)	Label torn, missing or expired	REMOVE FROM SERVICE. Have unit retested

PORTABLE DUST COLLECTOR OPERATING LOG
Form No. FMPC-PRO-2630
Figure 2 (Page 2 of 2)

4554

RECORD OF ISSUE/REVISIONS

ATE	REV. NO	DESCRIPTION AND AUTHORITY
09-19-86	N/A	Request for new SOP for operation of Spencer portable dust collectors per SOP Change Request No. 1299, initiated by D. G. Schmidt.
07-05-89	N/A	Reissued to combine Hoffman/Spencer collector SOPs and reformat to conform with procedure program requirement per Request P89-076, initiated by C. R. Palmer.
04-24-91	1	Revised to update per Request No. P89-429, initiated by C. R. Palmer.
12-14-92	2	Revised to incorporate C92-029 per Request No. P92-251 and to update to conform to procedure program requirements, initiated by J. Lenarduzzi.

REMEDIATION SUPPORT OPERATIONS PROCEDURE	WET AND DRY SYSTEMS CLEAN-OUT	SOP 20-C-014 Area: As Applicable

(Signature on File) Authorization: R.L. Gardner, Facilities & Waste Operations Mgr.	Supersedes: None	Issue Date: 02-18-93

NON-CONTROLLED COPY

1.0 **PURPOSE**

This document provides the procedure for removing residue from both wet and dry systems at the FEMP.

2.0 **APPLICABILITY**

When production was halted in 1989, the materials used in the process to purify uranium were not removed from the equipment or systems in which they were used. This procedure applies to any wet or dry systems containing such residual materials.

3.0 **RESPONSIBILITIES**

3.1 Supervisors

3.1.1 Ensure that systems are cleaned in accordance with this procedure.

3.1.2 Obtain and post all required permits and documents.

3.1.3 Assign trained personnel to perform work related to this procedure.

3.1.4 Ensure that Material Evaluation Form (MEF) has been completed and is available at the job site.

3.1.5 Ensure all required safety equipment is present at the job site.

3.1.6 Assist the Radiological Controls Technician (RCT) and Industrial Hygiene (IH) in establishing an appropriate exclusion zone.

3.1.7 Ensure that compatible containers have the required markings and labelings.

3.1.8 Prior to beginning work, ensure that the material being removed has been characterized.

3.1.9 Review applicable "Material Safety Data Sheets" (MSDS) with personnel.

3.1.10 Coordinate work activities with other departments as needed to perform the task.

3.1.11 Ensure work area is surrounded by barriers when necessary.

3.1.12 Ensure energy isolations are performed per PP-FMPC-0719.

3.0 RESPONSIBILITIES (cont.)

3.1.13 Establish a "Satellite Accumulation Area" (SAA) per SSOP-0035 if a temporary storage location is required for the material being removed.

3.1.14 Ensure two-way communication is possible for workers performing this procedure.

3.1.15 Request Maintenance to open system to be cleaned and to close system after cleaning.

3.2 Operator

3.2.1 Obtain a final disposition sample per SOP 01-C-101.

3.2.2 Obtain a sample for analysis of radionuclides per SOP 01-C-101.

3.2.3 Move waste containers to and from exclusion zones/work areas per PO-S-06-001.

3.2.4 Comply with this procedure.

3.2.5 Comply with requirements of posted permits.

3.2.6 Comply with safety instructions.

4.0 DEFINITIONS

4.1 Compatible Container - A drum (or other container, can, bottle, pail) that has been approved by Environmental Engineering for the material to be accumulated.

4.2 Exclusion Zone - A roped-off space around the system to be cleaned to prevent the spread of contamination by controlling access to the work area.

4.3 Hazardous Waste - A discarded material that is listed in the EPA Hazardous Waste List, fails the TCLP test, or exhibits any of the following three characteristics: ignitability, corrosivity, reactivity. Both "listed" and "Characteristic" Wastes are regulated under RCRA.

4.4 Satellite Accumulation Area (SAA) - A defined area approved for RCRA waste accumulation at or near the waste generation point.

4.5 Satellite Accumulation Container (SAC) - A portable polyethylene container that holds the equivalent of a 55 gallon drum.

4.6 Three-Day-Rule - A RCRA regulation requiring the transfer of containers of RCRA Waste to an approved storage facility within three days from the date the container is declared full.

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.0 APPLICABLE DOCUMENTS (cont.)

5.1.2 FEMP Conduct of Operations Manual

5.2 References

5.2.1 "Establishment and Control of Satellite Accumulation Areas", SSOP-0035.

5.2.2 "Energy Control (Lock Out and Tag Out)", PP-FMPC-0719.

5.2.3 "Movement of Hazardous Waste", PO-S-06-001.

5.2.4 "Completing the Material Evaluation Form", SSOP-0002.

5.2.5 "Sampling Residue and Waste Materials", SOP 01-C-101.

5.2.6 "Hazardous Material Spill Clean-Up", SOP 20-C-606.

5.2.7 "FEMP Lot Marking & Color Coding System", RM-0005.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 Dust Collectors and Fire Suppression Systems, sitewide, are safety systems to which this procedure can be applied.

6.2 For the cleaning of a system containing hazardous waste, radioactive waste, or asbestos, an exclusion zone shall be established prior to starting work.

6.3 The "Radiation Work Permit" (RWP), "Site Work Permit", "Asbestos Work Permit", and "Confined Space Entry Permit", as required, shall be posted.

6.4 Protective clothing, and respiratory equipment specified by the RWP shall be worn upon entry to the exclusion zone/work area and removed prior to exit.

6.5 A face shield or goggles and a rubber apron or splash suit shall be worn when removing lids or bungs from drums containing liquids and when the possibility exists of being splashed with caustics, acids or other hazardous chemicals.

6.6 Leather-palm gloves with cotton inner gloves shall be worn while handling drums and sharp-edged or abrasive material and while cleaning a system.

6.7 Chemical resistant gloves shall be worn when handling hazardous chemicals; the type of glove shall be determined by ES&H on the work permit.

6.8 Any release of hazardous waste shall be reported to the supervisor and handled per SOP 20-C-606.

6.9 Personnel safety equipment (eyewash, fire extinguishers, safety showers) shall be operational and readily available for emergencies.

6.10 Operators shall have reviewed and be familiar with Material Safety Data Sheets (MSDS) for hazardous material/chemicals that may be used or encountered.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.11 Plastic lined drums for clothing/equipment shall be located inside the exclusion zone/work area. There shall be a drum for each type of protective clothing and/or equipment required.

6.12 Safety equipment, drums, and cleaning equipment shall be inside the exclusion zone.

6.13 All containers of material shall be properly identified.

6.14 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a Supervisor. The Supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Control Department for evaluation. When the suspect isotope is uranium, the involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow up urine sample. When the suspect isotope is other than uranium, the involved personnel shall report to the Dosimetry Section of the Radiological Control Department for further determination of actions. Employees are responsible for complying with additional requirements as specified by the Radiological Control Section.

6.15 Any situation which could have resulted in the inhalation, ingestion, or absorption of a hazardous material shall immediately be reported to a Supervisor or to the Assistant Emergency Duty Officer (AEDO), who will immediately report the circumstances to Medical and Industrial Hygiene. The involved personnel shall be directed by the Supervisor or AEDO as to when and where to report for medical evaluation, completion of an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the step or item to which they apply.

8.0 PROCEDURE

8.1 Preparation for Cleanout of Wet or Dry Systems

8.1.1 Obtain completed Material Evaluation Form (MEF) as required.

8.1.2 Isolate all parts of the system(s) to be cleaned and Lockout and Tagout the system(s) per PP-FMPC-0719.

8.1.3 Ensure that required permits (RWP, Site Work Permit, Asbestos Work Permit and/or Confined Space Entry Permit) have been obtained and posted by the supervisor.

8.1.4 If sampling is required, proceed per SOP 01-C-101.

8.0 PROCEDURE (cont.)

8.1.5 Erect barricades around the exclusion zone/work area.

8.1.6 Ensure that warning and area entry requirement signs, as required, are posted at the barricades.

WARNING

Incompatible materials or materials of differing isotopic levels shall never be accumulated in the same container or in containers placed near each other or hazardous reaction may occur.

NOTE: Before delivery to removal site, collection containers shall be tare weighed as required by the supervisor, and the weight recorded on "Item Production/Certification/Identification" (65 card), Form FMPC-CONT-1945-XX.

8.1.7 Place the collection containers near the exclusion zone/work area.

8.1.8 Ensure the pump/vacuum intake hose is long enough to reach the bottom of the system to be cleaned to allow removal of residue as completely as possible.

8.1.9 Remove the lid/bung from the collection container(s).

8.1.10 To clean a wet system, continue with Paragraph 8.2; to clean a dry system, continue with Paragraph 8.3.

3.2 WET SYSTEM CLEANING

CAUTION

The pump's air flow and electrical specifications must match those of the power source in order to operate properly.

8.2.1 Check the hazard codes, and either the electric or air capacity of the pump to be used.

NOTE: The pump shall be specified by hazard code or a combination of hazard codes for the material being transferred.

8.2.1.1 If the pump hazard codes are not as specified on the pump, notify the supervisor.

8.2.2 Place the pump inside the exclusion zone/work area.

8.2.3 Connect the pump to the plant electric power source or auxiliary generator power source and to the plant air supply or an air compressor.

8.2.4 Connect supplied hoses to the pump intake and discharge.

8.0 PROCEDURE (cont.)

CAUTION

Ensure that the concentration of air contaminants is monitored (by Industrial Hygiene) before and after the system is opened.

8.2.5 Request Maintenance personnel to open the system.

8.2.6 Place the end of the pump discharge hose into the collection container opening.

8.2.7 Ensure that electrical connections and hose connections are tight.

8.2.8 Start the pump at low speed, increasing gradually to moderate operating speed to avoid splashing.

8.2.8.1 If using compressed air, open the air supply nozzle slowly until pump is primed.

WARNING

Bulging containers may rupture and present a hazard to personnel; stop filling immediately.

8.2.9 Check the collection container for bulging while filling.

8.2.9.1 If the container starts to bulge, shut off the pump and notify the supervisor.

8.2.10 When the system is empty, remove the intake hose from the system.

8.2.11 Drain the pump and both hoses into the collection container.

8.2.12 Check the sides and bottom of the wet system for residues.

8.2.12.1 Remove any solid residue using manual tools (such as shovels and spud bars).

8.2.12.2 Place solid residue in special drum.

8.2.13 If RCRA material was removed, rinse the pump with solvent specified by the supervisor (usually water) and drain the pump into the appropriately labeled container. Rinse and drain twice more for a total of three rinsings and drainings.

8.2.14 Contact maintenance to close the system.

8.2.15 Continue with Step 8.4.

8.3 Dry System Cleaning

8.3.1 Obtain HEPA portable vacuum cleaner with a current DOP test label.

8.0 PROCEDURE (cont.)

8.3.1.1 When the cleanout operation is expected to yield more material than the capacity of the vacuum, use a knockout drum connected to an operating Hi Vac.

8.3.2 Place portable vacuum in or near the exclusion zone/work area.

8.3.3 Connect the vacuum to the plant electric power supply, if accessible, or to an auxiliary generator.

8.3.4 Insert the intake hose into the dry system and ensure that there is enough hose for complete removal of material.

8.3.5 Using the portable vacuum cleaner or Hi-Vac hose, clean the entire system.

WARNING

Bulging containers may rupture and present a hazard to personnel; stop filling immediately.

8.3.6 Check the collection container for bulging while filling.

8.3.6.1 If the container starts to bulge, shut off the vacuum and notify the Supervisor.

8.3.7 Remove the intake hose from the system and take the vacuum to a designated area or to the dust collector residue storage drum.

8.3.8 Remove the collection bag/canister from the vacuum.

8.3.9 Empty the vacuum cleaner collection bag/residues into the collection container.

NOTE: Notify Supervisor to contact maintenance to change HEPA filters.

8.3.10 If the removed waste material is RCRA, replace all the vacuum cleaner filters.

8.3.10.1 Rinse the insides of all hoses and hose attachments (tools), completely, using a solvent specified by the supervisor (usually water) and drain into the collection container.

8.3.10.2 Repeat the rinse process twice more.

8.3.11 Contact maintenance to close the system.

8.4 Collection Container Identification

8.4.1 Seal the collection container.

8.4.2 Complete "Item Production/Certification/Identification" cards, (65 card), form FMPC-CONT-1945-XX, for the material in the collection containers.

8.0 **PROCEDURE** (cont.)

NOTE: Containers of RCRA hazardous waste must be removed to a hazardous waste storage area (in accordance with SSOP-0035) within 3 days of being declared full (the "Three Day Rule").

8.4.3 Label/stencil the collection and rinse containers per RM-0005.

8.4.3.1 The label/stencil on the collection container shall include the "Declared Full" date if the waste material is RCRA.

NOTE: The supervisor shall arrange to have Quality Assurance inspect the collection containers and SACs and then have them transferred to the applicable building or warehouse for weighing and storage.

8.4.4 Inform supervisor that cleaning is completed.

8.4.5 If no releases occurred, remove and store spill containment equipment in a specified location.

8.4.6 If a spill release has occurred, handle and clean spill containment equipment per SOP 20-C-606.

9.0 **APPLICABLE FORMS**

9.1 FMPC-CONT-1945-XX, "Item/Production/Certification/Identification"

9.2 FS-F-3252, "Material Evaluation Form"

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
12-14-92	0	Separate procedure written, using information from SSOP-0024, for packaging LLRW in drums per Request No. S92-123, initiated by M. Hundley. SSOP-0075, SSOP-0078, and SSOP-0079 replaces SSOP-0024.

1.0 PURPOSE

This procedure provides the instructions for packaging low level radioactive waste (LLRW) in drums for shipment off-site from the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure outlines the steps for (1) inspecting the waste to be packaged, (2) inspecting empty drums, (3) filling drums, (4) weighing filled drums, and (5) securing and labeling the drums.

The packaging operation is applicable to FEMP personnel (including subcontractors) responsible for packaging LLRW into open-head drums at any packaging location of the FEMP site. The packaging operation originates upon approval from DOE for a specific waste stream.

3.0 DEFINITIONS

Drum - A cylindrical, metal open-head container which meets Department of Transportation (DOT) and Environmental Protection Agency (EPA) requirements, and Nevada Test Site (NTS) acceptance criteria.

Free Liquid - Any free flowing liquid or any liquid that readily separates from the solid portion of a waste under ambient temperature and pressure conditions. Ice is also considered a free liquid.

Low-Level Radioactive Waste (LLRW) - All radioactive waste not classified as high-level waste, spent nuclear fuel, TRU waste, uranium mill tailings, or MW. Low-level waste can contain TRU nuclides in concentrations not greater than 100 nanocuries per gram, where TRU means transuranic and MW means mixed waste.

Packaging Location - Any area where waste is stored or generated.

Resource Conservation and Recovery Act (RCRA) - The Congressional Act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control, documentation and proper management of hazardous wastes.

4.0 RESPONSIBILITIES

Environmental Compliance & Quality Assurance (EC&QA)

- Ensures waste is not a prohibited material.
- Provides documentation supporting characterization results as needed.

4.0 **RESPONSIBILITIES** (cont.)

- Overviews packaging operation to ensure compliance with this procedure.

Industrial, Radiological Safety & Training (IRS&T)

- Provides a Radiological Safety Technician, as requested.
- Determines appropriate respiratory equipment and any other employee protection.

Logistics Administration specifies the drum type.

Materials Control and Accountability (MC&A) provides bar-code labels.

Motor Vehicle Operator (MVO) of Facilities and Warehousing (F&W)

- Transports packaged waste to the applicable storage area.
- Delivers empty drums to designated areas.
- Supports packager when performing scale inspection/test.

Packager

- Inspects waste per this procedure.
- Packages waste per this procedure.
- Complies with any additional requirements specified by Industrial, Radiological Safety and Training (IRS&T).

Supervisor

- Specifies applicable scale procedures and standard tare weight of packages.
- Ensures packaging materials are available for packagers.
- Ensures that trained personnel package waste material.
- Determines disposition of waste material identified in this procedure.
- Ensures that personnel package waste for shipment to meet applicable Nevada Test Site (NTS), Department of Transportation (DOT), and Environmental Protection Agency (EPA) regulations.

4.0 **RESPONSIBILITIES** (cont.)

- Contacts Industrial, Radiological Safety and Training (IRS&T) to determine the appropriate respiratory protection for the process being performed and the radiological surveys required for materials moving in and out of regulated areas.
- Provides packagers with the required respiratory protection and other personal protective equipment.
- Ensures the lid on an unfilled waste container is secured when no packaging is occurring to prevent addition of unknown materials.
- Ensures waste packages are weather-protected.
- Contacts IRS&T prior to opening any drum of unknown radioactive material.

5.0 **GENERAL**

None

6.0 **PREREQUISITES**

6.1 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

- Safety glasses with side shields shall be worn unless other eye protection is specified by IRS&T.
- Respiratory protection provided by the supervisor shall be worn when required.
- Leather-palm gloves shall be worn when handling drums, operating equipment, and handling rough, sharp-edged, or contaminated material.
- HEPA type filter vacuum cleaners or a vacuum system approved by IRS&T with a current DOP test label properly affixed to vacuum shall be used for cleaning.
- A minimum of two packagers shall package waste.

6.0 **PREREQUISITES** (cont.)

- Any circumstance which could have resulted in an employee inhaling, ingesting or absorbing radioactive materials shall immediately be reported to a supervisor. The supervisor shall immediately report the possibility of radioactive materials intake to IRS&T Radiological Safety Section. The involved employee(s) shall report to the FEMP Urine Sampling Station at the end of their shift to complete an "Incident Investigation Report" (IIR), Form FMPC-ES&H-1458 and submit an incident urine sample. The involved employee(s) shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees shall be held accountable for complying with additional requirements as specified by IRS&T.

6.2 PACKAGING SUPPLIES

- Obtain the following items/supplies prior to preparing drums and packaging waste:

  - indelible ink marker
  - black paint, red paint, white paint (as applicable)
  - 15/16 inch combination wrench
  - calibrated torque wrench
  - wire and wire pullers
  - applicable drum labels
  - lab label tape and dispenser

6.3 POSTING REQUIREMENTS

- A "Prohibited Materials List" (see Figure 1) shall be displayed in the packaging area.

6.4 WASTE CHARACTERIZATION

- A Material Evaluation Form (MEF), FS-F-3252, shall be completed to categorize the material as RCRA or Non-RCRA.

  NOTE: A numbered MEF may be obtained from Waste Management Records and initiated per SSOP-0002, "Completing the Material Evaluation Form".

- Additional documentation supporting the characterization results shall be provided by Environmental Compliance.

PACKAGING GUIDELINES FOR WASTE GENERATOR

Package has been properly prepared for closing:

No liquids of any kind have been placed in container

Heavy/bulky items have been secured within container

All available space has been utilized efficiently

Prohibited materials have been excluded (see below)

Packaging has not been damaged during loading

Liner is in place and properly lapped and sealed

PROHIBITED MATERIALS

Compressed Gases (unpunctured aerosol cans included)

Explosives

Free liquids

Fine particulates (respirable fines)

Hazardous Waste (suspect RCRA materials included)

Corrosive materials

Etiologic agents

Figure 1 - PROHIBITED MATERIALS LIST

6.0 **PREREQUISITES** (cont.)

- A sample of the waste for Toxicity Characteristic Leaching Procedure (TCLP) may be required as requested by Facilities and Material Evaluation (FME).
- A sample may be required for major radionuclides and other suspected nuclides as determined by supervision.

7.0 **PROCEDURE**

NOTE: Within this section, Warnings and Cautions precede the step to which they apply. Notes follow the step to which they apply.

7.1 INSPECTING THE WASTE

EC&QA AND PACKAGER

1. Ensure the waste to be packaged is not on the "Prohibited Materials List" (see Figure 1).

PACKAGER

a. If the waste is listed on the "Prohibited Materials List", do not package this waste. Notify supervisor for disposition.

2. As required, notify supervisor that a Radiological Safety Technician (RST) is needed.

> **WARNING**
>
> **AN RST SHALL BE PRESENT PRIOR TO OPENING ANY CONTAINER OF UNKNOWN RADIOACTIVE MATERIAL.**

3. As applicable, remove container lid. Visually check waste for free liquid.

   a. If free liquid is present or material is wet, notify supervisor.

4. When recent weather conditions have occurred that could cause ice, carefully inspect waste for ice.

   a. If ice is present in waste, notify supervisor.

7.1 INSPECTING THE WASTE (cont.)

PACKAGER

5. Complete a "Visual Inspection of Drummed Material", Form FS-F-3570 (see Figure 2), as applicable and transmit to supervisor.

6. Fill out an "Item Production/Certification/Identification", XX card, Form FS-F-1945-XX (see Figure 3) as follows:

   a. Record the FEMP Lot Marking Code per "FEMP Lot Marking and Color-Coding System", RM-0005, in the areas titled "P.O. No.", "Source", Material Class", and "Material Type".

   b. Record a general description of the waste in the area titled "Waste Description and Comments".

7.2 PREPARING EMPTY DRUMS

SUPERVISOR

1. Notify Facilities and Warehousing (F&W) to deliver appropriate type of drum(s) to the designated packaging area.

   NOTE: The specific drum type shall be determined by Logistics Administration.

PACKAGER

2. Visually inspect the drum interior and exterior for damage, such as corrosion, dents, holes, or other defects (refer to Tables 1 and 2).

   a. If the drum is damaged, mark the lid or side with a red "X" and refer to Tables 1 and 2 for corrective action, as applicable.

3. Visually inspect the interior to ensure the drum is empty.

   a. If material is present in the drum, notify supervisor.

4. Using indelible ink, mark the lot and drum number per the "FEMP Lot Marking and Color Coding System", RM-0005, on the lid and side of the drum (see Figure 4).

-1554-

FEMP

VISUAL INSPECTION OF DRUMS

INSPECTOR'S NAME:	BADGE NUMBER:	DATE:
INVENTORY NUMBER:	FEMP LOT NUMBER:	DRUM NUMBER:
DESCRIPTION OF MATERIAL: ☐ Solid ☐ Liquid ☐ Damp Color _____		FREE-STANDING LIQUID/ICE: ☐ Yes ☐ No
AMOUNT OF MATERIAL IN DRUM: ☐ Empty ☐ 1/4 Full ☐ 1/2 Full ☐ 3/4 Full ☐ Full	IS IT O.P., IF SO WHAT SIZE:	
WEIGHTS ON DRUM: G _____ T _____ N _____		pH, IF LIQUID:

COMMENTS: _____

_____ PACKAGER _____ DATE

FS-F-3570 (8/17/92)

Figure 2 - VISUAL INSPECTION OF DRUMMED MATERIAL
Form FS-F-3570

CARD 65-1 **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION** INV. NO.:

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	CONT. NO.	SERIAL

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	
PROJECT	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		
OVERPACK		
REPACK		

PLANT	PROD. MBA	MEF NO.

DCAR	SURV. NO.	GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945-1 (REV. 11/20/92)

Figure 3 - ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION CARD
Form FS-F-1945-XX

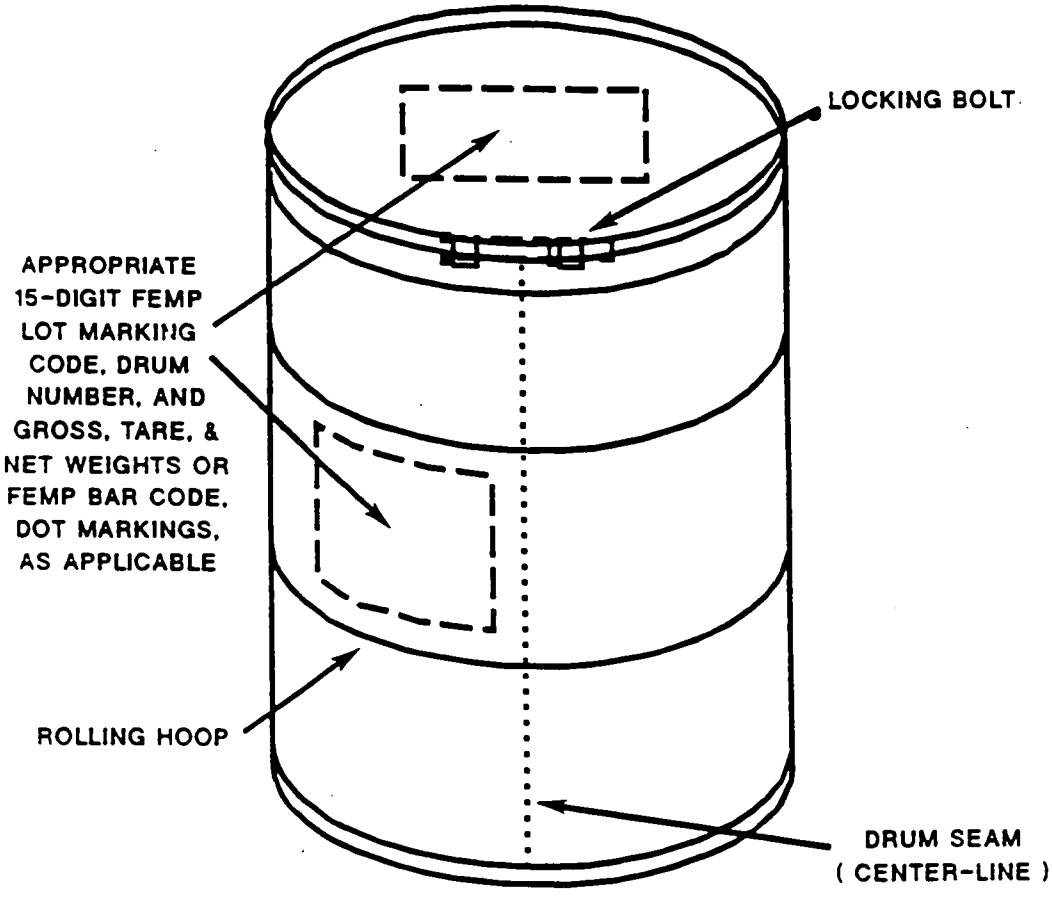
TABLE 1
CORROSION INSPECTION CATEGORIES

CATEGORY	CHARACTERISTIC	COULD CAUSE LOSS OF DRUM INTEGRITY		CORRECTIVE ACTION
		YES	NO	
A	Severe corrosion with deep pitting and/or metal flaking	X		1. Notify supervisor. **NOTE**: The drum requires disposition as directed by supervision within 24 hours.
B	Corrosion with shallow pitting and/or mild metal flaking		X	1. Proceed as directed by the supervisor. **NOTE**: Disposition shall be determined by the supervisor following review of completed inspection form.
C	Surface rust with no pitting and mild paint flaking which exposes bare metal		X	1. Proceed as directed by the supervisor. Repainting shall be scheduled by supervisor.

TABLE 2
LLRW DRUM INSPECTION

INSPECTION ITEM	INSPECTION CRITERIA	CORRECTIVE ACTION REQUIRED
Hole	An opening in the container including breach, gouge, puncture or leak.	Notify supervisor of condition and request disposition instructions.
Dent	A crease, depression or hollow made by blow or pressure; a concave distortion which jeopardizes the integrity of the container. A dent in the top or bottom rim.	Notify supervisor of condition and request disposition instructions.
Bulge	A swollen area, a convex distortion, an outward bend which jeopardizes the integrity of the container.	Notify supervisor of condition and request disposition instructions.

TYPICAL LABELING OF NON-RCRA OR LOW-LEVEL RADIOACTIVE WASTE DRUM



SIXDR-R1

Figure 4 - LOCATIONS FOR LLRW DRUM LABELING

7.2 PREPARING EMPTY DRUMS (cont.)

PACKAGER

5. On the XX Card (see Figure 3), record the type of container in the area titled "Package Size" and fill out the "Package Physical Certification" area excluding the last two items.

SUPERVISOR

6. Specify the scale for weighing and the method of transporting the drum to the scale.

PACKAGER

7. Inspect the scale to be used per the scale procedure applicable to the area.

8. Using method specified by supervisor, place drum on scale.

9. Tare weigh every twentieth drum for each drum type per the scale procedure applicable to the area.

10. Insert the XX card into the scale printer to record tare weight.

11. Using method specified by supervisor, remove drum from scale.

12. Move drum to loading area as directed by the supervisor.

7.3 FILLING DRUMS WITH WASTE MATERIAL

EC&QA

1. Oversee filling of drums to ensure compliance with this procedure.

    a. If a nonconformance is identified, document and evaluate for corrective action per applicable department procedure.

7.3 FILLING DRUMS WITH WASTE MATERIAL (cont.)

CAUTION

RESPIRATORS AND OTHER PERSONAL PROTECTIVE EQUIPMENT PROVIDED BY THE SUPERVISOR SHALL BE WORN PRIOR TO FILLING DRUMS.

PACKAGER

2. Manually remove lock ring and lid from empty drum.

3. Using method specified by supervisor, fill drum with LLRW ensuring the waste level remains three inches below top of drum.

   NOTE: Because the density varies according to waste type, the volume of waste to be packed will vary.

4. Place lid on drum ensuring gasket is seated to maintain a tigh seal.

5. Install bolt-type lock ring on lid.

7.4 WEIGHING FILLED DRUMS

SUPERVISOR

1. Specify scale for weighing and the method of transporting drum to scale.

PACKAGER

2. Inspect scale to be used per the applicable scale procedure.

MVO

3. Using equipment specified by supervisor, move drum onto scale.

PACKAGER

4. Using the applicable scale procedure, weigh drum and note scale indication of gross weight.

7.4 WEIGHING FILLED DRUMS (cont.)

PACKAGER

5. If drum gross weight is over specified limit (refer to Table 3), then proceed as follows:

TABLE 3
WEIGHT LIMITATIONS

DRUM SIZE	MAXIMUM GROSS WEIGHT
30 gallons	700 pounds
55 gallons	1,200 pounds
85 gallons	1,000 pounds

a. On the scale, remove lock ring and lid from the drum.

b. Gradually transfer waste from drum into approved container until the scale indicates gross weight of drum is within limits in Table 3.

NOTE: The removed material may be included in an underweight drum of the same lot or packaged in another drum of the same lot.

c. Place lid on drum and install bolt-type lock ring on lid.

MVO

6. Using equipment specified by supervisor, remove the drum from the scale.

PACKAGER

7. Using indelible ink, mark the gross weight on the lid and side of the drum in the area shown in Figure 4.

8. Calculate net weight.

9. Complete XX Card including gross weight, net weight, lot sequence number, badge number, and signature.

10. Transmit XX Card to supervisor.

7.4 WEIGHING FILLED DRUMS (cont.)

SUPERVISOR

11. Sign XX card and transmit XX card to MC&A.

MC&A

12. Using XX card data, print required bar-code labels and submit to supervisor.

7.5 SECURING AND LABELING DRUMS

PACKAGER

1. Visually inspect drum for corrosion and dirt.

   a. If drum is not clean, wipe drum exterior with a rag and dispose of rag in a designated container.

   b. If corrosion is present, notify supervisor.

2. Using a combination wrench and a torque wrench, tighten lock ring bolt to a minimum of 45 ± 5 pounds.

3. Secure lid by completing the following steps:

   a. Manually thread wire through bolt holes.

   b. Using wire pullers, clamp wire and pull away from bolt.

      NOTE: The wire should twist together when pulled.

   c. Remove wire pullers from wire.

   d. Manually grasp twisted wire and bend underneath the bolt.

4. Using red paint, apply dot on bolt.

5. Using bar-code labels provided by supervisor, affix labels to the lid and side of drum as shown in Figure 4.

   NOTE: For drums requiring immediate shipment, labels do not require the positioning (in relation to the seam) shown in Figure 4.

7.5 SECURING AND LABELING DRUMS (cont.)

MVO

6. Using a hoist/crane and barrel grab or equipment specified by supervisor, place the drum with bolt of lock ring facing outward on pallet.

PACKAGER

7. Notify supervisor the waste has been packaged.

SUPERVISOR

8. Request MVO to move pallet(s) to a designated storage area or to the designated waste staging area.

MVO

9. Strap drum(s) and move pallet(s) to the storage area or the waste staging area specified by the supervisor.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

8.2 REFERENCES

RM-0005, "FEMP Lot Marking and Color-Coding System"

SSOP-0002, "Completing the Material Evaluation Form"

NON-CONTROLLED COPY

PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW) INTO ISO CONTAINERS FOR OFFSITE SHIPMENT

SSOP-0078

Effective Date: 12-14-92

AUTHORIZED BY: _____ 11/30/92
H. F. Daugherty, President — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
12-14-92	0	New procedure required for shipping LLRW in ISO containers per Request S92-175, initiated by M. Hundley. SSOP-0079, SSOP-0075, and SSOP-0078 replace SSOP-0024.

1.0 PURPOSE

This procedure provides the instructions for packaging low level radioactive waste (LLRW) into ISO containers for shipment offsite from the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure outlines the steps for (1) preparing the empty ISO container, (2) inspecting the waste to be packaged, (3) filling container with waste, (4) weighing container, and (5) labelling container.

The packaging operation is applicable to FEMP personnel (including subcontractors) responsible for packaging LLRW in ISO containers at any packaging location of the FEMP site. This operation originates upon approval by DOE for a specific waste stream. LLRW may be packaged at any designated packaging location at the FEMP.

3.0 DEFINITIONS

Free Liquid - Any free flowing liquid or any liquid that readily separates from the solid portion of a waste under ambient temperature and pressure conditions. Ice is also considered a free liquid.

ISO Container - An Intermodal container (Dry Cargo Type). Those used at the FEMP typically measure 8-1/2 feet high X 8 feet wide X 20 feet long with two doors on the end. Although frequently referred to as a "Sea/Land" container at the FEMP, an ISO container may be, but is not necessarily, a Sea-Land container.

Low Level Radioactive Waste (LLRW) - Waste that contains radioactivity and is not classified as high level waste, transuranic waste, spent nuclear fuel or 11e(2) byproduct material as defined by DOE Order 5820.2A. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic is less than 100 nCi/g.

Packaging Location - Any area where waste is stored or generated.

Resource Conservation and Recovery Act (RCRA) - The Congressional Act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control, documentation and proper management of hazardous wastes.

3.0 **DEFINITIONS** (cont.)

Toxicity Characteristic Leaching Process (TCLP) - A RCRA term referring to wastes, the extracts from which contain the contaminants listed in Table 1 of 40 CFR 261.24, at a concentration equal to or greater than the respective value given in the table.

4.0 **RESPONSIBILITIES**

Checker fills out weight ticket.

Environmental Management (Facilities & Material Evaluation) provides documentation supporting characterization results as needed.

Industrial, Radiological Safety & Training (IRS&T)

- Provides a Radiological Safety Technician, as requested.
- Determines appropriate respiratory equipment and any other employee protection.

Logistics Administration specifies the required waste container.

Materials Control and Accountability (MC&A) provides bar-code labels.

Packager

- Inspects waste and container per this procedure.
- Packages waste per this procedure.
- Complies with any additional requirements specified by IRS&T.

Quality Assurance (QA) overviews packaging operation to ensure compliance with this procedure.

Supervisor of the waste generation area or packager

- Specifies applicable scale procedures and standard tare weight of packages.
- Ensures packaging materials are available for packagers.
- Ensures that trained personnel package waste material.
- Determines disposition of waste material identified in this procedure.

4.0 **RESPONSIBILITIES** (cont.)

- Ensures that personnel package waste for shipment to meet applicable Nevada Test Site (NTS), Department of Transportation (DOT), and Environmental Protection Agency (EPA) regulations.
- Contacts Industrial, Radiological Safety and Training (IRS&T) to determine the appropriate respiratory protection for the process being performed and the radiological surveys required for materials moving in and out of regulated areas.
- Contacts Radiological Safety for a radiological work permit or other safety permits and ensures permits are obtained and signed prior to performing work.
- Provides packagers with the required respiratory protection and other personal protective equipment.
- Ensures the doors on an unfilled waste containers are secured when no packaging is occurring thereby preventing addition of unknown materials.
- Ensures waste packages are weather-protected.
- Contacts IRS&T prior to opening any container of unknown radioactive material.

5.0 **GENERAL**

5.1 The determination to package a waste stream is based on approval by DOE and a completed Material Evaluation Form.

5.2 On-site movement of waste shall be completed per PP-0314.

6.0 **PREREQUISITES**

6.1 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

Safety glasses with side shields shall be worn unless other eye protection is specified.

Respiratory protection provided by the supervisor shall be worn when required.

Leather-palm gloves shall be worn when handling containers, operating equipment and when handling rough, sharp-edged, or contaminated material.

6.0 **PREREQUISITES** (cont.)

6.1 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

Neoprene rubber gloves shall be worn when handling HEPA type filter vacuum cleaners, or a vacuum system approved by IRS&T with a current DOP test label properly affixed to vacuum shall be used for cleaning.

A Radiation Work Permit must be approved and current.

Face shields shall be worn when removing lids or bungs of containers filled with liquids or during operations where the possibility exists that personnel could be splashed with liquids.

Any circumstance that could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

6.2 TOOLS AND MATERIALS REQUIRED

Obtain the following items/supplies prior to performing the packaging operation:

- appropriate safety protective equipment
- silicone caulk
- caulk gun
- absorbent pads
- 1/4 inch x 4 foot x 8 foot plywood sheets (all grades)
- plastic liner (6 mil)
- utility knife
- clean rags
- indelible marker
- 1-1/2 inch black bands, clips, and banding equipment

6.0 **PREREQUISITES** (cont.)

6.3 WASTE CHARACTERIZATION REQUIREMENTS

A Material Evaluation Form (MEF), FMPC-OPR-3252 shall be initiated to determine if the material as RCRA/Non-RCRA. The packaging operation may be started before the characterization results are received.

NOTE: A numbered MEF may be obtained from Waste Management Records and initiated per SSOP-0002.

Additional documentation supporting the characterization results shall be provided by Facilities and Material Evaluation (F&ME).

A sample of the waste for Toxicity Characteristic Leaching Process (TCLP) may be required as requested by Hazardous & Solid Waste Compliance.

A sample may be required for major radionuclides and other suspected nuclides as determined by supervision.

6.4 PERSONNEL REQUIREMENTS

A minimum of two personnel are required to package waste.

Packagers shall be certified in use of Personal Protective Equipment (PPE).

7.0 **PROCEDURE**

7.1 PREPARING EMPTY ISO CONTAINER

SUPERVISOR

1. Notify Facilities and Warehousing (F&W) to deliver an empty ISO container to the designated packaging area.

   NOTE: The specific ISO container type will be determined by Logistics Administration.

7.1 PREPARING EMPTY ISO CONTAINER (cont.)

PACKAGER

2. After the container is delivered, open ISO container doors and visually inspect the container interior and exterior for damage, such as dents, holes, or other defects.

   a. If the container is damaged or shows evidence of leakage, notify supervisor.

3. Visually inspect interior to ensure the container is empty.

   a. If material is present in the container, notify supervisor.

SUPERVISOR

4. Specify the scale for weighing and method of transporting the container to the scale.

PACKAGER

5. Inspect the scale to be used per the scale procedure applicable to the area.

HEO

6. As directed by the supervisor, move the container onto the scale.

PACKAGER

7. Tare weigh every twentieth container per the applicable department scale procedure applicable to the area.

8. Calculate tare weight by adding 350 lbs to weight of container.

   NOTE: The weight of 350 lbs represents the materials used to prepare the container.

9. Initiate an Item Production/Certification/Identification XX card, Form FS-F-1945 by recording the tare weight (see Figure 1).

HEO

10. Using the method specified by supervisor, remove the container from the scale.

7.1 PREPARING EMPTY ISO CONTAINER (cont.)

PACKAGER

11. Caulk seams, air vents, welded patches, and any other container openings.

    NOTE: Seams closed with a continuous weld need not be caulked.

    a. If a breach or hole is present, notify supervisor.

       NOTE: Supervisor shall contact Maintenance to complete repair.

12. Completely cover floor of container with two layers of absorbent pads permitting no gaps. Allow padding to extend three inches, ± one inch, upward along each wall.

    NOTE: Doorway edge shall remain free of padding at this time.

13. Apply silicone caulk, approximately 4 feet, ± 6 inches high, along the three walls of the container to hold liner in place.

14. Starting at the back of the container, unroll plastic liner over floor to the front of the container, ensuring plastic is up a minimum of 4 feet, along each wall.

15. Using a utility knife, cut off excess liner extending beyond front of container.

16. Drape and press remaining sections of liner to the three caulked walls of the container.

17. Place one layer of absorbent pads over liner on container floor, allowing pad to extend approximately three inches, ± one inch, upward along the three walls.

18. Starting at the back of container, place plywood sheets over the pads, overlapping, across the container floor to the doorway.

19. Lean three plywood sheets along each container side and one plywood sheet along the back wall.

7.1 PREPARING EMPTY ISO CONTAINER (cont.)

PACKAGER

20. Adhere the "Prohibited Materials List" (see Figure 2) to interior side of door.

21. Notify supervisor the container preparation is complete.

    NOTE: Supervisor shall notify QA that the container has been prepared.

QA

22. Inspect container preparation per applicable department procedure for compliance with this procedure.

7.2 INSPECTING THE WASTE

PACKAGER

1. Ensure the waste to be packaged is not on the "Prohibited Materials List" (see Figure 2).

    a. If the waste is listed on the "Prohibited Materials List", do not package this waste. Notify supervisor for disposition.

2. When weather conditions occur that could cause ice, carefully inspect waste for ice.

    a. If ice is present in waste, notify supervisor.

3. Record the following data on the XX Card (see Figure 1) for each container as follows:

    a. Determine the FEMP Lot Marking Code per RM-0005, "FEMP Lot Marking and Color-Coding System" and record code in the areas titled "P.O. No.", "Source", "Class", and "Material Type".

    b. Record a general description of the waste in the area titled "Waste Description and Comments".

CARD 65-1 **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION** INV. NO.:

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DATE DAY	DATE YEAR	SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.

SEAL NUMBER	SEAL DATE MONTH	SEAL DATE DAY	SEAL DATE YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	
PROJECT	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		
OVERPACK		
REPACK		

PLANT	PROD. MBA	MEF NO.
DCAR	SURV. NO.	GROSS WEIGHT
		TARE WEIGHT
		NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945-1 (REV. 11/20/92)

Figure 1 - Item Production/Certification/Identification (Form FS-F-1945)

PACKAGING GUIDELINES FOR WASTE GENERATOR

Package has been properly prepared for closing:

- No liquids of any kind have been placed in container
- Heavy/bulky items have been secured within container
- All available space has been utilized efficiently
- Prohibited materials have been excluded (see below)
- Packaging has not been damaged during loading
- Liner is in place and properly lapped and sealed

PROHIBITED MATERIALS

Compressed Gases (unpunctured aerosol cans included)

- Explosives
- Free liquids
- Fine particulates (respirable fines)
- Hazardous Waste (Suspect RCRA materials included)
- Corrosive materials
- Etiologic agents

Figure 2 - Prohibited Materials List

7.3 FILLING ISO CONTAINERS WITH WASTE MATERIAL

PACKAGER

1. Maintain communication with QA to permit QA to overview filling of containers in accordance with applicable QA department procedure.

QA

2. If a nonconformance is identified, document and evaluate for corrective action per applicable department procedure.

PACKAGER

> **CAUTION**
>
> **A RESPIRATOR AND OTHER PERSONAL PROTECTIVE EQUIPMENT PROVIDED BY THE SUPERVISOR SHALL BE WORN PRIOR TO FILLING CONTAINERS.**

3. As specified by supervisor, load waste into container as tightly as possible.

7.4 SECURING ISO CONTAINER

QA

1. Perform final examination of contents and complete documentation for verification of materials packaged.

   NOTE: This documentation may include photographs.

PACKAGER

2. If directed by supervisor, place two sheets of plywood vertically in front of container doorway for shoring.

3. Roll absorbent pads (double-thick) together and place evenly along the floor (maintaining continuous contact with floor) in front of the plywood sheets.

4. Caulk door frame interior and inside edges of each door.

5. Close the container doors.

7.4 SECURING ISO CONTAINER (cont.)

PACKAGER

6. Close and latch doors ensuring all latching mechanisms are engaged.

7. Band doors securely together with 1-1/4 inch bands spaced approximately 2 feet apart around the center locking bars at mid-height of the container.

8. Secure each band with two double-crimp seals.

7.5 WEIGHING FILLED ISO CONTAINERS

SUPERVISOR

1. Contact Logistics Administration for weight limits.

2. Notify Heavy Equipment Supervisor to move container to the appropriate scale.

   NOTE: The scale shall be a currently calibrated accountability scale.

HEO

3. Move container on to scale.

CHECKER

4. Fill out weight ticket and transmit to Shipping Coordinator.

   a. If the box is over the specified weight limit, notify supervisor and proceed as directed.

HEO

5. Remove container from the scale.

PACKAGER

6. Complete the XX card, Form FS-F-1945 (see Figure 1) and transmit card to supervisor.

7.5 WEIGHING FILLED ISO CONTAINERS (cont.)

SUPERVISOR

7. Sign XX card and transmit to MC&A.

MC&A

8. Using XX card data, print required bar-code labels.

9. Submit bar-code labels to supervisor.

7.6 LABELLING AND INSPECTING FILLED CONTAINERS

PACKAGER

1. Affix the bar-code labels, provided by MC&A, to sides of ISO container as shown in Figure 3.

2. Using paint, touch up container exterior. If paint is flaking, scrape container and paint over bare metal.

3. Using as "ISO Final Inspection Checklist" (see Figure 4), perform a final visual inspection of container and fill out checklist.

4. Transmit completed checklist to supervisor.

SUPERVISOR

5. Review checklist for unacceptable inspection items.

   a. If an item is unacceptable, complete appropriate corrective action.

   b. If container is acceptable, contact Heavy Equipment Supervisor to move box to designated staging area.

8.0 APPLICABLE DOCUMENTS

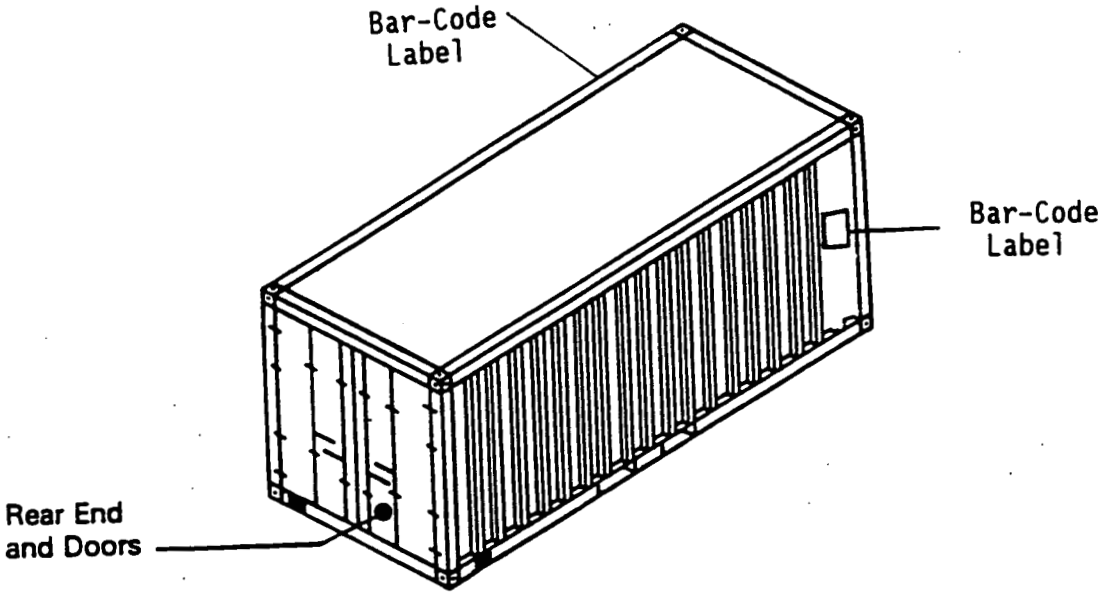
8.1 DRIVERS

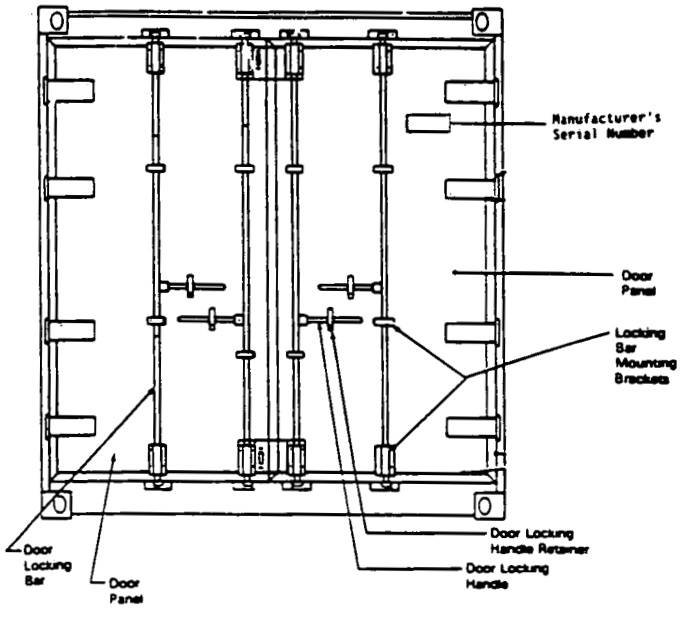
- NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

8.0 **APPLICABLE DOCUMENTS** (cont.)

8.2 REFERENCES

- RM-0005, "FEMP Lot Marking and Color-Coding System"
- SSOP-0002, "Completing the Material Evaluation Form"
- PP-0314, "Packaging, On-Site Movement, and Off-Site Shipment of Material"





TYPICAL REAR END AND DOOR STRUCTURE

Figure 3 - Diagram of LLRW ISO Container Labeling

ISO FINAL INSPECTION CHECKSHEET

ISO SHIPMENT NO: _____

NUMBER OF CONTAINERS IN SHIPMENT _____

NAME: _____
BADGE NO: _____
DATE OF INSPECTION: _____

NAME: _____
BADGE NO. _____
DATE OF INSPECTION: _____

INSPECTION ITEM	*PLACE INITIALS BELOW IF ACCEPTABLE*
1. Doors and vents caulked. Caulking visible around entire door and vent area	
2. Doors banded with two bands and two clips. Banding is tight.	
3. All erroneous markings blacked out.	
4. Container in good condition (no holes or structrually affecting dents)	
5. Container clean - free of debris and loose dirt.	
6. Labels are placed on two sides of container, not doors.	
7. Labels are placed on two sides of container, not doors.	

Inspector's Signature _____ Date _____

Inspectors's Signature _____ Date _____

Figure 4 - ISO Final Inspection Checksheet

Controlled Copy No.
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0079
REVISION NO. 0
- 4554-

NON-CONTROLLED COPY

PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES FOR OFFSITE SHIPMENT

SSOP-0079

Effective Date: 12-14-92

AUTHORIZED BY: _____ 11/30/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
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Cincinnati, Ohio 45239-8704

1093

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
12-14-92	0	Separate procedure written for packaging LLRW in boxes per Request No. S92-176, initiated by M. Hundley. SSOP-0079, SSOP-0075, and SSOP-0078 replace SSOP-0024.

1.0 PURPOSE

This procedure provides the instructions for packaging low level radioactive waste (LLRW) in metal boxes for shipment offsite from the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

The procedure outlines the steps for (1) inspecting the waste to be packaged, (2) inspecting and preparing empty boxes, (3) filling boxes with waste, (4) weighing filled boxes, (5) closing and labeling boxes, and (6) final inspection of boxes.

The packaging operation is applicable to FEMP personnel (including subcontractors) responsible for packaging noncontained LLRW in metal boxes. This activity originates upon approval by DOE for a specific waste stream. LLRW may be packaged at any designated packaging location at the FEMP.

3.0 DEFINITIONS

Free Liquid - Any free flowing liquid or liquid that readily separates from the solid portion of a waste under ambient temperature and pressure conditions. Ice is also considered a free liquid.

Low Level Radioactive Waste (LLRW) - Waste that contains radioactivity and is not classified as high level waste, transuranic waste, spent nuclear fuel or 11e(2) byproduct material as defined by DOE Order 5820.2A. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic is less than 100 nano curies per gram.

Packaging Location - Any area where waste is stored or generated.

Resource Conservation and Recovery Act (RCRA) - The Congressional Act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control, documentation and proper management of hazardous wastes.

4.0 RESPONSIBILITIES

Packager

- Inspects waste per this procedure.
- Packages waste per this procedure.

6.0 **PREREQUISITES** (cont.)

Any circumstance that could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

6.2 TOOLS AND MATERIALS REQUIRED

Obtain the following materials and tools, as needed, prior to performing the packaging operation:

- Appropriate safety protective equipment
- Foam-strip gasket (size appropriate for box)
- Diatomaceous earth
- Indelible marker
- Hammer and screw driver, as applicable
- Wrench and channel locks, as applicable
- Clear lab label tape and dispenser
- Clean rags
- Electric drill
- Ink/paint as required
- Calibrated torque wrench

6.3 POSTING REQUIREMENTS

A "Prohibited Materials List" (see Figure 1) shall be displayed in the packaging area or on the container.

6.4 WASTE CHARACTERIZATION

A Material Evaluation Form (MEF) shall be initiated to determine the waste as RCRA/Non-RCRA. The packaging operation may be started before the characterization results are received.

For bulk waste streams, complete evaluation per SOP 20-C-625.

NOTE: A numbered MEF may be obtained from Waste Management Records and initiated per SSOP-0002.

4.0 **RESPONSIBILITIES** (cont.)

Industrial, Radiological Safety & Training (IRS&T)

- Provides a Radiological Safety Technician, as requested.
- Determines appropriate respiratory equipment and any other employee protection.

Quality Assurance (QA) overviews packaging operation to ensure compliance with this procedure.

Environmental Compliance (EC) provides documentation supporting characterization results as needed.

Materials Control and Accountability (MC&A) provides bar-code labels.

5.0 **GENERAL**

None

6.0 **PREREQUISITES**

6.1 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

Safety glasses with side shields shall be worn unless other eye protection is specified.

Respiratory protection provided by the supervisor shall be worn when required.

Leather-palm gloves shall be worn when handling boxes, operating equipment, and handling rough, sharp-edged, or contaminated material.

Neoprene rubber gloves shall be worn when handling hazardous chemical substances where skin contact is possible.

A Radiation Work Permit must be approved and current.

Face shields shall be worn when removing lids of containers filled with liquids or during operations where the possibility exists that personnel could be splashed with liquids.

6.0 **PREREQUISITES** (cont.)

Additional documentation supporting the characterization results shall be provided by Facilities and Material Evaluation (F&ME)

A sample of the waste for Toxic Characteristic Leaching Process (TCLP) may be required as requested by F&ME.

A sample may be required for major radionuclides and other suspected nuclides as determined by supervision.

6.5 PERSONNEL REQUIREMENTS

A minimum of two personnel are required to package waste.

Packagers shall be certified in use of Personal Protective Equipment (PPE).

7.0 **PROCEDURE**

NOTE: Within this section, Warnings and Cautions precede the step to which they apply. Notes follow the step to which they apply.

7.1 INSPECTING THE WASTE

NOTE: The determination to package a waste stream is based on approval by DOE and a completed MEF.

PACKAGER

1. Ensure the waste to be packaged is not on the "Prohibited Materials List" (see Figure 1).

   a. If the waste is listed on the "Prohibited Materials List", do not package this waste. Notify supervisor for disposition.

2. Ensure the waste has been characterized.

   a. If the waste has not been characterized, package waste per this procedure and transfer box to a controlled holding area per SSOP-0008.

QA

3. Perform periodic surveillance of waste per applicable department procedure.

PACKAGING GUIDELINES FOR WASTE GENERATOR

Package has been properly prepared for closing:

No liquids of any kind have been placed in container

Heavy/bulky items have been secured within container

All available space has been utilized efficiently

Prohibited materials have been excluded (see below)

Packaging has not been damaged during loading

Liner is in place and properly lapped and sealed

PROHIBITED MATERIALS

Compressed Gases (unpunctured aerosol cans included)

Explosives

Free liquids

Fine particulates (respirable fines)

Hazardous Waste (Suspect RCRA materials included)

Corrosive materials

Etiologic agents

Figure 1 - Prohibited Materials List

CARD 65-2 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION INV. NO.:

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DATE DAY	DATE YEAR	SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.

SEAL NUMBER	SEAL DATE MONTH	SEAL DATE DAY	SEAL DATE YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	
PROJECT	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		
OVERPACK		
REPACK		

PLANT	PROD. MBA	MEF NO.
DCAR	SURV. NO.	GROSS WEIGHT
		TARE WEIGHT
		NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945-2 (REV. 11/20/92)

Figure 2 - Item Production/Certification/Identification Card, FS-F-1945-XX

7.1 INSPECTING THE WASTE (cont.)

PACKAGER

4. Visually check waste for free liquid.

   a. If free liquid is present or material is wet, write "FREE LIQUID-DON'T SHIP" on box exterior and notify supervisor.

SUPERVISOR

   b. Take appropriate action to absorb free liquid.

6. Fill out an "Item Production/Certification/Identification", XX Card (see Figure 2) for each box as follows:

   a. Record the FEMP Lot Marking Code per "FEMP Lot Marking and Color-Coding System", RM-0005, in the areas titled "P.O. No.", "Source", "Class", and "Material Type".

   b. Record a general description of the waste in the area titled "Waste Description and Comments" or attach a list of the items packaged for content documentation.

7.2 PREPARING EMPTY BOX

SUPERVISOR

1. Notify Facilities and Warehousing (F&W) to deliver empty metal box to the designated packaging area.

   NOTE: The specific box type shall be determined by Logistics Administration.

PACKAGER

2. Visually inspect the box for interior and exterior damage, such as corrosion, dents, holes, or other defects (refer to Tables 1 and 2).

   a. If the box is damaged, mark the lid or side with a red "X" and complete corrective action per Table 1.

3. Visually inspect interior to ensure the box is empty.

   a. If material is present in the box, notify supervisor.

TABLE 2
LLRW CONTAINER INSPECTION CRITERIA

INSPECTION ITEM	INSPECTION CRITERIA	CORRECTIVE ACTION REQUIRED
Hole	An opening in the container including breach, gouge, puncture or leak.	Notify supervisor of condition and request disposition instructions.
Dent	A crease, depression or hollow made by blow or pressure; a concave distortion which jeopardizes the integrity of the container. A dent in the top or bottom rim.	Notify supervisor of condition and request disposition instructions.
Bulge	A swollen area, a convex distortion, an outward bend which jeopardizes the integrity of the container.	Notify supervisor of condition and request disposition instructions.

TABLE 1
CORROSION INSPECTION CATEGORIES

CATEGORY	CHARACTERISTIC	COULD CAUSE LOSS OF BOX INTEGRITY		CORRECTIVE ACTION
		YES	NO	
A	Severe corrosion with deep pitting and/or metal flaking	X		1. Notify supervisor. **NOTE**: The box requires disposition as directed by supervision within 24 hours.
B	Corrosion with shallow pitting and/or mild metal flaking		X	1. Proceed as directed by the supervisor. **NOTE**: Disposition shall be determined by the supervisor following review of completed inspection form.
C	Surface rust with no pitting and mild paint flaking which exposes bare metal		X	1. Proceed as directed by the supervisor. Repainting shall be scheduled by supervisor.

7.2 PREPARING EMPTY BOX (cont.)

PACKAGER

14. Manually pour 1/2 to 1 inch of diatomaceous earth evenly over the pallets.

7.3 FILLING BOX WITH WASTE MATERIAL

PACKAGER

1. Check with supervisor for weight limitation of box.

QA

2. Overview filling of boxes per applicable department procedure to ensure compliance with this procedure.

   a. If a nonconformance is identified, document and evaluate for corrective action per applicable department procedure.

PACKAGER

> **WARNING**
>
> **A RESPIRATOR AND OTHER PERSONAL PROTECTIVE EQUIPMENT PROVIDED BY THE SUPERVISOR SHALL BE WORN PRIOR TO FILLING DRUMS.**

3. As specified by supervisor, load waste into box as tightly as possible ensuring the waste level remains at least three inches below the top of the box, the box weight is within the specified limitation, and the load is balanced to prevent tipping.

4. When the box is full, place lid on box and secure as directed by supervisor.

5. Notify supervisor the box is ready to be weighed.

7.2 PREPARING EMPTY BOX (cont.)

PACKAGER

4. If the bottom of the box has a drain plug, ensure plug is securely in place.

5. On the XX Card (Figure 2), record the type of container in the area titled "Type of Container", fill out the "Package Physical Certification" area excluding the last two items, and record box dimensions in area titled "Package Size".

SUPERVISOR

6. Specify the scale for weighing and method of transporting the box to the scale.

   NOTE: The scale shall be a currently calibrated accountability scale.

PACKAGER

7. Inspect the scale to be used per the scale procedure applicable to the area.

MVO/PACKAGER

8. As directed by supervisor, move the box onto the scale.

PACKAGER

9. Tare weigh every twentieth box per the scale procedure applicable to the area.

10. Record the weight on the XX card.

MVO/PACKAGER

11. Remove the box from the scale.

PACKAGER

12. Remove lid and place in a designated location to prevent damage.

13. Using the method specified by supervisor, place one layer of pallets in the bottom of the box.

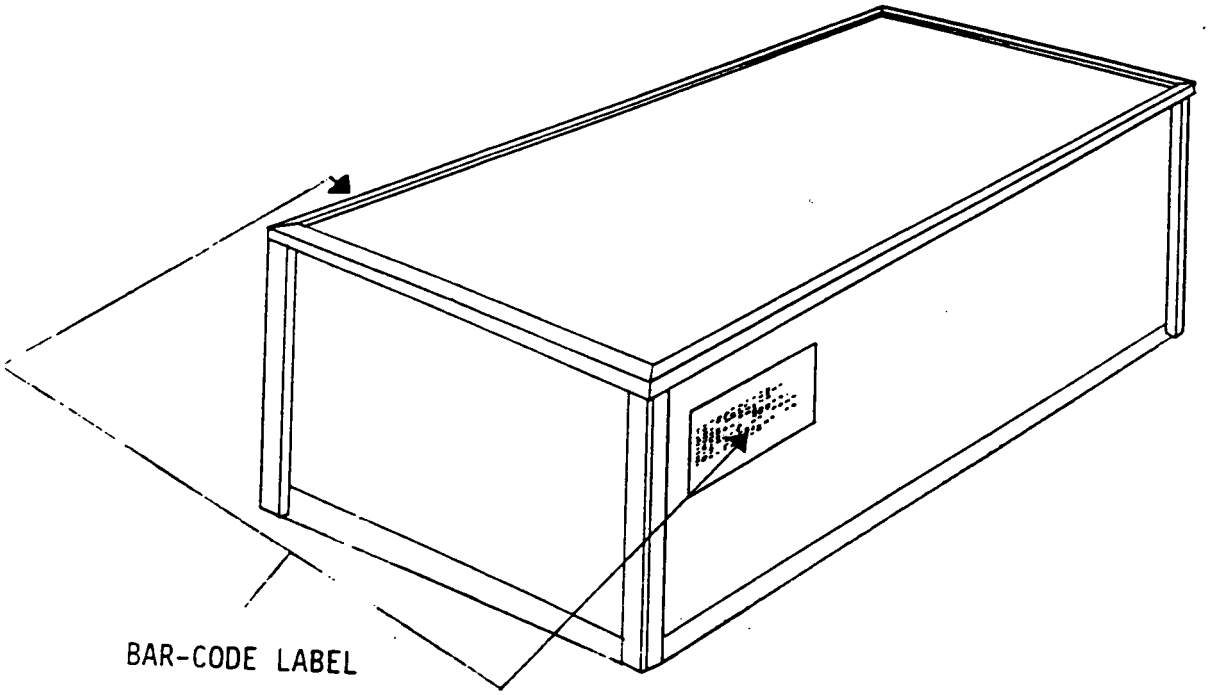

Figure 3 - LLRW Box Labeling

7.4 WEIGHING FILLED BOXES

SUPERVISOR

1. Specify the scale and the method of transporting the box to the scale.

PACKAGER

2. Inspect the scale to be used per the applicable scale procedure.

3. Per the method specified by supervisor, move the box on to the scale.

4. Using the applicable scale procedure, weigh the box including box pins and other hardware to obtain gross weight of the box.

   a. If the box is over the specified weight limit, notify supervisor and proceed as directed.

PACKAGER OR QA

5. For a box requiring temporary storage, apply a tamper-proof seal, lock, and other device to secure lid and prevent unauthorized additions.

PACKAGER

6. Using indelible ink, mark the gross weight and shipping number on the front side of box.

7. Complete XX Card (see Figure 2), including weights, and send card to supervisor.

SUPERVISOR

8. Sign XX card for accuracy and completeness and send card to MC&A.

MC&A

9. Using XX card data, print required bar-code labels and submit to supervisor.

10. Remove box from scale as directed by supervisor.

7.5 FINAL CLOSURE, LABELLING, AND INSPECTION

PACKAGER

1. Manually remove hardware and lid, as directed by supervisor, and place in designated area to prevent damage.

2. Using a clean rag, wipe top edge of box. Place rag in disposal container.

3. Peel protective paper from foam-strip gasket and carefully apply gasket to box edge and/or to channel of lid underside, as directed by supervisor.

4. Place lid on box as directed by supervisor.

5. Using appropriate hardware and tools, secure lid on the box in accordance with the manufacturer's recommendations.

6. Inspect exterior of box, excluding bottom, for damage such as corrosion, dents, holes, or other defects (refer to Tables 1 and 2).

7. Using a calibrated torque wrench, torque closure bolts to 45 $\pm$ 5 ft lbs.

8. Using paint, cover scratched areas on box.

SUPERVISOR

9. Contact QA for examination and certification of package.

   NOTE: QA shall perform an examination and certification per applicable department procedures.

10. Determine if the box will fit on the inspection stand.

7.5 FINAL CLOSURE, LABELLING, AND INSPECTION (cont.)

PACKAGER

16. Using a "Box Final Inspection Checklist" (see Figure 4), perform an inspection of box and record inspection results on checklist.

17. When inspection is complete, submit checklist to supervisor.

18. Review inspection checklist.

    a. If the inspection results are acceptable, request MVO to transport box to designated staging area.

    b. If the inspection results are not acceptable, complete appropriate corrective action.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

8.2 REFERENCES

- SOP 20-C-625, "Evaluating Low Level Radioactive (LLRW) Bulk Waste Streams for Shipment"
- RM-0005, "FEMP Lot Marking and Color-Coding System"
- SSOP-0002, "Completing the Material Evaluation Form"
- SSOP-0008, "Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area"

BOX FINAL INSPECTION CHECKLIST

WHITE METAL BOX SHIPMENT NO._____

NUMBER OF CONTAINERS IN SHIPMENT_____

NAME: _____
BADGE NO: _____
DATE OF INSPECTION: _____

NAME: _____
BADGE NO: _____
DATE OF INSPECTION: _____

INSPECTION ITEM	*ITEM ACCEPTABLE*	
	YES	*NO*
1. Box in good condition (no holes or structurally affecting dents or rust.)		
2. Boxes clean - free of debris and loose dirt.		
3. Boxes touched up and erroneous markings whited out.		
4. Red or black dot on box.		
5. Pins locked in place & flush against box. Nuts & bolts tight.		
6. Banding tight.		
7. Bar-Code label located on both sides of box.		

_____ _____
Inspector's Signature Date

_____ _____
Inspector's Signature Date

Figure 4 - Box Final Inspection Checklist

NON-CONTROLLED COPY

1.0 **PURPOSE**

The purpose of this document is to establish the procedure for using the Large Eimco Filter to remove precipitated uranium from sump water.

2.0 **APPLICABILITY**

This procedure is applicable to the wastewater filtration operation (Refer to Figure 1) in Plant 8.

3.0 **RESPONSIBILITIES**

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.2 Contacting Radiological Safety and/or Industrial Hygiene to determine appropriate respiratory protection for the material being processed.

3.1.3 Issuing the required respiratory protection to operators.

3.2 Operators shall be responsible for complying with this SOP.

4.0 **DEFINITIONS**

None

5.0 **APPLICABLE DOCUMENTS**

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 FEMP Conduct of Operations

5.2 References

5.2.1 SOP 8-C-104, "Makeup of Precoat Slurry and Precoating Rotary Vacuum Filters"

5.2.2 SOP 20-C-912, "Checking Scale Operation"

5.2.3 MS 8-BN/E-490-2, "Disposal of Waste Filtrate and Effluent"

5.2.4 RM-0005, "Lot Marking and Color-Coding System"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Leather-palm gloves shall be worn when operating equipment or while handling lime bags, sharp edged or abrasive material and metal drums.

6.3 Inner gloves shall be worn when the possibility of radiological contamination exists.

6.4 Nitrile rubber gloves shall be worn while taking samples and performing pH and dimple tests.

6.5 Safety glasses shall be worn unless additional eye protection is specified by the supervisor, IRS&T, or posted signs.

6.6 Respiratory protection provided by the supervisor shall be worn when required by IRS&T.

6.7 Floor area at tanks and the filter equipment shall be clean and dry. Spills shall be cleaned as soon as the spill occurs.

6.8 Spills outside the diked areas and/or posted radiological contamination areas shall be reported to Radiological Safety for evaluation.

6.9 A guarded, self-closing knife shall be used to open material bags. The bag shall be cut in a direction away from the body.

6.10 When working on/near the knife mechanism, the filter drum shall be stoppec and the knife moved away from the filter drum.

6.11 Personnel shall have reviewed and be familiar with MSDSs for chemicals/hazardous materials that may be used or encountered.

6.12 Personnel shall comply with radiological postings, instructions, and special requirements.

6.13 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T, Radiological Safety Section for evaluation. The involved personnel shall report to the urine sampling station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 PROCEDURE

7.1 General

7.1.1 Warnings, cautions, and notes precede the Step or Item to which they apply.

7.0 PROCEDURE (cont.)

7.2 Preparation

7.2.1 Prepare tare-weighed, premarked, color-coded drum(s) (Refer to MS 8-BN/E-490-2 and RM-0005) to receive filter cake.

7.2.2 Place a drum on the packaging station conveyor.

7.2.3 Move the drum under the discharge chute.

7.2.4 Ensure both drain valves in the filter basin are closed.

7.2.5 Ensure that the Large Eimco Filter has been precoated.

7.2.5.1 If the filter is not precoated, make-up filter precoat slurry and coat the filter per SOP 8-C-104.

NOTE: Digester Tank numbers are D101, D102, D103, D104, D105 and F104.

7.2.6 Start the agitator in the Digester Tank to be filtered.

7.2.7 Take an eight ounce sample from the Digester Tank to be filtered.

NOTE: If the pH is between 9 and 11, the liquid is ready to be filtered.

7.2.8 Using the portable pH test unit, check the sample to determine the pH of the liquid to be filtered.

7.2.8.1 If the pH is less than 9, add lime.

7.2.8.2 Repeat steps 7.1.7, 7.1.8, and 7.1.8.1 until pH is at least 9.

CAUTION
Capacity shall be available to contain the filtrate to be transferred.

7.2.9 Using the level indicators in the Plant 8 control room, check the capacity of Filtrate Hold Tanks 21A, 22A, and 28A.

7.2.9.1 If capacity is not available, notify the supervisor and proceed as directed.

7.2.10 Open the Discharge Valve from the selected Digester Tank to the East and/or West ODS Pump.

7.2.11 Ensure air is on to the ODS Pump(s) being used.

7.2.12 Open the inlet and outlet valves on the ODS Pump(s) being used.

7.2.13 Start filtrate pumps G43-224 and G43-225 to transfer filtrate to tanks 21A, 22A or 28A.

7.2.14 Shut off air bleed to vacuum to get maximum vacuum for filtration.

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7.0 PROCEDURE (cont.)

7.2.15 Start the knife mechanism.

7.2.16 Retract the knife mechanism as follows:

7.2.16.1 Set the selector switch to HAND.

7.2.16.2 Push and hold the JOG RETREAT button.

7.2.16.3 When the knife blade is completely retracted, release the JOG RETREAT button.

7.2.17 Start drum rotation drive (if not already on).

7.2.17.1 If the drum is rotating, slow the rotation speed to a reading of 15 on the speed indicator.

7.2.18 Ensure that the basin agitator is on.

7.3 Filtering Uranium Slurry

7.3.1 Open Large Eimco feed inlet valve.

NOTE: Both ODS Pumps can be used if a faster rate of filtration is desired.

7.3.2 Start the timer on the East and/or West ODS Pumps.

7.3.3 Observe the overflow level in the overflow sight glass.

7.3.3.1 Set East and/or West ODS pump timer to maintain the filter basin level so that there is minimum overflow (if any) returning to D101.

7.3.3.2 Adjust timer as required to maintain minimum (or no) overflow.

7.3.4 Visually check for sump water flow into the filter basin.

7.3.4.1 If no sumpwater flow is observed, use compressed air to blow out the lines between the ODS pump and the Large Eimco Filter and between the Digester Tank and the ODS Pump.

7.3.5 Turn the knife mechanism three position selector switch to AUTOMATIC.

NOTE: The limit switches on the knife mechanism will cause the knife to advance and remove filter cake.

7.3.6 Set the knife timer to cycle one minute on and five minutes off.

7.3.7 Check filtrate pump pressure gauges to ensure the pumps are operating.

7.3.7.1 If pressure gauge reads zero, notify the supervisor.

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7.0 PROCEDURE (cont.)

7.3.8 Visually check the Filtrate Receiving Tank for filtrate flow.

7.3.8.1 Recheck valve lineup to Filtrate Receiving Tank.

7.3.8.2 If still no flow, notify the supervisor.

7.3.9 Check the amount of material in the product drum as frequently as required by the feed type.

7.3.9.1 Remove and replace a full drum per Item 7.4.

7.3.10 Take a four ounce sample of filtrate.

7.3.11 Dimple check the sample per Item 7.9.

7.3.12 Check the tank level indicator for the Filtrate Hold Tank.

7.3.12.1 When the tank level indicator reads 80% or greater, shut off the operating ODS Pump(s).

7.3.13 Retract knife blade per Item 7.2.16.

NOTE: The drum rotation drive and basin agitator shall remain on.

7.3.14 Shut off pump G43-224 and/or G43-225.

7.3.15 Take two four ounce dip samples from the tank.

NOTE: The tank content shall not be agitated before sampling.

7.3.16 Fill out a "Sample Log," Form FMPC-PRO-1632 (See Figure 2), with date, time, sample number, and tank number.

7.3.17 Complete a "Sitewide Analysis Request/Custody Record," Form FS-F-3361 (See Figure 3).

7.3.17.1 Request analysis for U lb/gal (or g/l), Cu ppm, and pH per Analysis Code Book, IM-7005.

NOTE: To be within the specifications,the filtrate pH shall be 9 to 11, copper content (Cu) shall be 1.0 ppm maximum, and uranium content (U) (total) shall be 0.0004 lb/gal or 0.048 g/l.

7.3.18 When the lab results of the filtrate are received and if the filtrate is within specification, call the General Sump and request permission to pump filtrate.

7.3.19 If the filtrate is out-of-specification, proceed as follows:

7.3.19.1 Repeat Steps 7.3.15 through 7.3.17.

7.3.19.2 If the second analysis confirms the out-of-specification condition, notify the supervisor and proceed as directed.

7.0 **PROCEDURE** (cont.)

7.4 Pumping Filtrate to the General Sump

7.4.1 Inform the supervisor that filtrate is ready to be pumped.

NOTE: The transfer line to the General Sump may freeze in cold weather.

7.4.2 After receiving permission to pump, check the transfer line to the General Sump.

7.4.2.1 If the line is inoperable, notify the supervisor.

NOTE: The supervisor shall contact the Area Supervisor and the Utility Engineer for permission to set up a temporary transfer line.

7.4.2.2 At the supervisor's direction, install a temporary transfer line per Item 7.10.

7.4.3 Open the pump Discharge Valve.

CAUTION:

New filtrate shall be pumped into hold tanks until in-specification filtrate transfer is complete.

7.4.4 If the transfer line is operable or the temporary line is set up, start Transfer Pump 735-43-216 or 735-43-226 and pump filtrate to General Sump.

7.4.5 Check the permanent or temporary line for leaks.

7.4.5.1 If a leak is discovered, shut off the Transfer Pump.

7.4.5.2 Notify the supervisor and proceed as instructed.

7.4.6 When pumping is completed, proceed as follows:

7.4.6.1 Shut off the Transfer Pump.

7.4.6.2 Close the pump Discharge Valve.

7.4.6.3 In cold weather, notify the General Sump Operator that air will be left blowing through the transfer line.

7.5 Replacing and Marking the Product Drum

NOTE: Frequency of check depends on the type of feed material.

7.5.1 Check the amount of material in the product drum receiving filter cake.

7.5.2 When full, move the drum out from under the discharge chute.

7.0 **PROCEDURE** (cont.)

7.5.3 Place an empty drum under the discharge chute per Steps 7.2.1 thru 7.2.3.

7.5.4 Install a lid and lock ring on the product drum.

7.5.5 Using a clean rag, remove material from the outside of the drum.

7.5.6 Dispose of used rags in a container that is approved for the type of waste.

7.5.7 Using a handstacker, move the product drum onto a clean skid.

7.5.8 Move the drum to the scale to be used for weighing filter cake.

7.5.9 Ensure that the scale has been inspected per SOP 20-C-912.

7.5.10 Weigh the drum(s).

7.5.11 Record the weight on an "Item Production/Certification/Identification" (65 card), Form FMPC-CONT-1945-XX (See Figure 4).

7.5.12 Notify the supervisor that the drums are ready for storage.

7.5.13 Complete the 1945-XX card.

7.5.14 Give the completed card to the supervisor.

7.5.15 Move the loaded skids to a storage area designated by the supervisor.

7.6 Placing the Filter on Standby

NOTE: Before the filter can be placed on standby, the filter basin shall be run to a low level.

7.6.1 Shut off the East and/or West ODS pump(s) to discontinue filter feed.

7.6.2 Retract the knife blade, (if necessary) as follows:

7.6.2.1 Set the three position selector switch to HAND.

7.6.2.2 Push and hold the JOG RETREAT button.

7.6.2.3 When the knife is clear of the drum cake, release the button.

7.6.3 Set the knife blade three position selector switch to OFF.

NOTE: The vacuum on the filter keeps precoat from falling off the drum.

7.6.4 Adjust the Vacuum Bleed Air Valve to maintain 10 to 15 inches of vacuum on the filter.

7.0 PROCEDURE (cont.)

NOTE: Agitation prevents solids from settling in the filter basin.

7.6.5 Ensure that the filter basin agitator is on.

7.6.6 Adjust drum rotation to 5 Hertz (1/6 rpm) on the drum speed control.

7.6.7 Close the valves from the Digester Tank.

7.6.8 Shut off Filtrate Pump G43-224 or G43-225.

7.7 Shutting Down the Large Eimco Filter

7.7.1 Perform Item 7.6.

7.7.2 Add process water until the Filter basin is half full.

7.7.3 Shut off Nash Vacuum Pump G43-218.

7.7.4 Open the chain operated drain valves between the bottom of the filter basin and Digester Tank D101.

7.7.5 Close the valve on the overflow line.

7.7.6 Using process water, rinse the material in the basin to tank D101.

7.7.7 Using plant air, clear the pipeline above the drain valves.

7.7.8 Using process water, wash residual precoat and solids from the filter drum and filter basin.

7.7.9 Ensure that all liquid washed from the filter and basin drain to tank D101.

7.7.10 Using plant air, clear any solids from the pipeline above valving.

7.7.11 When the basin is empty, shut off the agitator.

7.7.12 Stop the filter drum rotation.

7.7.13 Close chain operated drain valves between the filter basin and digester tank D101.

7.8 Emergency Shutdown

7.8.1 Shut off East and/or West ODS Feed Pumps.

NOTE: The filter basin agitator and drum rotation shall remain on.

7.8.2 Set the knife drive three position selector switch to OFF.

7.8.3 Remove the key operator to lock out drum mechanism.

7.0 PROCEDURE (cont.)

7.8.4 Turn off filtrate pumps.

7.9 Filtrate Dimple Test

7.9.1 Ensure that the following are available at the dimple check station:

(A) clean dimple plate
(B) eye dropper
(C) 3% potassium ferrocyanide
(D) glacial acetic acid

7.9.1.1 Notify the supervisor of missing items.

7.9.2 Clean the dimple tray and eye dropper.

7.9.3 Fill eye dropper with filtrate from the four ounce sample.

7.9.4 Place ten drops of filtrate into a clean dimple.

7.9.5 Add three drops of potassium ferrocyanide to the dimple containing filtrate.

7.9.6 Add three drops of acetic acid to the dimple containing filtrate.

NOTE: Light yellow or light green indicates that the sample contains no detectable uranium.

7.9.7 If the filtrate turns light yellow or light green, continue the filtration process.

NOTE: Brown or dark green indicates that the sample contains uranium.

7.9.7.1 If the filtrate turns brown or dark green, check the pH of the sump water being filtered.

7.9.7.2 Notify the supervisor and proceed as directed.

7.10 Installing Temporary Transfer Lines

7.10.1 Obtain a temporary transfer line (firehouse or other acceptable line).

7.10.2 Connect the temporary line to the Transfer Pump manifold.

CAUTION:
The temporary line shall not be an obstacle to traffic.

7.10.3 Run the line to the General Sump.

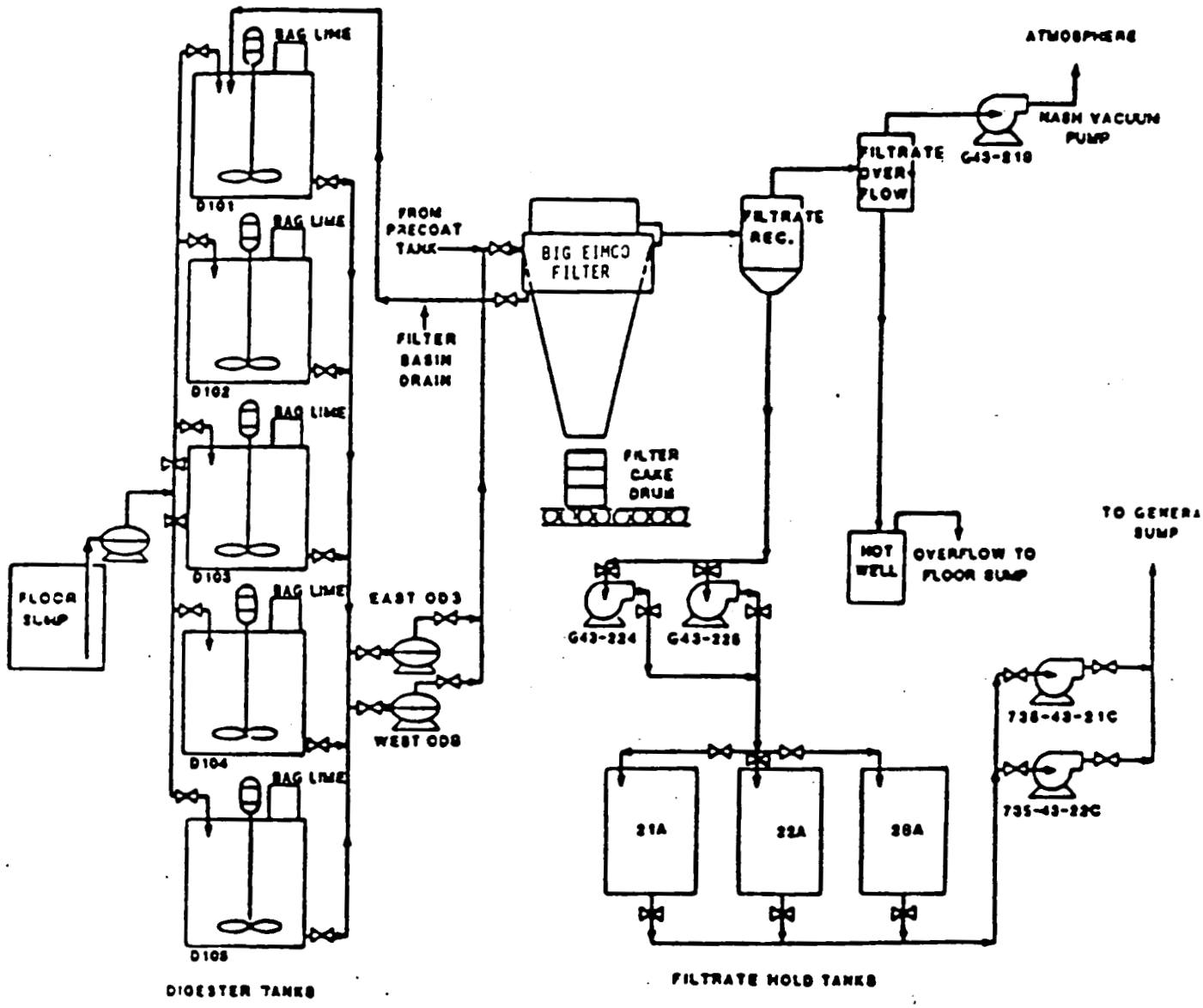
7.10.4 If necessary, post signs and/or barricades where the line crosses roads and/or walkways.

8.0 APPLICABLE FORMS

8.1 FMPC-PRO-1632, "Sample Log"

8.2 FS-F-3361, "Sitewide Analysis Request/Custody Record"

8.3 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"



FILTER FLOW DIAGRAM
Figure 1

FMPC

[illegible]

SAMPLE LOG

(For Samples Submitted to Analytical Dept.)

SAMPLE NUMBER	TIME SAMPLE TAKEN	DATE	TANK, DIGESTER OR MATERIAL	ANALYSES			TIME ANALYSES RECEIVED

NO.	DISTRIBUTION OF COPIES
1	Area Foreman - Plt. 8 [illegible]

[illegible]

SAMPLE LOG
FMPC-PRO-1632
Figure 2

FERNALD SITE
SITE SERVICES ANALYTICAL

Form Number ____ - ____ - ____

SITE-WIDE ANALYSIS REQUEST/CUSTODY RECORD

Page ____ of ____

PROJECT	FOR SAMPLE RELATED PROBLEMS, CONTACT:
— PLAN — NO OR — PROJECT — NO.	ORGANIZATION:
PROJECT MANAGER ENGINEER	NAME PHONE:
SAMPLER: PHONE:	SAMPLER REMARKS:
CHARGE NUMBER / LOT MARKING CODE	
SAMPLER SIGNATURE(S)	
SEND RESULTS TO:	

CHECK FOR: ☐ S R LAB ☐ BIO LAB ☐ WTP LAB

SAMPLE SOURCE, DESCRIPTION, IDENTIFICATION, ANALYSIS REGIMEN

ITEM NO	SAMPLE NUMBER	CUSTOMER NUMBER	SAMPLE POINT	MATRIX CODE	COLLECTED DATE	COLLECTED TIME	CONTAINER/ VOLUME	COMPOSITE	GRAB	NO OF CONTAINERS	ANALYTES CODE - (UNITS CODE)	REMARKS
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME	ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME

NO	DISTRIBUTION OF COPIES
1	LABORATORY
1	REQUESTER
1	SAMPLER

FS-F-3361 REV 10/17/91

SITEWIDE ANALYSIS REQUEST/CUSTODY RECORD
FS-F-3361
Figure 3

- 4554 -

CARD XX **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION** 180253

P O NO	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO	DATE (MO DAY YEAR)	SHIFT	BADGE NO	PACKAGE NO

SEAL NUMBER	SEAL DATE (MONTH DAY YEAR)	PACKAGE PHYSICAL CERTIFICATION (YES NO)	PLANT	PROD MBA
		EMPTY CONTAINER AT START		
		RUST HOLES OR DENTS		
		MATERIALS AS CODED	PLANT TO	MBA TO
WASTE DESCRIPTION AND COMMENTS		PROHIBITED MATERIALS		
		LIQUIDS IN CONTAINER		
PACKAGE TYPE		MINIMUM OF 10% SPACE		
PACKAGE SIZE		PACKAGE SECURED		
		DRAIN PLUG SECURED		

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-XX REV 12 19 88

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FMPC-CONT-1945-XX
Figure 4

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
04-10-86	N/A	Request for new SOP for Filtration of Uranium Bearing Slops per SOP Change Request No. 1231, initiated by T.N. Huey. Canceled SOP 8-C-112 used as reference.
07-05-89	N/A	Reissued to add IH&S statement, change step sequence, and verbiage per Request No. P86-185, initiated by T.N. Huey. Reformatted to conform with current procedure program.
08-08-90	1	Revised to add filtrate line blowout requirements per Request P90-021, initiated by B.L. Krupa, and incorporated CIO C89-126 (P90-147).
11-03-92	0	Reissued to update technical content per Request No. P92-178, initiated by C. Glassmeyer.

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1.0 PURPOSE

The purpose of this document is to establish the procedure for operating the EIMCO Filter System (East and West Filters)(See Figure 1).

2.0 APPLICABILITY

This procedure is applicable to the equipment used to filter slurry.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.2 Contacting Radiological Safety and/or Industrial Hygiene to determine appropriate respiratory protection and personal protective equipment for the material being processed.

3.1.3 Issuing the required protective equipment to operators.

3.1.4 Contacting Maintenance when repairs are required.

3.1.5 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.2 Operators shall be responsible for complying with this procedure.

4.0 DEFINITIONS

None

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.2 References

5.2.1 SOP 8-C-104, "Makeup of Precoat Slurry and Precoating Rotary Vacuum Filters"

5.2.2 MS 8-BN/E-490-2, "Disposal of Waste Filtrate and Effluent"

5.2.3 RM-0005, "FEMP Lot Marking and Color-Coding System"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Leather-palm gloves shall be worn when operating equipment or while handling sharp edged or abrasive material and metal drums.

6.3 Inner gloves shall be worn when the possibility of radiological contamination exists.

6.4 Nitrile rubber gloves shall be worn while taking samples and performing pH and dimple tests.

6.5 Safety glasses shall be worn unless additional eye protection is specified by the supervisor, IRS&T, or posted signs.

6.6 Respiratory protection issued by the supervisor shall be worn when required by IRS&T.

6.7 A "weep" hole for pressure equalization shall be kept open in filter drum head.

6.8 Floor area at tanks and the filter equipment shall be clean and dry.

6.9 Spills shall be cleaned as soon as the spill occurs.

6.10 Spills outside the diked areas and/or posted radiological contamination areas shall be reported to Radiological Safety for evaluation.

6.11 A guarded, self-closing knife shall be used to open material bags. The bag shall be cut in a direction away from the body.

6.12 When work is to be performed near the knife mechanism, the filter drum shall be stopped and away from the knife.

6.13 Personnel shall have reviewed and be familiar with MSDSs for chemicals/hazardous materials that may be used or encountered.

6.14 Radiological postings, instructions, and special requirements shall be complied with.

6.15 Any circumstance which could have resulted in an intake or radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T, Radiological Safety Section for evaluation. The involved personnel shall report to the urine sampling station at the end of their shift to complete an Investigation Report (IRR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 PROCEDURE

7.1 General

7.1.1 Warnings, cautions, and notes precede the Item or Step to which they apply.

7.2 Receiving Liquid for Processing

NOTE: The supervisor shall specify the tank(s) to be used.

7.2.1 Open the Inlet Valve on Tanks 203, 203A, D-101, D-102, D-103, D-104, D-105, or F-104.

NOTE: The supervisor shall ensure that transfer valving preparations are correct and that the transfer line is checked for leakage during pumping.

7.2.2 Notify the supervisor when the specified valves have been opened.

7.2.3 Call the General Sump Operator or the Refinery Sump Operator and request that slurry be pumped to Plant 8.

7.2.4 Check the level of material in the tank being used.

7.2.5 When the blades are covered by material, start the agitator in the tank being used.

7.2.6 Check the tank to ensure that the slurry is being received.

7.2.6.1 If slurry is not being received, ensure that valves are correctly aligned between the source and the receiving tank (Refer to Step 7.1.1).

7.2.6.2 If the correct valves are open, notify the General Sump Operator or the Refinery Sump Operator to stop pumping.

7.2.7 Monitor the tank level using the chart indicator located in the Plant 8 control room.

7.2.8 When the tank is three-fourths full, notify the General Sump Operator to discontinue pumping slurry.

7.2.9 Using process air, blow out the transfer lines.

7.2.10 Obtain an empty drum premarked for filter cake per RM-0005.

7.2.11 Place the drum on the conveyor.

7.2.12 Adjust the drum position under the discharge chute of the East/West EIMCO Filter.

7.0 PROCEDURE (cont.)

7.2.13 Check Filtrate Hold Tanks 25A, 21A, 22A, & 28A for sufficient capacity to receive filtrate.

7.2.14 Aline outlet valves for the filtrate to be pumped from the East/West EIMCO Filter to the selected Filtrate Hold Tank.

7.2.15 Open the valves between Filtrate Pump G43-107, G43-108, or G43-109 and the East/West EIMCO Filter.

7.2.16 Make up filter precoat slurry and precoat East/West EIMCO Filter per SOP 8-C-104.

7.3 Filtering Uranium Slurry

7.3.1 Check the weep hole at the end of the filter.

NOTE: The cleaning tool shall remain in the EIMCO Filter Area.

7.3.1.1 If the weep hole is clogged, clean the hole with the cleaning tool.

NOTE: The vacuum pump keeps the precoat layer on the filter drum.

7.3.2 Ensure that NASH vacuum pump G43-113/G43-114 is operating (Refer to 8-C-104).

7.3.3 Open the valves in the line between the tank to be filtered and the Oliver Diaphragm Slurry (ODS) Pump(s) to be used (North/South and/or East/West).

7.3.4 Open the Discharge Valve from the tank to be filtered.

7.3.5 Open the North/South ODS Pump Outlet Valve.

7.3.6 Press the Scraper Drive START button.

7.3.7 Start the ODS Pump Timer.

7.3.8 When precoating is completed, adjust the filter drum speed to 0.5 RPM.

7.3.9 Observe the filter. If liquid is not flowing into the basin, proceed as follows.

7.3.9.1 Using plant air, blow out the lines from the ODS Pump to the filter.

7.3.9.2 Using plant air, blow out the lines from the Feed Tank to the ODS Pump.

7.3.9.3 Check the flow into the basin.

7.3.9.4 If there is no flow, notify the supervisor.

7.3.10 Ensure that the precoat is sealed with slurry.

7.0 **PROCEDURE** (cont.)

7.3.11 Set the Knife Advance Mechanism on the EIMCO Filter for a light precoat cut.

7.3.12 Lock the feeder regulator hand crank for the knife advance mechanism.

7.3.13 Turn on water spray per supervisors instructions.

NOTE: Water flow rate from spray nozzles will be adjusted after nitrate concentration of the filter cake is determined.

7.3.14 Adjust the nozzle flow rate as directed by the supervisor.

7.3.15 Take a four ounce sample from the Filtrate Hold Tank.

7.3.16 Check the filtrate for uranium as follows:

NOTE: The supervisor shall obtain a dimple tray, eye dropper, and required reagents from the laboratory and provide the items to the operator.

7.3.16.1 Notify the supervisor that a dimple test for uranium is required.

7.3.16.2 Fill the eye dropper with filtrate from the four-ounce sample.

7.3.16.3 Place ten drops of filtrate into a depression in the dimple tray.

7.3.16.4 Add three drops of potassium ferrocyanide to the filtrate.

7.3.16.5 Add three drops of acetic acid.

NOTE: If the sample material turns light yellow or light green, the filtrate does not contain detectable uranium. Brown or dark green indicates the presence of uranium.

7.3.16.6 Check the color of the filtrate against the color standard to determine if uranium is present.

7.3.17 If the filtrate contains uranium, proceed as follows:

7.3.17.1 Check as determined by the supervisor, the pH of the liquid being filtered.

7.3.17.2 Check the pH of the filter precoat.

7.3.17.3 Notify the supervisor of the pH results and proceed as directed.

7.3.18 When the dimple test is negative and the Filtrate Hold Tank being filled (25A, 21A, 22A or 28A) is full, proceed as follows:

7.3.18.1 Align valves to change flow to the next hold tank.

7.3.18.2 When the tank is 3/4 full, perform Steps 7.2.15 thru 7.2.17.

7.0 PROCEDURE (cont.)

7.3.19 At the supervisors direction, start the agitator in the Filtrate Hold Tank (25A, 21A, 22A, or 28A) being used.

7.3.20 Take two four-ounce dip samples from the Filtrate Hold Tank.

7.3.21 Record the date, time, sample number, and tank number on a "Sample Log Sheet", Form FMPC-OPR-1632 (See Figure 2).

7.3.22 Complete a "Report of Chemical Analysis", Form No. FMPC-T-200 (See Figure 3).

7.3.22.1 Record material type, account number, date, submitted by, and sample number.

7.3.22.2 Request analyses of U lb/gal, Cu ppm, and pH.

NOTE: If the lab results show that filtrate is in-specification, for U lb/gal, Cu, and pH (Refer to MS 8-BN/E-490-2), the supervisor shall direct that filtrate be pumped to the General Sump.

7.3.23 Send the sample and form to the Analytical Laboratory.

7.3.24 After notification by the supervisor that the filtrate is in-specification, pump the filtrate as follows:

7.3.24.1 Call the General Sump and request permission to pump filtrate.

7.3.24.2 When the General Sump Operator grants permission, pump the filtrate to the General Sump.

NOTE: If lab results show that filtrate is out-of-specification (Refer to MS 8-BN/E-490-2) the supervisor shall direct that the filtrate be sampled and pumped to a Digester tank, if necessary, after sampling.

7.3.25 After notification by the supervisor that the filtrate is out-of-specification, proceed as follows:

7.3.25.1 Take an eight ounce dip sample from the tank.

7.3.25.2 Send the sample for analyses per Steps 7.2.21 thru 7.2.23.

7.3.25.3 If sample results indicate that filtrate is out-of-specification, pump filtrate to a Digester Tank (D101, D102, D103, D104, or D105).

7.3.25.4 If results show filtrate is within limits, proceed per Step 7.2.24.

7.3.26 If the General Sump can not receive in-specification filtrate and the filtrate tank in use is full, proceed as follows:

7.3.26.1 If the Filtrate Hold Tank in use was 21A, 22A, or 28A, check to see if either of the other tanks can receive filtrate.

7.0 PROCEDURE (cont.)

7.3.26.2 If capacity is available, align valves to transfer filtrate to another Filtrate Hold Tank.

7.3.26.3 If capacity is not available and the delay is temporary, place the system on stand-by per Item 7.3.

7.3.26.4 If the delay will be extensive, shut down the filter per Item 7.4.

7.3.27 When the product drum is full, proceed as follows:

7.3.27.1 Close the Slide Valve.

7.3.27.2 Remove the full drum.

7.3.27.3 Place a color-coded, premarked drum (Refer to RM-0005) under the chute.

7.3.27.4 Open the Slide Valve.

7.3.27.5 Install a lid and lock ring on the filled product drum.

WARNING

If the material on the drum is dry, respiratory protection issued by the supervisor shall be worn when wiping drums.

7.3.27.6 Using a clean rag, remove all material from the outside of the drum.

7.3.27.7 Place the used rags in a drum that is color-coded for contaminated trash (Refer to MS 8-BN/E-490-2).

7.3.27.8 Weigh the full drum.

7.3.27.9 Fill out an "Item Production/Certification/Identification" card, Form FMPC-CONT-1945-XX (See Figure 4).

7.3.28 Using a handstacker or fork truck, place the filled drum on a clean skid.

7.3.29 Ensure that the drum is correctly identified with a 15-digit code per RM-0005.

7.3.30 Secure the drum to the skid with an approved strap prior to moving the skid.

7.3.31 Give the 1945-XX card to the supervisor.

7.4 Placing the Filter on Standby

7.4.1 Shut off the water spray.

7.4.2 Shut off the ODS Pump(s).

7.0 PROCEDURE (cont.)

7.4.3 Close the valves from the Feed Tank.

NOTE: The rotating drum, with vacuum applied, will continue to pick up residual slurry from the filter bowl to seal the drum surface.

7.4.4 Stop the knife blade drive.

7.4.5 Release the knife from the drive.

7.4.6 Retract the knife blade.

7.4.7 Turn off the agitator (if on).

NOTE 1: When the Filtrate Pump is shut off, the filter will be on STANDBY.

NOTE 2: The pickup and drying vacuum shall remain on to keep the precoat from falling off the drum.

7.4.8 Shut off the Filtrate Pump being used (G43-107, G43-108 or G43-109).

7.5 Shutting Down Filter Operation

7.5.1 Perform Steps 7.3.1 through 7.3.7.

7.5.2 Fill the basin with water to slurry the residual solids.

7.5.3 Shut off NASH Vacuum Pump G43-118 or G43-114.

7.5.4 Open the Filter Basin Valve in the lines connected to Tank F-104.

7.5.5 Wash residual precoat and solids from the filter and filter basin into Tank F-104 until the filter and filter basin are completely clean.

CAUTION

Tank F-104 shall not be allowed to overflow.

7.5.5.1 If the liquid level in the Tank F-104 rises above the 3/4 full level, shut off the water until the tank drains.

7.5.6 Shut off the filter basin agitator.

7.5.7 Stop drum rotation.

7.5.8 Close the valves in the lines between the filter basins and Tank F-104.

7.6 Emergency Shutdown

7.6.1 Shut off the ODS Pumps.

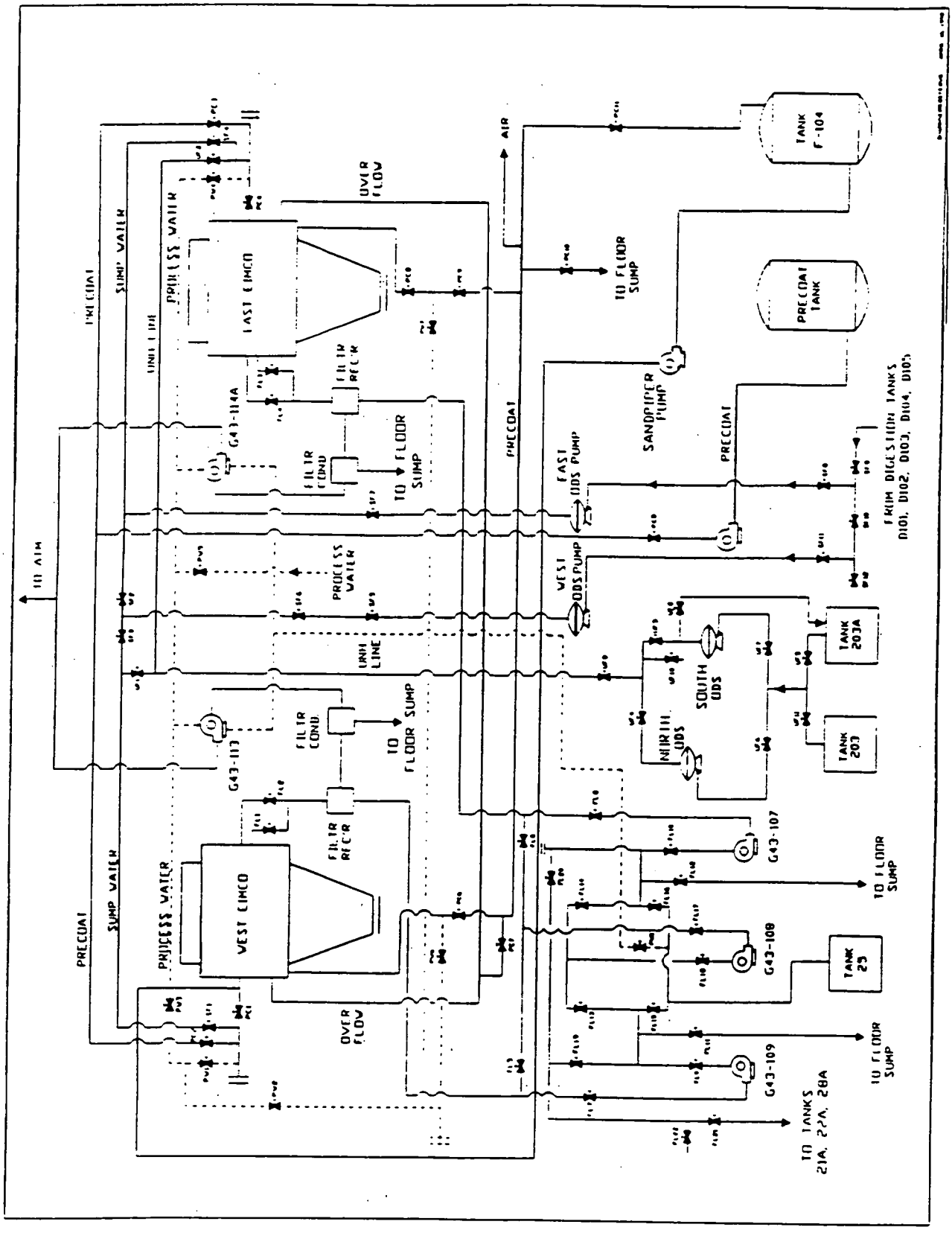
7.6.2 Stop the knife blade drive.

8.0 APPLICABLE FORMS

8.1 FMPC-OPR-1632, "Sample Log"

8.2 FMPC-T-200, "Report of Chemical Analyses"

8.3 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"



SYSTEM DIAGRAM
Figure 1

FMPC

RECOVERY PLANT - PLANT 8

SAMPLE LOG

(For Samples Submitted to Analytical Dept.)

SAMPLE NUMBER	TIME SAMPLE TAKEN	DATE	TANK, DIGESTER OR MATERIAL	ANALYSES			TIME ANALYSES RECEIVED

NO.	DISTRIBUTION OF COPIES
1	Area Foreman - Pl. 8 (RECORD COPY)

SAMPLE LOG
FMPC-OPR-1632
Figure 2

FMPC

REPORT OF CHEMICAL ANALYSES

(NOTE Write Firmly — Fill 4 must be legible)

Lab. Nos. _____

Lot No. _____

Analyses Requested _____

MATERIAL

ACCOUNT NO

DATE SAMPLED

SUBMITTED BY

REMARKS

LAB. NO.	IDENTIFICATION	ANALYTICAL DATA					

NO	DISTRIBUTION OF COPIES
1	Originator
2	Extra Copy
3	Quality Assurance
4	Analytical Records Copy

Approved By _____ Date of Report _____

REPORT OF CHEMICAL ANALYSES
FMPC-T-200
Figure 3

4554-

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO	DATE MO	DATE DAY	DATE YEAR	SHIFT	BADGE NO	PACKAGE NO

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD MBA
PLANT TO	MBA TO

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-XX (REV 12/19/88)

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DATE DAY	DATE YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD MBA
PLANT TO	MBA TO

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-65 (REV 12/19/88)

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DATE DAY	DATE YEAR	SHIFT	BADGE NO.	PACKAGE NO

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-66 (REV 12/19/88)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FMPC-CONT-1945-XX
Figure 4

RECORD OF ISSUE/REVISIONS

- 4554-

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
09-01-92	0	Document Requirement for EIMCO Filter Operation per CIO C92-055 (Request No. P92-220), initiated by C. Glassmeyer.

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM		Page 1 of 10 Revision No. 0 Revision Date: N/A
REMEDIATION SUPPORT OPERATIONS PROCEDURE	INDUSTRIAL CLEANING	SOP 20-C-612 Area: As Applicable
(Signature on File) Authorization: R. L. Gardner, Facilities & Waste Operations Mgr.	Supersedes: 01-103, Dated: 07-09-87	Issue Date: 01-06-93

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1.0 PURPOSE

The purpose of this document is to provide the procedure for cleaning industrial facilities and equipment.

2.0 APPLICABILITY

This procedure applies to Site Services areas requiring industrial cleaning.

3.0 RESPONSIBILITIES

3.1 The Industrial Cleaning Supervisor shall be responsible for the following:

3.1.1 Notifying facility owner of cleaning to be performed.

3.1.2 Contacting the Facility Owner to find out if the area is to be designated a Hazardous Waste Management Unit (HWMU).

3.1.3 Ensuring personnel are qualified per the established training requirements as identified by the department/staff manager.

3.1.4 Informing industrial cleaning personnel of applicable procedures for the area being cleaned and ensuring compliance.

3.1.5 Obtaining and posting required "Work Permits", "Radiation Work Permits", or "Confined Space Entry Permits" as applicable.

3.1.6 Contacting Environmental Safety and Health (ES&H) to ensure that a radiological survey is performed before and after cleaning.

3.1.7 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.8 Providing operators with the required respiratory protection and other protective equipment specified by ES&H.

3.1.9 Reviewing Material Safety Data Sheets applicable to the required cleaning operation with industrial cleaning personnel.

3.2 Operators shall be responsible for complying with this Standard Operating Procedure (SOP).

3.3 Facility Owners shall be responsible for determining the location of Hazardous Waste Management Units.

4.0 **DEFINITIONS**

4.1 Applicable Operating Procedure - A document used by Industrial Cleaning personnel to operate equipment or perform a task in the area where industrial cleaning is performed.

5.0 **APPLICABLE DOCUMENTS**

5.1 Drivers

5.1.1 10 CFR 71 Series

5.1.2 40 CFR 262 Series

5.1.3 40 CFR 265 Series

5.1.4 49 CFR 171 - 173 Series

5.1.5 OAC 3745-52 Series

5.1.6 OAC 3745-54 Series

5.1.7 OAC 3745-65 Series

5.1.8 DOE 5400 Series

5.1.9 DOE 5820.2A

5.1.10 PO-D-026, "Site Services Document Program"

5.1.11 FEMP Conduct of Operations Manual

5.2 References

5.2.1 SOP 01-107, "Operation of Genie Lift Model PL36PDC"

5.2.2 SOP 01-108, "Operation of ANTHES Model RZ-40 Roto-Zoom Aerial Lift"

5.2.3 SOP 20-C-101, "Moving and Storing Nuclear Materials Onsite at the FMPC"

5.2.4 SOP 20-C-605, "Establishment and Control of Satellite Accumulation Areas"

5.2.5 SOP 20-C-606, "Hazardous Material Spill Clean-up"

5.2.6 SOP 20-C-609, "Inspection of Safety Belts, Safety Harnesses, and Lanyards"

5.2.7 SOP 20-C-611, "Assembly and Disassembly of Portable Scaffolding"

5.2.8 SOP 20-C-614, "Operation of Genie Lift Model PL36PDC"

5.2.9 SOP 20-C-701, "Operation of Spencer and Hoffman Portable Dust Collectors"

5.2.10 SOP 20-C-801, "Storage of Enriched Material"

5.2 REFERENCES (cont.)

5.2.11 SOP 20-C-904, "General Nuclear Safety Requirements"

5.2.12 FMPC-0503, "FMPC Spill Incident Reporting and Cleanup"

5.2.13 PP-FMPC-0719, "Energy Control (Lockout and Tagout)"

5.2.14 RM-0006I.1, "Industrial Safety"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Industrial cleaning personnel shall comply with the Industrial Health and Safety and Nuclear Safety requirements of applicable operating procedures.

6.3 No smoking or open flame shall be permitted.

6.4 Respiratory protection provided by the supervisor shall be worn when required by ES&H.

6.5 Long-sleeved clothing, leather-palm gloves, and safety glasses shall be worn during cleaning operations.

6.6 Work at elevated locations shall be performed per RM-0006I.1.

6.7 When required, equipment shall be locked and tagged in accordance with PP-FMPC-0719.

6.8 Any part of the body exposed to a hazardous chemical shall be washed thoroughly and affected personnel shall report to Medical Services.

6.9 No work shall be performed within ten feet of exposed energized electrical wires.

6.10 While chipping deposits, personnel shall wear goggles and a half-mask respirator equipped with magenta filter cartridges.

6.11 Industrial cleaning shall be performed by a minimum of two personnel.

6.12 When cleaning areas where enriched material (greater than 2%) has been processed, materials (solid or liquid) shall be handled with reference to defined nuclear safety limits.

6.13 Hearing protection specified by ES&H shall be worn by personnel working near alarm horns or signals.

6.14 Safety glasses shall be worn at all times except when other eye protection is specified by ES&H.

6.15 Hard hats shall be worn for cleaning operations performed in areas where posted or per instructions of an issued permit.

6.16 Employees shall have reviewed and be familiar with the information contained in Material Safety Data Sheets for the chemicals/hazardous materials that may be used or encountered.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.17 HWMU designated areas shall not be cleaned.

6.18 Before personnel start work in areas where enriched material is stored in red drums, the drums shall be removed in accordance with SOPs 20-C-101 and 20-C-801 or IRS&T contacted to determine work restrictions.

6.19 Spills of hazardous material shall be processed in accordance with SOP 20-C-606 and FMPC-0503.

6.20 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Safety for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by Radiological Safety.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the Step or Item to which they apply.

8.0 PROCEDURE

8.1 Preparation

NOTE: The check sheet shall be filled out at the beginning of each shift before starting work.

8.1.1 Complete a "Pre-Cleaning Checksheet", Form FMPC-PRO-2806 (See Figure 1).

8.1.2 Check with the supervisor of the area to be cleaned to determine if other operations are in progress.

8.1.3 Using tape and/or barricades (or other applicable barriers) and warning signs, obstruct entry into the work area.

8.1.4 Shut off the power to electrical equipment in the area and lock and tag the equipment per PP-FMPC-0719.

8.1.5 Inspect portable vacuum equipment per SOP 20-C-701.

8.1.6 Inspect lift equipment per applicable procedure (SOP 01-107/SOP 01-108).

8.1.7 Inspect safety belts, harnesses, and lanyards per SOP 20-C-609.

8.1.8 Assemble portable scaffolding per SOP 20-C-611.

8.1.9 Inspect equipment per the "Industrial Cleaning Inspection Sheet", Form FMPC-PRO-2851 (See Figure 2).

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8.0 PROCEDURE (cont.)

8.1.9.1 If equipment is marked "Not Acceptable" on the inspection sheet, set the equipment aside.

8.1.9.2 Notify the Cleaning Supervisor for determination of use.

8.1.10 Set up required equipment to perform cleaning work.

NOTE: The supervisor shall inform Radiological Safety that a survey of the area to be cleaned is required.

8.1.11 Notify the Industrial Cleaning Supervisor when equipment setup is complete.

8.2 Cleaning

WARNING

When working with cleaning agents, goggles, chemical resistant gloves, and a face shield shall be worn.

8.2.1 Complete required cleaning work.

8.2.1.1 Check that the applicable permit(s) are posted.

8.2.1.2 Notify the supervisor if the required permit(s) is/are not posted.

WARNING

When chipping deposits, goggles and a respirator shall be worn.

8.2.1.3 If the job involves chipping, run a dust collector vacuum line to the chipping area.

8.2.1.4 Operate portable vacuum equipment (when required) per SOP 20-C-701.

8.2.1.5 Operate lift equipment, when required, per SOP 01-107 or 01-108 (as applicable).

8.2.1.6 When working overhead, erect barriers around the area per RM-0006I.1.

NOTE: The supervisor shall inspect the area to ensure cleaning is satisfactory.

8.2.1.7 Notify the supervisor when cleaning is completed.

8.2.2 Dispose of used cleaning materials as follows:

8.2.2.1 Place used cleaning materials in plastic bags.

8.2.2.2 Seal the bag closed with plastic tape.

8.0 **PROCEDURE** (cont.)

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CAUTION

Discarded cleaning materials shall have the same identification as the material being cleaned.

NOTE: Information for material identification shall be obtained from applicable operating procedures for the area being cleaned.

8.2.2.3 Mark the bag with material identification.

8.2.2.4 Place the bag in a container that is approved for the material being discarded.

8.2.2.5 Dispose of material designated as hazardous waste per SOP 20-C-605.

8.2.3 Dispose of residues as follows:

8.2.3.1 Gather residues from the work area.

8.2.3.2 Place residues in a plastic bag.

8.2.3.3 Seal the bag with plastic tape.

CAUTION

Residue materials shall have the same identification as the material being cleaned.

NOTE: If the residue material is non-RCRA, the supervisor shall contact Industrial Hygiene for identification.

8.2.3.4 If the material is non-RCRA, notify the supervisor that the material requires identification.

NOTE: Information for residue identification shall be obtained from applicable operating procedures for the area being cleaned.

8.2.3.5 Mark the bag with material identification from the supervisor or applicable operating procedure.

8.2.3.6 Place the bag in a container that is approved for the material being discarded.

8.2.3.7 Dispose of residues designated as hazardous waste per SOP 20-C-605.

8.0 PROCEDURE (cont.)

NOTE 1: If the residue material is non-RCRA, the supervisor shall contact Industrial Hygiene for container identification requirements.

NOTE 2: The Supervisor shall inform Radiological Safety that a radiological survey is required to determine effectiveness of cleaning.

8.2.4 Notify the supervisor that cleaning materials and residues are disposed of.

8.2.5 Disassemble equipment.

8.2.6 Secure equipment per instructions of Industrial Cleaning Supervisor.

9.0 APPLICABLE FORMS

9.1 FMPC-PRO-2806, "Pre-Cleaning Checksheet"

9.2 FMPC-PRO-2851, "Industrial Cleaning Inspection Sheet"

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DATE	EMPLOYEE(S) NAME:	BADGE NO.
Escape routes, fire extinguishers, fire alarms, and evacuation alarms identified. Employee(s) Initials		
SHIFT | 1 | 2 | 3	SUPERVISOR NAME AND BADGE NO.:	
AREA OF WORK:		
RADIOLOGICAL SURVEY COMPLETED BY:	DATE:	REPORT NO.

APPLICABLE OPERATING PROCEDURE NUMBER(S) OF OPERATIONS FOR AREA OF CLEANING:

PERMITS REQUIRED:

CLEANING METHODS REQUIRED:

PRE-CLEANING CHECKSHEET
Form No. FMPC-PRO-2806
Figure 1

FEMP
INDUSTRIAL CLEANING INSPECTION SHEET

Date:	Inspector Name and Badge No:	Shift 1 2 3
Supervisor Name and Badge No:	Condition	

ITEM	INSPECTION	ACCEPTABLE	NOT ACCEPTABLE
1. Scaffolding Poles, Fasteners, and Rails	Damage (Bent, Deformation)		
2. Stepladder/ Extension Ladder, Rings, Feet, Side Rails	Damage (Splintering, Fraying)		
3. Portable Power Tools Main Body and Electrical Cords	Damage (Fraying)		

Comments:

INDUSTRIAL CLEANING INSPECTION SHEET
Form No. FMPC-PRO-2851
Figure 2

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
01-06-93	0	Issued to establish the Industrial Cleaning procedure per Request No. P89-166, initiated by K. Dunbar. Supersedes SOP 01-103.

OPERATIONS PROCEDURE	BIRD CARCASS AND DROPPING REMOVAL	SOP 20-C-610
		SECTION: Manufacturing AREA: Process Area
Authorization: R. L. Gardner Per CIO No. C89-029	Supersedes: None	Issue Date: 10-27-89

1.0 PURPOSE

The purpose of this document is to define criteria for disposal of bird carcasses and droppings.

2.0 APPLICABILITY

This procedure shall apply to the Operations process area where birds are currently roosting or carcasses/droppings are present.

3.0 RESPONSIBILITIES

3.1 The supervisor shall be responsible for ensuring required equipment and materials are available personnel are authorized by medical, and that personnel are trained in this SOP.

3.2 Industrial Hygiene shall be responsible for training personnel in the safety aspects of this SOP.

3.3 Medical shall be responsible for authorizing personnel to work to this SOP.

3.4 Assigned personnel are responsible for performing removal operations per this SOP.

4.0 DEFINITIONS

4.1 PVA - Poly Vinyl Alcohol

5.0 REFERENCES

5.1 SOP 20-C-602, "Inspection & Operation of Nilfisk Portable Vacuum Units"

5.2 SOP 20-C-603, "Removal & Replacement of Nilfisk Portable Vacuum Unit Filters & Dust Bag"

5.3 FMPC-719, "Lock and Tag Procedure"

6.0 INDUSTRIAL HEALTH & SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 A full-face, air-purifying respirator equipped with a purple high efficiency filter cartridge or a hooded continuous flow airline respirator shall be worn. A vortex air cooling tube is available for use with the BULLARD hooded airline. Use combination organic vapor high efficiency filter canister on the full-face respirator if the smell of the debris is obnoxious.

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 INDUSTRIAL HEALTH & SAFETY REQUIREMENTS (cont.)

6.3 Used respirators, with canister/cartridge removed shall be placed in pink PVA plastic bags obtained from Industrial Hygiene, tied shut with PVA ties, and placed in polyethylene bags.

6.4 Company issued coveralls and rubber gloves shall be worn for removing small accumulations of bird droppings and carcasses. TYVEK vapor barrier coveralls. rubber gloves, and rubber boots shall be worn for large accumulations. Leather-palm gloves shall be worn over the rubber gloves if debris must be picked up by hand.

6.5 Hands and face shall be washed prior to entering break rooms, before eating, drinking, smoking, donning respirator, after removing respirator, and at completion of job.

6.6 The medical condition of an employee warrants re-evaluation by medical if there is a cut on the hand, cold, allergy, or other medical conditions exist.

6.7 A NILFISK hepa filter vacuum shall be used in accordance with SOP 20-C-602 and SOP 20-C-603.

6.8 Industrial Hygiene of Q&S shall inspect the area at the beginning and at the completion of work.

6.9 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety for evaluation. The involved employees shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample.

6.10 Industrial Hygiene shall specify the detergent/fungicide used for wetting carcasses/droppings.

7.0 PROCEDURE

7.1 Notify Industrial Hygiene of Q&S to inspect bird carcass and dropping removal work area.

7.2 Check with the facility owner that electrical equipment such as switches. transformers, are switched to the "OFF" position or protected (Refer to Tag and Lock Procedure", FMPC-719).

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.3 Obtain and put on protective clothing and respirator.

NOTE: When wearing TYVEK coveralls in hot weather, cold vests are available to control heat stress.

7.4 Obtain wood container to be used for placement of carcasses/droppings.

NOTE: If there are metal bands around container, remove bands and place in designated metal container for scrap metal.

7.5 Rope off the area perimeter and access points to be cleaned. Post signs as shown in Figure 1.

7.6 Wet the carcasses/droppings area with a combination detergent/fungicide solution.

7.7 Allow detergent/fungicide solution to soak for approximately 10 minutes.

7.8 Pick up carcasses and large pieces by hand and place in wood container.

NOTE: Use a shovel for smaller pieces.

7.9 Clean the area by sweeping with a hard bristle broom. Shovel debris into a wood container.

7.10 Vacuum area to remove remaining small amounts of dried material.

WARNING: VACUUM ONLY DRY MATERIAL.

7.11 Wet the affected area again with the detergent/fungicide solution.

7.12 Remove NILFISK vacuum dust bag per SOP 20-C-603 and place in wood container.

7.13 Place lid on wood container and secure using 1 to 3 inch nails.

7.14 Apply labels to top and side of container as shown in Figure 2.

7.15 Remove rope and signs from perimeter of work area.

7.16 Wash brooms and shovels with hot, soapy water then rinse with detergent/fungicide solution.

7.0 PROCEDURE (cont.)

7.17 Remove respirator and place respirator (less canister/cartridge) in pink PVA plastic bag, seal, apply label shown in Figure 1, and place in designated drum for cleaning.

7.18 Place respirator canister in designated drum as directed by supervisor.

7.19 Remove protective clothing and dispose in designated drum.

7.20 Notify Industrial Hygiene of Q&S to inspect cleaned area.

7.21 Complete Item 1 of Form FMPC-PRO-3020 and notify Transportation for transfer of wood container to Plant 8 for incineration.

7.22 When Transportation arrives, request driver to complete Item 2 of Form FMPC-PRO-3020.

8.0 APPLICABLE FORMS

8.1 FMPC-PRO-3020, "Bird Carcass/Dropping Box Container Transfer"

F - MATERIAL REVISED, ADDED, OR DELETED.

CAUTION

POSSIBLE BIOLOGICAL HAZARD

SPECIAL PROTECTIVE EQUIPMENT REQUIRED

AREA POSTING SIGNS
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

CAUTION

POSSIBLE BIOLOGICAL HAZARD

HANDLE ACCORDING TO APPROVED PROCEDURES

WOOD CONTAINER LABELS
Figure 2

F - MATERIAL REVISED, ADDED, OR DELETED.

OPERATIONS PROCEDURE	BIRD CARCASS AND DROPPING REMOVAL	SOP 20-C-610 SECTION: Manufacturing AREA: Process Area
Authorization: R. L. Gardner Per CIO No. C89-029	Supersedes: None	Issue Date: 10-27-89

FMPC
PRODUCTION OPERATIONS

BIRD CARCASS/DROPPING BOX CONTAINER TRANSFER

ORIGINATING LOCATION:

1.	ORIGINATING LOCATION:			
	BY:	NAME: SIGNATURE:	BADGE NUMBER:	DATE:

TRANSFER TO:

2.	TRANSFER TO: Plant 8 Box Furnace Area			
	TRANSPORTAION PICK UP:	NAME: SIGNATURE:	BADGE NUMBER:	DATE:

PLANT 8:

3.	RECEIPT OF TRANSFER:	NAME: SIGNATURE:	BADGE NUMBER:	DATE:
	INCINERATION COMPLETED:	NAME: SIGNATURE:	BADGE NUMBER:	DATE:

TRANSMIT COMPLETED FORM TO OPERATIONS PROJECT MANAGER

BIRD CARCASS/DROPPING BOX CONTAINER TRANSFER
Form FMPC-PRO-3020
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

OPERATIONS PROCEDURE	BIRD CARCASS AND DROPPING REMOVAL	SOP 20-C-610 SECTION: Manufact AREA: Process
Authorization: R. L. Gardner Per CIO No. C89-029	Supersedes: None	Issue Date: 10-27-89

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
10-27-89	0	Procedure requirement for Bird Carcass and Dropping Removal per Request No. P89-426 (CIO No. C89-029).

R - MATERIAL REVISED, ADDED, OR DELETED.

SITE SERVICES PROCEDURE	OVERPACKING DEFECTIVE CONTAINERS	SOP 20-C-600 AREA: As Applicable
Authorization: R. L. Gardner, Facilities and Warehousing	Supersedes: 1-C-804, 6-10-88	Issue Date: 03-06-91

NOTE: WARNINGS, CAUTIONS and NOTES precede the step to which they apply.

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to establish the procedure for overpacking defective containers.

2.0 APPLICABILITY

This procedure shall apply to material containers which are defective or unacceptable for storage.

3.0 RESPONSIBILITY

3.1 The supervisor shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the existing training requirements identified by the Department/Staff Manager.

3.1.2 Final determination to overpack a container.

3.1.3 If multiple containers are to be overpacked into a single overpack drum, ensuring that defective containers contain compatible materials.

3.1.4 Designating appropriate lifting device.

R 3.1.5 Supplying the Materials Control and Accountability (MC&A) Specialist
R with recorded information taken from container(s) including forms referred to in 8.1 and 8.2.

3.1.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.7 Providing operators with the required respiratory protection.

3.1.8 Immediately notifying the Assistant Emergency Duty Officer (AEDO) and submitting a Minor Event Report (MER) in the event of a hazardous material spill or abnormal event.

3.2 Materials Control & Accountability (MC&A) shall be responsible for reconciling and maintaining the inventory records of materials at the applicable location.

3.3 Operators shall be responsible for complying with this procedure.

R - MATERIAL REVISED, ADDED, OR DELETED.

4.0 DEFINITIONS

4.1 Overpack Drum - A drum into which one or more smaller defective containers are placed.

4.2 Defective Container - A container with holes, dents, bulges and/or corrosion which is unacceptable for storage of material.

4.3 Overpack Tare Weight - The sum of the tare weight(s) from the defective container(s) plus the tare weight of the overpack drum.

4.4 Overpack Net Weight - The overpack gross weight minus the overpack tare weight.

4.5 Overpack Gross Weight - The weight of the completed overpack; defective container(s) plus overpack drum.

5.0 REFERENCES

5.1 SOP 20-C-602, "Inspection and Operation of Nilfisk Portable Vacuum Units"

5.2 SOP 20-C-904, "General Nuclear Safety Requirements"

R 5.3 RM-0005, "FEMP Lot Marking and Color Coding System"

5.4 SOP 20-C-606, "Hazardous Material Spill Cleanup"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields shall be worn unless other eye protection is specified.

6.3 Respiratory protection provided by the supervisor shall be worn when required.

6.4 Leather-palm gloves shall be worn to protect the hands from rough or sharp edged material and possible contamination.

6.5 A NILFISK HEPA type filter vacuum cleaner shall be used in accordance with SOP 20-C-602, or a vacuum system approved by IRS&T, when cleanup is required.

6.6 As applicable, nuclear safety requirements of SOP 20-C-904 shall be followed in the handling of depleted, normal, and/or enriched material.

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6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.7 Any release of hazardous material shall be reported immediately per SOP 20-C-606.

6.8 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 PROCEDURE

7.1 Overpacking into Drums

7.1.1 Prepare loading area by laying down a tarpaulin, plastic sheet, or other equivalent material on ground.

7.1.2 Select defective containers to be overpacked.

NOTE: If multiple containers are to be overpacked into a single overpack drum, supervisor shall ensure that defective containers contain compatible materials.

NOTE: If defective containers are vented, supervisor shall ensure overpack drums are vented.

7.1.3 Inspect the area around the defective container(s). If material is visible around the container(s), notify the supervisor.

NOTE: Leaking container(s) shall be overpacked within 24 hours from time of discovery.

NOTE: The supervisor shall report the spill and direct spill cleanup per SOP 20-C-606.

NOTE: HEPA filtered vacuum systems shall not be used if the HEPA test has expired or test sticker is broken.

CAUTION: CAREFULLY MOVE THE DEFECTIVE CONTAINERS(S) TO PREVENT FURTHER DAMAGE.

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7.0 PROCEDURE (cont.)

7.1.4 Move defective containers to loading area.

NOTE: Containers loaded on a pallet for transport shall be strapped.

R 7.1.5 Complete "Container Overpack Information" sheet, Form FS-F-2987 (See Figure 1) with data from defective container(s).

7.1.5.1 If the information which appears on the defective drum(s) is illegible and/or non-existent, contact supervisor.

NOTE: Supervisor shall contact IRS&T, SWC, Transportation or MC&A as applicable for assistance in identifying material/container markings.

7.1.6 Prepare new markings/labels for the overpack drum identification by using the markings/labels on the defective container(s).

R 7.1.7 Transmit overpack form to MC&A Specialist's Office for verification.

7.1.7.1 If the form is acceptable, proceed to step 7.1.8.

7.1.7.2 If the form is not acceptable, correct any discrepancies with assistance from MC&A. Notify supervisor as necessary.

7.1.8 Obtain required overpack drum according to material compatibility and defective container size.

7.1.9 Inspect overpack drum to ensure no dents, holes, or corrosion is present.

7.1.9.1 If damage/corrosion is present, notify supervisor.

7.1.10 Ensure scale to be used has been inspected and calibrated per the applicable SOP for the scale to be used.

R 7.1.11 Tare weigh the empty overpack drum and record the overpack drum tare weight on overpack form.

7.1.12 Move the empty overpack drum to the loading area.

7.1.13 Remove the gasket, locking ring, and lid.

7.0 PROCEDURE (cont.)

7.1.14 Ensure that the forklift/or hoist and lifting device specified by supervisor has been checked per the applicable SOP.

CAUTION: KEEP FINGERS OUT OF PINCH POINTS WHILE LOWERING DEFECTIVE CONTAINER(S) INTO OVERPACK.

7.1.15 Using the specified forklift/or hoist and lifting device, place defective container(s) into the overpack drum (See Figure 2 for the primary equipment utilized for this task).

NOTE: Other lifting equipment may be utilized with the approval of the immediate supervisor and IRS&T.

7.1.16 Check condition of gasket, lock ring, and drum lid. Replace damaged items.

7.1.17 Seat lid and gasket evenly on overpack drum.

7.1.18 Place locking bolt ring around lid of overpack drum ensuring the flanges point downward from the lock ring.

NOTE: Locking bolt shall be positioned no more than six inches from the seam of the drum.

7.1.19 Install locking bolt shaft through the unthreaded flange, locking nut, and threaded flange (See Figure 3) so that the locking bolt head rests against unthreaded flange.

7.1.20 Tighten the locking bolt or latch lever lock.

7.1.21 Manually tighten the locking nut against the threaded flange.

7.1.22 Using a wrench, tighten the locking nut against the threaded flange an additional 1/4 turn.

R 7.1.23 Weigh the completed overpack and record the overpack gross weight on overpack form (See Figure 1).

7.1.24 Calculate overpack tare and net weights.

NOTE: Overpack Tare Weight is the sum of the tare weight(s) from the defective container(s) plus the tare weight of the overpack drum.

NOTE: Overpack Net Weight is the overpack gross weight (Step 7.1.23) minus the Overpack Tare Weight.

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7.0 PROCEDURE (cont.)

R 7.1.25 Record the overpack tare weight and the overpack net weight on overpack
R form (See Figure 1).

R 7.1.26 Using information from the overpack form, stencil/paint the required identification per Figure 4, using applicable section number.

NOTE: Paint sticks may be used until proper stenciling can be performed.

NOTE: Stencil or marking shall be legible block letters, 1-1/2 inches in height (minimum).

NOTE: The drum labeling arrangement in Figure 4 is effective upon date of issue of this procedure. Drums labeled prior to this date shall not require relabeling.

7.1.26.1 If the overpack drum contains non-RCRA material or uncharacterized material, stencil/paint the FMPC Lot Marking Code followed by the drum number using two lines as shown in Figure 4, Section 1.

7.1.26.2 If the overpack drum contains RCRA material, stencil/paint the FEMP Lot Marking Code followed by the drum number using one line as shown in Figure 4, Section 2.

7.1.27 Affix all markings/labels previously prepared (See step 7.1.6) to the overpack drum in accordance with Figure 4 per the applicable section number.

R 7.1.28 Transmit overpack form to the supervisor or the applicable MC&A Specialist.

7.1.29 Move the overpack as instructed by the supervisor and record location on the "Permanent Inventory Record", Form FMPC-CONT-367 (See Figure 5) and transmit to MC&A.

NOTE: Containers loaded on a pallet for transport shall be strapped.

7.2 Overpacking into Double Lid Drums

7.2.1 Complete steps 7.1.1 thru 7.1.12.

7.2.2 Stencil "TOP" on side of the overpack drum, left of center, and near to bolt ring. Stencil "BOTTOM" on side of the overpack drum, left of center, and near the bottom bolt ring (See Figure 4, Section 6).

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7.0 PROCEDURE (cont.)

7.2.3 Remove the bolt ring, gasket, and lid from drum end marked "BOTTOM".

7.2.4 Place a pallet in the loading area.

7.2.5 Place a 24 inch x 1-1/2 inch plywood disk on top of the pallet.

7.2.6 Check condition of gasket, bolt ring and drum lid. Replace damaged items.

7.2.7 Place the overpack drum bottom lid on top of the plywood disk with the inside of the lid facing up.

7.2.8 Place locking bolt ring around the lid of the overpack drum ensuring the flanges point upward from the lock ring (See Figure 4).

NOTE: Locking bolt shall be positioned no more than six inches from the seam of the drum.

CAUTION: CAREFULLY MOVE THE DEFECTIVE CONTAINER(S) TO PREVENT FURTHER DAMAGE.

7.2.9 Using the specified forklift/or hoist and lifting device, center the defective container(s) on the disk/lid.

7.2.10 Using the lifting device, place the overpack drum with a lid assembly on the end of the drum marked "TOP", over the defective container(s).

7.2.10.1 Seat overpack drum evenly on lid and gasket.

7.2.11 Complete steps 7.1.19 thru 7.1.22.

7.2.12 Remove the bolt ring, gasket, and lid from drum end marked "TOP".

7.2.13 Complete steps 7.1.16 thru 7.1.29.

7.3 Overpacking into Vented Single Lidded Drums

NOTE: Supervisor shall specify the method used to make the vent holes in the overpack drum.

7.3.1 Complete step 7.1.1 thru 7.1.13.

7.0 PROCEDURE (cont.)

7.3.2 Using the method specified by supervisor, make two 1/4 inch to 1 inch holes (180 degrees apart) in the side of the drum approximately 1 inch below the top rim of the overpack drum ensuring vent holes do not interfere with the lock ring (See Figure 4, Section 3).

7.3.4 Using a stencil and white paint, mark the side of the drum with the word "Vent" to indicate the drum has been vented.

NOTE: The word "Vent" shall be 1-1/2 to 2 inches high and located under the bottom chime at the drum seam (drum centerline). (See Figure 4, Section 3.)

7.3.5 Record the required data on the "Drum Venting Record", Form FMPC-OPR-3228 (See Figure 6).

7.3.6 Complete steps 7.1.14 thru 7.1.29.

7.4 Overpacking into Vented, Double Lidded Drums

7.4.1 Complete steps 7.1.1 thru 7.1.12.

7.4.2 Stencil "TOP" on one side of the overpack drum, near bolt rings and "BOTTOM" on the other side of drum near bolt rings.

7.4.3 Position drum with "TOP" end up (See Figure 4).

7.4.4 Remove the bolt ring, gasket, and lid from drum end marked "TOP".

7.4.5 Complete steps 7.3.2 thru 7.3.5.

7.4.6 Complete steps 7.2.4 thru 7.2.11.

7.4.7 Complete steps 7.1.16 thru 7.1.29.

8.0 APPLICABLE FORMS

R 8.1 FS-F-2987, "Container Overpack Information"

8.2 FMPC-CONT-367, "Permanent Inventory Record"

8.3 FMPC-OPR-3228, "Drum Venting Record"

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R

CONTAINER OVERPACK INFORMATION

DATE _____ BADGE _____

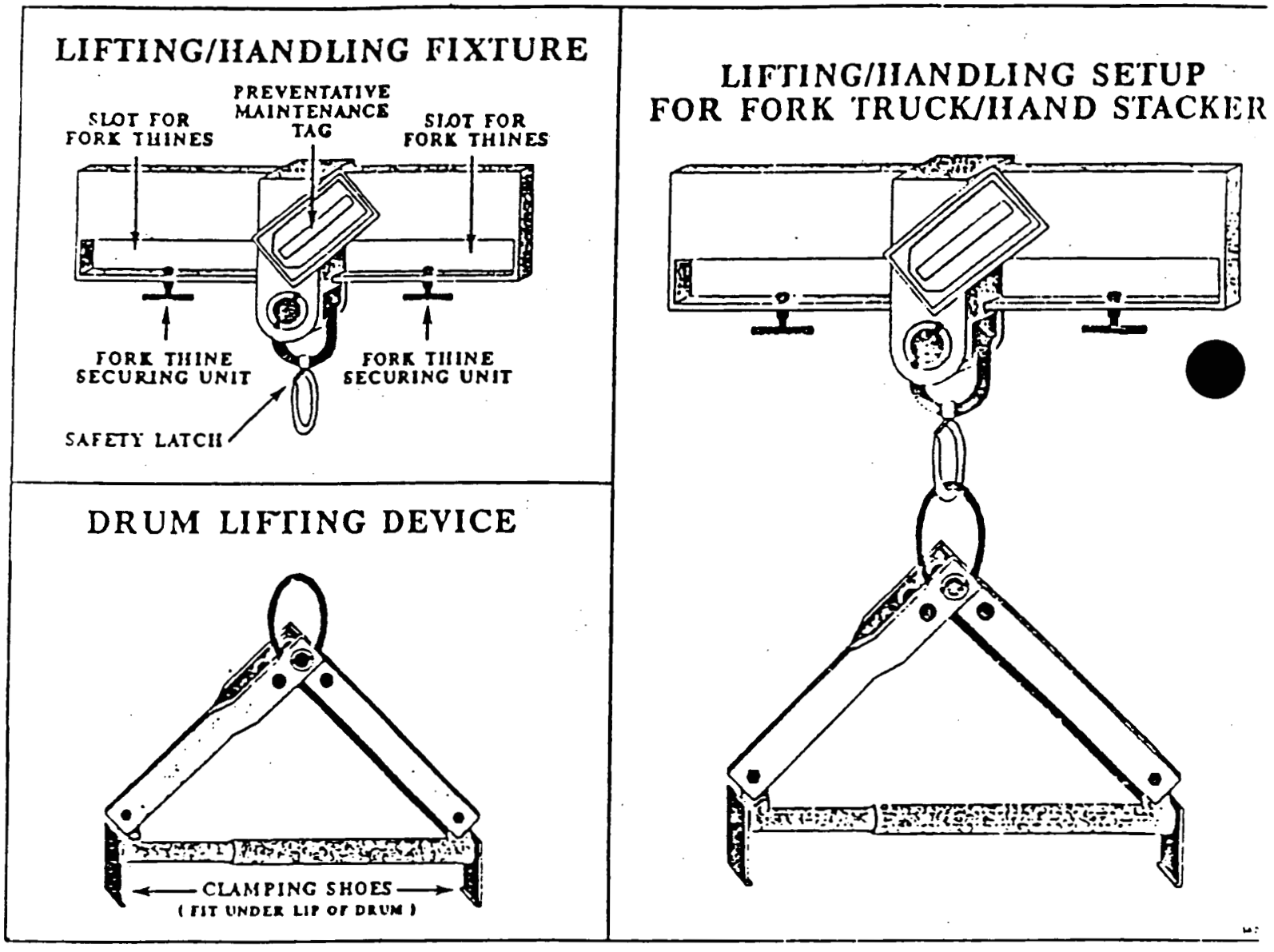
LOT NUMBER	DEFECTIVE CONTAINER WEIGHTS				OVERPACK WEIGHTS				ADDED INFORMATION				DRUM FROM			OVER-PACK SIZE IN GALLONS
	DRUM NO	GROSS	TARE	NET	DRUM NO.	GROSS	TARE	NET	GAIN	LOSS	WET	DRY	AREA	ROW	STACK	
TOTALS																

FS-F-2987 (REV 6-3-91)

R

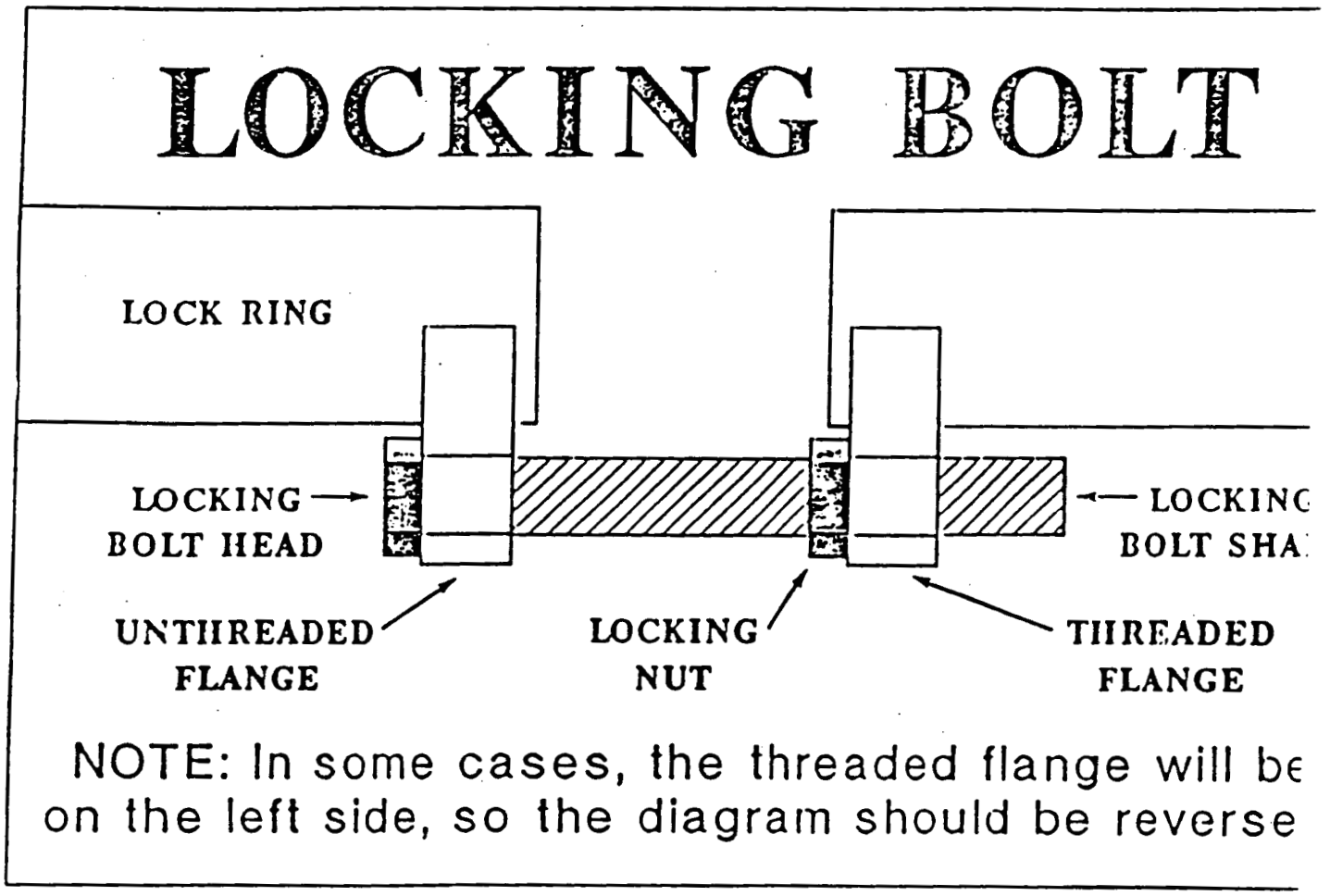
CONTAINER OVERPACK INFORMATION
FORM FS-F-2987
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.



TYPICAL LIFTING/HANDLING EQUIPMENT
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.



INSTALLATION OF BOLT-TYPE LOCKING RING
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

SITE SERVICES PROCEDURE	OVERPACKING DEFECTIVE CONTAINERS	SOP 20-C-600 AREA: As Applicable
Authorization: R. L. Gardner, Facilities and Warehousing	Supersedes: 1-C-804, 6-10-88	Issue Date: 03-06-91

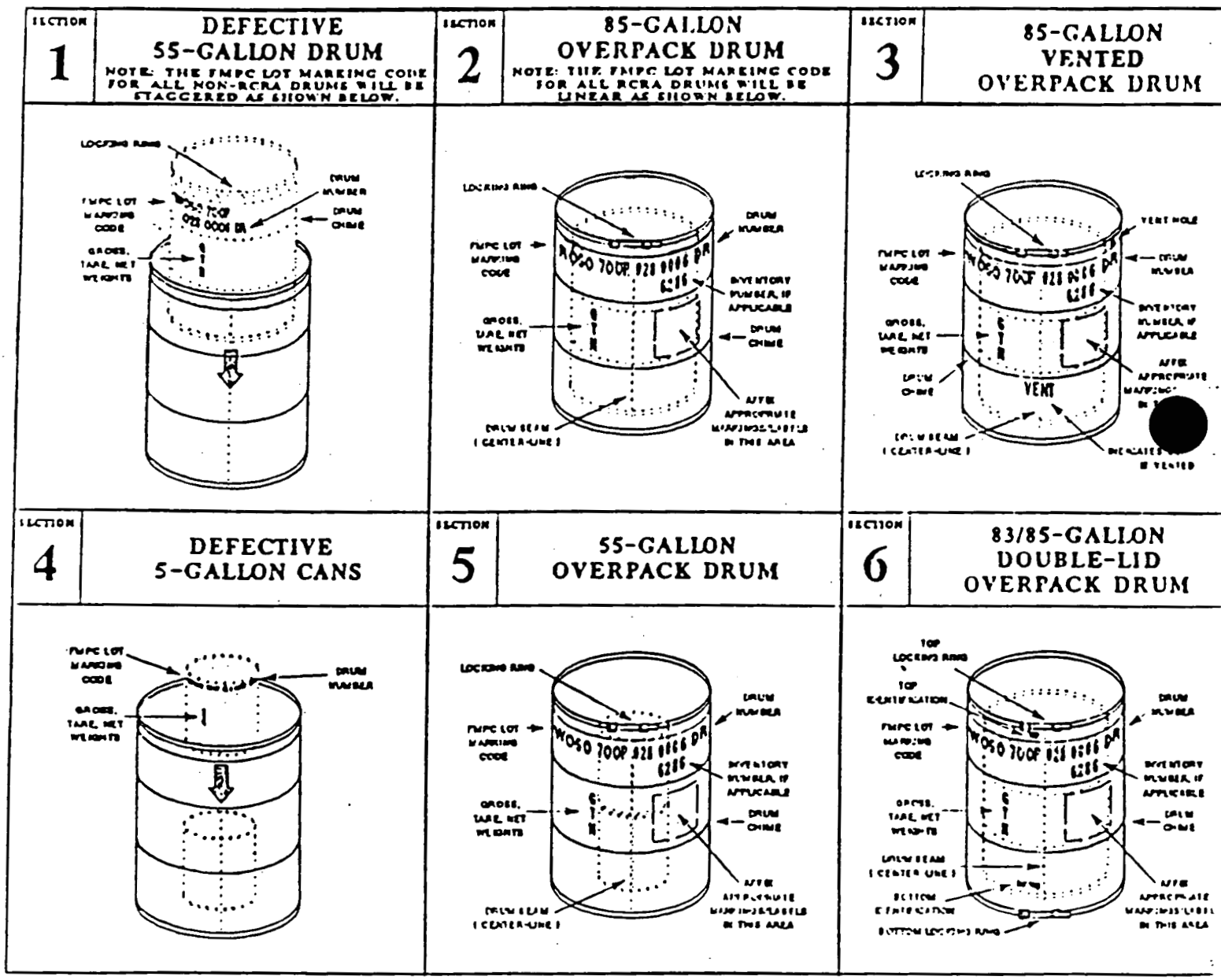


DIAGRAM OF OVERPACK/DEFECTIVE CONTAINER IDENTIFICATION
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC
CONTROLLER'S ORGANIZATION - MATERIALS CONTROL AND ACCOUNTABILITY
PERMANENT INVENTORY RECORD

DATE	INVENTORY SHEET NUMBER

PLANT	AREA	NUCLEAR MATERIAL

LINE NO	BADGE NUMBER	INVENTORY NUMBER	LOT NUMBER					DRUM NO	GROSS WEIGHT POUNDS	TARE WEIGHT POUNDS	NET WEIGHT POUNDS	MBA	LOCATION			DRUM SIZE	YES	
			P O NUMBER	SOURCE	CLASS	MATERIAL	SEQUENCE						ROW	STACK	LEVEL		DP	PODS
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

PERMANENT INVENTORY RECORD
FORM FMPC-CONT-367
Figure 5

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC
DRUM VENTING RECORD

Plant _____

DRUM NUMBER	LOT NUMBER	MTC.SRC	DAMAGED DEFORMED		DRUM VENTED		DATE	OPERATOR NAME AND BADGE NUMBER	OVERPACK	
			YES	NO	YES	NO			YES	NO

REMARKS: _____

DRUM VENTING RECORD
FORM FMPC-OPR-3228
Figure 6

1172
R - MATERIAL REVISED, ADDED, OR DELETED.

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
03-06-91	0	Requirement for a new procedure for overpacking defective containers per Request No. P91-058 initiated by J. W. Ogg.
09-11-91	1	Revised to replace Figure 1 with current form per Request No. P91-404, initiated by J. Ogg.

SITE SERVICES PROCEDURE	CLEANING SUMP SYSTEMS (Signature on File)	SOP 20-C-916 Area: As applicable
Authorization: R. L. Gardner, Facilities & Warehousing Manager	Supersedes: None	Issue Date: 07-09-92

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to provide the procedure for cleaning sumps and sump systems.

2.0 APPLICABILITY

This procedure is applicable to all sump systems located at the FEMP.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Coordinating with support organizations when assistance is required.

3.1.2 Ensuring that sump systems are emptied in accordance with this procedure.

3.1.3 Ensuring that material removed from sumps and sump systems is disposed of in accordance with this procedure.

3.1.4 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.5 Obtaining material and equipment required to clean sumps and dispose of removed material.

3.1.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection and/or protective clothing/equipment required for the process being performed.

3.1.7 Issuing the required respiratory protection to operators.

3.1.8 Ensuring that empty rinse drums are cleaned and stored for reuse or disposition.

3.1.9 Obtaining and posting "Radiation Work Permits" and "Confined Space Entry Permits" when required.

3.1.10 Ensuring that work areas are surrounded by barriers when necessary.

3.1.11 Reviewing applicable "Material Safety Data Sheets" (MSDS) with operators.

3.1.12 Ensuring that sump liquid and sludge characterization has been performed prior to starting work.

3.0 **RESPONSIBILITIES** (cont.)

3.1.13 Establishing a "Satellite Accumulation Area" if a temporary storage location is required for the material removed from the sump.

3.2 Site Services shall be responsible for the following:

3.2.1 Obtaining a final disposition sample.

3.2.2 Obtaining a sample for analysis of radionuclides.

3.2.3 Moving containers and SACs to and from pumping operations per section procedure PO-S-06-001.

3.3 Environmental Compliance & Quality Assurance (EC/QA) shall be responsible for the following:

3.3.1 Ensuring compliance with applicable regulations, including requirements specified by the Environmental Protection Agency, Ohio State Fire Marshall, Department of Energy, and the FEMP.

3.3.2 Providing EPA and UN numbers.

3.4 Industrial Hygiene shall be responsible for the following:

3.4.1 Monitoring air contaminant concentration while material is being removed from the sump systems.

3.4.2 Issuing "Confined Space Entry" permits when required.

3.5 Radiological Safety shall be responsible for the following:

3.5.1 Radiological surveys.

3.5.2 Issuing "Radiation Work Permits" (RWP) when required.

3.5.3 Specifying personnel protective equipment before operators work in or around a radiologically contaminated area.

4.0 **DEFINITIONS**

4.1 Compatible Container - A drum that has been approved for the material to be accumulated.

4.2 Hazardous Waste - A material which is listed on the EPA Hazardous Waste List or exhibits ignitability, corrosivity, reactivity, or exceeds Toxicity Characteristic Leaching Procedure (TCLP) limits. Both "listed" and "characteristic" wastes are regulated under RCRA.

4.3 Collection Container - A drum that is used to transfer material from a sump system to a designated location.

4.0 **DEFINITIONS** (cont.)

4.4 Release - Any unplanned event involving overflowing, sloshing, spilling, leaking, pumping, pouring, injecting, escaping, emitting, emptying, leaching, releasing, dumping, discharging, or disposing of hazardous waste onto the ground, into water, or into the air, within or beyond the boundaries of the FEMP.

4.5 Resource Conservation and Recovery Act (RCRA) - The Congressional Act which establishes safe and environmentally acceptable management practices for specific wastes.

4.6 Satellite Accumulation Area (SAA) - A defined area approved for waste accumulation at or near the waste generation point.

4.7 Satellite Accumulation Container (SAC) - A portable polyethylene container that holds one 55-gallon drum and contains material that may be released.

4.8 Three-Day Rule - A RCRA regulation requiring the transfer of containers in an SAC are transferred to an approved storage facility within three days from the date the container is filled.

5.0 **REFERENCES**

5.1 SOP 1-C-101, "Sampling Residue and Waste Material"

5.2 SOP 20-C-605, "Control of Satellite Accumulation Areas"

5.3 SOP 20-C-606, "Hazardous Material Spill Cleanup"

5.4 RM-0005, "FEMP Lot Marking and Color Coding System"

5.5 Section Procedure PO-S-06-001, "Movement of Hazardous Waste"

5.6 SSOP-0002, "Completing the Material Evaluation Form"

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 A defined safety system is not involved.

6.2 Safety glasses shall be worn unless other eye protection is specified by the supervisor, IRS&T, or posted signs.

6.3 Respiratory protection issued by the supervisor shall be worn when required by IRS&T.

6.4 Face shields and goggles shall be worn when removing lids or bungs from drums containing liquids and when a possibility exists of being splashed with liquids.

6.5 A rubber apron or splash suit shall be worn if there is a possibility of being splashed with caustic, acids, or other hazardous chemical.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.6 Leather-palm gloves shall be worn when handling containers, operating equipment, and when handling rough, sharp-edged, or contaminated materials.

6.7 Neoprene rubber gloves shall be worn when handling hazardous chemical material.

6.8 Any release of hazardous waste shall be reported to the supervisor and handled per SOP 20-C-606.

6.9 Personnel safety equipment (eyewash, fire extinguishers, safety showers) shall be operational and readily available for emergencies.

6.10 Operators shall have reviewed, and be familiar with, MSDSs for hazardous material/chemicals that may be used or encountered.

6.11 Any circumstance which could have resulted in an intake of radioactive/hazardous waste materials by inhalation, ingestion, or absorption shall immediately be reported to a supervisor or, in the supervisor's absence, to the AEDO. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Industrial Hygiene, Medical, and Radiological Safety for evaluation and any immediate action such as decontamination. The involved employees shall report to Medical Services at the end of their shift or as directed to submit a urine sample, and again report at the start of their next scheduled shift to submit another urine sample.

NOTE: Warnings, cautions, and notes precede the Item or Step to which they apply.

7.0 PROCEDURE

7.1 Emptying Sump Systems

7.1.1 If not already done, prepare a "Material Evaluation Form" per SSOP-0002 for the material in the sump to be cleaned.

7.1.1.1 If sampling is required, proceed per SOP 1-C-101.

NOTE: The supervisor shall complete a "System Content Removal Checklist - Supervisors Daily Startup Checklist."

7.1.2 Complete the following forms:

(A) "Daily Sump System Activity Verification Checklist," (See Figure 1)
(B) "Sump System Content Removal - Equipment Checklist," (See Figure 2)
(C) "Sump System Content Removal - Drumming Area Checklist," (See Figure 3)
(D) "Sump System Content Removal - Drum Activity Completed Checklist," (See Figure 4)

7.0 **PROCEDURE** (cont.)

7.1.3 Erect barricades around the work area.

7.1.4 Post warning and area entry requirement signs at the barricades.

NOTE: Before delivery to removal site, containers shall be tare weighed, and the weight recorded on a Form FS-F-1945-XX, "Item Production/ Certification/Identification."

7.1.5 Check to ensure that drums have been tare weighed.

NOTE: The supervisor shall arrange to have the drums weighed.

7.1.5.1 If not, notify the supervisor.

7.1.6 Contact the supervisor to ensure that the flash point of the sump liquid has been determined.

NOTE: The dike area shall be established so that the pump intake hose can reach the bottom of the sump.

7.1.7 Using a metal trough or Herculite material, construct a dike for the collection container and pumping equipment.

7.1.8 Place a SAC inside the diked area.

7.1.9 Install a collection container in the SAC.

7.1.10 Remove the lid/bung from the container.

CAUTION

The pump shall be specified (by hazard code or a combination of hazardous codes) for the material being transferred.

NOTE: Each pump shall be labeled with the hazard code for which the pump is used.

7.1.11 Check the pump to be used.

7.1.11.1 If the pump is not acceptable (due to the hazard code or a combination of hazard codes) for the material to be transferred, notify supervisor.

CAUTION

The power source shall not exceed the rated air or electric capacity of the pump.

7.1.12 Check the pump electric or air rating.

7.0 **PROCEDURE** (cont.)

NOTE: The supervisor shall obtain a pump that is rated for the power supply.

7.1.12.1 If the power supply exceeds the rating, notify the supervisor.

7.1.13 Place the pump inside the diked area.

NOTE: Plant electric or air supply may be used if in close proximity to pumping operation. A generator or air compressor will be needed if a remote operation is performed.

7.1.14 Connect the pump to the power source.

7.1.15 Connect hoses to the pump intake and discharge.

NOTE: Industrial Hygiene shall monitor for air contaminant concentrations prior to and after the sump is opened.

7.1.16 Remove or open the sump cap/cover.

7.1.17 Place pump intake hose into the sump and ensure that the hose reaches the sump bottom.

7.1.18 Place the pump discharge hose into the collection drum bung opening.

7.1.19 Ensure that air or electrical connections and hose connections are tight.

CAUTION

The pump shall be operated at a moderate speed to avoid splashing. If compressed air operation is used, the air supply nozzle shall be opened slowly until pump is primed.

7.1.20 Start the pump.

CAUTION

Containers that start to bulge shall not be filled.

7.1.21 Check the drum while filling.

NOTE: Bulging containers shall be handled under direct supervision of the Area Supervisor and IRS&T.

7.1.21.1 If the drum starts to bulge, shut off the pump and notify the supervisor.

7.1.22 When the sump is empty or material in the drum reaches three inches from the top, shut off the pump.

7.1.23 When the sump is empty, remove the intake hose from the sump.

7.0 **PROCEDURE** (cont.)

7.1.24 Check the sides and bottom of the sump for solid residues.

NOTE: Solids shall be removed using manual tools (such as shovels and spud bars).

7.1.24.1 If solids remain, remove and drum the material.

7.1.25 Close the sump.

7.1.26 Drain the pump and both hoses into the receiving drum.

7.1.27 Install the bung plug in the receiving container.

7.1.28 Clean and store pump and hoses per Item 7.2.

7.1.29 Complete "Item Production/Certification/Identification" cards, form FS-F-1945-XX (See Figure 5) for the material in the ~~rece~~iving and wastewater containers.

NOTE: The label/stencil shall include the "Declared Full" date.

7.1.30 Label and/or stencil the collection and rinse containers per RM-0005.

7.1.31 Complete forms that are required by SOP 20-C-605.

NOTE 1: The supervisor shall arrange to have the collection and rinse containers/SACs transferred to the applicable building or warehouse for weighing and storage.

NOTE 2: The "Three-Day Rule" is applicable to RCRA material.

NOTE 3: If material being pumped is declared RCRA, dispose of cleaning substances in same fashion as pumped material.

7.1.32 Inform the supervisor that cleaning is completed.

7.1.33 Dispose of spill containment equipment as follows:

7.1.33.1 If no release occurred, remove and store spill containment equipment in the specified location.

7.1.33.2 If a release has occurred, handle and clean spill containment equipment per SOP 20-C-606.

7.2 Cleaning and Storing the Pump

NOTE: The supervisor shall have a drum of rinse solution and a collection drum moved into the diked area and placed in SACs.

7.2.1 Inform the supervisor that the pump is ready for cleaning.

7.2.2 Remove the bung plugs from the drums.

7.0 PROCEDURE (cont.)

7.2.3 Place the pump intake hose into rinse drum below the liquid level.

7.2.4 Place the pump discharge hose into the collection drum.

CAUTION

The pump and hoses shall be cleaned at a moderate speed to prevent the detergent from splashing or bubbling. If air operation is performed, the air supply nozzle shall be opened slowly until pump is primed.

7.2.5 Start the pump.

7.2.6 When the rinse container is empty, shut off the pump.

7.2.7 Drain the hoses and pump into collection drum.

7.2.8 Disconnect the pump from the power source.
7.2.9 Carefully remove hoses from rinse and collection drums.

7.2.10 Install caps on the ends of the hoses.

7.2.11 Disconnect the hoses from the pump.

7.2.12 Cap the hose ends.

7.2.13 Install bung plugs in the rinse and collection drum.

7.2.14 Remove pump/hoses from the diked area.

7.2.15 Store the pump/hoses in the specified location.

8.0 APPLICABLE FORMS

8.1 "Daily Sump System Activity Verification Checklist"

8.2 "Sump System Content Removal - Equipment Checklist"

8.3 "Sump System Content Removal - Drumming Area Checklist"

8.4 "Sump System Content Removal - Drum Activity Completed Checklist"

8.5 FS-F-1945-XX, "Item Production/Certification/Identification"

DAILY SUMP SYSTEM ACTIVITY VERIFICATION CHECKLIST

This set of checksheets comprise a document to provide daily verification of Procedural and Task or Project Specific Health and Safety Plan & SOP Compliance.

Work Location: _____ **Sump System:** _____ **Date:** _____

Activity of Day:

Content Removal _____ Purging _____

Closure _____ Dismantling _____

Work Crew Members:

Name:	Badge Number:

Cognizant Supervisor: _____ **Badge No.:** _____

Comments or Additions:

_____

_____

DAILY SUMP SYSTEM ACTIVITY VERIFICATION CHECKLIST
FIGURE 1

SUMP SYSTEM CONTENT REMOVAL - EQUIPMENT CHECKLIST

4554

Work Location: _____ Sump System: _____ Date: _____

Items to Check:	Verifier's Badge No.:
1. Air Compressor Checksheet/OPR 2414	_____
2. Pneumatic Pump and Hoses	_____
3. Safety Equipment:	
Pigs	_____
Absorbent Pads	_____
Respirators	_____
Eye Wash	_____
Gloves	_____
PPE	_____
-	_____
4. Forklift - Checksheet/OPR 2414	_____

5. List of Materials Requiring Restocking:

_____

_____

_____

SUMP SYSTEM CONTENT REMOVAL - EQUIPMENT CHECKLIST
FIGURE 2

SUMP SYSTEM CONTENT REMOVAL - DRUMMING AREA CHECKLIST

4554

Work Location: _____ Sump System: _____ Date: _____

Items to Check:	Verifier's Badge No.:
1. Condition of Sump System	_____
2. Presence of Absorbent Pads	_____
3. Area Barrier in Place (Tarp)	_____
4. Drums Available and Coded	_____

Comments: _____

_____

_____

SUMP SYSTEM CONTENT REMOVAL - DRUMMING AREA CHECKLIST
FIGURE 3

SUMP SYSTEM CONTENT REMOVAL - DRUM ACTIVITY COMPLETED CHECKLIST

Work Location: _____ Sump System: _____ Date: _____

Items to Check:	Verifier's Badge No.:
1. Material characterize	_____
2. Drums Generated	_____
3. Coding Checked	_____
4. Number of Drums Transferred	_____
Filled	_____
Transferred	_____
Weighed	_____
Stored	_____
5. Checklist of Pneumatic Pump and Storage of Equipment.	_____

Comments: _____

_____

_____

SUMP SYSTEM CONTENT REMOVAL - DRUM ACTIVITY COMPLETED CHECKLIST
FIGURE 4

E 4554

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945-XX (REV 3/18/92)

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945-65 (REV. 3/18/92)

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO.	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945-66 (REV. 3/18/92)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FS-F-1945-XX
FIGURE 5

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
07-09-92	0	Procedure for cleaning sump systems required per Request P92-143 initiated by J. Ogg.

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to establish the procedure for using the Industrial Vacuum Loader Truck (Supersucker) for handling waste liquids, liquid sludges, and solids.

2.0 APPLICABILITY

This procedure is applicable to using the Supersucker for removing waste materials from facilities, units, and processes.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that the Supersucker is cleaned and maintained in operating condition.

3.1.2 Contacting the requestor to ensure that waste characterization analysis has been performed per a completed Material Evaluation Form.

3.1.3 Ensuring that material to be picked up is compatible with material contained in the collector body (if any).

3.1.4 Contacting Radiological Safety or Industrial Hygiene (when required) prior to starting a task to determine required protective equipment.

3.1.5 Providing operators with the protective equipment specified by IRS&T.

3.1.6 Ensuring that required protective equipment is used by the operators during the task.

3.1.7 Reporting exceptional circumstances and notifying the Assistant Emergency Duty Officer (AEDO) of the circumstances.

3.1.8 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

3.1.9 Ensuring that a "Radiation Work Permit" is posted when required.

3.1.10 Obtaining a "Confined Space Entry Permit" when the collector body is to be entered for cleaning or repair.

3.1.11 Conducting a preliminary check of the area and material to be handled to determine safety measures and personal protective equipment (PPE).

3.0 RESPONSIBILITIES (cont.)

3.1.12 Coordinating with Facilities and Materials Evaluation (F&ME) or Environmental Compliance and IRS&T, to determine requirements for the solvent wash process and the selection of solvents for triple rinsing of Supersucker collector body after moving RCRA and/or hazardous waste.

3.1.13 Arranging for transportation and disposal/storage of filled containers.

3.1.14 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.1.15 Estimating the volume of material to be picked up and specifying the number of empty containers required.

3.2 Operators shall be responsible for the following:

3.2.1 Complying with this procedure.

3.2.2 Reporting unusual occurrences to supervision or, in the supervisors absence, the AEDO.

4.0 DEFINITIONS

4.1 Container - Any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 FEMP Conduct of Operations

5.2 References

5.2.1 SOP 20-C-101, "Moving and Storing Nuclear Materials"

5.2.2 SOP 20-C-102, "Nuclear Safety for Receiving, Storing, Repackaging and Moving Enriched Uranium Materials < 20% 235U from Offsite"

5.2.3 SOP 20-C-605, "Control of Satellite Accumulation Areas"

5.2.4 SOP 20-C-606, "Hazardous Materials Spill Clean-up"

5.2.5 SOP 20-C-904, "General Nuclear Safety Requirements"

5.2.6 SOP 43-C-414, "Industrial Vacuum Loader Truck (Supersucker) Operation"

5.2.7 PP-0314, "Packaging on On-Site Movement and Off-Site Shipment of Material"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.2 Leather-palm gloves shall be worn when handling drums, locking rings, sharp or abrasive material, or when using hand tools.

6.3 Chemical cover goggles and/or face shields, neoprene gloves, and aprons shall be worn when handling caustic material, acid slurries, or liquids.

6.4 If necessary, a "Radiation Work Permit" shall be posted at the area to be cleaned prior to performing removal operations.

6.5 Releases of hazardous waste shall be reported to the supervisor and handled immediately per procedure SOP 20-C-606.

6.6 Material shall be handled per the requirements of SOP 20-C-101, SOP 20-C-102, SOP 20-C-904, and 20-C-605.

6.7 Non-compatible materials shall not be mixed in the Supersucker collector body.

6.8 Safety glasses shall be worn at all times, except while in the cab of the truck and when wearing cover goggles or full face respirators.

6.9 Operators shall have reviewed and be familiar with the MSDS, for hazardous materials/chemicals that may be used or encountered.

6.10 Materials outside the perimeter fence shall be handled per the requirements of PP-0314.

6.11 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

7.0 PROCEDURE

7.1 General

7.1.1 Warnings, cautions, and notes precede the Item or Step to which they apply.

7.1.2 The Supersucker shall be empty and clean before starting a new task.

7.1.3 Spills shall be handled per Item 7.5.

7.1.4 A supervisor shall accompany the Supersucker on assigned tasks.

7.1.5 The Supersucker shall be operated per SOP 43-C-414.

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7.0 PROCEDURE (cont.)

7.2 Handling Non-RCRA, Non-Hazardous Material

7.2.1 Check the inside of the Supersucker collector body.

NOTE: The supervisor shall direct that the body be cleaned or to proceed with the current task.

7.2.1.1 If the collector body contains material or residues, notify the supervisor.

7.2.2 Prepare Supersucker to begin operations per SOP 43-C-414.

7.2.3 When the collector body is full or the job is completed, empty (per SOP 43-C-414) the collector body into the containers specified by the supervisor.

7.2.4 Dispose of, or relocate, the containers as directed by the Utilities Supervisor.

NOTE 1: Unless the Utilities Supervisor specifies otherwise, non-hazardous residues and rinsings may be placed in the same containers and storage areas as bulk materials.

NOTE 2: Non-regulated residues may be disposed of, without concern for the weight or volume, by rinsing the collector body into the general sump.

7.2.5 Using a water hose, rinse the collector body and place liquid in containers or drain into the general sump.

NOTE: RCRA material shall be removed from the collector body within 90 days of completion of task to remain unregulated equipment.

7.3 Handling Regulated RCRA/Listed Hazardous Waste Material

7.3.1 Check the Supersucker collector body for material or residues.

NOTE: The supervisor shall direct that the collector body be cleaned or to continue with the task.

7.3.1.1 If found, notify the supervisor.

7.3.2 Obtain the empty containers specified by the supervisor.

NOTE: The supervisor shall contact the requestor to obtain container identification data.

7.3.3 Label the containers with information furnished by the supervisor.

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7.0 PROCEDURE (cont.)

NOTE: The supervisor shall schedule the task to permit containers of hazardous waste to be transferred to a RCRA warehouse before t end of the shift.

7.3.4 Begin operations with the Supersucker (Refer to SOP 43-C-414).

NOTE 1: After the collector body has been emptied, the level of residue remaining shall not exceed one inch or 0.3%, by weight, of the capacity.

NOTE 2: Usually, 0.3% of the capacity of the collector body will equa 100 pounds of material, depending on the specific gravity.

7.3.5 Empty the Supersucker tank into the prepared containers, per SOP 43-C-414.

NOTE: The supervisor shall specify action for removing additional material.

7.3.5.1 If the collector body can not be emptied below 0.3% of the capacity, notify the supervisor.

NOTE: The rinsate shall be disposed of per the same requirements applicable to the material that was removed from the body.

7.3.6 Rinse the collector body.

NOTE: The supervisor shall ensure that containers of hazardous waste are transferred to a RCRA warehouse before the end of the shift

7.3.7 Notify the supervisor that containers are ready for transport.

NOTE: Acutely-hazardous waste shall be removed from the collector body within 90 days of completion of a task.

7.4 Handling Regulated Acutely-Hazardous Waste Material

7.4.1 Check the Supersucker collector body for material or residues.

NOTE: The supervisor shall direct that the collector body be cleane or to continue with the task.

7.4.1.1 If found, notify the supervisor.

7.4.2 Obtain the number of empty hazardous waste drums/containers specified b the supervisor.

NOTE: The supervisor shall contact the requestor to obtain container identification data.

7.4.3 Label the containers with information furnished by the supervisor.

7.0 PROCEDURE (cont.)

NOTE: The supervisor shall schedule the task so that containers of hazardous waste can be transferred to a RCRA warehouse before the end of the shift.

7.4.4 Begin operations with the Supersucker (Refer to SOP 43-C-414).

NOTE 1: After being emptied, the level of residues remaining shall not exceed one inch or 0.3%, by weight, of the capacity of the collector body.

NOTE 2: Usually, 0.3% of the capacity of the Supersucker collector body will equal 100 pounds of material, depending on the specific gravity.

7.4.5 When the tank is full or the job is completed, empty Supersucker collector body into the prepared containers (Refer to SOP 43-C-414).

NOTE: The supervisor shall specify action for removing additional material.

7.4.6 If the collector body cannot be emptied below 0.3% of capacity, notify the supervisor.

NOTE: The supervisor shall ensure that drums of hazardous waste are transferred to a RCRA warehouse before the end of the shift.

7.4.7 Notify the supervisor that containers are ready for transfer to stora

7.4.8 Using solvents furnished by the supervisor and process water, rinse and drain the collector body as follows:

7.4.8.1 Open the Tailgate per SOP 43-C-414.

7.4.8.2 If the collector body is to be entered, check that a "Confined Space Entry Permit" is posted.

7.4.8.3 Spray the solvent on the inside of the collector body.

7.4.8.4 Using a hose, rinse the solvent off the collector body walls.

7.4.8.5 Drain the collector body (per SOP 43-C-414) into containers that are labeled for the material.

7.4.8.6 Repeat 7.4.8.2 thru 7.4.8.4 two more times.

7.4.8.7 Close the Tailgate.

NOTE: The supervisor shall arrange to have the containers transported and stored in the same manner as the material that was picked up.

7.4.9 Notify the supervisor that rinsing is complete.

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7.0 PROCEDURE (cont.)

7.5 Handling Hazardous Material Spills

NOTE: The supervisor shall immediately report the incident to the AE by telephone (Ext. 6511) or by radio (202).

7.5.1 If a spill should occur during the operation of the Supersucker or transfer of hazardous waste or acutely hazardous waste, notify the supervisor or, in the supervisors absence, the AEDO.

7.5.2 At the supervisors direction, clean up the spill per SOP 20-C-606.

8.0 APPLICABLE FORMS

None

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
11-09-92	0	A procedure for using the "Supersucker" truck required per Request No. P92-208 initiated by J. Hensley.

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RADIOLOGICALLY NON-CONTAMINATED ASBESTOS CONTAINING MATERIAL WASTE (ACM) DISPOSITION

SSOP-0081

Effective Date: 09-03-92

AUTHORIZED BY: _____ 8/25/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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4.0 RESPONSIBILITIES (cont.)

Competent Person

- Ensures that ACM that is removed and placed in containers in accordance with this procedure has been verified by a radiological safety technician to meet the requirements of Section 7.1.
- Signs the appropriate log.
- Forwards all surveys for ACM waste generated in accordance with this procedure to the Asbestos Program Coordinator or his designee.

5.0 GENERAL

ACM waste created in radiologically non-contaminated areas on site has been considered radiologically contaminated waste. This policy was initiated because radiologically contaminated material has been found during past renovations in radiologically non-controlled areas.

The primary sources of ACMs in radiologically non-contaminated areas are found in air duct and pipe insulation, floor tile and floor tile mastic. Because the non-permeable lagging of pipe and duct insulation form a barrier preventing contamination of the internal ACM, external contamination surveys are sufficient to determine if this material is radiologically contaminated. This material shall be radiologically released in accordance with section 7.1 of this procedure. Floor tile and mastic material may be surveyed after removal in accordance with procedures for the radiological release of general construction waste.

This procedure is established to clarify site policy for the radiological unrestricted release of ACM and does not supersede the site "Radiological Controls Requirements Manual", RM-0009 or the "Unrestricted Release of Materials from FMPC", SP-P-35-010.

This procedure requires that the lagging around the ACM is impermeable and that there is no radioactive contamination beneath the lagging. This procedure is not to be used when ACM is suspected to have internal radiological contamination which cannot be verified by external radiological surveys. Some indications of internal ACM contamination exposure that should be evaluated by the radiological technician are:

- Areas where repairs were made and loose/fixed contamination was found in surrounding areas.
- Areas where lagging is porous or has signs of internal water damage.

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
09-03-92	0	Procedure required to establish new ACM Waste Disposition procedure. Per Request No. S92-178, initiated by L.W. Johns.

1.0 PURPOSE

To provide a protocol to permit disposition of Asbestos Containing Material (ACM) waste produced in a radiologically non-controlled area as non-radioactive.

2.0 SCOPE

This procedure is created to address the radiological concerns for transfer of radiologically non-contaminated ACM waste created in radiologically non-controlled areas at the Fernald Environmental Management Project (FEMP) to an approved final burial site. This would help minimize the burden of assumed radiologically contaminated ACM waste on site storage and reduce final disposition costs. This procedure does not supersede the material evaluation form procedure for characterizing waste.

3.0 DEFINITIONS

ACM - Asbestos Containing Material

Competent Person - Supervisor of an Asbestos Project, as defined by (7.0 OSHA) 29CFR1926.58.

Inaccessible Areas - Areas accessible to radiological contamination but where the material geometry does not permit a radiological contamination determination to be made.

Julian Calendar Date - A date format using four numbers the first number is the last digit of the year ie. for the year 1992 all the julian calendar dates for that year will begin with the number "2". The number for the year is followed by the number for that day during the year. For January 15, 1992 the julian calendar date is 2015.

Lagging - The cloth wrapping around insulating material used for protection, usually painted to make it nonporous.

Radiologically Controlled Area (RCA) - Any area to which access is controlled in order to protect individuals from exposure to radiation and radioactive materials.

Reusable Container - Locking waste receptacles that will be accessed more than once before container is full, i.e., ISO (sea/land), railroad car and dumpsters.

Serialized Seal - A uniquely numbered connecting device which once installed cannot be opened without breaking the device.

3.0 DEFINITIONS (cont.)

Single Use Containers - Locking waste receptacles that typically are filled on initial entry and are not expected to be opened again except perhaps on a final inspection prior to disposal, i.e., drums or metal boxes.

Unrestricted Release - A release of property (e.g., waste) based on a formal, documented decision reflecting DOE standards and associated implementing procedures that the property may be utilized, treated or disposed of by any party without concern to radioactive content.

4.0 RESPONSIBILITIES

Asbestos Program Coordinator

- Ensures that the requirements of this procedure are followed.
- Assigns responsibilities for maintaining the required lists/logs, such as:
  - Radiologically Non-Contaminated ACM Waste Log.
  - ACM Reusable Container Log.
  - ACM Reusable Container Location List.

Radiological Safety

- Evaluates lagging integrity with an asbestos hazard evaluation specialist, certified in the state of Ohio.
- Responsible for radiological surveys of ACMs.
- Ensures that the Competent Person understands the areas which are below the limits specified in Section 7.1 and any specific controls which will be required to insure survey integrity.
- Ensures that the ACM waste removed in accordance with this procedure meets the requirements of Section 7.1 prior to being loaded into its respective container.
- Provides the seals/locks to control access to containers.
- Has sole responsibility for keys to reusable containers.

Quality Assurance

- Provides audits and surveillance as necessary to ensure that the guidelines listed in this procedure are followed.

5.0 **GENERAL** (cont.)

- Insulation around radiologically contaminated system piping.
- Damaged lagging ends.
- Where process knowledge does not make it prudent to permit the ACM to meet the requirements in the "Unrestricted Release of Materials from FMPC", SP-P-35-010.

Floor tile and mastic ACM waste is characteristically non-porous material with no inaccessible areas after removal. These materials shall be radiologically characterized just prior to placing them in a container. If survey results on the floor tile exceed limits specified in "Unrestricted Release of Material from FMPC", SP-P-35-010 the floor tile shall be considered radiologically contaminated material.

6.0 **PREREQUISITES**

6.1 TOOLS AND SPECIFIC EQUIPMENT

Drums, containers, dumpsters, ISO (sea/land) containers as requi.

Keys/seals for drums

Appropriate lists and documentation.

7.0 **PROCEDURE**

7.1 GENERAL

RADIOLOGICAL TECHNICIAN

1. Survey ACM to be removed and record in accordance with the "Unrestricted Release of Materials from FEMP", SP-P-35-010.

2. Verify that ACM meets the standards of Section 7.1.

   NOTE: If the time between radiological survey and ACM removal is greater than 3 days, and it has been determined that not all the ACM in the area meets the requirements of section 7.1 step 3 (NOTE) the radiologically non-contaminated ACM will be marked in place using the Article Surveyed Tags (this tag may be found in SP-P-35-010).

7.1 GENERAL (cont.)

RADIOLOGICAL TECHNICIAN

3. Verify the integrity of the outer lagging.

   NOTE: If there is no indication that the internal insulation has been exposed to radioactive contamination (Section 5.0) and outer lagging radioactive contamination levels are less than those limits found in SP-P-35-010, the lagging and internal ACM will be considered radiologically non-contaminated.

COMPETENT PERSON

4. Locate ACM containers in a radiologically non-controlled area.

5. Sign the appropriate ACM Log (Figure 1 and 2) to verify that all material in the container was permitted to be radiologically released and that all line items are correct. This log shall be maintained by the Asbestos Program Coordinator or designated person.

6. Store filled radiologically non-contaminated ACM containers in a radiologically non-controlled area.

7. Provide a copy of the radiological contamination survey to the Asbestos Program Coordinator or designee after receiving survey from Radiological Technician.

RADIOLOGICAL TECHNICIAN

8. Install a serialized seal to prevent unauthorized opening of the container.

9. Provide the Competent Person with a written copy of the ACM radiological contamination survey.

10. Control access to reusable/single use containers.

ASBESTOS PROGRAM COORDINATOR

11. List and file a copy of the ACM radiological contamination survey received from the Competent Person.

12. Number the radiological contamination surveys, used to characterize ACM being stored in single use containers in sequential order.

7.1 GENERAL (cont.)

ASBESTOS PROGRAM COORDINATOR

13. Number the radiological contamination surveys used to characterize ACM being stored in reusable containers with the load number (#) followed by the sequential number (#) of the survey for that load.

    NOTE: Refer to 7.3 step 7 for instructions on how to determine the LOAD NUMBER (#).

7.2 SINGLE USE CONTAINERS

C IPETENT PERSON

1. Number single use containers in sequential order, starting with ASB-1.

2. Separate ACM which meets the standards of Section 7.1 from radiologically controlled waste and place in a lockable container.

3. Have a radiological technician present when con er is being filled, and if the container is to be reopened any reason.

4. When the container is full, have a radiological technician install a serialized seal to prevent unauthorized opening of the container.

5. Log seal serial numbers in the Radiologically Non-contaminated ACM Waste Log. (See figure 1).

   NOTE: Each line entry will also include: the DATE/TIME the container is filled, The identification number (#) of the survey used to determine if the ACM waste was is not radiologically contaminated, and the Radiological Technician responsible for installing the seal. It will be signed by the Competent Person, whose signature verifies that all material in the container was permitted to be radiologically released and that all line items are correct. This log shall be maintained by the Asbestos Program Coordinator or designated person.

   NOTE: If the container is opened in a radiologically non-controlled area the radiological technician is not required to perform a survey but is required to ensure that no radiologically contaminated materials have been introduced into the container.

RADIOLOGICALLY NON-CONTAMINATED ACM WASTE LOG

Date	Time	seal #	container #	Survey #	Name of Radiological Technician	Competent Person Signiture	Transferred to	Transferred from

Figure 1 - Radiologically Non-Contaminated ACM Waste Log

7.2 SINGLE USE CONTAINERS (cont.)

RADIOLOGICAL TECHNICIAN

6. Supervise the initial filling to ensure that no radiologically contaminated materials have been introduced into the container. Install a serialized seal to prevent unauthorized opening of the container.

7. Supervise any operations where containers are reopened by breaking old seal, verifying radiological controls while the drum is open, and installing a new serialized seal to prevent unauthorized opening of the container.

COMPETENT PERSON

8. Have a radiological technician present if container has to be reopened for any reason and make a new line entry in the radiologically non-contaminated ACM Waste Log. Enter the new seal number in the system administrator log "Transferred to" block, and enter a new line entry.

   NOTE: The new line entry shall contain the new seal number, the old seal number in the "Transferred from" block, the name of the radiological technician present when container was opened, and the signature of the person opening the container.

7.3 REUSABLE CONTAINERS

ASBESTOS PROGRAM COORDINATOR

1. Maintain a list of all reusable ACM containers on site in the ACM Reusable Container Location List (See figure 3). Sequentially number reusable ACM containers by general geographic location.

   NOTE: When an empty container is moved to a new general location, the next open consecutive number will be used to identify the container at this location.

2. Keep a separate "ACM Reusable Container Log" (See Figure 2) for each container load.

7.3 REUSABLE CONTAINERS (cont.)

RADIOLOGICAL TECHNICIAN

3. Ensure that reusable containers are locked at all times, except when entries are supervised by Radiological Safety.

   NOTE: Keys for all reusable containers will be kept by Radiological Safety.

COMPETENT PERSON

4. Label container, as specified by the Asbestos Program Coordinator, with "For Radiologically Non-contaminated Asbestos Containing Material Only - for entry contact Name/Phone" (list name/phone of designated person in charge of container). This identifies Radiologically Non-contaminated ACM only and the person responsible for information on the container.

ASBESTOS PROGRAM COORDINATOR (or designee)

5. Log the person responsible for each container in the ACM Reusable Container Location List.

6. Use a separate ACM Reusable Container Log for each container.

COMPETENT PERSON

7. List the Container number (1), and the Julian calendar date (2) that indicates when the container was last empty, at the top of the ACM Reusable Container Log (See figure 2) to individually identify each load. This new number (3) becomes the load number. (Load #_ _ - _ _ _ _)

8. Make a line entry, on the ACM Reusable Container Log, (See figure 2) each time material is placed in a container. The line entry shall include the date, time, number of bags to load in dumpster, survey number used to radiologically release the ACM, and the name of the radiological technician controlling access to the reusable container.

9. Sign the line entry when the bagged ACM is placed in the container. This signature is to verify that all material in the container was verified by a radiological technician to meet the requirements of Section 7.1, and all line entries are correct to the best of his/her knowledge.

ACM REUSABLE CONTAINER LOCATION LIST

Date	Container #	Person incharge of container	Name of Radiological Technician Controlling Keys	Location

Figure 2 - ACM Reusable Container Log

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ACM REUSABLE CONTAINER LOCATION LIST

Date	Container #	Person Incharge of container	Name of Radiological Technician Controlling Keys	Location

Figure 3 - ACM Reusable Container Location List

7.3 REUSABLE CONTAINERS (cont.)

COMPETENT PERSON

10. Ensure that the ACM Reusable Container Log includes a copy of the surveys for the ACM inside the container. The survey shall be numbered by load number - sequential survey number for this load.

    NOTE: For example, the survey number for the 3rd radiological survey for container number 1 with the last empty date of Feb 15. 1992 would be 01-2046-03.

11. Label each bag of ACM waste with the survey number used for ACM removal, and the date/time it was placed in the container.

12. Send the container log to the Asbestos Program Coordinator for review and storage, when the container is emptied.

COMPETENT PERSON

13. Complete a line entry, and sign the entry; if no waste is added when a reusable container is opened, the line entry will include time/date, reason for entry, and the name of the radiological technician present.

    NOTE: If a partially filled reusable container is moved to a new location, a line entry will be made in the Reusable ACM Container Log consisting of Time/Date and "Container moved to (location description)". The next time the container is emptied the log number for the new location will be used.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities"
- RM-0012, "Quality Assurance Program Description"

8.2 REFERENCES

- RM-0012, "Quality Assurance Program Description"
- RM-00009, "Radiological Controls Requirements Manual"
- SP-P-35-010, "Unrestricted Release of Materials from FMPC"

Safety Procedures	Title: Unrestricted Release of Materials from the FEMP	SP-P-35-010
		Department: IRS&T Section: RS

Authorization: S.G. Hunnefeld

Supersedes: None

Revision Date: 8/07/92

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1.0 PURPOSE

To assign responsibility and establish the procedure for the unrestricted release of materials from the FEMP.

2.0 SCOPE

This procedure establishes the requirements necessary for the unrestricted release of materials from the FEMP. This procedure does not apply to the release of liquids or bulk material such as soil and concrete.

3.0 DEFINITIONS

3.1 Material - An all inclusive term used to refer to building materials, tools, office equipment, etc.

4.0 RESPONSIBILITIES

4.1 The Manager(s) of personnel required to perform work per this procedure shall ensure that affected personnel are informed or trained to the extent necessary, prior to the initiation of that work.

4.2 Radiological Safety Technicians are responsible for performing all surveys required by this procedure.

5.0 GENERAL

5.1 The predominant radionuclides of concern at the FEMP are natural and low-enriched Uranium and their short-lived decay products. Contamination with thorium and radium is also possible in some areas such as the waste storage area and the Thorium storage warehouses.

5.0 GENERAL (continued)

5.2 Acceptable surface contamination levels for known radionuclides are set forth in Attachment A, "Surface Contamination Limits".

5.3 Surveys for removable contamination need not be performed when direct survey indicates contamination levels are below the removable contamination limits.

5.4 When U-238 is the isotope of concern direct beta surveys alone are acceptable for determining unrestricted release limits.

5.5 Contamination surveys may be performed with hand held instruments or automated equipment provided that the contamination limits given in Attachment A can be detected.

5.6 Liquids and bulk materials such as concrete and rubble can not be released as unrestricted per this procedure.

5.7 The Manager of Radiological Safety shall be contacted for "special case" items such as radium dial watches, thoriated camera lenses, etc..

6.0 PROCEDURE

6.1 Verify that survey equipment is in calibration and has been successfully source checked for the day.

6.2 Perform surveys per SP-P-35-023, "Radiological Contamination Surveys" or use automated contamination monitoring instruments such as tool monitors.

6.3 Materials with inaccessible surfaces which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for unrestricted release.

6.4 When material is surveyed for unrestricted release at locations other than Controlled area exits and meets applicable criteria, material identification and control shall be maintained as follows:

6.4.1 An Article Surveyed Tag, Attachment B, containing the following information shall be attached to the article or lot of articles surveyed.

6.4.1.1 Description of article(s).

6.4.1.2 Contamination levels.

6.4.1.3 Area from which the article was moved.

6.0 PROCEDURE (continued)

6.4.1.4 Name, printed and signature, of the RST performing the survey.

6.4.1.5 Date and time of survey.

6.5 If material is found to have removable contamination the following steps shall be taken:

6.5.1 Materials shall be bagged to minimize the potential of spreading contamination.

6.5.2 A tag with the words "Caution - Radioactive Material" (Attachment C) shall be secured to the bag indicating the type and level of contamination detected.

6.5.3 Material shall be transported to an appropriate area for decontamination or storage.

6.6 Materials shall be released from the FEMP only after survey results adequately demonstrate compliance with the release limits.

6.6.1 Material not released within eight hours or one work shift of the time of the previous survey shall be resurveyed unless the following conditions are met:

6.6.1.1 The material or articles must be placed in radiologically clean containers after the survey.

6.6.1.2 The containers must be sealed using a tamper proof seal with a unique identification number. Containers may be anything that prevents contamination such as drums, sealands etc..

6.6.1.3 The seal identification number shall be recorded on the survey form.

6.6.1.4 If the container is to be released with the materials inside, its external surface must be surveyed prior to release.

6.6.2 The RST stationed at the control point through which material is released may choose to resurvey material even though it has been previously surveyed within the prescribed time.

6.6.3 The control point RST shall remove any Article Surveyed Tags prior to release

7.0 APPLICABLE DOCUMENTS

7.1 SP-P-35-023, "Radiological Contamination Surveys".

7.2 DOE Order 5400.5, "Radiation Protection of the Public and Environment".

8.0 FORMS USED

8.1 Article Surveyed Tag, FMPC-IRS&T-1545.

8.2 "Caution - Radioactive Material" Tag.

9.0 ATTACHMENTS

9.1 Attachment A, "Surface Contamination Limits".

9.2 Attachment B, "Article Surveyed Tag".

9.3 Attachment C, "Caution - Radioactive Material" Tag.