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ANNUAL PROCEDURE UPDATE FOR SAFE SHUTDOWN PROGRAM, REMOVAL ACTION NUMBER 12 - VOLUME 1 OF 2

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Department of Energy
Fernald Environmental Management Project
P. O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 648-3155

JUN 14 1995

DOE-1074-95

~~Mr. James A. Saric, Remedial Project Director~~
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

ANNUAL PROCEDURE UPDATE FOR SAFE SHUTDOWN PROGRAM, REMOVAL ACTION NUMBER 12

This letter transmits a compilation of revisions to the originally submitted procedures, newly implemented procedures, and procedure update instructions for the Safe Shutdown Program. This documentation fulfills the requirement to provide annual updates by June 30, 1995, to the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) under the terms of the Amended Consent Agreement for Removal Action Number 12.

If there are any questions, please contact John H. Trygier at (513) 648-3154.

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Trygier

Enclosure: As Stated

Recycled and Recyclable

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SAFE SHUTDOWN REMOVAL ACTION NUMBER 12
ANNUAL SUBMITTAL OF WORK PROCEDURES, JUNE 30, 1995

INDEX OF DOCUMENTS

The attached two volume submittal "Documentation Supporting the Fernald Environmental Management Project (FEMP) Safe Shutdown Removal Action #12 Updated Documents Parts One and Two, June 30, 1995" is an **UPDATE** to the June 30, 1994 submittal of the same title. The two previously submitted June 30, 1994 volumes are to be retained and updated using the documents provided in this submittal. Four front and side binder identification pages are also being provided to correctly label the revised binders. They are located in the front binder cover of Volume 1. When updated, the result will be four binders containing uncontrolled copies of work procedures in the same order shown in this index of documents.

To update the June 30, 1994 submittal the following subsequent steps are to be performed:

1- Document identifications followed by an "asterix" (*) in this index are documents impacting the Safe Shutdown program but **excluded from this submittal**. They are available upon request. The documents have been excluded for either of the following reasons:
   a-have indirect impact on Safe Shutdown activities
   b-are single or multi-volume reference manuals of considerable size.

2- Document identifications followed by an "at" symbol (@) in this index are documents in which only the document number has changed since the June 30, 1994 submittal. FERMCO document numbers have been changed to reflect FERMCO functional area responsibilities. No other document revisions have been made to the documents. **The cover page showing the new document number is included** in this submittal and is to be attached to the front of the document in the June 30, 1994 submittal.

3- Document identifications followed by a "pound symbol" (#) in this index are documents in which no changes have been made since the June 30, 1994 submittal. **No new copies are included** in this submittal. Retain the June 30, 1994 submittal of these documents.

4- Document identifications **NOT followed by a symbol are the documents submitted** in this transmittal. They are either newly issued documents (issued later than the June 30, 1994 submittal) or are revisions of documents submitted in the June 30, 1994 submittal. These new and revised documents are to be added to the June 30, 1994 binders in the steps identified in this index, replacing the earlier revision copies as appropriate.

A. **Program Overview**

- Program Overview, Safe Shutdown Removal Action # 12
- Table 1 Annual Procedures Update, Safe Shutdown Removal Action 12, Fernald Environmental Management Project (FEMP), Revised 5/17/95 (replaces Table 1 submitted June 30, 1994)

B. **Enclosure**

I. **General Supporting Documentation**

- U.S. Department of Energy Order 5820.2A, Radioactive Waste Management *
- U.S. Department of Energy Radiological Control Manual DOE/EH-0256T *
- MS-08-1001, Fermco Site Document System (number changed from SSOP-0103, revised 10/14/94)
- PO-D-007, Document Periodic Review Program #
- ES&H-1-1000, Comprehensive Environmental Occupational Safety and Health Program (two volumes) *
- EM-0010, Event Notification and Occurrence Reporting (number changed from ED-0001, revised 5/15/95)
- RM-0021, Safety Performance Requirements Manual (replaced RM-0006 Industrial Safety) *
- RC-DPT-015, ALARA Review and Evaluation (revised 5/5/94)
- RM-2086, Chemical Hazard Communication Program Manual #
- RM-0002, Training Department Program Manual *
- RM-0007, FEMP Respiratory Protection Requirements Manual (revised 10/14/94)
- IM-7006, Incident Building Evacuation Manual *
- EM-0020, Building Emergency Procedure (number changed from SSOP-0077, revised 9/27/94)
- RM-0012, Quality Assurance Program Description Manual *
- QA-0002, Quality Assurance Project Plans (number changed from SSOP-0036) @

- OP-0003, Control of Processes (number changed from SSOP-0716) @
- QA-0006, Quality Improvement (number changed from SSOP-0082) @
- QA-0001, Processing Deviation and Corrective Action Reports (number changed from SSOP-0023, revised 2/16/95)
- SM-0005, FERMCO Operational Readiness Manual (revised 2/27/95)
- FMPC-2214, Environmental Restoration and Waste Management Site Specific Plan *
- Shutdown/Facility Acceptance and Criteria Plan (subtitled Transfer of the Feed Materials Production Center #
- IM-6001, Safe Shutdown Program Planning and Implementation Manual (revised 5/10/95 and replaces PO-D-028, Preparation and Implementation of Work Packages)
- EP-0004, Spill Incident Reporting and Clean-up (number changed from SSOP-0067 and EM-0018, revised 3/17/94)
- EW-0009, Control and Tracking of Chemical Substances (number changed from SSOP-0059) @
- PT-0003, Control and Movement of Containers at the FEMP (number changed from SSOP-0027, revised 3/18/95)
- RM-0005, FEMP Lot Marking and Color Coding System Manual #
- IM-6020, FEMP Nuclear Criticality Safety Guide (number changed from FMPC-2034, revised 10/25/94-small blue book located in the front binder cover of Volume 1)
- SOP-20-C-011, Physical Inventory of Nuclear Materials #
- D10-20-015, Timely Orders to Operators (number changed from PO-D-023, Shift Orders, revised 4/13/95)
- RM-0020, Radiological Control Requirements Manual (new submittal) *
- RP-0003, Performing Personnel Monitoring (new submittal)
- M-108, Safe Shutdown Program Manager's Standing Orders (new submittal)
- PT-0012, Shipment of Low Level Radioactive Waste Requirements *

- MS-0002, Records Management *
- MS-0003, Document Filing System *
- D10-00-002, Remedial Support Operations Lessons Learned Program *
- RC-RDA-009, Radiation Surveys *
- RC-DPT-022, Radiological Posting *
- RP-0009, Release of Materials from the FEMP *
- RC-DPT-009, Monitoring for Airborne Radioactive Materials *
- ~~RC-DPT-008, Radiation Work Permits *~~
- EW-0014, Managing PCB's and PCB Items
- SOP-20-C-711, HAKO Minuteman Portable Vacuum Cleaner Operation

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

- EW-0001, Initiating Waste Characterization Activities Using the Material Evaluation Form (MEF)(number changed from SSOP-0002) @
- EW-0005, Handling Containers of Unidentified Material (number changed from SSOP-0039 @
- SOP 20-C-625, Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment #
- Amended Consent Decree #
- SOP 20-C-806, Sampling Waste for Hazard Identification (number changed from SOP-20-C-805, revised 11/27/94 and replaces SOP 1-C-101)

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 Containers (revised 4/21/94)

- SOP 20-C-623 Receipt and Storage of Low Level Radioactive Waste and Nuclear Material (number changed from SOP-1-C-608, revised 2/6/95)
- 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 (revised 10/4/94)
- PT-0004, Packaging and Loading Radioactive Material For Offsite Shipment (number changed from SSOP-0060) @
- SR-2117 Nuclear Criticality Safety Requirements #
- SOP 20-C-017, Movement of Hazardous/Mixed Waste (revised 9/20/94)
- EW-0006, Management of Soil, Debris, and Waste from a Project (number changed from SSOP-0044) @
- SOP 20-C-604, Control and Utilization of Contaminated Trash Dumpsters (revised 5/4/94)
- SOP 2-C-923, Trash Baler Operation (revised 10/27/94)
- PO-SE-02, Materials Control and Accountability (replaces PO-0307, Control and Accountability of Nuclear Materials)

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

- MT-0003, FEMP Work Request/Order Procedure (number changed from SSOP-0061) @

- OP-0004, FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure (number changed from SSOP-0719, revised 3/20/95)
- SSOP-0069, Freon Management *
- D10-05-001, Safe Shutdown Program Energy Isolation Procedure (new submittal)

Step 5. Prepare Safety Documentation

- CRU3-HSP-1036, Safe Shutdown Health and Safety Program (revised 4/95)
- SOP 20-C-609, Inspection of Safety Harnesses and Lanyards (new submittal)
- SOP 20-C-611, Assembly/Disassembly of Scaffolding (new submittal)
- NS-0001, Criticality Safety Analysis Approval Process (new submittal)
- SPR 2-7, Safety Performance Requirements-Job Safety Analysis (new submittal)
- RM-2116, Safety Analysis Program Requirements (replaces FMPC-508, Safety Analysis Documentation Program)

Step 6. Prepare NEPA Documentation

- EP-0001, National Environmental Policy Act (NEPA) Document Process (number changed from SSOP-0031) @

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

- SPR 2-8, Work Permits (replaces FMPC-516, Control of Permits for Accomplishing Hazardous Work)
- SPR 5-13, Permit-Required Confined Space Program (revised Rev 3)
- RC-DPT-008, Radiation Work Permits #
- EW-0018, Management of Low Level Waste (LLW) (number changed from PP-FMPC-5010) @
- SOP 20-C-606, Hazardous Material Spill Clean-up (revised 1/27/95)

- EW-0004, Satellite Accumulation Areas for Hazardous Wastes (number changed from SSOP-0035, revised 2/15/95)
- SOP 20-C-500, Inspecting RCRA Waste Load/Unload and Staging Areas (revised 9/7/94)
- PT-0002, Packaging and Transferring Uncharacterized Waste to the Controlled Holding Area (number changed from SSOP-0008) @
- OP-0002, Controlling Portable HEPA Filtration Devices (HFDs) (number changed from SSOP-0028, revised 6/2/94)
- SOP 20-C-700, NORCLEAN Portable Vacuum Operation #
- SOP 20-C-701, Operation of Spencer & Hoffman Portable Dust Collectors #
- SOP 20-C-014, Wet and Dry Systems Clean-out #
- PT-0005, Packaging Low Level Radioactive Waste (LLRW) in Drums for Shipment to the Nevada Test Site (number changed from SSOP-0075, revised 3/30/95)
- PT-0006, Packaging Low Level Radioactive Waste (LLRW) into ISO Containers for Shipment to the Nevada Test Site (number changed from SSOP-0078, revised 3/30/95)
- PT-0007, Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Shipment to the Nevada Test Site (number changed from SSOP-0079, revised 3/30/95)
- PT-0008, Packaging, On-Site Movement and Off-Site Shipment of Material (number changed from PP-0314)
- SOP 2-C-601, Refinery Sump (revised 2/10/94)
- SOP 8-C-608, East EIMCO Filter Operation (replaces SOP 8-C-605)
- SOP 8-C-609, West EIMCO Filter Operation (new submittal)
- PT-0001, Receiving, On-Site Movement and Off-Site Shipment of Nonradioactive Hazardous Material (number changed from SSOP-0003) @
- EW-0012, Tank/Sump Contents Removal (new submittal)
- EW-0013, Tank/Sump Removal or Abandonment (new submittal)

Step 8. Control Loose Contamination

- 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 (revised 2/24/95)
- 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-Surplus Property Disposition

- PM-0001, Management of Government Property (number changed from SSOP-1044, revised 3/24/95)
- EW-0003, Nuclear Materials Disposition Order Management (number changed from SSOP-0034, revised 6/10/94)
- PO-D-035, Shipment of Low Level Radioactive Waste Requirements #
- SP-P-35-010, Unrestricted Release of Materials from FMPC #
- SP-P-35-023, Routine Radiological Contamination Surveys #
- OP-0005, Disposition of Safe Shutdown Excess Personal Property (new submittal)

C. Cancelled Procedures

The following Fernald Site Operating Procedures submitted in the June 30, 1994 Submittal of Work Procedures have been cancelled. A replacement document, if issued, has been identified.

- RM-0006, Industrial Safety (remove from General Supporting Documentation section, replaced by RM-0021, Safety Performance Requirements Manual)
- SOP 1-C-101, Sampling Residual and Waste Materials (remove from step 2, replaced by SOP 20-C-806, Sampling Drummed Waste for Hazard Identification)

- PO-0307, Control and Accountability of Nuclear Materials (remove from step 3, replaced by PO-SE-02, Materials Control and Accountability)

- FMPC-508, Safety Analysis Documentation Program (remove from step 5, replaced by RM-2116)

- PO-0712, Risk Assessment and Management (RAM) System Policy (remove from step 5, replaced by NS-0001, Criticality Safety Analysis Approval Process, no replacement issued)

- SM-0001, Risk Assessment and Management (RAM) System Manual (remove from step 5, replaced by NS-0001, Criticality Safety Analysis Approval Process, no replacement issued)

- ~~SSOP-0014, Documentation of a Subject Matter Expert (remove from~~ step 5, no replacement document issued)

- PO-0518, National Environmental Policy Act (NEPA) Program (remove from step 6, no replacement issued-material covered in EP-0001, National Environmental Policy Act Document Process)

- PO-D-028, Preparation and Implementation of Work Package (remove from step 7, replaced by IM-6001, Safe Shutdown Program Planning and Implementation Manual)

- FMPC-516, Control of Permits for Handling Hazardous Work (remove from step 7 replaced by SPR-2-8, Work Permits

- Task Specific Health & Safety Plan for Decontamination of Various Areas of Existing Fixed or Removal Contamination, June 5, 1991 (remove from step 8, there is no longer a generic Decontamination plan. It is replaced by project specific work instructions provided in project specific work plans)

- SSOP-0081, Radiologically Non-Contaminated Asbestos Containing Material Waste (ACM) Disposition (remove from step 8, not replaced)

Revision 1
Internal Special

- 6943

Fernald
Environmental
Management
Project

Nuclear Criticality Safety Guide

October 25, 1994
revised by:
Safety Analysis / Nuclear Safety

prepared for:
U.S. Department of Energy
Fernald Office
Contract DE-AC05-920R21972

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Revision 1
Internal Special

FEMP
NUCLEAR CRITICALITY
SAFETY GUIDE

Revised By
Safety Analysis/Nuclear Safety

October 25, 1994

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD ENVIRONMENTAL
RESTORATION MANAGEMENT
CORPORATION

P. O. Box 538704
Cincinnati, Ohio 45253-8704

Prepared for the
U.S. Department of Energy
Fernald Office
Under Contract DE-AC05-92OR21972

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INTRODUCTION

This guide was prepared as a reference for those having responsibility for handling, processing, storing, and transporting enriched uranium. The limits listed in this guide are intended primarily for planning as a guide in the preparation and review of operating procedures. **It should be emphasized that this booklet should not, nor is it intended to, be used in place of operating procedures.**

Many of the remediation activities at the FEMP have the possibility of involving considerable moderation and reflection. Because of this, the limits provided in this booklet have already taken optimum conditions of water moderation and reflection into account.

In order to permit the least restrictive controls possible, yet maintain safety, the tables in this guide are categorized into groups depending upon the physical form of the uranium, i.e., a small or large piece of metal or a high or low density compound. Table A provides the form groups and their corresponding table to be used for the various uranium forms.

Depending on the form of the material, uranium may be kept safely subcritical by limiting one of the following factors:

1. MASS - The weight of uranium in any type of material.

2. **GEOMETRY** -

   A. **Slab Thickness** (Height) - The thickness/height of a container or an array of containers regard less of length or width.

   B. **Cylinder Diameter** - The inside diameter of a cylinder of any length.

   C. **Volume** - The inside volume/capacity of any drum, can, equipment, etc., which contains uranium in any form.

3. **CONCENTRATION** or **DENSITY** - Weight per unit volume of uranium in a material (g/l, lbs/gallon)

4. **MASS/UNIT AREA** - Weight of uranium per unit area, with the uranium being evenly distributed over the area (lbs/ft^2)

In all cases, only one limit needs to be followed; you don't have to put a safe mass of material into a safe cylinder (example: there would be no mass limit on 4.5% UO_2 pellets stored in a six-inch diameter container.) Proper spacing requirements, however, must be followed at all times. Spacing requirements, along with drum color codes and other important information, are listed in Appendix I, "General Nuclear Criticality Safety Requirements."

TABLE A - Uranium Form Group and Its Corresponding Table

Uranium Form	Group	Table	Examples of Material
Small dimension metal	I	I	Cores and chips
Large dimension metal	II	IIA & IIB	Derbies, billets, and ingots
High density compounds (≤5.0% U-235)	III	III	UO_3, UF_4, U_3O_8
High density compounds (>5.0% and ≤20.0% U-235)	III	V	UO_3, UF_4, U_3O_8
Low density compounds, solutions, and mixtures	IV	IV	Contaminated materials such as MgF_2 liner, coolant, and sump cake

TABLE I - Safe Limits for Uranium Metal - Group I

These values are applicable to any uranium material, but most especially to small dimension (<1 in.) metal and other heterogeneous materials (e.g., UO_2 pellets).

%U-235	MASS (lb)	SLAB THICKNESS (in.)	CYLINDER DIAMETER (in.)	VOLUME		MASS/UNIT AREA (lb/ft^2)
				(ft^3)	(gal.)	
0.86	5100	20.0	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

TABLE IIA - Safe Mass Limits (lb. U) for Uranium Metal Pieces - Group II

% U-235	Smallest Dimension (in.) of Solid Piece or Wall Thickness of Hollow Cylinder*						
	≥1	≥1.5	≥2	≥2.5	≥3	≥3.5	≥4
0.95	3050	5200	12800	41500	200000	∞	–
1.0	2360	3390	5400	11700	40000	∞	–
1.1	1600	2200	3400	5300	9100	16000	24000
1.2	1200	1600	2500	3650	5260	7300	9560
1.25	1040	1470	2250	3300	4350	5870	7450
1.3	910	1300	2000	2800	3870	4900	6080
1.4	730	1080	1600	2260	3000	3800	4650
1.5	600	930	1390	1900	2500	3130	3740
1.6	520	800	1190	1630	2100	2600	3130
1.7	440	700	1040	1400	1800	2260	2700
1.8	400	630	930	1260	1600	2000	2340
1.9	360	565	830	1130	1430	1780	2080
1.95	340	540	790	1070	1350	1670	1990
2.0	330	525	760	1020	1300	1600	1870
2.1	300	480	695	935	1180	1450	1720
2.5	230	360	520	690	870	1070	1270
3.0	180	285	410	540	675	830	100
3.5	155	245	350	460	570	700	850
4.0	140	225	320	420	510	635	750
4.5	135	210	300	390	475	585	700
5.0	130	200	285	375	455	560	655

* Values in this table may be applied to hollow metal cylinders by using the wall thickness (OD-ID)/2 as the "smallest dimension".

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TABLE IIA - (Continued)

Smallest Dimension (in.) of Solid Piece or Wall Thickness of Hollow Cylinder*								% U-235
≥5	≥6	≥7	≥8	≥9	≥10	≥11	≥12	
–	–	–	–	–	–	–	–	0.95
–	–	–	–	–	–	–	–	1.0
∞	–	–	–	–	–	–	–	1.1
14300	17400	43500	∞	–	–	–	–	1.2
10400	12200	14300	18200	∞	–	–	–	1.25
8260	10000	11300	13000	14300	∞	–	–	1.3
6080	7390	8700	9780	10800	11700	12400	14300	1.4
4870	6000	6950	7950	8870	9900	10600	11100	1.5
4060	4950	5870	6740	7430	8430	9130	9560	1.6
3470	4260	5040	5740	6520	7400	8000	8600	1.7
3040	3740	4390	5130	5700	6520	7130	7650	1.8
2700	3300	3950	4520	5130	5780	6430	6900	1.9
2600	3170	3740	4345	4870	5565	6174	6565	1.95
2450	3020	3600	4170	4750	5320	5900	6470	2.0
2240	2760	3260	3780	4300	4820	5300	5780	2.1
1650	2040	2430	2820	3200	3630	4040	4780	2.5
1300	1600	1900	2200	2520	2850	3150	3470	3.0
1100	1390	1640	1900	2170	2400	2650	2950	3.5
980	1220	1450	1670	1900	2130	2340	2600	4.0
900	1120	1300	1520	1740	1920	2130	2340	4.5
850	1040	1230	1420	1600	1800	2000	2180	5.0

TABLE IIB - Safe Slab Limits for Uranium Metal Pieces - Group II

% U-235	Smallest Dimension (in.) of Solid Piece or Wall Thickness of Hollow Cylinder*							
	≥1	≥1.5	≥2	≥2.5	≥3	≥3.5	≥4	≥5
0.95	12.5	15.5	22.0	33.5	58.0	∞	–	–
1.0	11.5	14.5	20.0	29.0	47.5	∞	–	–
1.1	10.0	12.5	16.0	23.0	32.0	46.0	65.0	∞
1.2	9.0	11.0	13.5	17.5	24.5	30.5	38.5	52.0
1.25	8.5	10.5	13.0	17.0	22.0	27.0	32.0	41.5
1.3	8.0	10.0	12.0	15.0	20.0	24.5	28.5	36.0
1.4	7.5	9.0	11.0	13.5	16.5	19.5	23.0	28.0
1.5	7.0	8.5	10.0	12.0	14.5	16.5	19.0	23.5
1.6	6.5	7.5	9.0	11.0	13.0	14.5	16.5	20.0
1.7	6.0	7.5	8.5	10.0	11.5	13.0	15.0	17.5
1.8	6.0	7.0	8.0	9.5	10.5	12.0	13.5	16.0
1.9	5.5	6.5	7.5	8.5	10.0	11.0	12.5	14.5
1.95	5.5	6.5	7.5	8.5	9.5	11.0	12.0	14.5
2.0	5.5	6.5	7.5	8.5	9.5	10.5	11.5	14.0
2.1	5.0	6.0	7.0	8.0	9.0	10.0	11.0	13.0
2.5	4.5	5.5	6.0	7.0	8.0	8.5	9.5	11.0
3.0	4.0	5.0	5.5	6.5	7.0	7.5	8.5	10.0
3.5	4.0	4.5	5.5	6.0	6.5	7.5	8.0	9.5
4.0	4.0	4.5	5.0	5.5	6.5	7.0	7.5	9.0
4.5	3.5	4.5	5.0	5.5	6.0	7.0	7.5	9.0
5.0	3.5	4.0	5.0	5.5	6.0	7.0	7.5	9.0

* Values in this table may be applied to hollow metal cylinders by using the wall thickness (OD-ID)/2 as the "smallest dimension."

TABLE IIB - (Continued)

Smallest Dimension (in.) of Solid Piece or Wall Thickness of Hollow Cylinder*							% U-235
≥6	≥7	≥8	≥9	≥10	≥11	≥12	
–	–	–	–	–	–	–	0.95
–	–	–	–	–	–	–	1.0
–	–	–	–	–	–	–	1.1
71.5	385.0	∞	–	–	–	–	1.2
55.0	77.0	300.0	∞	–	–	–	1.25
46.0	57.5	72.0	230.0	∞	–	–	1.3
34.5	42.0	50.0	54.5	64.5	72.0	150.0	1.4
28.5	33.5	39.0	42.0	47.5	53.0	58.0	1.5
24.0	28.5	32.0	35.0	39.0	43.0	47.0	1.6
21.0	24.5	28.0	30.0	33.5	36.5	40.0	1.7
19.0	21.5	24.5	26.5	30.0	32.0	35.0	1.8
17.0	20.0	22.0	24.5	27.0	29.0	32.0	1.9
16.5	19.0	21.5	23.5	26.0	28.5	30.5	1.95
16.0	18.5	20.5	23.0	25.0	27.5	29.5	2.0
15.0	17.0	19.0	21.0	23.5	25.0	27.5	2.1
12.5	14.5	16.0	17.5	19.5	21.5	23.0	2.5
11.5	13.0	14.5	16.0	17.5	19.0	20.5	3.0
11.0	12.5	14.0	15.5	17.0	18.5	20.0	3.5
10.5	12.0	13.5	15.0	16.5	18.0	19.5	4.0
10.5	12.0	13.5	14.5	16.0	17.5	19.0	4.5
10.5	12.0	13.0	14.5	16.0	17.5	19.0	5.0

TABLE III - Safe Limits for Uranium Compounds (≤5.0% U-235) - Group III

These values apply to homogeneous compounds and aqueous solutions. For purposes of classifying, this includes all materials having a uranium density less than 200 lb/ft^3 and containing less than 10% by weight free uranium metal.

% U-235	MASS (lbs U)	SLAB THICKNESS (in.)	CYLINDER DIAMETER (in.)	VOLUME	
				(ft^3)	(gal.)
<1.0	∞	∞	∞	∞	∞
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	18.8	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	16.5	4.1	30
2.0	252	8.75	16.3	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
4.0	52	5.5	11.5	1.2	9.0
4.5	43	5.25	10.9	1.1	7.9
5.0	36	5.0	10.4	0.95	7.1

TABLE IV - Safe Density and Concentration Limits - Group IV

Homogeneous uranium solutions, compounds and mixtures having concentrations or densities equal to or less than the values below may be handled and stored in unlimited quantities.

% U-235	Maximum Safe U Density and Solution Concentration		
	lb. U/ft3	g U/l	lb. U/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	384	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	0.76
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

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TABLE V - Safe Limits for Higher Enrichment Uranium Compounds - Group III

These values are applicable to any uranium material, at the specified enrichments, but most especially to homogeneous compounds and aqueous solutions.

% U-235	MASS (lb. U)	SLAB THICKNESS (in.)	CYLINDER DIAMETER (in.)	VOLUME	
				(ft^3)	(gal.)
5.5	31				
6.0	27	4.5	9.6	0.72	5.4
6.5	24				
7.0	22				
7.5	19				
8.0	18	3.9	8.7	0.56	4.2
8.5	16				
9.0	15				
9.5	14				
10.0	13	3.6	8.2	0.49	3.7
11.0	10.5				
12.0	8.7	3.4	7.9	0.45	3.3
13.0	7.0				
14.0	6.2				
15.0	5.2	3.0	7.5	0.41	2.9
16.0	4.6				
17.0	4.1				
18.0	3.4	2.8	7.1	0.37	2.7
19.0	3.3				
20.0	3.0	2.6	6.8	0.34	2.5

APPENDIX I - General Nuclear Criticality Safety Requirements

NOTE: The following information can also be found in SOP 20-C-904, "General Nuclear Safety Requirements."

1. Spacing Requirements

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.

1.1 Spacing between a container, mass, or material stored as a safe grouping and other material shall be per Table 1.

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
Non-uranium-bearing material (including walls or barriers)	1 foot

1.2 Spacing between uranium-bearing material stored as unlimited and other material shall be per Table 2.

TABLE 2 - UNLIMITED GROUP SPACING

DESCRIPTION	MINIMUM ISOLATION DISTANCE
Material stored as a safe group	2 feet
Non-uranium-bearing material	1 foot

1.3 Spacing requirements of Items 1.1 and 1.2 shall be adhered to unless specific spacing is given in the process procedure, Criticality Safety Analysis, or Nuclear Safety Operational Authorization.

1.4 Aisles shall be eight feet in width to allow room for operation of material handling equipment.

2. Container and Material Identification

NOTE: Material identification is essential to ensure that the nuclear safety restrictions for handling and storing are being followed.

2.1 Containers filled with uranium-bearing material shall be color-coded (refer to Item 3) prior to use and premarked with percent enrichment, material codes, and a tare weight of the container.

2.1.1 Filled containers shall be marked with gross and net weights.

2.2 Non-uranium-bearing materials shall be contained in solid black cans or drums.

2.2.1 The containers shall have a description of the material stenciled on the side.

2.2.2 A generic stencil "No Fissile Material" may be used.

2.3 Empty containers shall have the material code, enrichment, and weights marked out, unless otherwise specified in another procedure.

3. Color Coding

NOTE: The color coding system ensures safe transport and storage or uranium-bearing materials by reducing the possibility of intermixing enrichments. The enrichment is the percent of U-235 in an amount of uranium.

3.1 Drum and/or can color coding shall be in accordance with Table 3.

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	Red	None	White
Waste Shipments	White	None	Black
Thorium	White or Black	Blue	Black or White
(1) Six-inch diameter bare aluminum cans marked per Item 2.1 shall be handled one at a time and stored according to the spacing requirements in Item 1.			

3.2 The enrichment of uranium metal on skids shall be identified by attaching a color-coded card to the skid. Table 4 identifies the color coding for cards.

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.	

4. Handling Requirements for Solid Red Containers

NOTE: Solid red drums/cans shall be handled with care.

4.1 30- and/or 85-gallon solid red drums shall not be stacked.

4.2 5-gallon and 10-gallon red cans may be stacked two high when permitted by
SOP 20-C-801.

4.3 Small containers shall not be stacked on top of 30- and/or 85-gallon drums.

4.4 Solid red drums/cans shall be used for enriched uranium material requiring special Nuclear Safety Restrictions.

4.4.1 Trash or non-uranium-bearing material shall not be placed in solid red drums/cans.

4.4.2 Empty solid red drums/cans shall be stored in accordance with industrial safety limits. Red containers shall not be used as safety barriers or for any purpose other than the intended use.

5. Equipment Identification

5.1 Process equipment shall be marked with color coded cards showing the enrichment of the uranium currently being processed. (See Table 4)

6. Handling Material of Unknown Enrichment

6.1 Uranium of unknown enrichment shall be handled with the proper nuclear safety restrictions for the highest possible enrichment until analyzed. (e.g. safe mass, concentration, geometry, etc.). The highest possible enrichment will be determined based on past process history and/or the origin of the material.

6.1.1 After analysis, the material shall be remarked and handled according to the limits for the actual enrichment.

6.1.2 Any material or equipment which has come into contact with uranium must be assumed to contain uranium.

7. Storing and Posting Requirement

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.

7.1.1 Signs posted in storage areas shall be in plain view. The signs shall identify the material that may be stored in the area and the limits.

7.2 Material with an enrichment greater than 2.1% U-235 shall be stored in areas surrounded by supporting chains. Standard signs or cards shall be hung on the chains or on the stanchions to mark the area. The signs or cards shall be clearly marked with the maximum enrichment of the stored material. Skid loaded containers shall be placed with markings outward.

7.3 Materials with an enrichment equal to, or greater than, 5% shall be stored indoors.

7.4 Process equipment and operator stations shall be posted with the nuclear safety limits and restrictions for the process.

8. Interplant Shipments

8.1 Shipments shall be per SOP 20-C-100.

9. Isotopic Changeover, Cleanup, and Inspection

9.1 Refer to the SOP pertaining to the appropriate plant.

REFERENCES

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The tables in this revision were checked against the following references.

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TABLE I - SAFE MASS AND GEOMETRY LIMITS

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TABLE I - SAFE MASS/UNIT AREA LIMITS

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TABLES IIA AND IIB

N. Ketzlach, Nuclear Safety of Iron-Encased Fuel Elements, Report HW-56423, June 1958.

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TABLE V

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SAFE SHUTDOWN REMOVAL ACTION NUMBER 12
ANNUAL SUBMITTAL OF WORK PROCEDURES, JUNE 30, 1995

PROGRAM OVERVIEW

The Safe Shutdown mission at the Fernald Environmental Management Project is to mitigate a hazard to the environment by removing nuclear and hazardous holdup material from the former Uranium Processing facilities on site. This is accomplished by the removal of bulk material from equipment, pipes, ducts and tanks and the subsequent appropriate packaging and storage of that material. Additionally, the deenergization of the facilities is accomplished by termination of all utility feeds, including electrical, water, steam, compressed air and other gases, and hydraulic systems. A gross decontamination of equipment and the interior of each facility is performed as well. The effort will ensure that further onsite contamination, and the effect to the environment from these facilities will be minimized.

The following is a brief description of the planned second half 1994 and 1995 ongoing activities in the Safe Shutdown Program:

Plant 4
Plant 4 Safe Shutdown field activities commenced in August 1994 for a duration of 8 months. During this time:

- -174 equipment task orders were completed resulting in the removal of 14,718 pounds of holdup material
- -461 utility disconnects were completed
- -salvageable and stored equipment was removed to an alternate storage location on site
- -1650 drums of enriched restricted material were removed to an alternate storage location on site
- -conducted Non Destructive Assay (NDA) scans and surveys and visual inspections for final verification of holdup removal
- -no lost time due to injuries occurred

Plant 4 was placed into Safe Shutdown configuration on March 31, 1995. A Facility Turnover method was developed to document the transfer through a formal transfer letter, visual inspections and 4 video taped tours during the final two months of work. A turnover information binder containing an annotated equipment data base, drawings, radiological and NDA survey data, and a facility status summary documented the facility status at the time of turnover.

Plant 1
Removal activities were initiated in April 1995, are currently in progress, and are planned for completion in late July 1995. Holdup removal in the facility is underway. Relocation of enriched restricted material is planned for June 1995.

Pilot Plant
Pilot Plant work activities were initiated in April 1995, are currently in progress and are planned for completion in the first quarter of 1996. To date, a radiological control point including a dressout area has been established, utility disconnects are in progress and the relocation of enriched restricted material stored in the Pilot Plant has begun.

Plant 9
Initiated work planning activities in Plant 9 in Mid March 1995. Relocation of an operating construction shop and the DOE owned Minimum Additive Waste Stabilization (MAWS) equipment are necessary before removal activities can commence. Plant 9 currently feeds electric power to outlying facilities and trailers. Termination of non-critical utilities is required for the initiation of removal activity, and will result in power redistribution to the outlying areas.

Select utility disconnects are to commence in Late June 1995 with holdup removal to commence by August 1995. Plant 9 holdup removal activities are planned to complete in the first quarter of 1996.

Plant 5
Initiated work planning activities in Plant 5 in May 1995. Options are currently being evaluated for the relocation of enriched restricted material stored in Plant 5. Initiation of removal activities are planned for the 4th quarter of 1995 with removal of holdup taking the majority of the effort for the following 20 months.

ANNUAL PROCEDURES UPDATE, SAFE SHUTDOWN REMOVAL ACTION 12, FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)
TABLE 1 REVISED 5/17/95

STEP	REGULATION/PROCEDURE	COMMENTS
General Supporting Documentation	U.S. Department of Energy Order 5820.2A, Radioactive Waste Management *	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.
	MS-08-1001, Fermco Site Document System	This procedure establishes the document control system by which Fernald Environmental Restoration Management Company (FERMCO) develops, processes, and controls 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.
	ES&H-1-1000, Comprehensive Environmental Occupational Safety & Health Program *	This site plan provides the overall means for planning and implementing the job site characterization, health and safety training, and job orientation for personnel.
	EM-0010, Event Notification and Occurrence Reporting	This procedure establishes the requirements for evaluating and reporting all reportable events and emergency events at or involving the FEMP.
	RM-0021, Safety Performance Requirements Manual *	This requirements manual specifies the Occupational Safety and Health Program that applies to all activities at the FEMP,
	RC-DPT-015, ALARA Review and Evaluation	This procedure establishes the process for conducting an as-low-as-reasonably-achievable (ALARA) review and evaluation of work activities performed at the FEMP.
	RM-2086, Chemical Hazard Communication Program	The purpose of this manual is to provide information that will increase knowledge of work place chemical hazards, promote an understanding of the Hazard Communication Program at the FEMP, and encourage personnel to comply with OSHA requirements.
	RM-0002, Training Department 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 Supporting Documentation 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.
	EM-0020, 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 Manual *	This document establishes the QA requirements for FERMCO and all other contractor and subcontractor organizations performing work at the FEMP.
	QA-0002, Quality Assurance Project Plans	This procedure assigns responsibilities and identifies the requirements for developing Quality Assurance Project Plans for FERMCO data generating activities. The Amended Consent Agreement establishes the need for quality assurance plans in accordance with EPA requirements.
	OP-0003, 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.
	QA-0006, 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.
	QA-0001, Processing Deviation and Corrective Action Reports	This procedure describes the process for the identification, response, evaluation, and resolution of deviations and corrective actions required at the FEMP.
	SM-0005, FERMCO Operational Readiness Manual	This systems manual establishes conditions and/or requirements to be used by the Fernald Environmental Restoration Management Corporation (FERMCO) for implementing a Readiness Review (RR) process. This manual 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.

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STEP	REGULATION/PROCEDURE	COMMENTS
General Supporting Documentation Continued	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.
	IM-6001, Safe Shutdown Program Planning and Implementation Manual	This document is an information manual that describes the safe shutdown program planning aspects to the actual implementation of field activities.
	EP-0004, 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 state and federal regulations and laws.
	EW-0009, 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.
	PT-0003, Control and Movement of Containers at the FEMP	This procedure 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 Manual	This requirement manual details identification markings for containers of material on-site at the FEMP.
	IM-6020, FEMP Nuclear Criticality Safety Guide	This guide is a reference for those having responsibility for handling, processing, storing, and transporting enriched uranium.
	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.
	D10-20-015, Timely Orders to Operators	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.
	RM-0020, Radiological Control Requirements Manual	This requirements manual specifies the radiological protection program applying to all activities at the FEMP.
	RP-0003, Performing Personnel Monitoring	This procedure provides the instruction for methods and actions to be taken by personnel who monitor themselves upon exiting any radiologically controlled area at the FEMP.

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STEP	REGULATION/PROCEDURE	COMMENTS
General Supporting Documentation Continued	M-108, Safe Shutdown Program Manager's Standing Orders	This document provides the specific requirements and guidelines for all workers to follow for the safe conduct of Safe Shutdown field activities.
	PT-0012, Shipment of Low Level Radioactive Waste Requirements	This document defines the requirements for off-site shipment of Low Level Radioactive waste at the FEMP.
	MS-0002, Records Management	This procedure provides instructions for creating, receiving, utilizing, distributing, maintaining, storing and disposing of records at the FEMP.
	MS-0003, Document Filing System	This procedure is a tool for maintaining and retrieving records.
	D-10-00-002, Remedial Support Operations Lessons Learned Program	The purpose of this procedure is to establish the Remedial Support Operations Lessons Learned program and to apply the lessons learned information obtained from projects occurring at the FEMP, other DOE facilities, DOE publications, Site Wide Lessons Learned program and Occurrence Reporting program to Remedial Support operations.
	RC-RDA-009, Radiation Surveys	This procedure assigns responsibilities and establishes the requirements for the performance of routine radiation surveys in accordance with FEMP and DOE guidelines.
	RC-DPT-022, Radiological Posting	This procedure establishes a method for posting radiologically controlled areas at the FEMP in accordance with 10 CFR 835.
	RP-0009, Release of Materials from the FEMP	This procedure discusses the release of material for unrestricted use as well as restricted release of material for items which are maintained under FEMP administrative control.
	RC-DPT-009, Monitoring for Airborne Radioactive Materials	This procedure establishes the methods for monitoring airborne radioactive material concentrations by retrospective air sampling techniques.
	RC-DPT-008, Radiation Work Permits	This procedure establishes methods for completing, issuing and controlling Radiological Work Permits at the FEMP.
	EW-0014, Managing PCB's and PCB Items	This procedure provides the instructions for managing Polychlorinated Biphenys (PCB's) and PCB items at the FEMP.
	SOP 20-C-711, HAKO MINUTEMAN Portable Vacuum Cleaner Operation	This procedure provides the instructions for operating the vacuum used in removing material including mercury. (Mercury is not removed by Safe Shutdown personnel)

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STEP	REGULATION/PROCEDURE	COMMENTS
Step 1 Preliminary Assessment of Process Facilities	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 materials and information on factors that could influence the selection of decommissioning alternatives.
Step 2 Characterize Process Equipment and Hold-up Materials	EW-0001, Initiating Waste Characterization Activities Using the Material Evaluation Form (MEF)	This site standard operating procedure provides guidance for the proper completion of the Material Evaluation Form in order to classify substances or material.
	EW-0005, Handling Containers of Unidentified Material	The purpose of this document is to provide instruction for the processing of unidentified or mislabeled containers of material/substance.
	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 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 20-C-806, Sampling Waste for Hazard Identification	The purpose of this document is to establish the procedure for sampling drummed waste.
Step 3 Transfer of Existing Inventories of Chemicals, Materials, and Uranium Materials from Process Buildings to Approved Storage Locations	SOP 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.
	SOP 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.
	SOP 20-C-910, Venting Potentially Explosive Drums	This document provides the procedure for venting drums containing materials that could evolve hydrogen gas.

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STEP	REGULATION/PROCEDURE	COMMENTS
Step 3 Transfer of Existing Inventories of Chemicals, Materials, and Uranium Materials from Process Buildings to Approved Storage Locations Continued	SOP 20-C-918, Preparation for Movement of Unvented Containers	This document provides the procedure for safe moving and handling of unvented drums containing potential hydrogen generating material.
	SOP 20-C-623, Receipt and Storage of Low Level Radioactive Waste and Nuclear 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.
	PT-0004, Packaging and Loading Radioactive Material for Off-site Shipment	This document provides the procedure for packaging radioactive material for off-site shipment.
	SR-2117, Nuclear Criticality Safety Requirements	This site requirement establishes required safety principles and program requirements for site remediation activities at the FEMP.
	SOP 20-C-017, Movement of Hazardous/Mixed 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.
	EW-0006, Management of Excess Soil, Debris, and Waste from a Project	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 document 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.
	PO-SE-02, Materials Control and Accountability	This document states that FERMCO shall maintain control and accountability of nuclear materials at the FEMP in accordance with DOE orders.

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STEP	REGULATION/PROCEDURE	COMMENTS
Step 4 Isolate, Lock & Tagout Process Equipment, Piping Systems, & Associated Utilities	MT-0003, FEMP 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.
	OP-0004, FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure	This site procedure establishes the controls to ensure 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 for the recovery and recycling of commonly used freon by FERMCO at the FEMP.
	D10-05-001 Safe Shutdown Program Energy Isolation Procedure	This procedure describes the requirements for isolating energy connected to and/or releasing energy contained within systems, equipment and utility connections while placing them in a safe shutdown configuration.
Step 5 Prepare Safety Documentation	CRU3-HSP-1036, Safe Shutdown Health and Safety Program	This plan provides an outline of specific problems and issues for Safe Shutdown Personnel who are involved in hazardous and radioactive waste operations during the conduct of Safe Shutdown field activities.
	SOP 20-C-609, Inspection of Safety Harnesses and Lanyards	This procedure provides the inspection and operating requirements for safety harnesses and lanyards to be used during work assignments.
	SOP 20-C-611 Assembly/Disassembly of Scaffolding	The procedure provides instructions for assembly and disassembly of tubular welded and coupler type frame scaffolding.
	NS-0001, Criticality Safety Analysis Approval Process	This procedure details how to initiate a criticality safety evaluation and obtain nuclear criticality safety approval for activities involving enriched material.
	SPR 2-7, Safety Performance Requirements-Job Safety Analysis	This Safety Performance Requirement (SPR) defines the minimum requirements for developing and using the Job Safety Analysis (JSA).
	RM-2116, Safety Analysis Program Requirements	This document establishes the basic principles, responsibilities, and requirements of the FEMP Safety Analysis Program. These requirements are provided to help ensure the health and safety of the public, the workers, and the environment.

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STEP	REGULATION/PROCEDURE	COMMENT
Step 6 Prepare NEPA Documentation	EP-0001, 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 National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEP), DOE Guidelines and Orders, and Secretary of Energy Notices.
Step 7 Transfer Substances from the Process Equipment and Associated Support Systems	SPR 2-8, Work Permits	This Safety Performance Requirement defines the requirements for obtaining written authorization and instructions before beginning work in any area of the FEMP.
	SPR 5-13, Permit-Required Confined Space Program	This procedure outlines the minimum safety requirements for work inside a permit-required confined space. This procedure also lists requirements for protecting individuals in a permit space from hazards such as hazardous atmospheres, hazardous materials, moving parts, and blocked escape routes.
	RC-DPT-008, Radiation Work Permits	This document assigns responsibilities and establishes the procedure initiation of, the use of, and termination of Radiation Work Permits (RWP).
	EW-0018, 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.
	EW-0004, Satellite Accumulation Areas for Hazardous Waste	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.

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STEP	REGULATION/PROCEDURE	COMMENT
Step 7 Transfer Substances from the Process Equipment and Associated Support Equipment Continued	PT-0002, Packaging 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.
	OP-0002, Controlling Portable HEPA Filtration Devices (HFDs)	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.
	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.
	PT-0005, Packaging Low Level Radioactive Waste (LLRW) in Drums for Shipment to the Nevada Test Site	This document provides the instructions for packaging low level radioactive waste (LLRW) in containers for shipment to the Nevada Test Site.
	PT-0006, Packaging Low Level Radioactive Waste (LLRW) in ISO Containers for Shipment to the Nevada Test Site	This procedure provides the instructions for packaging low level radioactive waste (LLRW) in metal boxes for shipment to the Nevada Test Site.
	PT-0007, Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Shipment to the Nevada Test Site	This procedure provides the instructions for packaging low level radioactive waste (LLRW) in metal boxes for shipment to the Nevada Test Site.
	PT-0008, Packaging, On-Site Movement and Off-Site Shipment of Material	It is the policy of 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.

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STEP	REGULATION/PROCEDURE	COMMENT
Step 7 Transfer Substances from the Process Equipment and Associated Support Systems Continued	SOP 2-C-601, Refinery Sump	This procedure establishes the procedure for processing the contents of the Refinery Sump.
	SOP 8-C-608, East EIMCO Filter Operation	The purpose of this document is to establish the procedure for operating the East EIMCO Filter System.
	SOP 8-C-609, West EIMCO Filter Operation	The purpose of this document is to establish the procedure for operating the West EIMCO Filter System
	PT-0001, 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.
	EW-0012, Tank/Sump Contents Removal	This procedure provided the method for removing the contents of tanks/sumps located at the FEMP.
	EW-0013, Tank/Sump Removal or Abandonment	This procedure provides the instructions for either removal or abandonment in-place of the tanks and/or sumps located at the FEMP.
Step 8 Control of Loose Contamination	SOP 20-C-612, Industrial Cleaning	This document provides the procedure for cleaning industrial facilities and equipment.
	SOP 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.
	SOP 20-C-600, Overpacking Defective Containers	The purpose of this document is to establish the procedure for overpacking defective containers.
	SOP 20-C-916, Cleaning Sump Systems	This procedure is for cleaning all sump systems located at the FEMP.
	SOP 43-C-413, Handling Waste Materials with the Industrial Vacuum Loader Truck (Supersucker)	This document establishes the procedure for using the Vacuum Loader Truck (Supersucker) for handling waste liquids, liquid sludges, and solids.

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STEP	REGULATION/PROCEDURE	COMMENT
Step 9 Disposition of Surplus Property	PM-0001, 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.
	EW-0003, 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.
	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
	SP-P-35-023 Routine Radiological Contamination Surveys	This safety procedure provides the instructions for performing radiological contamination surveys.
	OP-0005, Disposition of Safe Shutdown Excess Personal Property	This procedure gives guidelines for the disposition of Safe Shutdown Personal Property.

* Documents followed by an (*) have indirect impact on Safe Shutdown activities or are single or multi-volume reference manuals. They are available upon request.

Note: Activities refrences under the individual steps (ex. Step 1) can be found in the logic diagram in figure 2 of the May 17, 1994 submittal.

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Control No. FER-0018
SITE PROCEDURE MS-08-1001
REVISION NO. 0

FERMCO SITE PROCEDURE SYSTEM

NON-CONTROLLED COPY

Effective Date: 02/01/95

Originator (Subject Expert): Vernon B. Taylor Jr. 1/23/95
Date

Checker Concurrence: Michael K. Yates 1/24/95
Date

APPROVED BY: Michael K. Yates 1/24/95
Mike Yates, Office of the President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	02/01/95	New procedure requested by M. Yates for the establishment, revision, and control of FERMCO site procedures. Supersedes SSOP-0103.

1.0 PURPOSE

1.1 This site procedure provides instructions for identifying, developing, reviewing, approving, revising, cancelling, authorizing, and distributing site procedures used by the Fernald Environmental Restoration Management Corporation (FERMCO) for Fernald Environmental Management Project (FEMP) activities. This procedure also provides guidance for establishing, revising, implementing, and controlling divisional procedures. The FERMCO procedure system promotes consistency, continuity, and understanding throughout the functional areas. Procedures document established standards, responsibilities, steps, including references, and guidelines for conducting day-to-day operations.

NOTE: All existing FEMP documents (those currently defined as section, department, division, and site documents identified in the Site Document Index) that meet the scope of MS-1001 are considered site procedures. These procedures are to be identified and reclassified as site procedures in accordance with this procedure (see Attachment G) within one year from the effective date of MS-1001 or reassigned to the appropriate hierarchy of documents as defined in RM-0016, Management Plan - FERMCO Policies and Requirements Manual.

2.0 SCOPE

2.1 FERMCO managers ensure that site procedures are prepared and controlled according to the instructions of MS-1001. This procedure applies to all FERMCO personnel involved in establishing, revising, controlling, and implementing site and divisional procedures.

2.2 This procedure does not cover preparing and controlling other document categories (such as policies, site requirements, and charters). Policies and charters are issued by the FERMCO President in RM-0016, Management Plan - The FERMCO Policies and Requirements Manual.

3.0 REFERENCES

3.1 FERMCO RM-0012, Quality Assurance Program

3.2 FERMCO RM-0016, The Management Plan, FERMCO Policies and Requirements Manual

4.0 RESPONSIBILITIES

NOTE: Responsibility for steps in the procedures are assigned to key personnel. Key personnel may delegate those activities to individuals under their supervision. Therefore, it is not necessary to use the phrase "Or Designee" when writing procedures. The individual performing the activity is responsible for performing it as specified; however, the ultimate responsibility for assuring proper performance of activities remains with the identified key person.

4.1 Functional Area Manager (FAM) - Ensures the identification, development, authorization, implementation, and revision of site procedures to meet requirements of the assigned functional area(s).

4.2 Subject Expert (SE) - Prepares procedures in accordance with this procedure.

4.3 Checker - Verifies procedures in accordance with this procedure.

4.4 Central Procedure Control (CPC) - Provides services for support of the Site Procedural System in accordance with this procedure.

4.5 Procedure Coordinator - Coordinates procedural reviews in accordance with this procedure.

4.6 Site Procedure Custodian - Ensures divisional control of the Site Procedural System in accordance with this procedure.

4.7 Supervisor - Ensures affected site personnel are trained to new or revised procedures.

5.0 GENERAL

5.1 Site procedures are organized by functional areas (refer to Table 1: FEMP Functional Areas) as defined in RM-0016. The site procedure system centralizes the control of site procedures at the FEMP using one system and allows flexibility to each division for draft development and processing.

5.2 Functional area managers may request the support of a technical writer from the Forms and Procedures Development group or another organization.

5.3 All divisions are responsible for complying with the requirements of this procedure when managing site procedures. Changes completed outside the requirements of this procedure are not permitted. Changes defined in interoffice memos, employee updates, electronic mail, or any other method of communication will not be recognized or followed.

5.4 The numbering system for the Site Procedural System is defined in Attachment B: Numbering System for Site Procedural System. Procedure developers use this system to assign procedure numbers.

5.5 The required format with guidance for the preparation of site procedures is defined in Attachment C: Site Procedure Format and Guidelines.

5.6 Procedures may be revised at any time to reflect changes made necessary by changing policy, organization structure, regulatory requirements, or to improve the effectiveness/efficiency of the process.

5.7 All activities requiring FERMCO-developed forms shall be proceduralized. Procedures using forms must route forms through Forms and Procedures Development for development and control. Forms included in a procedure should be marked "SAMPLE" or "EXAMPLE." Print original copies from the electronic file. Contact Forms and Procedures Development for the source of the electronic file.

5.8 A form created by the procedure owner may not be changed by any secondary user of the procedure. Only the originator of the form can change the form. Coordinate form revisions with Forms and Procedures Development.

5.9 The FERMCO Site Procedural System consists of a volume of site procedures implementing the requirements of each functional area identified in RM-0016. Site procedures are required to implement the requirements cited in the Standards/Requirements Identification Document (S/RID), found in RM-0016, Management Plan - The FERMCO Policies and Requirements Manual, and in accordance with RM-0012, FERMCO Quality Assurance Program.

5.10 The FERMCO Site Procedure System flow process is shown in Attachment A: FERMCO Site Procedure System Flow Chart.

6.0 PREREQUISITES

NOTE: The roles of the Procedure Coordinator and the Site Procedure Custodian may be performed by one or more individuals in a division.

6.1 Division managers appoint an employee in their division to be the Procedure Coordinator to manage the review and approval routing process for any given site procedure -- whether generated by their division or by other divisions.

6.2 Division managers designate an employee in their division to be the Site Procedure Custodian to maintain the Functional Area Site Procedure Volume(s) or specific site procedure volumes within their area and complete a secondary distribution as needed.

NOTE: Specific divisions maintain Functional Area Site Procedure Volumes based on location and need as determined by the division manager.

6.3 Each division reports the name of the assigned procedure custodian to the Central Procedure Control (CPC).

7.0 PROCEDURE

7.1 IDENTIFYING REQUIRED SITE PROCEDURES FOR A FUNCTIONAL AREA

NOTE: The Forms and Procedures Development section of the Administration Division may be contacted for assistance in identifying needed procedures.

Functional Area Manager

7.1.1 Use the applicable section of the S/RID in RM-0016 to identify the requirements for the functional area; and use the requirements defined in RM-0012, FERMCO Quality Assurance Program, to identify quality assurance criteria.

7.1.2 Research codes, policies, procedures, regulatory requirements, and other applicable documents to gain full knowledge of technical, quality, and administrative requirements. Determine the effect of the proposed procedure or revision on existing procedures and/or other organizations.

7.1.3 Consult, review, and discuss with knowledgeable individuals and affected organizations to ensure that the procedures appropriately document how FERMCO will meet the requirement.

7.1.4 Review existing site and division procedures pertaining to the functional area against current requirements to determine if a revision is required for compliance.

7.1.5 As applicable, develop new site procedures or procedure changes to establish the Functional Area Site Procedure Volume(s).

7.2 NOTIFYING ORGANIZATIONAL MANAGEMENT OF NEED FOR A NEW SITE PROCEDURE, CHANGE, OR CANCELLATION

Functional Area Manager

7.2.1 Ensure that the procedure topic is relevant to the assigned functional area; if not, refer the procedure to the assigned FAM. (See Table 1: FEMP Functional Areas for guidance.)

7.2.2 For a new procedure or change, assign a Subject Expert (SE) and Checker to develop the draft. Define the priority of the procedure and assign an action completion date.

7.2.3 For a procedure cancellation, go to Step 7.11 of this procedure.

7.2.4 Direct the SE to request a technical writer to assist in draft development, if needed.

7.3 DEVELOPING A NEW SITE PROCEDURE OR REVISION

Subject Expert and Technical Writer (as applicable)

7.3.1 Develop a draft using the format guidelines in Attachment C: Site Procedure Format and Guidelines and the applicable drivers and/or source documents.

NOTE: If an external requirement states the need to use another format, comply with that requirement. Define this requirement in the scope of the procedure with a statement such as "This procedure is written to comply with the format requirements of (name of driver)."

7.3.2 If a site procedure is being revised, obtain the electronic copy from the applicable Procedure Coordinator.

7.3.3 Change the revision number (located in the procedure header) to the next sequential number.

7.3.4 Update the Issue and Revision Summary page to reflect revision. (This form is page two of a procedure).

7.3.5 Identify changes by shading revised/added text or lining through any deleted text, as shown in the example below.

Example

This is an example of shaded text that has been added or revised.

~~This is an example of lined out text that is deleted.~~

NOTE: A revision affecting over 50% of the procedure does not require shading.

NOTE: If ICPs exist in the procedure, incorporate as part of the revision to the procedure.

NOTE: If a form is required for the procedure, draft the form content and format and coordinate the final development and control of the form with the Forms and Procedures Section within the Administration Division.

Subject Expert

7.3.6 When the draft is satisfactory, send it to the Checker for review and verification.

Checker

7.3.7 Review the draft to verify that the site procedure content and format are accurate, it adequately instructs the user, and it implements applicable requirements. If the draft content is not accurate, resolve comments with the SE.

Subject Expert and Checker

7.3.8 When the draft is complete, sign the cover page to signify that the draft is ready for management review.

7.4 REVIEWING A NEW SITE PROCEDURE OR REVISION

Subject Expert and Functional Area Manager

7.4.1 Determine the required reviewers and the review period based on the complexity of the site procedure.

NOTE: Reviewers shall include a representative from any division required to perform an action within the procedure or from any division whose performance will be affected by the requirements of the procedure. For revisions, original reviewers must be included in the review.

NOTE: Typically, the procedure review period should be completed within five work days depending on the complexity of the procedure subject.

Subject Expert

7.4.2 Deliver the draft and a list of the reviewers with the determined review due date to the Procedure Coordinator.

7.4.3 Provide a copy of the draft to the FAM for review.

7.4.4 Prepare a Routing Memo (Attachment D) and a Site Procedure Review Comment Sheet (Attachment E) for each reviewing division and department.

NOTE: Department names may be specified on the routing memo.

Procedure Coordinator

7.4.5 Coordinate the review process.

7.4.6 Develop and use a tracking system to coordinate the review process and to ensure that reviewer comments are submitted on schedule. Use the tracking system to follow up on delinquent reviews.

Reviewer

7.4.7 Review the site procedure for specific areas of responsibility or for areas where the procedure step affects other operations. See Attachment C: Reviewer Guidelines. Record comments on the attached Site Procedure Review Comment Sheet.

7.4.8 If a comment is significant (as defined in the guidance in the table at the bottom of Attachment D: Routing Memo), check the Significant Review Comment column of the comment sheet.

7.4.9 Return the comment sheets and routing memo to the Procedure Coordinator by the specified due date.

Procedure Coordinator

7.4.10 Immediately upon receipt, forward the comments to the SE. Maintain temporary file copies of the review comments.

7.4.11 At the review due date, notify the SE that the review phase is complete and that the comments received require resolution.

7.4.12 If an organization has not returned its review by the due date, notify the SE for corrective action.

Subject Expert

7.4.13 For a procedure review that is overdue, contact the delinquent reviewer and expedite the completion of the review.

NOTE: Typically the comment resolution phase should be completed within five work days depending on the complexity of the procedure subject.

7.5 RESOLVING COMMENTS FOR A NEW SITE PROCEDURE OR REVISION

Subject Expert (and Technical Writer as appropriate)

7.5.1 Resolve all comments and record resolutions on the comment sheet.

Subject Expert

7.5.2 If a Significant Review Comment is not incorporated, discuss resolution with the reviewer.

NOTE: A signature is not required from the reviewer for significant review comments that are incorporated verbatim.

7.5.3 If the reviewer agrees that the significant comment has been resolved satisfactorily, obtain a concurrence signature on the comment sheet.

7.5.4 If the reviewer does not concur with the resolution, transmit comment to the reviewer's supervisor and the SE's supervisor for resolution. When the significant comment is resolved, obtain the reviewer's concurrence signature on the comment sheet.

Subject Expert (and Technical Writer as appropriate)

7.5.5 Review resolutions with the Checker.

7.5.6 Edit the site procedure to incorporate comment resolutions, as needed.

NOTE: If a new site procedure is written to provide specific direction for operating systems and equipment, perform a walk-through to validate the procedure.

7.5.7 If the procedure requires changes from the walk-through, convene a meeting of applicable reviewers to discuss the changes, obtain concurrence, and revise the procedure.

7.5.8 Repeat the walk-through, as needed, to validate procedure changes.

Subject Expert

7.5.9 Obtain Checker's concurrence signature on the master cover page.

7.5.10 Return the completed comment sheets and the revised site procedure master to the Procedure Coordinator.

Procedure Coordinator

7.5.11 Log receipt of resolution and retain the original review comment sheets on file.

7.6 APPROVING A NEW SITE PROCEDURE OR REVISION

Procedure Coordinator

7.6.1 Prepare a Routing Memo (Attachment D) and attach the site procedure package (master cover page and a copy of the comment resolutions).

NOTE: The master cover page is the original cover page with the Subject Expert and Checker signatures.

7.6.2 Record approval routing information and transmit site procedure to SE.

Subject Expert

7.6.3 Sign and forward the site procedure with all review comment sheets and approvals to the FAM.

7.7 AUTHORIZING A NEW SITE PROCEDURE OR REVISION

Functional Area Manager

7.7.1 Ensure the site procedure meets or is exempted from the format requirements of this site procedure and is consistent with the requirements of RM-0012.

7.7.2 Ensure that the proper reviews have been obtained, all comments have been resolved, and signatures have been obtained for significant comments.

7.7.3 If the site procedure is satisfactory, sign authorization and date the cover page. Return the site procedure to the SE.

7.7.4 If the site procedure is not satisfactory, resolve the issue(s) with the SE according to Section 7.5.

Subject Expert

7.7.5 Deliver the approved master copy of the site procedure to the Procedure Coordinator.

Procedure Coordinator

7.7.6 Record authorization date in tracking system.

7.7.7 Type the effective date of the procedure on the master cover page and add the effective date to the procedure header.

NOTE: Typically the effective date should be 15 working days from the date the procedure is authorized. The 15 working day period before the effective date provides time to authorize and distribute the procedure, and provide training.

7.8 DISTRIBUTING A NEW SITE PROCEDURE OR REVISION

Functional Area Managers and Division Managers

7.8.1 Submit a list of required controlled site procedure owners to Central Procedure Control.

NOTE: At a minimum, all other FAMs and division managers shall receive controlled copies of new site procedures or revisions.

Central Procedure Control

7.8.2 Distribute the authorized procedure to those on the list of controlled procedure owners.

7.8.3 Maintain the site procedure package on file.

Site Procedure Custodian

7.8.4 Upon receipt of a site procedure, immediately file it in the Functional Area Site Procedure Volumes and remove and discard superseded procedures and ICPs.

7.8.5 Sign the distribution receipt signifying the site procedure has been received and filed.

7.8.6 Return the receipt to CPC.

Central Procedure Control

7.8.7 Collect and file distribution receipts.

Site Procedure Custodian

7.8.8 If a secondary distribution is needed for division personnel, prepare controlled copies.

NOTE: Only the Site Procedure Custodian may distribute <u>controlled</u> procedures to division personnel.

7.8.9 At the top of the procedure, use red ink and stamp each secondary copy with the word "Controlled", and mark the procedure with a new control number. Ensure the control number on the secondary copy is traceable to the original control number by use of a log or incorporating part of the original control number with the secondary control number.

7.8.10 Prepare distribution receipts.

7.8.11 Distribute controlled secondary copies with receipts to applicable division personnel. Retain distribution list of the controlled copy holders with corresponding control numbers.

7.8.12 Collect distribution receipts and maintain on file within the division.

7.9 IMPLEMENTING A NEW SITE PROCEDURE OR REVISION

Supervisor

7.9.1 Upon receipt of a new site procedure or revision, and prior to the site procedure effective date or implementation of the site procedure, provide the required training to affected personnel.

7.10 PREPARING AND ISSUING AN INTERIM CHANGE TO A PROCEDURE (ICP)

Subject Expert

7.10.1 Initiate an ICP for affected procedures according to Attachment F: Interim Change to a Site Procedure.

7.10.2 Obtain ICP Number from CPC and add to ICP Form.

7.10.3 Forward ICP Form to FAM for approval.

Functional Area Manager

7.10.4 Assess the ICP and confirm the benefits and whether the justification warrants an ICP rather than a procedure revision.

NOTE: An ICP may be initiated:

- **To implement changes required to comply with Safety and Health (S&H) or Quality Assurance Program requirements or to improve S&H or quality practices.**

- Due to changes of FEMP requirements specified in DOE Orders, specifications, drawings, FERMCO site procedures, etc. when such revisions cause the site procedure in use to be incorrect, inaccurate, or inadequate.

- For purposes of cost effectiveness, ease of administration, and process improvement, or for the purpose of closing an audit or surveillance finding as specified in the disposition of a Corrective Action Report (CAR) or Deviation Report (DR). In this case, the CAR or DR number shall be noted on the ICP in the "Justification" section. To expedite necessary procedural changes when the affected schedule would be delayed by using the normal revision process, return the ICP to the subject expert.

  NOTE: Temporary ICPs shall be cancelled when they are no longer needed. Permanent ICP's shall be incorporated into the procedure as soon as practical. ICP's cannot make revisions to other ICP's. days.

Central Procedure Control

NOTE: The distribution of an ICP shall be given priority over other procedure distributions.

7.10.5 Distribute the ICP to Site Procedure Custodians of the affected procedure and file the master ICP.

NOTE: Pink paper shall be used to distribute controlled ICP copies.

Site Procedure Custodian

7.10.6 Sign the distribution receipt and return to CPC.

7.10.7 Complete a secondary controlled distribution of the ICP according to Section 7.8.7 of this procedure.

Controlled Document Owners

7.10.8 File the ICP facing the affected page of the controlled site procedure.

7.10.9 Sign the distribution receipt and return the ICP to the custodian.

7.10.10 Notify affected personnel of the ICP.

Subject Expert

7.10.11 Initiate a procedure revision as required (within 90 calendar days) according to Section 7.3 of this procedure. Prepare a revision to the affected procedure in accordance with these procedure steps.

Central Procedure Control

7.10.12 On or before the expiration date of an ICP, prepare a distribution receipt.

7.10.13 Send receipt to applicable Site Procedure Custodians for removal of the expired ICP.

Site Procedure Custodian

7.10.14 When a distribution receipt is received indicating ICP removal, complete secondary distribution as needed.

7.10.15 Remove the expired ICP from the applicable procedure and discard.

7.10.16 Sign the distribution receipt and return to CPC.

7.11 CANCELLING A SITE PROCEDURE/ICP

Subject Expert

7.11.1 Coordinate cancellation of a site procedure ICP with the Procedure Coordinator.

Procedure Coordinator

7.11.2 Prepare a routing memo for cancellation concurrence to the responsible divisions and the FAM. Log concurrence, date sent, due date, procedure/ICP number and title.

7.11.3 Transmit the routing memo to concurring managers.

7.11.4 After concurrence is received, forward approval package to CPC. If a manager does not concur with the cancellation, notify the SE for further action.

7.11.5 Record cancellation date on the cover page and on the Issue and Revision Summary page.

Central Procedure Control

7.11.6 Process cancellation of the procedure/ICP and distribute to Site Procedure Custodians.

Site Procedure Custodian

7.11.7 Sign the receipt to the procedure/ICP cancellation and return the receipt to CPC.

7.11.8 Remove cancelled procedure from the applicable Functional Area Site Procedure volume and discard.

7.11.9 Complete a secondary distribution of the cancellation to division controlled copy owners. Collect the distribution receipts and maintain on file.

7.12 MANAGING DIVISIONAL PROCEDURES

NOTE: Divisions (or delegated departments within divisions) will develop divisional procedures if the procedure is to be performed only by persons within that division, and if the procedure does not impact the operations of another division. If both of these qualifiers are not met, the procedure is a site procedure and will be developed by following the procedural steps for site procedures. Divisional procedures will not be included in the Functional Area Site Procedure Volumes. They will be retained within the owner division and will be made available to those who must perform the procedure.

7.12.1 Develop and implement a divisional procedure system that includes, at a minimum, the following:

- o A divisional procedure that documents how the division will identify, develop, review, approve, authorize, distribute, change, control, and cancel divisional procedures.

  NOTE: The procedure should define the format (section titles and definition of content) for all procedures developed within the division. The minimum format and content requirements are listed below.

- o The procedure for site procedures (MS-08-1001) can be adapted for the division's procedure on procedures.

- o A divisional procedure numbering system that is compatible with and does not conflict with the site procedure system.

NOTE: A suggested numbering system will identify the division and will include a number which logically orders procedures. For example, numbers could be based on department work scope, a quality assurance criterion, or some other organization of work.

- The assignment of responsibility for procedure management to a person, group, or department to ensure consistency and good management.

Minimum requirements for format and content of divisional procedures are as follows:

- A standardized cover page that includes procedure title, procedure number, revision number, effective date, and required signatures
- A standardized header that includes on each page the procedure title, number, revision number, and page number (with total number of pages in the document)
- A standardized table of content
- A record of document issues and revisions
- Purpose of the procedure
- Scope of the procedure
- Brief description of responsibilities for implementing the procedure
- Procedure steps to describe how the division will identify need for divisional procedures; and how the division will develop or revise, review, resolve, approve, authorize, and control distribution of divisional procedures

8.0 DRIVERS

8.1 FERMCO RM-0012, Quality Assurance Program

8.2 FERMCO RM-0016, The Management Plan, FERMCO Policies and Requirements Manual

9.0 DEFINITIONS

9.1 Action Completion Date - Date assigned by the FAM for completing a new procedure according to the priority of the procedure.

9.2 Central Procedure Control (CPC) - A group within Forms and Procedures Development, Administration Division that distributes controlled site procedures, maintains the site procedure management database and records, issues the Site Procedure Index, and performs periodic assessments of controlled site procedure volumes.

9.3 Checker - An employee competent in the subject matter of the site procedure who verifies and validates the procedure content. The checker shall be assigned by the responsible Functional Area Manager.

9.4 Controlled Procedure Distribution - A formal system for delivering controlled copies of authorized site procedures and subsequent revisions with control numbers and receipts to designated individuals for the purpose of preventing the use of outdated procedures.

9.5 Division Procedure - A document providing detailed, written direction for performing any repetitive activity. A division procedure may only direct personnel within that division and shall not affect the operations of another division or assign duties to personnel from other divisions. The owner of a division procedure is the applicable division manager who has primary responsibility for the management of the procedure. Divisions may designate procedures as department procedures.

9.6 Driver - Operational, technical, and administrative external or internal requirements, derived from agreement, law, contract, regulations, or DOE directives, with which FERMCO maintains compliance (as cited in the S/RID).

9.7 External Requirement - A document that identifies the requirements imposed on FERMCO from outside sources for a functional area. External requirements include statutory laws, DOE Orders, contract regulations and clauses, and others. (External requirement documents at FERMCO are cited in the Standards/Requirements Identification Document [S/RID].)

9.8 Functional Area - A logical grouping of activities associated with environmental, safety, health, or business management processes of a facility.

9.9 Functional Area Site Procedure Volume(s) - A complete set of volumes (organized by functional areas) containing all FERMCO site procedures. The set is controlled by Central Procedure Control and maintained for each division by a Site Procedure Custodian.

9.10 Functional Area Manager (FAM) - A FERMCO manager, assigned by the President, who has primary responsibilities for ensuring that all management systems and documentation necessary to satisfy requirements of the assigned functional area(s) are developed and implemented.

9.11 Forms and Procedures Development - A section of the Administration Division providing technical writing, editing, and form design services.

9.12 Interim Change to a Procedure (ICP) (Attachment F) - A change to an approved site procedure when the change must be implemented before a revision can be made to the procedure through the normal review and approval cycle. Interim changes can be temporary or permanent.

9.13 Internal Requirements Document - A document establishing the specific standards and requirements that a functional area must satisfy. An internal requirement also identifies organizational responsibilities to ensure these standards are met. An internal requirement is not an instructional document and is not to be used when performing work. (Examples of internal requirement documents at FERMCO are plans, programs, information manuals, policies, etc.)

9.14 Organizational Manager - A FERMCO employee assigned to manage a FERMCO division or department.

9.15 Procedure Coordinator - An employee within a division assigned to prepare, track, and collect routing memos for site procedure reviews and approvals.

9.16 Reviewer - An employee who reviews a site procedure for his/her specific area of responsibility or expertise.

9.17 Revision - A second or subsequent issue of a procedure which supersedes the preceding issue.

9.18 Secondary Distribution - The act of distributing and controlling a second copy of a controlled site procedure to applicable division personnel as determined by division management.

9.19 Significant Review Comment (SRC) - A review comment stating technical inaccuracies, noncompliance, and/or inconsistencies with established requirements, regulations, or procedures. An SRC requires satisfactory resolution by the SE and a concurrence signature by the reviewing organization before issuance. (See Attachment D: Example of Routing Memo -- Review Guidelines for additional guidance on significant review comments.)

9.20 Site Procedure Custodian - An employee assigned to maintain a Functional Area Site Procedure Volume Set or specific site procedure volumes for a division or other organizational/geographic unit; and/or to perform a secondary distribution to division personnel as needed.

9.21 Site Procedure - A document that gives general written direction for performing any repetitive activity to satisfy a project requirement. Site procedures are written for activities that are performed by personnel in more than one division or if the procedure affects how another division conducts its activities.

9.22 Standards/Requirements Identification Document (S/RID) - A document that cites all requirements for the functional areas that FERMCO must satisfy in the conduct of its activities.

9.23 Subject Expert (SE) - An employee experienced and knowledgeable in the activity covered by the procedure who is responsible for the development or revision of the assigned procedure.

9.24 Technical Writer - An individual who develops, writes, and edits written technical and administrative materials for documents or other publications concerned with work methods and procedures.

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

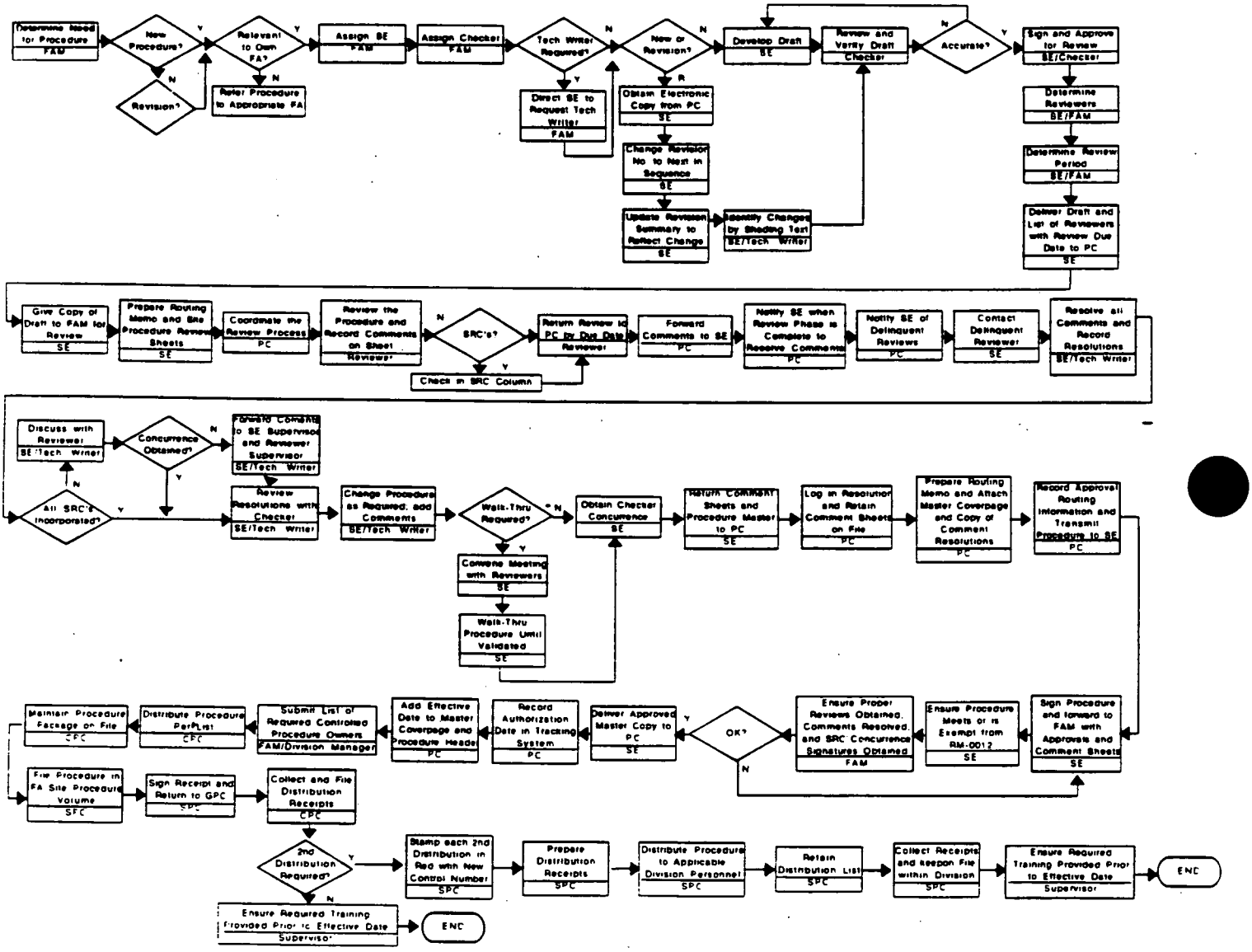
9.26 Verify - The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether data, items, processes, services, or documents conform to specified requirements.

TABLE 1 - FEMP FUNCTIONAL AREAS

No.	FUNCTIONAL AREAS	MANAGER
1	Configuration Management (CM)	ENGINEERING
2	Engineering Design (ED)	ENGINEERING
3	Emergency Preparedness and Management (EM)	HEALTH & SAFETY
4	Research and Development and Experimental Activities (RD)	TECHNOLOGY PROG.
5	Environmental Protection (EP)	ENVIRON COMPLIANCE
6	Fire Protection (FP)	HEALTH & SAFETY
7	Maintenance (MT)	RSO
8	Management Systems (MS) -Procedures and Internal Requirements * -Policies and External Requirements *	SPI QA SPI
9	Nuclear and Systems Safety (NS)	HEALTH & SAFETY
10	Occupational Safety and Health (SH)	HEALTH & SAFETY
11	Operations (OP)	RSO
12	Packaging and Transportation (PT)	WPM
13	Quality Assurance (QA)	QA
14	Radiological Protection (RP)	HEALTH & SAFETY
15	Safeguards and Security (SE)	ADMINISTRATION
16	Training and Qualification (TR)	ADMINISTRATION
17	Environmental Restoration and Waste Management (EW) -Env. Sciences* -Waste Mgmt* -CRU Operations* -Reg. Coordination*	EVIRON COMPLIANCE ENV TECH SERV WPM CRU DIR. EVIRON COMPLIANCE
18	Construction (CT)	CONSTRUCTION/RA
19	Acquisition (AC)	C&A
20	Human Resources and Industrial Relations (HR)	ADMINISTRATION
21	Project Control (PC)	P&IC
22	Property Management (PM)	C&A
23	Public Involvement (PI)	PUBLIC AFFAIRS
24	Financial Management (FM)	FINANCE

* Some functional areas, while managed by one identified functional area manager, have been subdivided into several discrete areas, each coordinated by another manager.

ATTACHMENT A - FERMCO SITE PROCEDURE SYSTEM FLOW CHART



ATTACHMENT B - NUMBERING SYSTEM FOR SITE PROCEDURAL SYSTEM

The Functional Area Site Procedure Volumes include site procedures necessary to implement requirements of all Functional Areas identified in RM-0016.

Each procedure within each volume is given a sequential number by the functional area responsible for the procedure. The following example further describes the numbering system for the Site Procedural System.

Example: PROCEDURE NUMBER EM-0017 (formerly numbered SSOP-0058)

```
                                          EM                0017
                                           |                  |
Functional Area (use the two letter  -----|                  |
functional area number from Table 1)                         |
                                                             |
Document number (consecutive numbering using  ---------------|
four digits to identify specific procedure)
```

NOTE: **Current procedure number referenced in parenthesis for clear transition.**

The Table of Contents in the front of each volume of the Functional Area Site Procedure Volumes lists the new procedure number, existing procedure number, procedure title, revision number, and effective date for each procedure in that volume.

NOTE: **If a Functional Area Site Procedure Volume requires more than one binder, a complete Table of Contents in each binder will identify all of the procedures in the volume. The Table of Contents will be organized by volume, and the procedures will be listed under the correct volume by number designation; e.g., Volume 1, Volume 2.**

Because of the consistency of their current numbering systems, the following Functional Areas will maintain their numbering methodology:

- **Engineering Design (ED)**
- **Construction (CT)**
- **Human Resources and Industrial Relations (HR)**
- **Project Control (PC)**

ATTACHMENT C - SITE PROCEDURE FORMAT AND GUIDELINES, PAGE 1 OF 2

SITE PROCEDURE FORMAT AND GUIDELINES

FERMCO site procedures shall consist of a Cover Sheet, Table of Contents, Issue and Revision Summary page, the required consecutively numbered procedure pages, and any required attachments. An abbreviated header shall be used as shown in this procedure, including the mandatory compliance statement. Indicate the name of the SE and Checker with phone number directly below the procedure header for questions during the review and approval phases.

The typeface font should be WordPerfect, Letter Gothic - 12 point.

Each procedure shall be prepared in the following format identifying the responsible key-person and actions required in chronological sequence. These sections are mandatory and must be in the order shown.

1. The **Cover Sheet** states the site procedure title; site procedure number; revision number; effective date; review, approval, and authorization signature lines; and FERMCO address. The cover sheet of this procedure should be used as a model for all cover sheets.

2. The **Table of Contents** presents each section of the procedure, list of tables, and a list of attachments in that order. The information for the Table of Contents is organized and formatted as shown in the Table of Contents of this site procedure. The Table of Contents is page 1 of the procedure.

3. The **Issue and Revision Summary** page shows the history of the original issue and all revisions to the procedure. Revision 0 is the original issue. All future revisions are shown in chronological order. Each description should state why the revision was made and who requested the revision. Refer to the Issue and Revision Summary in this procedure for an example.

   NOTE: **During draft of procedures, use an alpha designator (A, B, C) for the revisions.**

4. **PURPOSE** (Section 1.0) provides a clear, concise statement explaining the intent of the procedure. The purpose statement should briefly reflect the significance of the procedure to the project (i.e., vision, mission, values, goals, objectives).

   NOTE: To simply state that the purpose of the procedure is to explain how the activity will be performed at the FEMP by FERMCO is an insufficient Purpose statement.

5. **SCOPE** (Section 2.0) establishes the limits of the procedure. The activity/function applicable to the procedure and the affected organizations should be specified.

6. **REFERENCES** (Section 3.0) contains relevant interface documents used to implement a procedure.

7. **RESPONSIBILITIES** (Section 4.0) provides a list of those organizations/positions that have responsibilities listed within the procedure. A brief, overall description of the responsibility should be included as shown in this procedure. If the procedure applies to all organizations, this should be stated.

8. **GENERAL** (Section 5.0) contains explanatory information that is not specific to the procedure section (Section 7.0) but is necessary for clarity and understanding of the procedure. The General section shall not contain action steps or procedural information; however it may direct the user to that information. The General section shall not contain lengthy detailed information that is more appropriate as an attachment.

9. **PREREQUISITES** (Section 6.0) identifies those actions needed before the procedure can be performed. Prerequisites include, for example, such things as tools and equipment, qualifications, initial conditions, training, and safety assessments. If there are no prerequisites, state "None" in this section.

ATTACHMENT C - SITE PROCEDURE FORMAT AND GUIDELINES, PAGE 2 OF 2

SITE PROCEDURE FORMAT AND GUIDELINES

10. **PROCEDURE** (Section 7.0) describes, but is not limited to:

    a. The action steps required to accomplish the activities covered by the procedure.
    b. The chronological order of the actions to be performed.
    c. The key-person responsible for each step.
    d. The required documentation activities.

    Action steps shall be written using a command verb to perform a specific step instead of declarative sentences. Steps do not begin with words such as will, should, must, and shall for expressing required actions. The procedure section is written to a level of detail consistent with qualifications and training of the expected users. Information that is useful only to reviewers or other persons involved in supporting the procedure is excluded.

    WARNINGS are used in the procedure only for conditions that may cause injury to, or death of, procedure users, if extreme care is not taken.

    CAUTIONS are included in the procedure text when a condition may cause equipment/material damage. Warnings and Cautions always precede the step they address, and begin and end on the same page as the procedure step to which they apply.

    NOTES: may precede or follow the step they are addressing depending on their usage as follows:

    a. Notes are placed before a step when they provide descriptive or explanatory information to aid the user in performing or understanding the given procedure step.
    b. Notes are placed after a step when they concern step results or provide information that lends continuity to the flow of the procedure.

    Do not include action steps in notes. Include only one topic in each note.

11. **DRIVERS** (Section 8.0) lists drivers of the document. Drivers or administrative requirements identify the requirement for the procedure. Interface documents and drivers are listed by official document number and title. See the Drivers section of this procedure for an example of format.

12. **DEFINITIONS** (Section 9.0) includes those terms and statements contained in the body of the document which require definition for uniform understanding. The terms are listed in alphabetical order.

13. **TABLES** are used to display information in organized rows and columns and may be incorporated within the text (if less than 1 page) as close to their reference as possible, or placed after the procedure section before any Attachments.

14. **ATTACHMENTS** are placed after the procedure section and are used to provide visual aids such as forms, figures, maps, flow charts, illustrations, and diagrams that are needed to perform the activities. Attachments may also provide guides to, or amplifications of, specific procedural steps and other items such as source requirements, acceptance criteria and supplemental guidance material (such as charts, codes, or numbering systems).

NOTE: **Because of the consistency of their current format, the following Functional Area's procedures can maintain their current formats if desired:**

- **Engineering (ED)**
- **Construction (CT)**
- **Human Resources and Industrial Relations (HR)**
- **Project Control (PC)**

New Coversheets and Issue Revision Summary sheets will be required for these procedures in accordance with this procedure.

ATTACHMENT D - EXAMPLE OF ROUTING MEMO

PROCEDURE MEMO

TO: (Reviewing Division Manager)

FROM: (Subject Expert, Phone Number)
DATE:
DOCUMENT: (Procedure Title and Number)

ACTION REQUIRED:

PROCEDURE REVIEW

1. Please review only those sections of the procedure pertinent to your organization. A minimum number of personnel should be involved in order to expedite the review process.

2. Record comments on the attached document review comment sheet.

3. **Return by** required return date to Procedure Coordinator at Mail Stop _____.

   If there are NO COMMENTS, sign below and return this sheet only.

_____
Division Manager Signature Date

REVIEWER GUIDELINES

1.	Review for specific 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.
3.	Comment only on the Review Comment Sheet. Make a statement. Avoid writing questions. If necessary to resolve a conflict, call the SE indicated on the procedure.
4.	Indicate a comment is a significant review comment if the change indicated is required to meet FERMCO policies, established regulations applicable to the FEMP operation, or has significant procedural impact for a safe/efficient operation. A comment that is a suggestion, grammar/spelling correction, or organizational title change shall not be considered significant.
5.	If the technical or administrative accuracy of the procedure is questionable, compare procedure to source documents and/or contact the SE.
6.	If material is technically correct, do not change because of personal opinion.

ATTACHMENT E - SITE PROCEDURE REVIEW COMMENT SHEET

PRT/OWNER:	REVIEWING DIVISION:	DATE:
DOCUMENT NUMBER AND TITLE:		DATE COMMENTS DUE:

ITEM NO.	REVIEWER NAME	PAGE NO./ SECTION	COMMENT	SRC *	COMMENT RESOLUTION

SIGNIFICANT REVIEW COMMENT RESOLUTION APPROVAL SIGNATURE:	DATE:

FS-F-3069 (10/22/93)

ATTACHMENT F - INTERIM CHANGE TO A SITE PROCEDURE (ICP), PAGE 1 OF 3

INTERIM CHANGE TO A SITE PROCEDURE (ICP)

DATE: (1)	PROCEDURE NO.: (2)	ICP NO.: (3)
PROCEDURE TITLE: (4)	REV. NO.: (5)	
ICP TYPE: (6) [ ] PERMANENT [ ] TEMPORARY	EXPIRATION DATE: (7)	
JUSTIFICATION: (8)		
AFFECTED PARAGRAPH(s): (9)		
EXISTING REQUIREMENT(s): (10)		
CHANGE(s): (11)		
SUBJECT EXPERT: (12)	CHECKER: (13)	
FUNCTIONAL AREA MANAGER: (14) FUNCTIONAL AREA: (15)		
OTHER AFFECTED FERMCO DIVISION(s): [ ] YES [ ] (16)		
EFFECTIVE DATE: (17)		

ATTACHMENT F - INTERIM CHANGE TO A SITE PROCEDURE (ICP), SHEET 2 OF 3

INSTRUCTIONS FOR COMPLETING THE ICP FORM

SUBJECT EXPERT

1. Enter date ICP is initiated.
2. Enter the number of the site procedure being changed.
3. Enter in ICP number obtained from CPC.
4. Enter the title of the site procedure being changed by the ICP.
5. Enter the revision number of the site procedure being changed by the ICP.
6. Indicate whether the ICP is a permanent change or a temporary change by checking the appropriate blank.

   NOTE: A temporary ICP is used when a change is required to a site procedure for a specific application or limited duration of time which shall be specified on the ICP. If a temporary ICP is not incorporated into the site procedure, it will expire on the specified date.

   NOTE: A permanent ICP is used for permanent changes to the site procedure and shall be incorporated into the next revision of the site procedure. A permanent ICP is in effect until incorporated into the site procedure.

   For a permanent ICP, enter N/A. For a temporary change, enter the date the ICP will expire.
8. Enter the justification for the ICP. If the ICP is in response to a CAR or DR, enter the CAR or DR number.
9. List the existing paragraph(s)/section(s) being changed.
10. Enter a brief summary of the existing requirement(s) that are being changed.
11. Enter the changes to the site procedure.
12. Sign as the ICP originator.
17. Enter effective date required.

CHECKER

13. Sign and date to signify approval of the ICP
15. Enter the name of the functional area to which the procedure is assigned.
16. If applicable, indicate FERMCO divisions that are affected by the changes to the site procedure. If yes, enter the affected divisions.

FUNCTIONAL AREA MANGER

14. Sign and date to signify approval of the ICP.

ATTACHMENT F - INTERIM CHANGE TO A SITE PROCEDURE (ICP), SHEET 3 OF 3

INSTRUCTIONS FOR COMPLETING THE ICP FORM

OTHER AFFECTED FERMCO DIVISION(S) (IF LISTED)

16. The affected FAMs/FERMCO Division Managers, if any, or their designees will sign and date to signify concurrence with the ICP.

    NOTE: If additional space is required for any entries, attach a sheet of paper which includes the ICP number, CP title, and title of the entry. On the ICP form, enter "see attached sheet" in the appropriate entry.

    NOTE: An ICP is effective on the date it is approved by the FAM.

    NOTE: Approved ICPs shall be printed on pink paper and distributed to owners of Functional Area Site Procedure Volumes.

    NOTE: While an ICP is effective, it is a permanent part of the site procedure, and the owner of the Functional Area Site Procedure Volumes shall place the ICP in front of the affected site procedure page(s).

ATTACHMENT G - FERMCO SITE PROCEDURE SYSTEM IMPLEMENTATION REQUIREMENTS, PAGE 1 OF 2

1.0 PURPOSE

This attachment provides instruction for the identification, reclassification, and development of site procedures for the Functional Area Site Procedure Volumes. The restructuring process shall be completed within six months from the effective date of this procedure.

2.0 SCOPE

The instructions in this attachment apply to all site procedures (as defined in Section 9.0).

3.0 INSTRUCTIONS

3.1 EVALUATION OF EXISTING PROCEDURES

Functional Area Manager (FAM)

3.1.1 Review the assigned functional area section(s) of the S/RID to identify the site procedures that are required to implement functional area requirements.

3.1.2 Develop a Table of Contents of required procedures to include existing site procedures, division procedures that need to be site procedures, and procedures that must be developed for each Functional Area Procedure Volume. The Table of Contents will include the new procedure number and title. Attachment F: Numbering System for the Site Procedure System describes this numbering system.

3.1.3 Identify any existing procedures that are inadequate or are no longer applicable that must be revised, replaced or cancelled.

3.2 RECLASSIFICATION AND DEVELOPMENT OF EXISTING PROCEDURES

Functional Area Manager (FAM)

3.2.1 All procedures identified as usable shall be revised according to the format of this procedure within one year from the effective date of this procedure.

3.2.2 For procedures that are inadequate or determined "need to be developed," initiate development of new procedures according to Section 7.3 of this procedure.

3.2.3 For procedures that are no longer applicable, initiate a cancellation according to Section 7.11 of this procedure.

ATTACHMENT G - FERMCO SITE PROCEDURE SYSTEM IMPLEMENTATION REQUIREMENTS, PAGE 2 OF 2

3.3 ISSUANCE OF EXISTING PROCEDURES

3.3.1 All procedures required as site procedures in the new FERMCO Site Procedure System are to be issued by Central Procedure Control within 60 days of issuance of Rev. 0 of this procedure.

NOTE: Issued procedures are valid unless revised after the effective date of this procedure, whether they are still in old books or in new volumes.

-6943

UNCONTROLLED

~~CONTROL NUMBER: [illegible]~~

SITE PROCEDURE: EM-0010 (ED-0001)
REVISION NO. 5

EVENT NOTIFICATION AND OCCURRENCE REPORTING

Effective Date: 05/15/95

Originator (Subject Expert):
Laura L. Morrow — 5-12-95
Laura Morrow, Emergency Preparedness — Date

Checker Concurrence:
Sharon C. Cornwell — 5-12-95
Sharon C. Cornwell, Manager, Emergency Preparedness — Date

APPROVED BY: S L Hinnefeld — 5/15/95
S. L. Hinnefeld, FAM, Emergency Preparedness and Management — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

Title: EVENT NOTIFICATION AND OCCURRENCE REPORTING PROCEDURE	DOCUMENT NO: EM-0010	
	Date: 05/15/95	Revision No. 5
MPLIANCE WITH THIS PROCEDURE IS MANDATORY WHILE REFORMING THE ACTIVITIES WITHIN ITS SCOPE	Page 1 of 41	

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F	OFFSITE NOTIFICATION FORM	46

ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	02-14-92	Emergency document required for Event Notification and Reporting per Request No. S92-045, initiated by M. S. McClane. Replaces OM-FMPC-0001, dated 12-03-90, Revision 0.
1	08-14-92	Document revised per Request No. S92-150, initiated by S. Duley.
2	08-20-93	Document revised per Request No. S93-098, initiated by S. Duley. This document supersedes ED-0001, Rev. 1, dated 08-14-92, and SSOP-4006, Rev. 0, dated 08-14-92.
3	06-30-94	Minor revision to document to reflect change in procedure per Request No. S94-017, initiated by C. Hood. This document supersedes ED-0001, dated 08-20-93, Revision 2.
4	01-26-95	Minor revision to document per Request No. S94-152, initiated by C. Hood. This document supersedes ED-0001, dated 06-30-94, Revision 3
5	05/15/95	Being revised to incorporate changes initiated by S. Cornwell, Manager, Emergency Preparedness and Management and format changes in accordance with Site Procedure MS-08-1001. This document Supersedes ED-0001, dated 01-26-95, Revision 4.

1.0 PURPOSE

1.1 This procedure establishes the requirements for evaluating and reporting all reportable events and emergency events either occurring at or involving the Fernald Environmental Management Project (FEMP) in accordance with DOE Orders, Federal and State Regulations, and Environmental Permits, to ensure that appropriate corrective action is taken and similar events are avoided in the future.

1.2 This document establishes the mechanisms for consistent, timely reporting of events to the U.S. Department of Energy (DOE), Fernald Environmental Restoration Management Corporation (FERMCO) Management, and for immediate notifications to regulatory agencies. Complete, accurate, and current information is provided about any events which could:

A. affect the health and safety of the public
B. seriously impact the intended purpose of DOE facilities
C. have a noticeable adverse effect on the environment
D. endanger the health and safety of workers

1.3 This procedure implements the requirements of DOE Order 5000.3B, (03/22/92) "Occurrence Reporting and Processing of Operations Information." For appropriate response actions refer to the FEMP Emergency Plan, PL-3020.

2.0 SCOPE

This procedure is applicable to personnel including employees, supervisors, Communications Center Operators, Duty Officers (Emergency Duty Officers and Assistant Emergency Duty Officers), Managers, and all other site contractors and subcontractors. This procedure also provides the actions required to prepare, track, and issue Occurrence Reports for reportable events at the FEMP.

3.0 REFERENCES

3.1 CERCLA 40 CFR 302

3.2 PL-3020, FEMP Emergency Plan

3.3 RM-0021, Safety Performance Requirements (SPR) Manual, SPR 1-8, Accident/Illness Reporting and Investigation

3.4 SARA 40, CFR 355

3.5 SSOP-0018, Event Categorization/Classification Procedure

3.6 SSOP-0088, Fernald Environmental Management Project (FEMP) Offsite Emergency Warning System

3.7 SSOP-0067, Spill Incident Reporting and Clean-up

3.8 SOP-20-C-606, Hazardous Materials Spill Clean-up

4.0 RESPONSIBILITIES

4.1 Employee - Attends critiques and provides information on event.

4.2 Supervisor - Ensures employees attend critiques and provides additional information to Occurrence Reporting Team (ORT). The supervisor or manager of the personnel involved in the event makes an entry into the daily logs as required by the Conduct of Operation Guidelines. This entry includes enough information to reconstruct the event and its associated actions. A copy of this entry will be forwarded to Emergency Preparedness within 24 hours. Emergency Preparedness forwards a copy of this daily log to appropriate site personnel.

4.3 Communications Center Operator - Receives reports of events from employees, supervisors, or by alarm circuits, and promptly contacts the Assistant Emergency Duty Officer (AEDO). If an alarm signal is received in the Communications Center, the Communication Center Operator is responsible for taking whatever necessary emergency actions the system prompts the Operator to take, including activation of the Emergency Response Team (ERT) and the Plant Alarm System.

Responsible for making local regulatory and other notifications, as directed by the AEDO.

4.4 Assistant Emergency Duty Officer (AEDO) - Assesses the event, consults with the Emergency Duty Officer (EDO) in the categorization of the event, and determines if it is reportable to DOE-HQ or others, following event categorization guidelines outlined in SSOP-1018, Event Categorization and Classification Procedure. Notifies the designated Release Evaluator if it is a spill incident to determine reportability to regulatory agencies under RCRA, CERCLA, or other applicable regulations. Responsible for acting as the Facility Manager under the scope of this procedure. Any notifications to regulatory agencies are documented on the Event Notification Verification Form (ENVF). Logs all events (use Form #FS-F-3175) and ensures that original reports and logs are forwarded to Emergency Preparedness.

Has the authority to initiate all necessary response actions based on categorization of the event. This includes activating the ERT, Offsite Emergency Warning System, and/or the activation of the Emergency Operations Center (EOC). Responsible for keeping the appropriate emergency personnel and plant officials apprised of conditions, directing evacuations, determining the need for mutual aid, and directing follow-up monitoring and re-entry activities.

4.5 Emergency Duty Officer (EDO) - Responsible for event categorization. Responsible for ensuring that all required notifications are made, recorded on ENVF, and the original ENVF is mailed to the Release Evaluator. Contacts and ensures that the FERMCO Office of the President and the Manager of Public Affairs are notified, as necessary, for all events categorized as Off-Normal or higher.

4.6 Release Evaluator - Using information provided by the EDO or AEDO, determine if a spill incident is reportable to regulatory agencies. Advises the EDO and/or the AEDO of this determination.

4.7 Manager, Public Affairs - Assists the EDO and/or the AEDO in determining whether to report event information to the public and/or plant neighbors. Responsible for coordinating news releases, announcements, statements prepared for response to query, and information to be provided to neighbors with permission of FERMCO Management and the DOE-FN Public Affairs Director. Responsible for reviewing Final Occurrence Reports to ensure that information is ready for release to the public.

Provides copies of FEMP Final Occurrence Reports, within 10 days after approval by the DOE Program Manager, to the Administrator of the FEMP Public Reading Room and to the DOE-HQ Freedom of Information Act Reading Room.

4.8 Manager, Emergency Preparedness - Identifies and assigns the Division Manager responsible for providing technical support for the follow-up reporting on the event, as appropriate. Provides a copy of the Notification Report, Fact Sheet and Daily Operations Report to the assigned Division Manager. Ensures that the annual Emergency Preparedness training provided to all employees includes employee responsibilities upon discovery of an emergency or reportable event and will ensure that all AEDOs and EDOs receive annual training on the requirements contained in this document. Responsible for staffing and directing the ORT.

4.9 Occurrence Reporting Team (ORT) - Responsible for the creation, submittal and distribution of the Fact Sheet and Daily Operations Report for every reportable event within six working hours to the DOE-FN. Prepares and uploads the Notification Report by the end of the next business day from the time of categorization (not to exceed 80 hours). Prepares and uploads all Occurrence Reports. Tracks the status of all corrective actions listed in the Occurrence Reports and supports the Division Vice-President in critiques, identification of causes, and corrective actions. Inputs the daily AEDO log entries into a database for tracking purposes.

4.10 Division Vice-President, or designee - Responsible for obtaining pertinent data about the event from the AEDO and other personnel involved in the event or in mitigation of the event, investigating events to determine root cause, initiating corrective actions, and completion of 10-day and final reports. Recognizes and reports programmatic events within the Manager's area of responsibility in accordance with this procedure and SSOP-1018, Event Categorization and Classification Procedure. Follows the progress of scheduled corrective actions and informs the Manager of Emergency Preparedness in writing when a corrective action is completed so that the completion date can be uploaded in the Occurrence Reporting and Processing System (ORPS) database.

4.11 Administrator of FEMP Public Reading Room - Places copies of approved FEMP Final Occurrence Report in the Public Reading Room within two weeks after approval by the DOE Program Manager.

4.12 DOE Fernald Area Office Duty Officer - Receives event information for all events categorized as Off-Normal and above. Responsible for notifying all appropriate state and federal regulatory agencies, as necessary. Documents all regulatory notifications on the ENVF.

4.13 Emergency Operations Center (EOC) - If the EOC is operational or the event occurs during working hours, the EOC Offsite Notification Advisor will complete and telefax the Offsite Notification Report to Butler and Hamilton Counties, Ross Township, Crosby Township, and Morgan Township Fire Departments within **ONE** hour of the event classification.

5.0 GENERAL

5.1 Project and line management organizations may have specific reporting criteria within procedures on how to notify the AEDO of an abnormal event.

5.2 All spill incidents that occur at the FEMP, or at operations associated with the FEMP, are to be reported through the AEDO/EDO to the Release Evaluator for a determination of additional notification requirements.

This would include activities offsite as well as incidents during transportation of materials from the FEMP. Upon determination that a release is reportable, the EDO is required to make immediate notifications to the applicable regulatory agencies.

5.3 Because of the need to quickly implement protective and response actions to ensure the safety of FEMP and offsite personnel, and to meet requirements for regulatory reporting, the AEDO/EDO must, under all circumstances, categorize all events based on the information available within two hours of being notified that an event has occurred.

This does not authorize the use of the full two hours for categorization if the pertinent information is available in a lesser period of time. If the AEDO/EDO cannot clearly determine the relative severity of the event within two hours of event discovery, the event is to be initially categorized at the highest level being considered and DOE notified in accordance with this procedure. The event categorization must be elevated, maintained, or lowered as information becomes available.

5.4 The ORT conducts a critique for any event at the FEMP categorized as an Off-Normal or higher.

The AEDO informs the appropriate area supervisor whenever an event has occurred in his/her area of responsibility, as soon as possible. The responsible supervisor will assist the ORT in a critique within 3 working hours of event categorization.

The ORT determines who attends the critique. To the greatest extent possible, all individuals directly involved in the event, along with the affected Division Manager or his/her designee, will attend the critique.

The critique will focus on the facts of the event and avoid conjecture about why an event occurred, although apparent contributing causes should be included. Information discovered during the critique will ultimately be used to determine root cause of the event and possible corrective actions necessary to prevent recurrence.

5.5 All issues resulting in a dispute between FERMCO and DOE will be resolved expeditiously by elevating the issue in dispute to the Assistant Secretary for Environmental Restoration and Waste Management, the Program Secretarial Official , or, if necessary, to the Secretary of Energy.

5.6 Activation of the FEMP EOC by the AEDO is mandatory for all Emergency Classes. DOE-FN EDOs are notified immediately upon activation of the FEMP EOC via personal pagers. The FEMP EOC may be activated for Unusual Occurrences if the AEDO or EDO deem this action necessary.

5.7 After receiving notification of an Alert or Site Area Emergency from the EDO, the Manager of Public Affairs determines the need to activate the Joint Information Center (JIC) and directs this action. On General Emergency, the JIC activation is mandatory.

5.8 For any General Emergency, the first notification that must be initiated is an immediate warning to onsite and offsite personnel. This warning, as directed by the AEDO, is achieved in the Communications Center by activation of the FEMP Plant Alarm System, Sitewide Emergency Message System (EMS), and the Offsite Emergency Warning System.

5.9 All references to time periods in days are to be interpreted as calendar days unless otherwise noted. Time is noted using military designations (e.g. 1600 hrs as opposed to 4:00 pm).

5.10 Any changes in categorization must be documented in a 10-Day Occurrence Report and submitted before the close of the next business day from the time of re-categorization (not to exceed 80 hours). A justification for the new categorization must be included in the report.

5.11 When an event is categorized as an Emergency and the EOC becomes operational, the responsibilities of the EDO are assumed by the Deputy Emergency Director (DED) and the EOC staff.

5.12 If, after assessing the event and coordinating with the EDO and other concerned personnel, the AEDO recategorizes the event (up or down), appropriate renotification must be made to DOE Ohio Field Office (DOE-OH), DOE Headquarters (DOE-HQ) and all other parties notified of the original categorization. Recategorization restarts the notification clock; the renotification time limits are now the same as required by the new categorization level.

5.13 **ENFORCEMENT AGAINST FERMCO**

Upon receiving any formal notification of a Notice of Violation that has been received from the regulatory agency regarding environmental issues, the contractor will provide a Fact Sheet to the Associate Deputy Secretary for Field Management, the General Counsel, the Assistant Secretary for Environment, Safety & Health, and the cognizant Secretarial Officer within 24 hours of receipt of the violation.

The Fact Sheet will determine if allegations are believed to be accurate and will contain the following information:

A. The nature of the alleged violation and of the environmental threat posed.

B. Whether the alleged violation has been corrected or is continuing.

C. The basis for the regulatory authority's discovery of the alleged violation (e.g., DOE or FERMCO self-reporting or external regulatory inspection).

D. Whether fines or penalties are being assessed and, if so, the amount.

Immediately following the receipt of an enforcement notice, the Operations Office must be provided with:

A. A preliminary assessment of whether the alleged violation resulted from a failure of the DOE to provide FERMCO with the requested guidance, funding, or authorization to correct the conditions leading to the alleged violation.

B. A preliminary assessment of whether FERMCO disagrees with the legal or factual grounds for the alleged violation.

C. A preliminary recommendation as to whether the issuing authority's proposed resolution should be accepted, or whether an attempt should be made to contest the notice or to negotiate a different settlement.

D. A description of actions taken, or proposed, to prevent similar alleged violations from occurring in the future.

5.14 ENFORCEMENT AGAINST THE DEPARTMENT OF ENERGY

Within 24 hours of receipt of an enforcement notice against the Department, the DOE-OH Field Office should prepare and forward to the Associate Deputy Secretary for Field Management, the General Counsel, the Assistant Secretary for Environment, Safety and Health, and cognizant Secretarial Officer, a copy of the enforcement notice and an information paper that describes:

A. The nature of the alleged violation and of the environmental threat posed thereby.

B. Whether the alleged violation has been corrected, or is continuing.

C. The basis for the regulatory authority's discovery of the alleged violation (e.g., DOE or FERMCO self-reporting or external regulatory inspection).

D. Whether fines or penalties are being assessed and, if so, the amount.

E. Whether duplicate notices were issued to the Department and to a contractor for the same alleged violation.

Within 10 working days after receipt of an enforcement notice, the DOE-OH Field Office should supplement the above report with an analysis of:

A. The degree of responsibility of the DOE and FERMCO for the alleged violation, regardless of who received the notice.

B. Whether the Operations Office or FERMCO disagrees with the legal or factual ground for the alleged violations.

C. Whether the issuing regulatory authority's proposed resolution should be accepted, or whether an attempt should be made to contest the notice or to negotiate a different settlement.

D. The actions taken, or proposed, to prevent similar alleged violations from occurring in the future.

5.15 **TRANSITION RESPONSIBILITY TO EOC**

A. Full activation of the FEMP EOC is mandatory for all Emergency classification levels. When the EOC is operational, the EDO transfers responsibilities to the DED and EOC staff.

B. The EOC staff is a functional organization which oversees and manages emergency response actions and consists of four functional groups:

a. a Policy Group
b. a Response Management Group
c. a Support Group
d. an Offsite Communications Group

C. Specific details of EOC operations are defined in the FEMP Emergency Plan, PL-3020. Under Emergency conditions, responsibility for assuring that proper notifications are made is transferred from the EDO to the DED. The DED may assign specific notification responsibilities to members of the Response Management Group or the Offsite Communications Group. It is still the responsibility of the DED to assure that the required notifications are made in a timely manner.

6.0 PREREQUISITES

6.1 Each category has the notification and reporting requirements of all lesser levels as well as those listed. All employees have the responsibility to notify and report an abnormal event to the AEDO.

6.2 Table 1 provides a summary of the event notifications and reporting requirements of DOE Order 5000.3B and this procedure. Figure 6-1 provides an Event Notification and Reporting Process Flow Diagram.

6.3 The ORT logs the time and date for each of the steps of this procedure. This log provides the documentation of the Event Notification and Occurrence Reporting procedure.

7.0 PROCEDURE

7.1 VERBAL NOTIFICATIONS

Assistant Emergency Duty Officer (AEDO)

Notifies the EDO, as appropriate, and notifies the Release Evaluator for any spill incidents, including inside a building, or as consistent with applicable, approved departmental procedures.

7.1.1 OFF-NORMAL EVENTS

Emergency Duty Officer (EDO)

A. Notifies the DOE-FN EDO, Fernald Environmental Restoration Management Corporation (FERMCO) Office of the President, Public Affairs (as needed) and Regulatory Agencies (required local notifications as needed).

B. Confirms that the notifications were made if responsibility is delegated.

7.1.2 UNUSUAL OCCURRENCE EVENTS

NOTE: Verbal notification to DOE-HQ and DOE-OH of Unusual Occurrences must be made as soon as sufficient information is available to indicate the general nature and extent of the event, but in all cases, within two hours of categorization.

EDO

A. Notifies the FERMCO Office of the President, Public Affairs (as needed), and Regulatory Agencies (required local notifications as needed).

B. Confirms that the notifications were made if responsibility is delegated.

EDO and DOE-FN EDO

C. Notifies DOE-HQ and DOE-OH of Unusual Occurrences.

7.1.3 EMERGENCY EVENTS

NOTE: Verbal notifications to DOE-HQ and offsite authorities for Emergency Classifications must be made within 15 minutes or less of categorization. However, recognizing that the majority of, if not all, emergency events will result in external interest, notifications should be accomplished as soon as possible.

EDO

Notifies or directs the Communications Center Operator to notify, DOE-HQ, DOE-OH, State of Ohio Emergency Management Agency, Butler and Hamilton Counties immediately via their 24-hour notification points.

EMERGENCY OPERATIONS CENTER (EOC)

A. Notifies DOE-HQ, DOE-OH, State of Ohio Emergency Management Agency, Butler and Hamilton Counties.

B. After the EOC is operational, the Emergency Director (ED) and Site Manager establishes a conference call, utilizing the DOE-HQ EOC, with the DOE Program Manager and DOE-OH. The ED relays all available information relating to the event to those parties.

7.2 WRITTEN REPORTS

7.2.1 LOGGABLE EVENTS

AEDO

A. Completes the AEDO Daily Log, Form FS-F-3175 (C), and assigns an event log number.

B. Delivers original AEDO Daily Event Log to the Emergency Preparedness Section each work day morning.

SUPERVISOR

Ensures employees attend critiques and provide additional information to Occurrence Reporting Team (ORT). The supervisor or manager of the personnel involved in the event makes an entry into the daily logs as required by the Conduct of Operation Guidelines. This entry includes enough information to reconstruct the event and its associated actions. A copy of this entry will be forwarded to Emergency Preparedness within 24 hours. Emergency Preparedness forwards a copy of this daily log to appropriate site personnel.

EMERGENCY PREPAREDNESS

Maintains a master file and distributes the AEDO Daily Event Log to the Emergency Duty Officers (EDOs), DOE-FN EDOs, and various site personnel.

7.2.2 OFF-NORMAL AND UNUSUAL OCCURRENCE EVENTS

OCCURRENCE REPORTING TEAM (ORT)

A. Creates a Fact Sheet and Daily Operations Report and submits these reports to the DOE-FN within 6 working hours following the categorization of the event.

NOTE: **The Fact Sheet and Daily Operations Report are intended to be concise summaries of occurrences. Information contained in the Fact Sheet should be kept short, 1-2 pages in length, and contain information relating to Event Summary, Significance to ES&H/Public/Personnel, Immediate Actions Taken, and Notifications Made.**

The Daily Operations Report is a 1/2-page summary of the Fact Sheet. Distribution of the Fact Sheet and Daily Operations Report will be to DOE-FN Manager, DOE-FN EDO, Office of the President, FERMCO EDO, Manager, Emergency Preparedness and Manager, Public Affairs.

B. Completes and issues the Notification Report for all events by the close of the next business day from the time of categorization (not to exceed 80 hours).

C. Completes and uploads into the Occurrence Reporting and Processing System (ORPS) database in Idaho, Items 1 through 18 of the Occurrence Report.

NOTE: **Instructions for completing the report are provided in Attachment B of this procedure.**

D. Provides copies of the Fact Sheet, Daily Operations Report and the Notification Report to the responsible Division Vice President.

RELEASE EVALUATOR

A. Recommends the necessary regulatory notifications on the ENVF, if the event is a spill incident.

B. Provides this information to the AEDO, EDO and the Communications Center within sufficient time to complete regulatory notifications.

EDO

A. Makes the required local regulatory notifications and notes this information on the ENVF or directs the Communications Center Operator to do so.

B. Forwards a copy of the completed ENVF to the Release Evaluator, AEDO, and Emergency Preparedness.

DOE-FN EDO

A. Makes the required federal and state notifications and notes information on the ENVF.

B. Makes the final determination of reporting requirements IF FERMCO and DOE-FN disagree about required regulatory notifications and notes any changes in determination on the ENVF.

C. Forwards a copy of the completed ENVF to the Release Evaluator, AEDO, and Emergency Preparedness.

EMERGENCY PREPAREDNESS/ORT

Identifies and assigns Division Vice-President responsible for the followup reporting.

DIVISION VICE-PRESIDENTS

Provides technical support to the ORT for the preparation of a 10-Day and Final Occurrence Report (see Attachment B) for uploading into the ORPS database.

NOTE: Requirements and instructions for completing the 10-Day and Final Occurrence Report are found in Attachment B of this procedure.

7.2.3 EMERGENCY EVENTS

NOTE: All responsibility for written reporting as stated 7.2.2 <u>OFF-NORMAL AND UNUSUAL OCCURRENCE EVENTS</u> are applicable for emergency events as well with the following additions or modifications.

EDO

Directs the Communications Center Operator to complete and telefax the Offsite Notification Report (Attachment F) to Butler and Hamilton Counties, Ross Township, Crosby Township, and Morgan Township Fire Departments within **ONE** hour of the event classification.

NOTE: Working hours for the Fernald Environmental Management Project (FEMP) are 0730 hours to 1600 hours Monday through Friday.

EOC

If the EOC is operational or the event occurs during working hours, the EOC Offsite Notification Advisor will complete and telefax the Offsite Notification Report to Butler and Hamilton Counties, Ross Township, Crosby Township, and Morgan Township Fire Departments within **ONE** hour of the event classification.

ORT

Issues Notification Report within 24 hours of event classification if the event has been categorized as an emergency.

7.2.4 PREPARATION OF THE 10-DAY OCCURRENCE REPORT

DIVISION VICE-PRESIDENT

A. Receives a copy of the Notification Report, Fact Sheet, and Daily Operations from the Manager, Emergency Preparedness.

B. Performs investigation of the event.

C. Submits 10-day report to ORT within 8 working days. (This allows two days for management approval and Office of the President signature).

D. Obtains approval for the Occurrence Report from the appropriate line management.

ORT

A. Obtains signature on cover letter from FERMCO President to DOE-FN Manager.

B. Transmits to ORPS database and distributes copies of the transmittal letter and Occurrence Report to the following:

a. Manager, Performance Assessment
b. Manager, Emergency Preparedness
c. Appropriate Line Management for the particular event

7.2.5 PREPARATION OF THE 10-DAY UPDATE OCCURRENCE REPORT

DIVISION VICE-PRESIDENT

A. Provides technical support and information to the ORT for the preparation and transmittal of new or significant information when available.

B. Obtains approval for the Occurrence Report from the appropriate line management, including other Division Vice-Presidents.

ORT

A. Transmits Occurrence Report via cover letter from FERMCO President to DOE-FN Manager.

B. Transmits and distributes copies of the transmittal letter and Occurrence Report to the following:
   a. Manager, Performance Assessment
   b. Manager, Emergency Preparedness
   c. Appropriate Line Management for the particular event

7.2.6 PREPARATION OF THE FINAL OCCURRENCE REPORT

DIVISION VICE-PRESIDENT

A. Continues technical support for the event investigation and assists the ORT in identifying the root cause, direct cause, contributing causes, and lessons learned from the event.

B. Assists in assuring that corrective actions are appropriate and establishes completion dates for the actions.

C. Submits necessary information to the ORT for review and preparation of the Occurrence Report within 43 days of event categorization. (This allows two days for management approval and signature from the Office of the President.)

ORT

A. Verifies causes to ensure accuracy, and that corrective actions satisfy listed causes to help prevent recurrences.

B. Transmits Occurrence Report via cover letter from FERMCO President to DOE-FN Manager.

C. Transmits the Occurrence Report within 45 days and distributes copies of the transmittal letter and Occurrence Report to the following:

   a. Manager, Performance Assessment
   b. Manager, Emergency Preparedness
   c. Appropriate Line Management for the particular event

DOE FACILITY REPRESENTATIVE

A. Completes a review of the report and adds any additional input required to complete the Facility Representative's section within 7 working days of the uploading and system acceptance.

B. Uploads acceptance or rejection of the report.

DOE PROGRAM MANAGER

Reviews the report and uploads acceptance or rejection within 14 days of receipt. If accepted, the Final Report will be available in the ORPS database for reviewing throughout the system. If rejected, the report will remain unavailable to other ORPS users.

7.2.7 REVISION OF REJECTED REPORTS

DIVISION VICE-PRESIDENT

A. Provides the required technical support to the ORT, which prepares a revised report within 19 days from the date of rejection. (This allows two days for management approval and signature from the FERMCO Office of the President.)

B. Obtains approvals for the Occurrence Report from the appropriate line management, including other Division Vice-Presidents.

ORT

A. The ORT will consult with the Facility Representative or Program Manager, as needed, to address additional information is needed in the revision.

B. Transmits Occurrence Report via cover letter from FERMCO President to DOE-FN Manager.

C. Transmit the Occurrence Report within 21 days and distributes copies of the transmittal letter and Occurrence Report to the following:

a. Manager, Performance Assessment
b. Manager, Emergency Preparedness
c. Appropriate Line Management for the particular event

7.2.8 TRACKING, TRENDING, AND STATUS REPORTS

DIVISION VICE-PRESIDENT

A. Completes corrective actions as described in Final Occurrence Report.

B. Submits a letter of completion to the Manager of Emergency Preparedness, including all documentation used to complete the action. This is verified and approved by the ORT for each corrective action.

ORT

A. Updates Corrective Action status in the ORPS database.

B. Submits a copy of each final Occurrence Report to the Manager of the Performance Assessment Department, Performance/Quality Assurance Division. Verification of completed corrective action will include a signature from Quality Assurance (QA).

PUBLIC AFFAIRS

A. Obtains a printout of the report from the ORPS database and mails a copy of each FEMP Final Occurrence Report to the DOE-HQ Reading Room, address as follows:

Freedom of Information Act (FOIA) Reading Room
IE-190, AD-62-FORS
U. S. Department of Energy
Washington, D. C. 20585-0002

PUBLIC READING ROOM ADMINISTRATOR

Maintains a file of FEMP Final Occurrence Reports. Receives additional Final Reports from the Program Manager and adds the reports to the Reading Room file. Reports must be placed in the Reading Room within two weeks after approval by the DOE Program Manager.

8.0 DRIVERS

8.1 DOE Order 5000.3B, Occurrence Reporting and Processing of Operation Information

8.2 DOE Order 5500.1B, Emergency Management System

8.3 DOE Order 5500.2B, Emergency Categories, Classes, and Notification and Reporting Requirements

8.4 DOE Order 5500.3A, Planning and Preparedness for Operational Emergencies

8.5 FEMP RCRA Contingency Plan

9.0 DEFINITIONS

9.1 Assistant Emergency Duty Officer (AEDO): The emergency management authority onsite when the EOC is not operational. The AEDO is the Incident Commander of the FEMP emergency response activities. The AEDO is the Facility Manager Designee.

9.2 Categorization: Relative ranking of an event or condition to ensure that the urgency of notification is readily identifiable and that the more serious occurrences are highlighted to management.

9.3 Classification: The placement of an event or condition in one of three classes under the Emergency categorization. The classes are: Alert, Site Area Emergency, and General Emergency.

9.4 Communications Center Operator: The person assigned responsibility for operating the communications equipment in the FEMP Communications Center for notifications, announcements and reports as necessary.

9.5 Counties: The Law Enforcement, and/or Emergency Management, and Civil Defense agencies of Hamilton and Butler Counties.

9.6 Critique: A critical discussion with the individuals involved in an abnormal event to ascertain the actions that took place before, during, and immediately following the event.

9.7 Daily Operations Report: A one-page bullet list of occurrence information condensed from the Fact Sheet.

9.8 Deputy Emergency Director (DED): The immediate successor to the ED. The DED's primary emergency responsibility is the direction and control of emergency incidents as manager of the EOC.

9.9 Division Vice-President: The FERMCO Vice-President with responsibility for providing technical assistance for event investigation, root cause determination, corrective action, and developing the information that will be uploaded into the ORPS database for the 10-day and Final Occurrence Reports. In regard to the 10-day and Final Occurrence Reports, the FERMCO Vice-President or his or her designee has the responsibilities assigned to the individual designated "Facility Manager" in DOE Order 5000.3B.

9.10 DOE Fernald Area Office Manager: The senior DOE representative onsite for the FEMP.

9.11 DOE Fernald Area Office Duty Officer (DOE-FN EDO): A designated, on-call member of the DOE Fernald Area Office with the responsibility for initial event notifications.

9.12 Emergency: An Emergency, the most serious event, consists of any unwanted operations, civil, natural phenomenon, or security occurrence which could endanger or adversely affect people, property, or the environment. The emergency category is subdivided into three classes: Alert, Site Area, and General Emergency.

9.13 Emergency Director (ED): The FERMCO President or his designee has overall authority and responsibility for activities at the FEMP, including emergency management.

9.14 Emergency Duty Officer (EDO): The trained, senior management personnel responsible for the management and oversight of the FEMP. Responsible for event categorization.

9.15 Emergency Operations Center (EOC): The command and control center, located in the Administration Building, designed for management and oversight of the FEMP emergency response actions.

9.16 Emergency Preparedness: The functional organization within FERMCO responsible for compliance to DOE Orders related to Emergency Management, Occurrence Reporting, and for ensuring FERMCO personnel and management are prepared to respond to emergencies at the FEMP.

9.17 Employees: All persons employed by FERMCO, DOE-FN, and subcontractors, including: Supervisors, Communications Center Operators, Duty Officers, Managers, DOE, Parsons, and all other site contractors and subcontractors.

9.18 Event: Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment.

9.19 Event Notification Verification Form (ENVF): Record of compliance for reportable release(s).

9.20 Facility Manager: The President of FERMCO, or his or her designee, who has direct line responsibility for operation of a facility or group of facilities including authority to direct physical changes to the facility. The Facility Manager designee is a person within the facility operations organization who has been delegated responsibility by the facility manager. Within the scope of this procedure, the delegated responsibility has been assigned to the AEDO and the ORT.

9.21 Facility Representative: A field office individual or his/her designee assigned responsibility by the Head of the Field Organization for monitoring the performance of the facility and its operation. This individual shall be the primary point of contact with the contractor and will be responsible to the appropriate Program Secretarial Officer and Head of Field Organization for implementing the requirements of DOE Order 5000.3B.

9.22 Fact Sheet: Approximately one-page summary of occurrence information in outline form including the event summary, significance to ES&H/Public/Personnel, immediate actions taken, and notifications made. A Fact Sheet is required for all Off-Normal and higher events.

9.23 Joint Information Center (JIC): The FERMCO facility located at a predestinated location equipped to receive, coordinate, and disseminate emergency information to the media from the state, counties, and the FEMP.

9.24 Loggable Event: A non-routine event which is not required to be reported to DOE. It must, however, be recorded (along with all events of higher categorization) 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.

9.25 Occurrence Report: A documented evaluation of an event or condition that is prepared in sufficient detail to enable the reader to assess its significance, consequences, or implications and to evaluate the actions being proposed or employed to correct the condition or to avoid recurrence, there are four occurrence reports defined as follows:

A) **Notification Report:** (Attachment A)
The report that serves as the initial event report. This report, Items 1-18 of the Occurrence Report, is completed and uploaded into the ORPS data base. This report must be completed and issued by the close of the next business day from the time of categorization (not to exceed 80 hours) or re-categorization, if the initially assigned level is modified prior to issuing the Notification Report.

B) **10-day Occurrence Report** (Refer to section 7.2.4)
The Occurrence Report that provides sufficient details of the event. This report must be completed on the ORPS database and uploaded within 10 working days of event categorization.

C) **Update Occurrence Report** (Refer to section 7.2.5)
This report updates the 10-day Occurrence Report with significant new information once it becomes available. The Update Report is completed on the ORPS database. An unlimited number of Update Reports may be submitted on any given event prior to submittal of the Final Occurrence Report.

D) **Final Occurrence Report:** (Refer to section 7.2.6) This report includes analysis of cause of occurrence, determination of root and contributing causes, determination and scheduling of corrective actions and identification of lessons learned. This report shall be submitted to the DOE Facility Representative within 45 calendar days of categorization of the occurrence. The Final Occurrence Report is completed on the ORPS database and uploaded by the ORT. The final report must be reviewed and approved by the DOE Facility Representative and the DOE Program Manager prior to being transferred into the general user-accessible portion of the database. This transfer is automatically performed by the database once approval is indicated by the Facility Manager, Facility Representative, and the DOE-PM.

9.26 Occurrence Reporting and Processing System (ORPS): A DOE-wide centralized database and computerized support for the collection, generation, distribution, updating, analysis, and sign-off of information in occurrence reports.

9.27 Occurrence Reporting Team (ORT): A group of FERMCO personnel, under the direction of the Manager of Emergency Preparedness, responsible for the creation and distribution of the Fact Sheet, Daily Operations Report, uploading of all Occurrence Reports, follow-up on corrective actions, supporting the Division Manager with critiques and identifying causes and corrective actions.

9.28 Off-Normal Occurrence: Abnormal or unplanned events or conditions, as described in DOE 5000.3B, that adversely affect, potentially affect, or are indicative of degradation in the safety, security, environmental or health protection performance or operation of a facility.

9.29 Program Manager (PM): The DOE-HQ individual, or his/her designee designated by and under direction of a Program Secretarial Officer, who is directly involved in the operation of the facilities under his/her cognizance, and with authority to provide technical direction through DOE Field Organizations to contractors for these facilities.

9.30 Public Affairs: The Division responsible for informing the public, neighbors, DOE Public Affairs, and employees of significant events at the FEMP.

9.31 Release: For the purpose of this manual, a release is defined as a spill incident.

9.32 Release Evaluator: A designated individual within the Environmental Protection Department with the responsibility for ensuring the FEMP notifications and reporting in response to a spill incident comply with federal and state environment laws and environmental permits.

9.33 Reportable Occurrence: An event(s) or condition(s) to be reported after

evaluation and categorization in accordance with the criteria defined in DOE Order 5000.3B.

9.34 Reportable Quantity (RQ): The quantity of a hazardous substance that triggers reporting under CERCLA/SARA. A list of these substances is found in 40 CFR 302.4 and 40 CFR 355.

9.35 Spill Incident: For purposes of this procedure, a spill incident is defined as any release as defined by the statutory definition in CERCLA Section 101(22). This definition includes any spilling, leaking, pumping, pouring, injecting, escaping, emitting, emptying, leaching, releasing, dumping, discharging or disposing of a hazardous substance, extremely hazardous substance, hazardous material, hazardous waste, toxic pollutants, hazardous air pollutants, radioactive substance, oil, chemical substance or mixture into the land, into the water, or into the air within or beyond the boundaries of the FEMP.

9.36 Unusual Occurrence: An unusual occurrence is a non-emergency occurrence that has significant impact or potential for impact on safety, environment, health, security or operations as defined by DOE 5000.3B.

9.37 Visitor: Any person other than FERMCO and DOE employees, subcontractor or vendor personnel, who have been properly authorized and issued temporary or permanent credentials for access to the FEMP.

TABLE 1
SUMMARY OF REPORTING REQUIREMENTS

NOTIFICATION		REPORTING			
EVENT CATEGORY	AEDO MAKES VERBAL REPORT TO DOE-FEMP AND DOE-HQ	ORT UPLOADS NOTIFICATION REPORT INTO ORPS DATA BASE AND ISSUES COPIES TO DOE-FEMP AND FERMCO MANAGEMENT	ORT UPLOADS OCCURRENCE REPORT & ISSUES COPIES TO DOE-FEMP AND FERMCO MANAGEMENT	ORT UPLOADS UPDATED OCCURRENCE REPORT AND ISSUES COPIES TO DOE-FEMP AND FERMCO MANAGEMENT	ORT UPLOADS FINAL OCCURRENCE REPORT AND ISSUES COPIES TO DOE-FEMP AND FERMCO MANAGEMENT
Emergency	Within 15 minutes of event categorization	Within 24 hours of event categorization	Within 10 working days of event categorization	When significant new information is available	When root cause, contributing causes, and lessons learned have been determined and corrective actions scheduled within 45 days of categorization of the occurrence
Unusual Occurrences	Within two hours of event categorization	By the end of the next business day from the time of categorization (not to exceed 80 hours)	Same as above	Same as above	Same as above
Off-Normal Occurrence	Not required	By the end of the next business day from the time of categorization (not to exceed 80 hours)	Same as above	Same as above	Same as above
Loggable Event (1)	Not required	Not required	Not required	Not required	Not required

(1) Logged by the Assistant Emergency Duty Officer's Daily Event Log.

ATTACHMENT A - LIST OF ACRONYMS AND ABBREVIATIONS

AEDO	Assistant Emergency Duty Officer
CERCLA	Comprehensive Environmental Response Compensation, and Liability Act
CP	Command Post
DED	Deputy Emergency Director
DOE	Department of Energy
DOE-FN EDO	Fernald Area Office Emergency Duty Officer
DOE-HQ-EOC	Department of Energy Headquarters Emergency Operations Center
DOE-HQ	Department of Energy, Headquarters
DOE-OH	Department of Energy, Ohio Field Office
ED	Emergency Director
EDO	Emergency Duty Officer
EOC	Emergency Operations Center
EMS	Emergency Message System
ENVF	Event Notification Verification Form
EP	Emergency Preparedness
ERT	Emergency Response Team
ERPG	Emergency Response Planning Guide
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
[illegible]	Fernald Area Office
[illegible]IA	Freedom of Information Act
JIC	Joint Information Center
OEMA	Ohio Emergency Management Agency
OR	Occurrence Report
ORPS	Occurrence Reporting and Processing System
ORT	Occurrence Reporting Team
PAG	Protective Action Guideline
PBX	Plant Branch Exchange
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization Act
SNM	Special Nuclear Material
SOP	Standard Operating Procedure
TSCA	Toxic Substance Control Act

ATTACHMENT B - INSTRUCTIONS FOR COMPLETING AN OCCURRENCE REPORT

1. **GENERAL**

The numbers on the specific report items correspond with the numbers used in the Occurrence Report format.

Please note that all fields with an asterisk (*) preceding it are required fields for all (notification, 10-Day Update, and Final) reports. Fields marked with a pound (#) are required under certain conditions, for example, depending on occurrence type, report type, or the answer to a previous question.

2. **OCCURRENCE REPORT ITEMS.**

A. **Facility/Personnel Information**

1. ***NAME OF FACILITY** - Enter the name of the facility where the occurrence took place. (FEMP)

2. ***FACILITY FUNCTION** - Enter the type of facility or the activity/function performed by the facility. Only one function can be selected.

Possible entries are: (✓ USED EXCLUSIVELY AT FEMP)

A. Plutonium Processing and Handling
B. SNM Storage
C. Explosive
D. Uranium Enrichment
E. Uranium Conversion/Processing and Handling
F. Irradiated Fissile Material Storage
G. Reprocessing
H. Nuclear Waste Operations
I. Tritium Activities
J. Fusion Activities
✓ K. Environmental Restoration Operations
L. Category "A" Reactors
M. Category "B" Reactors
N. Solar Activities
O. Fossil and Petroleum Reserves
P. Accelerators
✓ Q. Balance-of-Plant (e.g., offices, machine shops, site/outside utilities, safeguards/security, and transportation)

3. ***NAME OF LABORATORY, SITE, OR ORGANIZATION** - Enter the name of the laboratory, site, or organization. If ORPS is being used, the laboratory, site, or organization and, in addition, the name of the DOE contractor for the facility will be automatically provided by the computer. (FERMCO)

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4. ***FACILITY MANAGER/DESIGNEE** - Enter the name, title, and telephone number of the Facility Manager of designee who has direct line responsibility for operation of the facility. If ORPS is being used, the Facility Manager's or designee's name will be automatically provided by the computer when he/she uploads the input to ORPS. The ORT is the Facility Manager designee for FEMP

5. ***ORIGINATOR** - Enter the name, title, and telephone number of the person who originated this report within the responsible Division. This is the person who gathered the information and is most knowledgeable about the event.

B. **Specific Report Items.**

1. ***OCCURRENCE REPORT NUMBER** - Enter an alphanumeric designation that identifies the DOE Field office, area office (if applicable), DOE contractor or laboratory involved, facility, the calendar year of the occurrence, and sequential number of the occurrence by facility. If ORPS is being used, the OR number will be automatically generated by the computer.

   EXAMPLE: OH-FN-FERM-FEMP-1995-000X.

2. ***REPORT TYPE AND DATE** - Check the block that identifies the type of Occurrence Report being submitted. Use a 10 Day/10 Day Update Report for re-categorization of an occurrence. Check **only one box unless you are submitting a 10-Day and a Final together**, which is the only case where two boxes can be checked. Possible entries are:

   Notification Report
   10-Day Report
   Latest 10-Day Update
   Final Report

   A. Items 1 through 18 of the Occurrence Report constitute the Notification Report, which remains a part of subsequent Occurrence Reports.

   B. All dates and the time of the Notification Report submission are computer generated. The date that the report is entered into the ORPS database is the Occurrence Report's submission date.

   C. For hard-copy reports, show all dates. That is, for a Final Report, this block must show the Final Report submission date and the dates of the Notification, 10-Day and Update Report submissions. If subsequent 10-day Update Occurrence Reports were submitted, only the latest date needs to be shown.

   D. To cancel an Occurrence Report, check the blocks under Report Type for 10-Day Report (if a 10-Day Report has not already been submitted) and Final Report, as well as the block for Canceled under Occurrence Category (Item 3 below). Canceled reports must go through the approval process and be completed the same as all other Occurrence Reports; however, Items 19 through 32 are not required fields for canceled reports and, upon signature of the DOE Facility Representative and Program Manager, the Occurrence Report will be removed from the active database.

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3. ***OCCURRENCE CATEGORY** - Indicate which category has been determined for the occurrence. Only one category can be selected. Possible entries are:

   Emergency
   Unusual
   Off-Normal
   Canceled

4. ***DIVISION OR PROJECT** - Identify in full the project or the contractor organizational unit responsible for the facility at which the occurrence took place.

5. ***DOE PROGRAM OFFICE** - Identify the DOE Program Office to which this facility is operationally responsible. Only one Program Office can be selected. If the facility is operationally responsible to more than one Program Office, enter the Program Office that is most directly involved in the specific work activity during which the occurrence took place.

   Possible entries are:(✓ USED EXCLUSIVELY AT FEMP)

   CE - Conservation and Renewable Energy
   ER - Energy Research
   FE - Fossil Energy
   ✓ EM - Environmental Restoration and Waste Management
   DP - Defense Programs
   NE - Nuclear Energy
   RW - Civilian Radioactive Waste Management
   ESH - Environmental, Safety, and Health
   NP - New Production Reactor
   AD - Administration and Management
   EI - Energy Information Administration
   RG - Economic Regulatory Administration
   IN - Intelligence
   SA - Security Affairs

6. ***SYSTEM, BUILDING, OR EQUIPMENT** - Identify all systems, equipment, or structural items involved in the occurrence, as applicable.

7. ***UCNI** - When required by Paragraph 7E(1) of the Order and when appropriate, UCNI guidance is available, a Reviewing Official shall make a Final Determination that the report does contain (enter "Y" for Yes) or does not contain (enter "N" for No) UCNI. Where appropriate UCNI guidance is not available, a Reviewing Official shall make a Preliminary Review Determination that the report may contain UCNI (still enter "Y" for Yes) or does not contain (enter "N" for No) UCNI. Response is always be "N" for FEMP reports.

8. **#PLANT AREA** - Indicate the name of the site-specific plant area (e.g., F-Area, M-Area) where the occurrence took place.

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9. ***DATE AND TIME OCCURRENCE WAS DISCOVERED** - Enter the date and time when the facility staff discovered the event or condition being reported.

10. ***DATE AND TIME OCCURRENCE WAS CATEGORIZED** - Enter the date and time when the Facility Manager determined that the event or condition constituted a Reportable Occurrence and determined its category (Emergency, Unusual, or Off-Normal occurrence).

11. **#DOE NOTIFICATION** - Enter the name and organization of the DOE Program manager and the date and time when the DOE Program Manager was notified (via the simultaneous notification to the DOE Field Representative and DOE Program Manager).

12. **#OTHER NOTIFICATIONS** - Enter the name(s), organization(s), date(s), and time(s) of notification of State and local officials or other agencies.

13. ***SUBJECT OR TITLE OF OCCURRENCE** - Enter a brief title or description (20 words or less) that best details the nature, cause, and result of the occurrence.

14. ***NATURE OF OCCURRENCE** - Enter the nature of the occurrence as given in I of DOE Order 5000.3B. Up to three selections can be made. Possible entries are:

<u>Facility Condition</u>

A. Nuclear Criticality Safety
B. Fires/Explosions
C. Safety Status Degradation
D. Loss of Control of Radioactive Material/Spread Contamination
E. Vital System/Component Degradation
F. Violation/Inadequate Procedures
G. Unsatisfactory Surveillance/Inspections
H. Costly Vital Structure/System/Component/Facility Deficiency
I. Operational Occurrence
J. Inadequate Experiment/Test Performance

<u>Environmental</u>

A. Radionuclide Releases
B. Hazardous Substances/Regulated Pollutants/Oil Releases
C. Hazardous Material Contamination
D. Ecological Resources
E. Agreement/Compliance Activities

<u>Personnel Safety</u>

A. Occupational Illness/Injuries
B. Vehicular Incidents
C. Miscellaneous

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Personnel Radiation Protection

A. External Radiation Exposure
B. Personnel Contamination
C. Internal Exposure

Safeguards/Security

A. Criminal Acts
B. Loss of Control of Classified Matter
C. Substance Abuse
D. Foreign Intelligence Activities
E. Computer Equipment/Systems
F. Unplanned/Unscheduled Outage of Site Security System
G. Demonstrations/Protests
H. Firearms
I. Other Security Concerns
J. Material Control and Accountability

Transportation

A. Offsite Transportation (DOT jurisdiction) Occurrences.
B. Onsite Transportation (DOE jurisdiction) Occurrences.

Value Basis Reporting

Facility Status

A. Facility/Process Securing/Curtailing Operations
B. Facility/Process Shutdown Extension
C. New Facility/Process Startup Delay

Cross-Category Items

A. Collectively Significant Related Occurrences
B. Near-Miss Occurrences
C. Potential Concerns/Issues

15. *DESCRIPTION OF OCCURRENCE - Enter a clear, concise, objective description of what happened and what was observed. To the maximum extent possible, a sequence of events shall be provided. The type of information to be provided in the description includes all of, but is not limited to, the following:

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A. The method of discovery;
B. Any component failures and the failure modes;
C. Any personnel errors involved, including the type and result of the error;
D. Any procedure problem encountered;

16. ***OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE** - Describe the operational status of the facility or equipment at the time of the occurrence including, for example, pertinent temperatures, pressures, or other parameters necessary for evaluation of the occurrence and its consequences. If said information is not applicable, enter "Does not apply."

17. ***ACTIVITY CATEGORY** - Enter one of the following activities that best describes the ongoing activity at the time of the occurrence:

Construction
Maintenance
Normal Operations
Startup
Shutdown
Facility/System/Equipment Testing
Training
Transportation
Emergency Response
Inspection/Monitoring
Facility Decontamination/Decommissioning

18. ***IMMEDIATE ACTIONS TAKEN AND RESULTS** - Describe the immediate or remedial actions taken to return the facility, system, or equipment item to service; to correct or alleviate the anomalous condition; and to record the results of those actions.

19-21. **#CAUSE** - This must be thoroughly addressed as the information becomes available. Enter the cause(s) that best describes the apparent direct and contributing cause. Only one direct cause may be entered, but up to three contributing causes may be entered. In the final evaluation of a Reportable Occurrence, there must be complete consideration of the cause, including contributory factors, with analysis to show what cause was root to the occurrence and what causes were only contributory. The root cause (only one allowed) is that fundamental cause that, if corrected, will prevent recurrence of this or similar events. The possible entries are the same for all three cause fields. The direct, contributing, and root causes of reportable occurrences are classified into seven broad categories and various subcategories.

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The seven categories of causes and their associated subcategories are as follows:

EQUIPMENT/MATERIAL PROBLEM - An event resulting from the failure, malfunction, or deterioration of equipment or parts, including instruments or material.

A. **Defective or Failed Part** - A part/instrument that lacks something essential to perform its intended function.

B. **Defective or Failed Material** - A material defect or failure.

C. **Defective Weld, Braze, or Soldered Joint** - A specific weld/joint defect or failure.

D. **Error by Manufacturer in Shipping or Marking** - An error by the manufacturer or supplier in the shipping or marking of equipment.

E. **Electrical or Instrument Noise** - An unwanted signal or disturbance that interferes with the operation of equipment.

F. **Contamination** - Contamination due to radiation damage or foreign material such as dirt, debris, or impurities.

PROCEDURE PROBLEM - An event that can be traced to the lack of a procedure, an error in a procedure, or a procedural deficiency or inadequacy.

A. **Defective or Inadequate Procedure** - A procedure that either contains an error or lacks something essential to the successful performance of the activity.

B. **Lack of Procedure** - No written procedure was in place to perform the activity.

PERSONNEL ERROR - An event due to an error, mistake, or oversight.

A. **Inadequate Work Environment** - A deficiency or fault in the physical conditions of the work area.

B. **Inattention to Detail** - Inadequate attention to the specific details of the task.

C. **Violation of Requirement or Procedure** - The inappropriate use or violation of written instruction, procedures, or other documentation.

D. **Verbal Communication Problem** - Inadequate spoken presentation or exchange of information.

E. **Other Human Error** - Human error other than those described above.

DESIGN PROBLEM - An event that can be traced to a defect in design or other factors related to configuration, engineering, layout, tolerances, calculations, etc.

A. **Inadequate Man-Machine Interface** - Inadequate design of equipment used to communicate information from the facility to a person (displays, labels, etc.).

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B. **Inadequate or Defective Design** - A design in which something essential was lacking (defective) or when a detail was included but was not adequate for the requirement (inadequate).

C. **Error in Equipment or Material Selection** - A mistake in the equipment or material selection only, not to include a procurement error (see 3E) or a specification error (see 4D).

D. **Drawing, Specification, or Data Errors** - An error in the calculation, information, or specification of a design.

TRAINING DEFICIENCY - An event that can be traced to a lack of training or insufficient training to enable a person to perform a desired task adequately.

A. **No Training Provided** - A lack of appropriate training.

B. **Insufficient Practice or Hands-On Experience** - An inadequate amount of preparation before performing the activity.

C. **Inadequate Content** - The knowledge and skills required to perform the task or job were not identified.

D. **Insufficient Refresher Training** - The frequency of refresher training was not sufficient to maintain the required knowledge and skills.

E. **Inadequate Presentation or Materials** - The training presentation or materials were insufficient to provide adequate instruction.

MANAGEMENT PROBLEM - An event that can be directly traced to managerial actions or methods.

A. **Inadequate Administrative Control** - A deficiency in the controls in place to administer and direct activities.

B. **Work Organization/Planning Deficiency** - A deficiency in the planning, scoping, assignment, or scheduling of work.

C. **Inadequate Supervision** - Inadequate techniques used to direct workers in the accomplishment of tasks.

D. **Improper Resource Allocation** - Improper personnel or material allocation resulting in the inability to successfully perform assigned tasks.

E. **Policy Not Adequately Defined, Disseminated, or Enforced** - Inadequate description, distribution, or enforcement of policies and expectations.

F. **Other Management Problem** - A management problem other than those defined above.

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EXTERNAL PHENOMENA - An event caused by factors that are not under the control of the reporting organization or the suppliers of the failed equipment or service.

A. **Weather or Ambient Condition** - Unusual weather or ambient conditions, including hurricanes, tornadoes, flooding, earthquake, and lightning.

B. **Power Failure or Transient** - Special cases of power loss that are attributable to outside supplied power.

C. **External Fire or Explosion** - An external fire, explosion, or implosion.

D. **Theft, Tampering, Sabotage, or Vandalism** - Theft, tampering, sabotage, or vandalism that could not have been prevented by the reporting organization.
Specific information pertaining to each cause field is as follows:

19. **#DIRECT CAUSE** - The cause that directly resulted in the occurrence. For example, in the case of a leak, the direct cause could have been the failure in the component or equipment that leaked. In the case of a system misalignment, the direct cause could have been operator error in the alignment. Enter only one direct cause for the occurrence. One subcategory for the direct cause selected must also be checked. The direct cause is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

20. **CONTRIBUTING CAUSES** - The cause that contributed to the occurrence but, by itself, would not have caused the occurrence. For example, in the case of a leak, the contributing cause could be lack of adequate operator training in leak detection and response resulting in a more severe event than would have otherwise occurred. In the case of a system misalignment, the contributing cause could be excessive distractions to the operators during shift, resulting in less than adequate attention to important details during system alignment. Enter up to three contributing causes for the occurrence. One subcategory for each of the contributing causes must also be checked. The required field.

21. **#ROOT CAUSE** - The cause that, if corrected, would prevent recurrence of this and similar occurrences. The root cause does not apply to this occurrence only, but has generic implications to a broad group of possible occurrences, and it is the most fundamental aspect of the cause that can logically be identified and corrected. There may be a series of causes that can be identified, one leading to another. This series shall be pursued until the more fundamental, correctable cause has been identified.

    For example, in the case of a leak, the root cause could be a failure of management to ensure that maintenance is effectively managed and controlled. This cause could have led to the use of improper seal material or missed preventive maintenance on a component, which ultimately led to the failure. In the case of a system misalignment, the root cause could be failure in the training program, leading to a situation in which operators are not fully familiar with control room procedures and are willing to accept excessive distractions. Enter only one root cause for the occurrence. One subcategory for the root cause selected must also be checked. The root cause is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

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22. **#DESCRIPTION OF CAUSE** - Discuss the cause of the occurrence to include root, direct, and contributing causes (do not repeat a description of the occurrence but discuss the results of the causal analysis). The Root Cause analysis methodology used should be identified. When appropriate, separate documentation for the root cause analysis may be attached. If ORPS is being used, the separate analysis may be attached. If ORPS is being used, the separate documentation should be referenced as s to the Occurrence Report, with specifics as to where or from whom they can be obtained. This field is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

23. **#EVALUATION BY FACILITY MANAGER** - With the information available, the Facility Manager shall provide his or her evaluation of the occurrence and its effect or possible effect on the plant, system, program, etc., in the 10-Day Occurrence Report.

24. **#IS FURTHER EVALUATION REQUIRED?, CHECK "YES" or "NO"** - This is a required field on all reports except the Notification Report. It is not expected that this response would be "Yes" in a Final Report since further evaluation could change the root cause or identify additional corrective actions.

    If further evaluation is required, the "Yes" or "No" must be checked as to whether that evaluation is required before further operation.

    If further evaluation is required before further operation (i.e., both "Yes" blocks checked), then who will take the action (a person's name, title, or a specific organizational unit) and a date when the action shall be taken must be provided.

25. **#CORRECTIVE ACTIONS** - List all actions identified to correct the problem which, when completed, will prevent recurrence. In addition, provide actual or target completion dates for all of the corrective actions listed. This field is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

26. **#IMPACT ON ENVIRONMENT, SAFETY, AND HEALTH** - Provide an assessment of the environment, safety, and health consequences and implications of the occurrence. Describe the impact of the occurrence on the environment, safety, and health of workers, the public, and onsite/offsite environs. This shall include amounts and types of hazardous or radioactive materials released, levels and types of contamination, exposure levels of workers and the public, and known or projected environmental, safety, and health impacts. This assessment may be based on the conditions existing at the time of the occurrence. The evaluation must be carried out to the extent necessary to fully assess the safety consequences and safety margins associated with the occurrence.

    For occurrence related to nuclear safety, an assessment of the occurrence under alternative conditions must also be included if the occurrence could have been more severe (e.g., the facility would have been in a condition not analyzed in the Safety Analysis Report) under reasonable and credible alternative conditions such as power level or operating mode. For example, if the occurrence happened while the facility was at 15 power and the same occurrence could have taken place while the facility was at 100 power, and, as a result, the environment, safety, or health consequences would have been considerably more serious, the assessment must describe those conditions and consequences. This field is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

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27. **#PROGRAMMATIC IMPACT** - Describe the impact of the occurrence on the program or project affected. This could be a loss of data, loss of plant availability for a specified period, additional costs, schedule delays, or other measurable consequences of the occurrence. This field is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

28. **#IMPACT UPON CODES AND STANDARDS** - If the occurrence affects the requirements of national codes and standards, program standards, or DOE Orders; a statement regarding the adequacy of the codes or standards shall be provided, along with any recommended changes. This field is not required for 10-Day Update Reports; however, it is required for Final Reports.

29. **#FINAL EVALUATION AND LESSONS LEARNED** - This item shall be completed only in the final Occurrence Report. Include any lessons that others might learn from the occurrence that could be of importance to other facility operators or that should be addressed in personnel training or facility procedures. Consequences of the occurrence and steps taken to alleviate those consequences should not be described here unless they contribute to an understanding of the occurrence. This field is not required for 10-Day Reports or 10-Day Update Reports; however, it is required for Final Reports.

30. **#SIMILAR OCCURRENCE REPORT NUMBERS** - Indicate by their report numbers any similar occurrence(s) of which you are aware for this or other facilities. The purpose of this item is to identify, if recognized, occurrences that might suggest a generic problem. This field is not required for 10-Day Reports or 10-Day Update Reports; however, it is a required field for Final Reports.

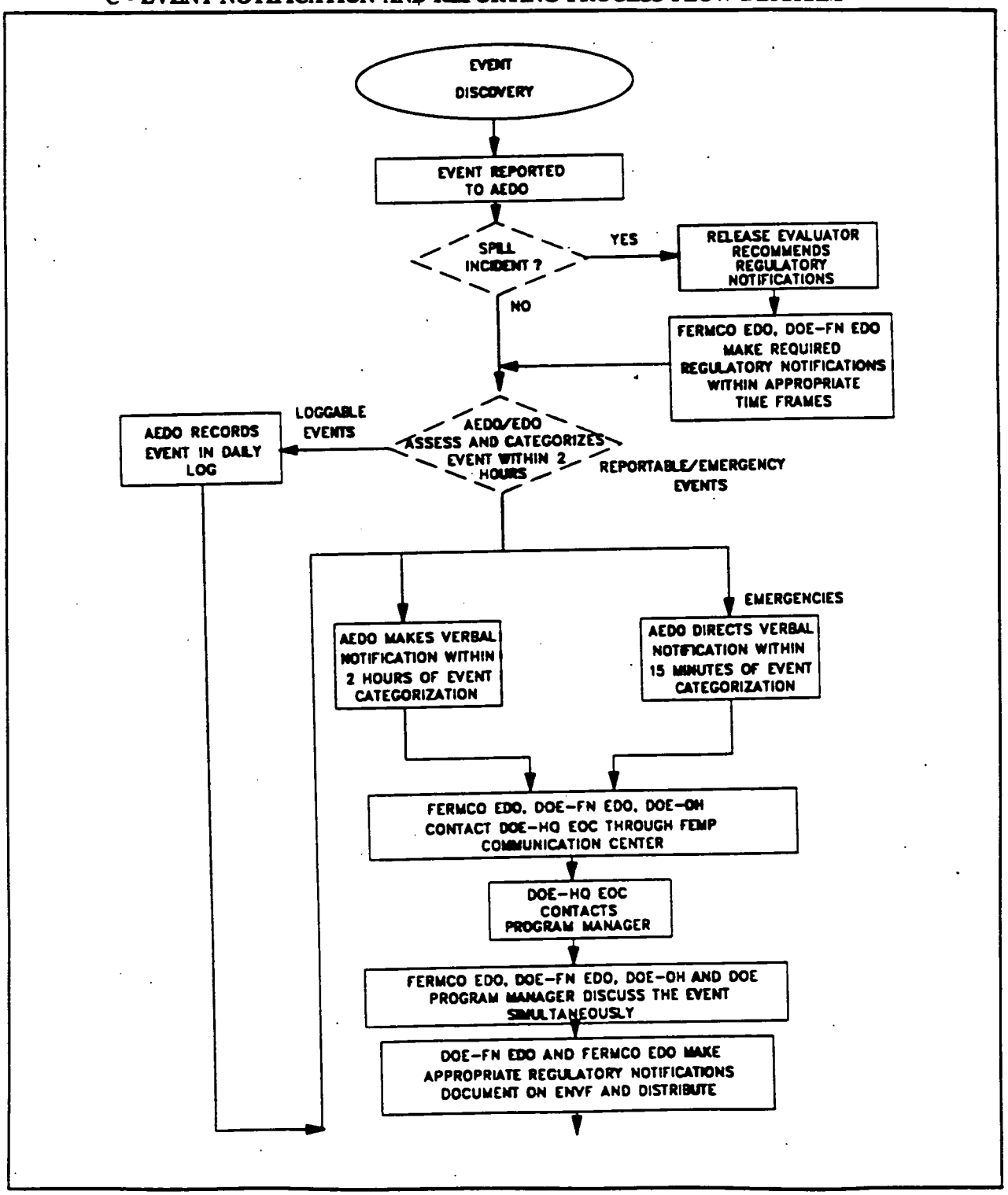
31. **DOE FACILITY REPRESENTATIVE INPUT** - The DOE Facility Representative or designee should provide his or her evaluation of the occurrence. Including an evaluation of the initial and proposed corrective actions and all follow-up by the contractor, and should describe any other actions that DOE has taken since the occurrence. The Facility Representative may supplement such information with subsequent additional entries, as appropriate. After completing the input, enter the Facility Representative's name and the date. If ORPS is being used, the Facility Representative's name and the date will be automatically entered by the computer. This is not a required field on any report.

32. **PROGRAM MANAGER INPUT** - The DOE Program Manager or designee should provide his or her evaluation of the occurrence, including an evaluation of the initial and proposed corrective actions and all follow-up, and should describe any other actions that DOE has taken since the occurrence. The DOE Program Manager may supplement such information with subsequent additional entries, as appropriate. If a Final Occurrence Report is being rejected the DOE Program Manager may use this space to indicate why. This is not a required field on any report.

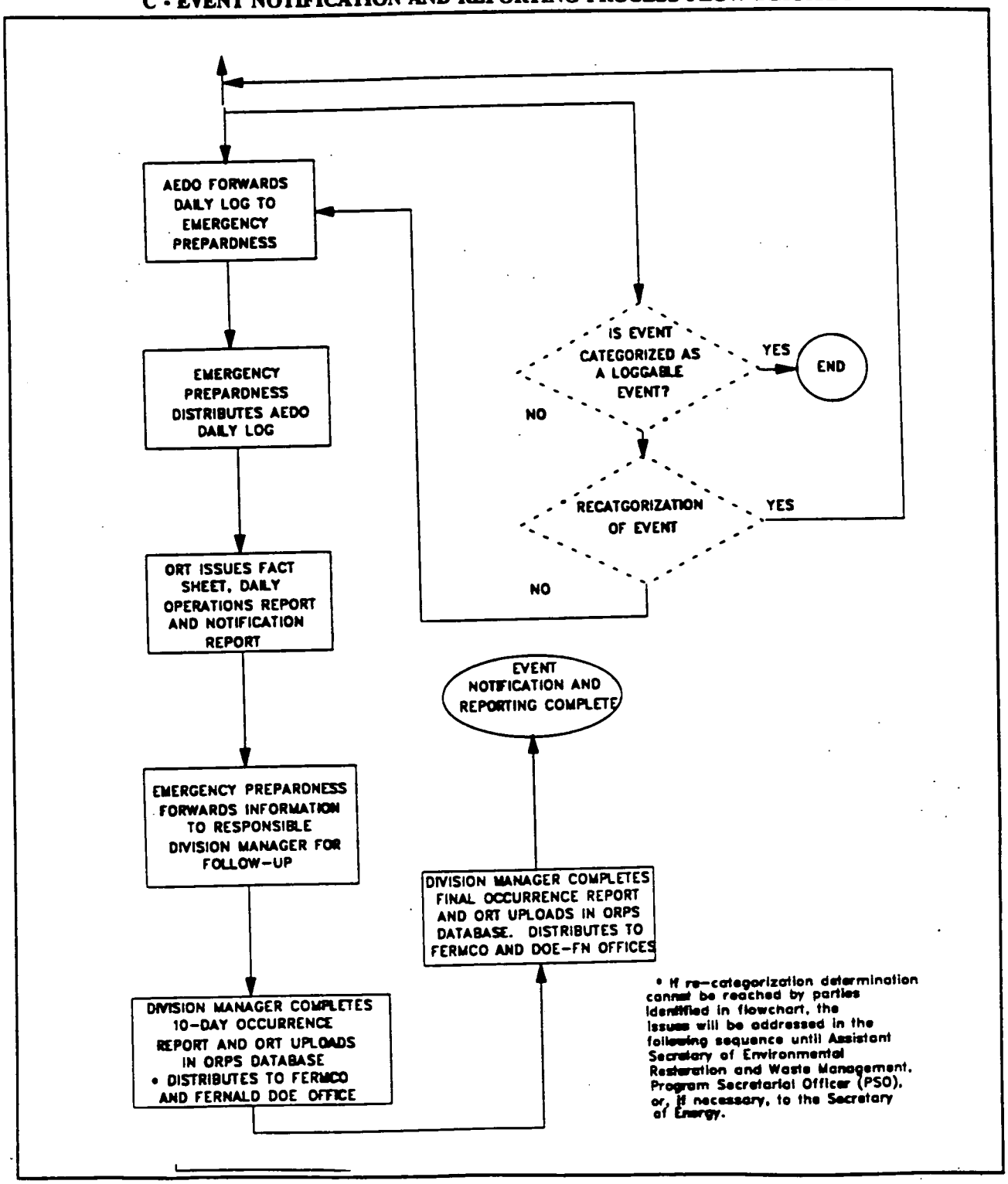
33. **#SIGNATURES** - The Facility Manager's or designee's name, after transmitting the Final Report to the mainframe computer, will automatically be provided with an indication of acceptance. The Final Report will then be available for the Facility Representative and Program Manager, or their designees, to review, it will automatically be available to all DOE Elements for their use in analysis and trending.

NOTE: This field is required for Final Reports only.

C - EVENT NOTIFICATION AND REPORTING PROCESS FLOW DIAGRAM



C - EVENT NOTIFICATION AND REPORTING PROCESS FLOW DIAGRAM



D - AEDO'S DAILY EVENT LOG

AEDO'S DAILY EVENT LOG

EVENT LOG NUMBER (YR-MO-NO)	TIME AND DATE DISCOVERED	DESCRIPTION	AEDO'S BADGE NUMBER	LE	ON	UO	E	NOTIFIED RELEASE EVAL.	DIRECTED AREA MONITORING

COPIES OF THIS LOG MUST BE DELIVERED TO THE EOC DAILY.

NO.	DISTRIBUTION
1	EOC TO MAKE DISTRIBUTION
2	Originator
3	Manager, Utilities

Facility Owner: _____

LE - LOGGABLE EVENT ____
ON - OFF-NORMAL OCCURRENCE ____
UO - UNUSUAL OCCURRENCE ____
E - EMERGENCY

E - EVENT NOTIFICATION VERIFICATION FORM

NOTIFICATION		ORGANIZATION/AGENCY	NAME OF PERSON NOTIFIED/ AGENCY REPORT NUMBER	TIME	VERIFIED BADGE NUMBER
REQUIRED	INFORMATIONAL				
1		DOE-FEMP (Facility Representative)			
1		DOE-HQ-EOC (202) 586-8100 FAX (202) 586-0420			
1		DOE-HQ (Program Manager) FAX (301) 903-8136			
2	1	BUTLER COUNTY LEPC 844-8020			
2	1	HAMILTON COUNTY LEPC (FAX) 851-5190			
2	1	CROSBY TOWNSHIP FIRE DEPARTMENT 825-2260			
3	1	NATIONAL RESPONSE CENTER (800) 424-8802			
	1	OEPA/SWDO/DHWM (513) 285-6357 P. PARDI, G. MITCHELL, P. HARRIS			
	1	US EPA Region 5 (312) 353-2318			
6	1	OHIO EMA (614) 889-7150			
2,7	1	OHIO EMERGENCY RESPONSE COMMISSION (800) 282-9378			
4		OHIO STATE FIRE MARSHAL (800) 686-0736			
5		SOUTHWEST OHIO AIR POLLUTION CONTROL 651-9437			

VERIFIER SIGNATURE | DATE

DISTRIBUTION	
Original	Environmental Compliance Release Evaluator (MS 51-1)
Copy 1	Emergency Preparedness (MS 31)
Copy 2	AEDO (MS 60)

1	All Releases	5	Air Emission Violations
2	Offsite Releases	6	All Emergencies
3	Release to Environment	7	RCRA Releases
4	UST & Oil-Type Releases		

ATTACHMENT F - OFFSITE NOTIFICATION FORM

OFFSITE NOTIFICATION REPORT

FEMP	OFFSITE
# _____	Log # _____
Date _____ ☐ Sent	Date _____ ☐ Sent
Time _____ ☐ Rec'd	Time _____ ☐ Rec'd
	Routing Code: _____

FEMP Communicator _____
Butler County Communicator _____
Hamilton County Communicator _____

1. Incident occurred on _____ (date) at _____ (time) and is
   A. ☐ escalating B. ☐ de-escalating C. ☐ stable
2. Emergency Categorization Level Categorized by: _____
   SITE AREA GENERAL
   A. ☐ ALERT B. ☐ EMERGENCY C. ☐ EMERGENCY
3. Type of incident
   ☐ Chemical Release ☐ Radiological Release ☐ Other
   A. ☐ Hydrogen Fluoride D. ☐ Thorium G. ☐ Uranium Tetrafluoride
   B. ☐ Chlorine E. ☐ Radon H. ☐ _____
   C. ☐ _____ F. ☐ Uranium Trioxide I. ☐ _____
4. Amount Released _____
5. Incident Location and Brief Description _____

Meteorological Data
Wind from _____ to _____ Speed _____ mph Temperature _____ °F
A. ☐ Clear B. ☐ Cloudy C. ☐ Rain D. ☐ Snow E. ☐ Ice F. ☐ Fog

7. Offsite Concentrations

At site		Field Measurement	Projection	Exposure Limit
A. ☐ boundary	_____ ppm _____ mg/m³	Time _____	ETA _____	_____
B. ☐ At 1 mile	_____ ppm _____ mg/m³	Time _____	ETA _____	_____
C. ☐ At 2 miles	_____ ppm _____ mg/m³	Time _____	ETA _____	_____
D. ☐ Other	_____ ppm _____ mg/m³	Time _____	ETA _____	_____

8. Onsite Protective Action ☐ No Action ☐ Shelter ☐ Evacuation _____
9. Offsite Protective Action ☐ No Action ☐ Shelter ☐ Evacuation _____
10. Offsite Warning System Activated ☐ Yes ☐ No Time _____
11. Request for Mutual Aide ☐ Yes ☐ No ☐ Time _____
    ☐ Department and Equipment _____
12. FEMP Casualty Status
    A. ☐ No Injuries B. ☐ Number of Injuries _____
    C. ☐ Onsite Treatment D. ☐ Transported Offsite to _____
13. County Response Activities
    _____
14. Other information
    _____

FS-F-3001 (REV. 8/10/92)

UNCONTROLLED -6943

Fernald Environmental FERMCO Restoration Management Corporation	ENVIRONMENTAL SAFETY AND HEALTH DIVISION RADIOLOGICAL CONTROL	PROC NO: RC-DPT-015 EFFECTIVE DATE: 05/05/94 REV NO: 0
TITLE: ALARA Review and Evaluation		PAGE 1 OF 20 AUTHOR: Chris Schilling
APPROVAL: Michael L. Tester, Manager, Radiological Control		DATE: 5/3/94

SUPERSEDES SP-P-35-067

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SUMMARY LOG

Revision Number	Description of Revision	Pages Affected
0	Initial Implementation	All

1.0 PURPOSE

It is the policy of FERMCO to maintain the dose from ionizing radiation and the spread of radioactive materials As Low As Reasonably Achievable (ALARA).

2.0 SCOPE

This procedure outlines the steps to follow when performing preliminary ALARA assessments, ALARA reviews, monitoring and evaluating dose and post ALARA reviews of non-routine or complex work activities.

3.0 REFERENCES

3.1 DOE Order 5480.11, Radiation Protection for Occupational Workers.

3.2 DOE/EH-0256T, DOE Radiological Control Manual.

4.0 DEFINITIONS

4.1 DAC - Derived Air Concentration (values in DOE 5480.11).

4.2 DAC-hour - Product of the concentration of radioactive material in air (expressed as a fraction or multiple of the derived air concentration for each radionuclide) and the time of exposure to that radionuclide, in hours.

4.2.1 $$\text{DAC-hour} = \frac{\text{Airborne concentration } (\mu\text{Ci/cc})}{\text{DAC of radionuclide (DOE 5480.11)}} \times \text{hours exposed}$$

4.3 Technical Work Document (TWD) - A term used to generally identify approved documents that direct work, such as procedures, work packages, or job or research plans.

4.4 TLD - Thermoluminescent Dosimeter.

4.5 Trigger Level - Radiological conditions that may require additional engineering or administrative controls and are defined as follows.

NOTE: The values assigned to the trigger levels are not intended to signify an acceptable level but, to be used as an aid in assessing whether the engineering or administrative controls are adequate.

4.0 **DEFINITIONS** (continued)

4.5.1 Any individual involved in the activity with the potential to exceed a whole body dose exceeding 500 mrem for the duration of the activity or in one year.

4.5.2 Any activity in which collective dose has the potential to exceed 2 person-rem for the duration of the activity or in one year.

4.5.3 Any individual involved in the activity with the potential to accumulate more than 100 DAC-hours of the specific radionuclide in one quarter or less.

4.5.4 Work area removable contamination levels greater than 100 times the values given in Table 2-2 (DOE/EH-0256T).

4.5.5 Any entry into an area where general area effective dose rate exceed 1 rem/hour.

4.5.6 Any activity that has a potential for an environmental release to the surrounding area.

5.0 **RESPONSIBILITIES**

5.1 Manager, Radiological Control

Ensure that affected personnel are informed or trained to the extent necessary, before initiation of that work.

5.2 Radiological Compliance Section

Perform ALARA reviews to prescribe additional controls necessary to eliminate or reduce the sources of exposure, trend dose data, conduct post ALARA reviews, correct and resolve dose problems, and maintain completed ALARA records for non-routine or complex work activity.

5.3 Radiological Engineering Section

Provide technical support to the Radiological Compliance Section for dose reduction techniques (e.g., shielding, ventilation, etc.).

5.0 **RESPONSIBILITIES** (continued)

5.4 Radiological Control Technician Supervisor (RCTS) or Designee

Determine if an ALARA review is necessary for activities performed in their area.

5.5 Radiological Control Technician (RCT)

Collect all radiological data for the preliminary ALARA assessment. This will include contamination and radiation surveys and air sample data (as applicable) for the activity.

6.0 **PROCEDURE**

6.1 PRELIMINARY ALARA ASSESSMENT

RCT

6.1.1 Perform required radiation and contamination surveys to adequately characterize the radiological conditions of an activity.

6.1.2 Obtain air sampling data (as applicable) and evaluate the potential for the generation of airborne radioactivity in the work area.

NOTE: **IF** historic or the most recent radiological surveys of the area are adequate to characterize the radiological hazards, **THEN** additional surveys may not be required.

RCTS or DESIGNEE

6.1.3 Obtain all pertinent information and any TWDs that concerns the activity from line supervision.

6.1.4 Assign a RCT to perform the necessary radiation and contamination surveys and air sampling.

NOTE: Allot sufficient time in advance of the activity to allow for a proper assessment of the radiological conditions.

6.1.5 Evaluate the radiation and contamination surveys and air sample data to estimate the following.

6.0 **PROCEDURE** (continued)

6.1 PRELIMINARY ALARA ASSESSMENT (continued)

NOTE: Attachment A, TRIGGER LEVEL WORK SHEET, is provided to aid in evaluating the radiological hazards.

A. Highest whole body dose (mrem) that an individual general employee might receive during the activity.

B. Estimation of the collective whole body dose (person-rem) expected during the activity.

C. Total DAC-hours a general employee might accumulate during the activity.

1. Consider the actual airborne radioactivity levels and the potential airborne radioactivity caused by disturbing loose surface contamination during the activity.

2. Determine the specific radionuclide of concern.

3. Estimate the maximum amount of time (hours) a general employee will spend working under these conditions.

4. After estimating the number of DAC-hours, apply the corresponding Protection Factor (P.F.) of the respiratory protection to obtain the total DAC-hours.

D. Determine the highest contamination levels that will be encountered during the activity.

E. Determine the highest general area dose rate (mrem/hr).

F. Evaluate the potential for an environmental release to the surrounding area.

1. Ensure that the methods to control, reduce, or eliminate environmental releases to the surrounding area are addressed in the TWDs governing the activity; or

2. Consult the Environmental Protection Department if not addressed in the TWDs governing the activity.

6.0 **PROCEDURE** (continued)

6.1 PRELIMINARY ALARA ASSESSMENT (continued)

6.1.7 Complete FS-F-3749, PRELIMINARY ALARA ASSESSMENT, Attachment B. Provide the required information in blocks (1) through (10) and check **YES** or **NO** for blocks (11) through (16) in **PART I**.

A. **IF** blocks (11) through (16) are all checked **NO**, **THEN** do the following.

1. Sign and date in the block provided.

2. Forward Attachment B with copies of the contamination and radiation surveys and air sample results to the ALARA Coordinator (Radiological Compliance Section) for review, filing and retention.

OR

B. **IF** any block is checked **YES** in **PART I**, **THEN** determine if the administrative or engineering controls are adequately identified in either ES&H procedures or the TWD governing the activity to reduce doses below the trigger levels, prevent personnel contaminations (internal and external), or environmental release and do the following.

1. **IF** the necessary administrative or engineering controls are adequately identified, **THEN** check **YES** in **PART II**, block (17), and do the following.

a. Briefly describe the controls in block (18).

b. Sign and date in the block provided.

c. Forward with copies of the contamination and radiation surveys and air sample results to the ALARA Coordinator (Radiological Compliance Section) for review, filing and retention.

OR

2. **IF** the necessary administrative or engineering controls are NOT adequately identified, **THEN** check **NO** in **PART II**, block (17) and do the following.

a. Annotate in **Part II**, block (18), "*ALARA REVIEW REQUIRED.*"

6.0 PROCEDURE (continued)

6.1 PRELIMINARY ALARA ASSESSMENT (continued)

b. Sign and date in block provided.

c. Forward with copies of the contamination and radiation surveys, air sample results and other pertinent information concerning the activity, to the ALARA Coordinator (Radiological Compliance Section) for an ALARA review.

3. **IF** collective and/or individual exposures exceed their respective trigger level, **THEN** provide the names and badge numbers of the individuals involved in the activity to allow the evaluation of year-to-date doses.

ALARA COORDINATOR

6.1.8 Provide guidance, as needed, to RCTS in completing Attachment B.

6.1.9 Assign an assessment number to aid in the tracking and filing of ALARA records associated with an activity.

6.1.10 Review Attachment B for completeness and accuracy, sign and date in the block provided.

6.1.11 **IF** an ALARA review is required proceed to 6.2, **OTHERWISE** go to 6.5.

6.2 ALARA REVIEW

ALARA COORDINATOR or REVIEWER

6.2.1 **IF** the requirements exist for an ALARA review, **THEN** complete FS-F-3750, ALARA REVIEW, (Attachment C) as follows.

A. Provide the necessary information in blocks (1) through (4).

B. Check **YES** or **N/A** in blocks (5) through (19) for "*ITEMS TO CONSIDER FOR THE ALARA REVIEW.*"

C. List the necessary requirements in the block (20) for the items checked **YES**.

6.0 PROCEDURE (continued)

6.2 ALARA REVIEW (continued)

D. Check block (21) **YES** or **NO** with respect to an ALARA Committee review.

NOTE: A review by the ALARA Committee is required if the dose received by an individual general employee or the collective dose **CANNOT** be reduced below its trigger level after the application of additional controls.

E. Check block (22) **YES** or **NO** if any cost benefit analyses were performed in support of additional controls, attach to Attachment C.

MANAGER, RADIOLOGICAL COMPLIANCE or DESIGNEE

6.2.2 Review, sign and date Attachment C.

RADIOLOGICAL ENGINEER

6.2.3 Support in the development of engineering controls required to maintain exposures ALARA (e.g., ventilation, shielding, etc.).

MANAGER, RADIOLOGICAL ENGINEERING or DESIGNEE (as required)

6.2.4 **IF** special engineering controls were developed for the activity, **THEN** review, sign, and date Attachment C.

ALARA COMMITTEE (as required)

6.2.5 Review, sign and date Attachment C.

6.3 MONITORING REQUIREMENTS

ALARA COORDINATOR

6.3.1 **IF** a dose budget is established for the activity, **THEN** complete FS-F-3747, TLD DOSE TRACKING, (Attachment D) as follows.

A. Provide the required information in blocks (1) through (3).

B. Enter general employee's name and badge number in columns (4) and (5).

6.0 **PROCEDURE** (continued)

6.3 MONITORING REQUIREMENTS (continued)

C. Enter general employee's TLD dose (job specific TLDs or assigned TLDs) in column (6) for the period covered.

D. Enter the general employee's total TLD dose (job specific TLDs or assigned TLDs) accumulated during the activity, including the current periods TLD dose in column (7).

E. Enter appropriate comments in column (8).

F. Enter the totals of columns (6) and (7), at the end of the period covered, at the bottom of the columns.

6.3.2 Evaluate Attachment D.

A. **IF** the TLD results (Attachment D) exceeds 20% of the estimated collective dose or other monitoring results indicate or exhibit a unacceptable trend during the activity, **THEN** do the following.

1. Determine the cause of the unacceptable trend.

2. Recommend the course of action that will correct the problem.

NOTE: Work stoppage is not required.

OR

B. **IF** the real or potential hazards being monitored or tracked approach established administrative limits, **THEN** the activity shall be stopped and placed in a safe condition to prevent further exposures or releases and the following is done.

1. Evaluate the activity to determine the root cause of the problem.

2. Determine and document the corrective actions.

3. Forward to Manager, Radiological Control for review and approval of corrective actions.

NOTE: Review and approval is required prior to restart of the activity.

6.0 PROCEDURE (continued)

6.3 MONITORING REQUIREMENTS (continued)

MANAGER, RADIOLOGICAL CONTROL DEPARTMENT

6.3.3 Review corrective actions and approve the restart of the activity.

6.4 POST ALARA REVIEW

ALARA COORDINATOR

6.4.1 Upon completion of the activity, use FS-F-3751, POST ALARA REVIEW, (Attachment E) **PART I** to identify the following:

NOTE: A post ALARA review is required for an activity that required special engineering controls, reviewed by the ALARA Committee, or work stoppage of 6.3.2.B exercised.

A. Initiatives employed to reduce exposures and contamination levels.

B. Incidents of internal and external contamination of personnel and corrective actions.

C. Successful efforts involving new technologies.

D. Lessons learned and ways to improve similar activities in the future.

6.4.2 Completing **PART II** of Attachment E.

NOTE: Only required if a dose budget (estimated collective dose) established for the activity.

A. Compare the actual collective dose to the estimate collective dose.

B. **IF** the absolute value of the percent variance is greater than 25, **THEN** determine the cause and attach to Attachment E.

F. Sign and date in block provided.

MANAGER, RADIOLOGICAL COMPLIANCE

6.4.2. Review, sign and date Attachment E.

6.5 RETENTION OF ALARA RECORDS

ALARA COORDINATOR

6.5.1 Maintain a file on all ALARA assessments and completed reviews to aid in future assessments and demonstrate compliance with applicable DOE Orders.

7.0 FORMS

7.1 FS-F-3749, Preliminary ALARA Assessment.

7.2 FS-F-3750, ALARA Review.

7.3 FS-F-3747, TLD Dose Tracking.

7.4 FS-F-3751, Post ALARA Review.

8.0 ATTACHMENTS

8.1 Attachment A - "Trigger Level Work sheet."

8.2 Attachment B - "Preliminary ALARA Assessment."

8.3 Attachment C - "ALARA Review."

8.4 Attachment D - "TLD Dose Tracking."

8.5 Attachment E - "Post ALARA Review."

9.0 CHARTS

9.1 CHART 1 - "Preliminary ALARA Assessment Flow Chart."

9.2 CHART 2 - "ALARA Review Flow Chart."

ALARA Review and Evaluation	PROC NO: RC-DPT-015
	REV NO: 0
	PAGE 14 OF 20

ATTACHMENT A
TRIGGER LEVEL WORK SHEET

ACTIVITY:

I. INDIVIDUAL DOSE

TASK 1				
	LOCATION	DOSE RATE	HOURS WORKING	DOSE
GENERAL AREA				
LOCATION 1				
LOCATION 2				
			TOTAL	

TASK 2				
	LOCATION	DOSE RATE	HOURS WORKING	DOSE
GENERAL AREA				
LOCATION 1				
LOCATION 2				
			TOTAL	

II. COLLECTIVE DOSE

	INDIVIDUAL DOSE (mr)	NUMBER OF WORKERS	PERSON-REM
TASK 1			
TASK 2			
	TOTALS		

III. AIRBORNE RADIOACTIVITY

NUCLIDE	CONCENTRATION (μCi/cc)	PERCENT DAC	HOURS[NOTE 1]	PROTECTION FACTOR (P.F.)	DAC-HOURS

NOTES: 1) Based on longest exposure time of an individual worker.

ATTACHMENT B
PRELIMINARY ALARA ASSESSMENT

FEMP
RADIOLOGICAL CONTROL DEPARTMENT
PRELIMINARY ALARA ASSESSMENT

To be assigned by Radiological Compliance Section
ASSESSMENT NUMBER:

PART I

(1) RCT6 OR DESIGNEE:	(2) EXTENSION:	(3) DATE:

(4) RWP NUMBER:	(5) TECHNICAL WORK DOCUMENT (TWD)	(6) START DATE:	(7) NUMBER OF PEOPLE INVOLVED IN ACTIVITY:	(8) ESTIMATED PERSON-HOURS:
	☐YES ☐NO			

(9) LOCATION:

(10) ACTIVITY DESCRIPTION:

TRIGGER LEVELS		YES	NO
(11)	Any individual with the potential to exceed 500 mrem for the activity or in one year?		
(12)	Collective exposure with the potential to exceed 2 person-rem for the activity or in one year?		
(13)	Any individual with the potential to exceed 100 DAC-hours in one quarter?		
(14)	Removable radioactive contamination levels exceeding 100 times table 2-2 values, DOE/EH-0256T?		
(15)	General area exposure rate exceeding 1 rem/hr in the work area?		
(16)	Potential release to the environment?		

PART II		YES	NO
(17)	If any trigger level is checked (✓) YES in part I, Can the dose and/or levels be reduced below the trigger levels utilizing Administrative/Engineering Controls specified in ES&H Safety Procedure or TWD?		

If "YES", Briefly describe the controls in the "COMMENTS" section, forward to the ALARA coordinator (Radiological Compliance Section) for review and filing.
NOTE: Radiological Compliance Section concurrence is not required to start the activity if the controls utilized can reduce the exposures or levels below the trigger levels.
If "NO", annotate "ALARA REVIEW REQUIRED" in "COMMENTS" section and forward to the ALARA coordinator (Radiological Compliance Section) for an ALARA Review.
NOTE: The ALARA review must be completed prior to the start of the Activity.

(18) COMMENTS:

REVIEWS

RCT6 OR DESIGNEE	DATE	MANAGER, RADIOLOGICAL COMPLIANCE OR DESIGNEE	DATE

ATTACHMENT C
ALARA REVIEW

FEMP
RADIOLOGICAL CONTROL DEPARTMENT
ALARA REVIEW

(1) ACTIVITY:		
(2) REVIEWED BY:	(3) ASSESSMENT NUMBER:	(4) DATE:

YES	N/A	ITEMS TO CONSIDER FOR THE ALARA REVIEW
		(5) Inclusion of Radiological Hold Points in the Technical Work Document (TWD).
		(6) Elimination or reduction of radioactivity through line flushing and decontamination.
		(7) Use of work processes and special tooling to reduce time in the work area.
		(8) Use of engineering controls to minimize the spread of contamination and generation of airborne radioactivity.
		(9) Specification of special radiological training or monitoring requirements.
		(10) Use of mock-ups for high exposure or complex tasks.
		(11) Engineering, design and use of temporary shielding to reduce radiation exposure.
		(12) Walkdown or dry-run of the activity using applicable procedures.
		(13) Staging and preparation of necessary materials and special tools.
		(14) Maximization of prefabrication and shop work.
		(15) Review of abnormal and emergency procedures and plans.
		(16) Identification of points where signatures and second party or independent verifications are required.
		(17) Establishment of success or completion criteria, with contingency plans to anticipate difficulties.
		(18) Development of a Pre-Job Estimate of collective exposure to be incurred for the job.
		(19) Provisions for waste minimization and disposal.

(20) FOR ITEMS CHECKED "YES," EXPLAIN HOW THEY WILL BE INCORPORATED IN THE ACTIVITY *(ATTACH SUPPORTING DOCUMENTATION)*:

_____

_____

_____

_____

(21) ALARA COMMITTE REVIEW REQUIRED?
☐ YES ☐ NO

NOTE: Only required if the Administrative/Engineering controls utilized CANNOT reduce either the individual or collective dose below its trigger level.

(22) WERE COST BENEFIT ANALYSES PERFORMED?
☐ YES ☐ NO

If "YES," attach to this form.

REVIEWS		
	REVIEWER:	DATE:
NOTE: Only required if special Engineering control(s) utilized.	MANAGER, RADIOLOGICAL ENGINEERING OR DESIGNEE:	DATE:
	MANAGER, RADIOLOGICAL COMPLIANCE OR DESIGNEE:	DATE:
NOTE: Only required if the Administrative/Engineering controls utilized CANNOT reduce either the individual or collective dose below its trigger level.	ALARA COMMITTEE:	DATE:

ATTACHMENT D
TLD DOSE TRACKING

FEMP
RADIOLOGICAL CONTROL DEPARTMENT
TLD DOSE TRACKING

(1) PERIOD:	(2) ASSESSMENT NUMBER:
(3) ACTIVITY:	

(4) EMPLOYEE	(5) BADGE NUMBER	(6) TLD DOSE (mrem)	(7) TLD DOSE TOTAL (mrem)	(8) COMMENTS
TOTALS				

PB-F-3747 (REV. 02/14/94)

ATTACHMENT E
POST ALARA REVIEW

FEMP
RADIOLOGICAL CONTROL DEPARTMENT
POST ALARA REVIEW

PART I

ACTIVITY:			
REVIEWED BY:		ASSESSMENT NUMBER:	DATE:
ACTUAL START DATE:	ACTUAL COMPLETION DATE:	ACTUAL PERSON-HOURS:	ACTUAL NUMBER OF PERSONS INVOLVED:

INITIATIVE:

INCIDENTS:

SUCCESSES:

LESSONS LEARNED:

PART II

EXPOSURE EVALUATION *(ONLY REQUIRED IF TLD EXPOSURE TRACKED DURING THE ACTIVITY.)*	A	ESTIMATED COLLECTIVE DOSE (PERSON-REM)	
	B	ACTUAL COLLECTIVE DOSE (PERSON-REM)	
	C	PERCENT VARIANCE = [(A-B)/A]*100	
	D	HIGHEST INDIVIDUAL DOSE (mRem)	
	E	AVERAGE INDIVIDUAL DOSE (mRem)	

IS THE ACTUAL COLLECTIVE DOSE (B) GREATER THAN THE ESTIMATED COLLECTIVE DOSE (A)?
☐ YES ☐ NO *IF "YES," ATTACH EXPLANATION.*

IS THE PERCENT VARIANCE'S (C) ABSOLUTE VALUE GREATER THAN 25?
☐ YES ☐ NO *IF "YES," ATTACH EXPLANATION.*

REVIEWS

REVIEWER'S SIGNATURE:	DATE:	MANAGER, RADIOLOGICAL COMPLIANCE OR DESIGNEE:	DATE:

CHART 1

PRELIMINARY ALARA ASSESSMENT FLOW CHART

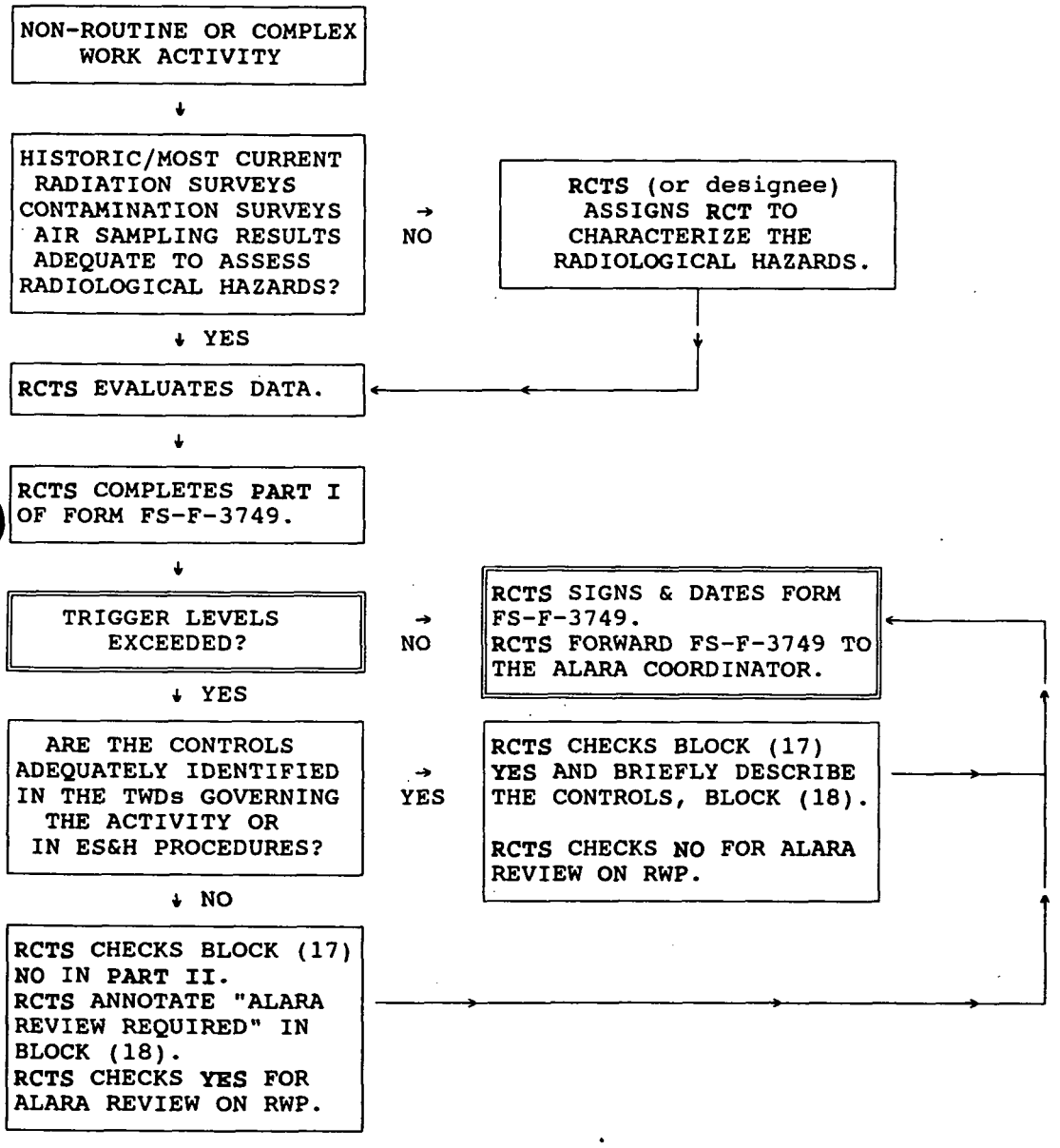
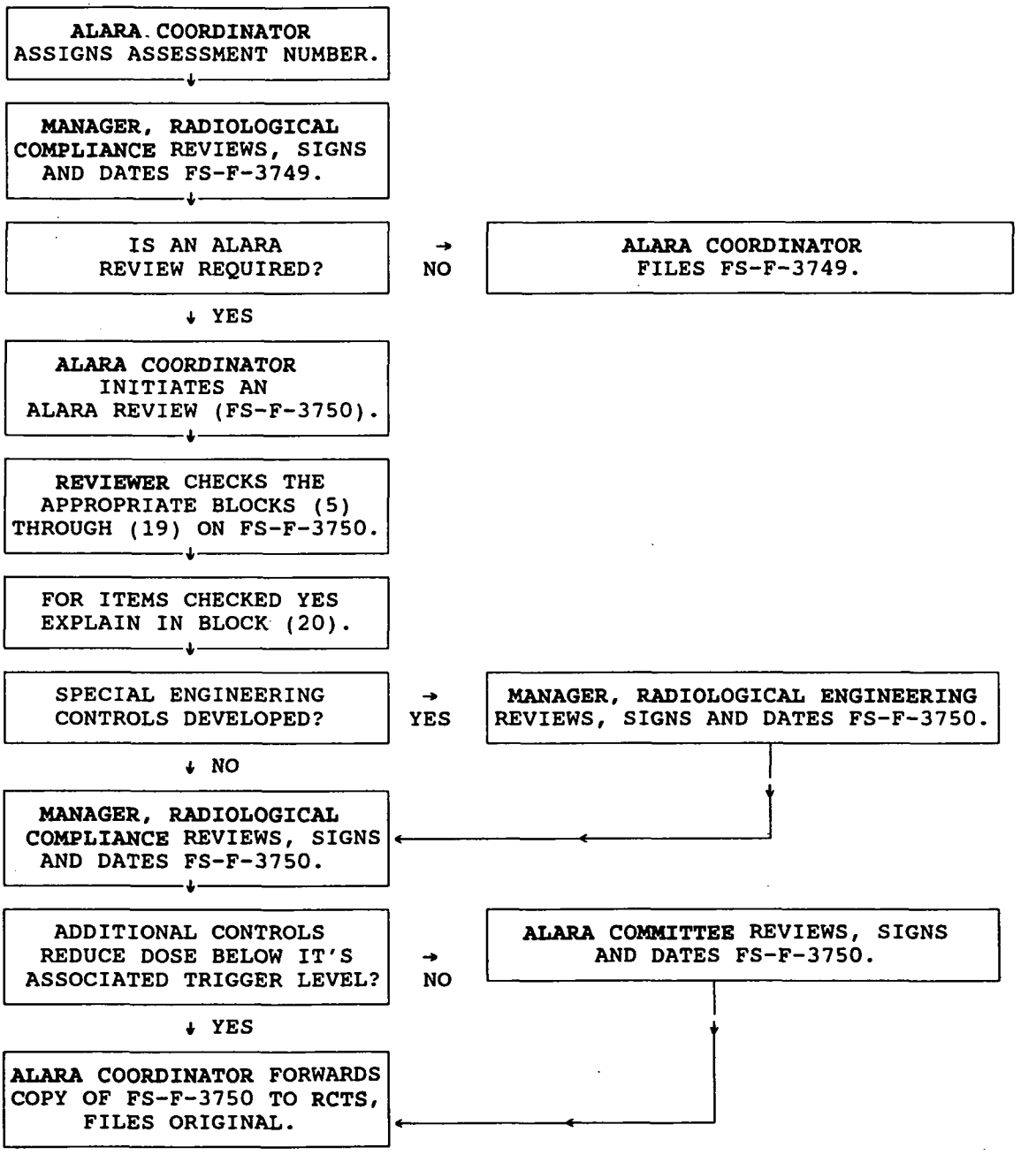


CHART 2

ALARA REVIEW FLOW CHART



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FEMP RESPIRATORY PROTECTION REQUIREMENTS MANUAL

RM-0007

Effective Date: 10-14-94

AUTHORIZED BY: _____ 5 Oct 94
D. Ofte, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

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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 Fernald Environmental Management Project (FEMP).

1.2 INTRODUCTION

1.2.1 The Fernald Environmental Restoration Management Corporation (FERMCO) accomplishes the prevention and control of potential respiratory hazards at the FEMP as far as it is 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, NIOSH approved respiratory protection equipment furnished by FERMCO 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 FERMCO procedures which are designed to comply with Occupational Safety and Health Administration (OSHA) and American National Standards Institute (ANSI) Z88.2 requirements.

1.2.3 These manual requirements take precedence over all other FERMCO 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 and other personnel 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 activities 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 and to use respirators in accordance with instructions and training received. Employees shall not damage or modify respirators. Employees shall report to FERMCO Medical any change in their facial appearance or medical condition which may affect their medical ability to use a respirator or the respirator seal (see Section 4.3.8).

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. The Administrator shall be responsible for investigating any malfunctions of respiratory protective equipment to determine the cause and to assure corrective measures are taken. The Administrator shall be responsible for writing, maintaining, and evaluating written procedures for the respirator program and ensuring compliance with them and current applicable regulations.

1.3.3 FERMCO Industrial Hygiene and Radiological Control 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 as described in Section 5.4.

1.3.4 FERMCO Industrial Hygiene shall ensure that air quality on the breathing air system and from Self-Contained Breathing Apparatus (SCBA) cylinders is checked periodically. Industrial Hygiene shall also verify that portable breathing air compressors provided by subcontractors meet quality requirements.

1.3.5 Supervisors and designated issuers who have attended supervisors and respirator issuance training shall be responsible for issuing respirators in accordance with written respirator selections.

1.3.6 Supervisors with storage cabinets and recycling receptacles in their areas shall maintain these receptacles in accordance with requirements of this manual.

1.3.7 Laundry personnel shall be responsible for ensuring only clean and fully operational respirators are sent to Inventory Control and Warehousing for redistribution. The laundry manager shall ensure that only personnel trained to clean, sanitize, repair, and replace parts shall recondition respirators.

CHAPTER 1.0 (cont.)

1.3 RESPONSIBILITIES

1.3.8 The Manager of Inventory Control and Warehousing in order to maintain adequate supplies of respirators, shall order, store, and distribute respirators and parts to all holders of properly completed Stores Requisitions.

1.3.9 A physician in FEMP Medical Services shall certify employees as medically able to use respirators prior to respirator use. A physician in Medical Services shall also review and approve all non-FERMCO respirator medical documentation for subcontractors, vendors, and/or visitors.

1.3.10 FERMCO 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).

1.3.11 FERMCO Training Records Management shall maintain records of the names, performance, and dates of people given respirator training and fit tests on the Training Records Management System (TRMS) computer database. Training Records Management shall notify personnel due for respirator training and fit-testing that they are scheduled for training.

1.3.12 FERMCO Safety and Fire Protection Services shall maintain and inspect on a monthly basis all emergency use SCBAs and keep records of inspection dates. SCBA regulators and alarms shall be repaired only by manufacturer or Safety and Fire Protection personnel who have been trained by the manufacturer.

1.4 DEFINITIONS

1.4.1 Abrasive Blasting Respirator - an air-supplying respirator (see 1.4.6) designed to protect the wearer from impact from and inhalation of flying particles created by sand or other abrasive blasting materials.

1.4.2 Administrative Controls - Methods to decrease employee exposures to contaminants by job-rotations, work assignments, work practices, or time periods away from contaminants, as well as training, and warning and/or information sign postings.

1.4.3 Administrator - Individual designated by the Industrial Hygiene Manager, responsible for developing and maintaining the FEMP Respiratory Protection Program.

CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.4 Airline-Only-Eligible - A term designating that an individual cannot use any type of respiratory protection equipment other than airline respirators and ELSA (see 1.4.15) units.

1.4.5 Air-Purifying Respirator - A device which removes contaminants from ambient air by drawing it through either a filter or absorbent media.

1.4.6 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.

1.4.7 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.

1.4.8 Breathing Air - Respirable air which meets Compressed Gas Association (CGA), G-7.1-1989, Grade D, Type I specifications.

1.4.9 Canister - Large container filled with air-purifying media including absorbents, catalysts, and/or aerosol filters that remove gases, vapors, and/or particulates from air which is drawn through it.

1.4.10 Cartridge - Small container filled with air-purifying filter and/or absorbent media.

1.4.11 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 while allowing one or more cylinders to be kept in reserve.

1.4.12 Contaminants - Undesired airborne materials in an individual's potential breathing zone.

1.4.13 Continuous Flow Respirator - A type of air-supplying respirator that provides clean air at constant flowrate to the facepiece, independently of how much air is being breathed. These respirators operate at a flowrate of at least 4 cubic feet per minute (cfm) for tightly sealing facepieces or at least 6 cfm for loose hoods.

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CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.14 Dusts - Solid airborne particles generated by handling, crushing, grinding, rapid impact, detonation, or cracking of materials.

1.4.15 Emergency Life Support Apparatus (ELSA) - An emergency use respirator designed for escaping from a sudden release of air contaminants.

1.4.16 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.

1.4.17 Facepiece - Portion of respirator that covers wearer's nose and mouth (half-mask respirator); or nose, mouth and eyes (full-face respirator).

1.4.18 Fit test - Method used to determine whether a respirator facepiece provides a good seal for the wearer.

1.4.19 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/FTF.

1.4.20 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.

1.4.21 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.

1.4.22 Immediately Dangerous to Life or 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. An atmosphere is considered to be IDLH when either: 1) it contains contaminants above the listed IDLH levels, 2) it contains less than 20.9% oxygen and the cause of the oxygen reduction is not known, or 3) it has a reduced total pressure that lowers oxygen partial pressure below 95 mm mercury column.

1.4.23 Medical Certification - Determination made by a medical physician on basis of medical evaluation of potential user's ability to use respiratory protection equipment.

CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.24 Mists - Suspended liquid airborne droplets generated by condensation from gaseous to liquid state or by breaking up liquid into dispersed state (examples include splashing, bubbling, sparging, foaming, or atomizing).

1.4.25 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.

1.4.26 Non-eligible - Determined medically unable to use any type of respiratory protection equipment.

1.4.27 Non-SCBA-eligible - Determined medically unable to use a SCBA unit.

1.4.28 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.

1.4.29 Oxygen Deficient Atmospheres - Any atmosphere with inadequate levels of oxygen to support human respiration and life. ANSI Z88.2 defines oxygen deficient at sea level pressure as requiring an air-supplied respirator containing between 16% and 12.5% oxygen. Below 12.5% oxygen an SCBA or air-supplied respirator with escape cylinder must be used. For respirator selection purposes, see the IDLH definition (1.4.22).

1.4.30 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. (See References 14.9 through 14.21 for list of OSHA substance specific standards.)

1.4.31 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.

1.4.32 Physician - A medical doctor responsible for evaluating whether employees are medically able to use respiratory protective equipment.

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CHAPTER 1.0 (cont.)

1.4 DEFINITIONS (cont.)

1.4.33 Pliable - Easily stretchable; state of usable rubber straps or facepiece material on respirator.

1.4.34 Pressure Demand - A type of air-supplying respirator that maintains approximately 1 inch water gauge positive pressure at all times inside the facepiece and supplies additional air on demand as needed during inhalation.

1.4.35 Protection Factor (PF) - Actual protection assigned to a respirator when used 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.

1.4.36 Respirator - Device worn by employee for protection from inhalation of harmful airborne contaminants.

1.4.37 Respirator-Eligible - Determined medically able to use both air-purifying and airline respirators.

1.4.38 SCBA - Self-contained breathing apparatus. An emergency use respirator which provides the wearer with a portable supply of air from a compressed gas cylinder worn on the back.

1.4.39 SCBA-Eligible - Determined medically able to use a SCBA unit.

1.4.40 Subcontractors/Vendors - Employees of non-FERMCO 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. Onsite employees of other DOE prime contractors are considered subcontractors.

1.4.41 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.

1.4.42 Time Weighted Average (TWA) - Average exposure of worker during an eight hour work day as determined by either periodic or continuous sampling.

1.4.43 Visitors - Any person (to include temporary employees) other than FERMCO/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 2-4 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 Controls for proper selection.

2.5 Respirator selection for each job shall be communicated in writing (see Chapter 5.0).

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 (PAPRs):* • *MSA OptimAir MM PAPR with Ultravue Silicone Facepiece +* • *MSA OptimAir6 PAPR 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.

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CHAPTER 2.0 (cont.)

TABLE 2-2
AIR-SUPPLIED RESPIRATORS AVAILABLE AT THE FEMP

Airline Respirators: • *MSA Comfo Welder's Silicone Half Mask Continuous Flow Airline Respirator +* • *MSA Silicone Full-Face Continuous Flow Airline Respirator +* • *MSA Silicone Full-Face "DuoFlo" Continuous Flow Airline Respirator* • *MSA Silicone Full-Face "DuoFlo" Pressure-Demand Airline Respirator* • *MSA Sandblast II Abrasive Blasting Hooded Continuous Flow Airline Respirator* • *Bullard TIC-20 Hooded Continuous Flow Airline Respirator* • *Bullard TIC-20 Hooded Airline Continuous Flow Respirator with Vortex Tube* • *North 85300 Series Hooded Continuous Flow Airline Respirator* • *SurvivAir Combination Self Contained Breathing Apparatus (HIP-PAC) and Pressure Demand Airline Respirator** • *MSA Silicone Full-Face 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
MSA 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 Highly Toxic Dusts, Fumes, Mists, and Asbestos and Radionuclide Particulates*
• *GMD*	*Chemical Cartridge (Green) for Ammonia and Methyl Amine*
• *GMD-H*	*Chemical/Filter Combination Cartridge (Magenta and Green) for Ammonia and Methyl Amine and Highly Toxic Dusts, Fumes, and Mists, and Asbestos and Radionuclide Particulates*
• *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*
• *Type H*	*Ultra Filter Cartridge (Magenta) for Highly Toxic Dusts, Fumes, Mists, Asbestos-containing Dusts, Mists, and Radionuclides for MSA OptimAir MM PAPR*
MSA Canisters:	
• *GMD-C*	*Chemical Canister (Dark Green with Orange Stripe) for Ammonia, Not Highly 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*

CHAPTER 2.0 (cont.)

TABLE 2-4
NORTH CARTRIDGES AVAILABLE AT THE FEMP

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*

CHAPTER 2.0 (cont.)

Figure 2-1
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)

CHAPTER 2.0 (cont.)

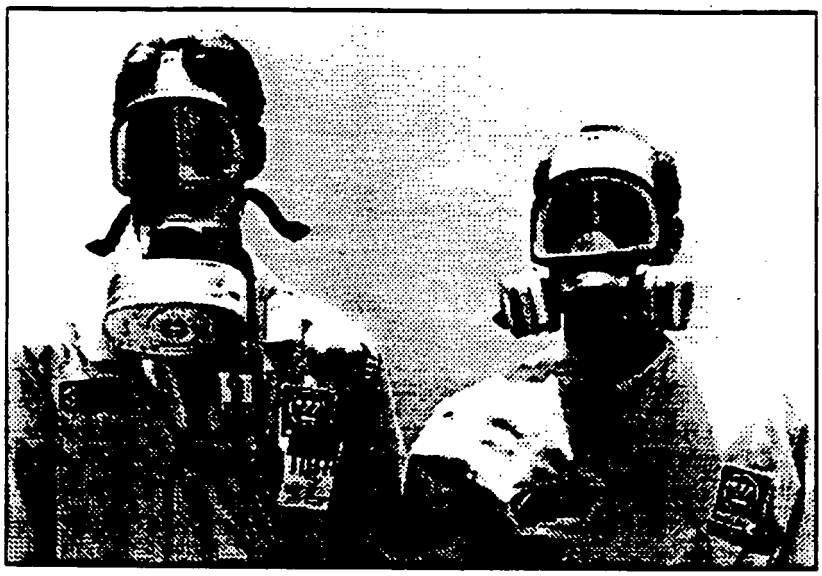

Figure 2-2
TWO FULL-FACE RESPIRATORS
(FROM LEFT TO RIGHT, A MSA ULTRAVUE SILICONE RESPIRATOR, AND A MSA ULTRA-TWIN SILICONE RESPIRATOR)

CHAPTER 2.0 (cont.)

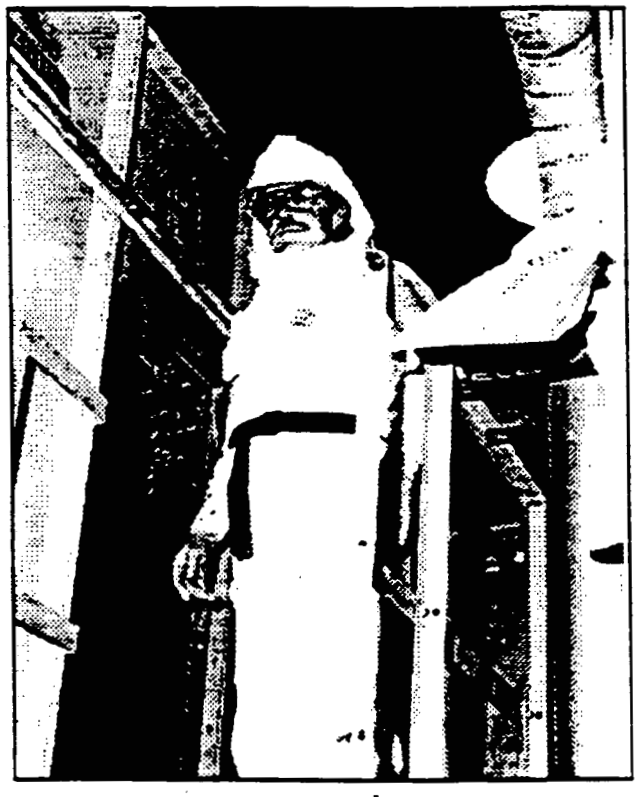

Figure 2-3
BULLARD TIC-20 HOODED AIRLINE RESPIRATOR AND ANTI-CONTAMINATION PROTECTIVE CLOTHING

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CHAPTER 2.0 (cont.)

Figure 2-4
SURVIVAIR MARK 2 SCBA

CHAPTER 2.0 (cont.)

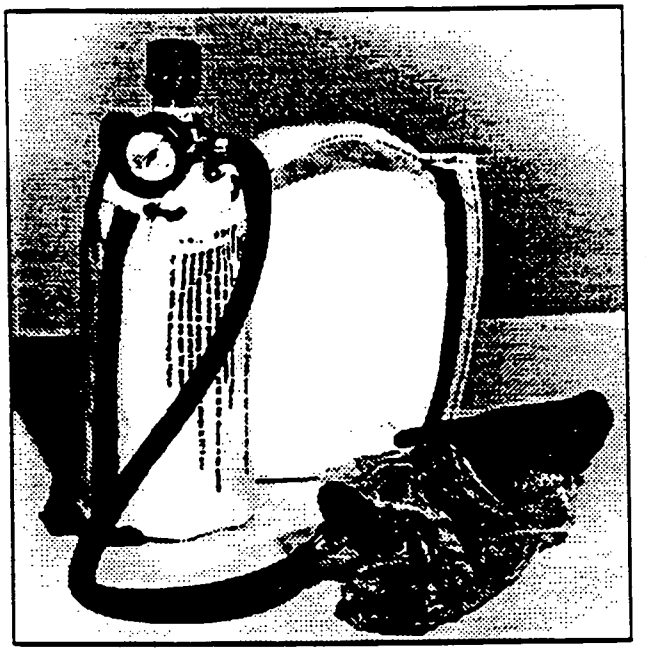

Figure 2-5
ISI EMERGENCY LIFE SUPPORT APPARATUS (ELSA)

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 Controls 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.

3.1.9 If an employee requests a powered air-purifying respirator (PAPR) for protection against airborne asbestos or lead, the PAPR shall be provided as long as Industrial Hygiene or Radiological Control has determined that it will furnish sufficient protection.

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 IDLH. Interruption of airflow to the respirator could be rapidly fatal or very harmful to health.

CHAPTER 3.0 (cont.)

3.2 AIR-SUPPLIED RESPIRATORS (cont.)

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.

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 Protection has determined that conditions are or could quickly and unexpectedly become 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 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 Protection 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 5-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.

3.2.9 Airline respirators specifically designed and approved for abrasive blasting shall be selected for use in abrasive blast cleaning. Pressure-demand abrasive blast type respirators shall be used when using blasting agent with over 1% crystalline silica content.

CHAPTER 4.0 - PREREQUISITES FOR RESPIRATOR USE

4.1 MEDICAL CERTIFICATION

4.1.1 An employee must be medically certified by FEMP Medical Services physicians according to SPR 7-5, "Respirator Wearer Medical Qualification," 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 shall notify FEMP Medical 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.)

4.2.4 Supervisors shall be responsible for ensuring that 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.

TABLE 4-2
RESPIRATOR TRAINING COURSES

Training Course Title	Course Length (hours)	Frequency	Required Attenders
Basic Principles of Respiratory Protection	3.0	Annually	All respirator program participants
SCBA training	3.0	Annually	SCBA Wearers as determined by Safety and Fire Protection Services
Supervisors and Issuance Training	1.5	Every 3 years	Supervisors of employees who use respirators or designated respirator issuers

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.

CHAPTER 4.0 (cont.)

TABLE 4-3
RESPIRATOR PROGRAM JOB CLASSIFICATIONS FERMCO PERSONNEL

ES&H Division	Occupational Safety & Health (cont.)	Facility Engineering & Maintenance (cont.)
Occupational Safety & Health	Industrial Hygiene Supervisor, Industrial Hygiene Technician I, II, III	Instrument Mechanic
Manager Occupational Safety & Health	Senior Industrial Hygiene Technician	Laborer
Manager Occupational Safety & Health Compliance	Radiological Controls	Mason
Manager Safety Engineering, Fire Protection, and EmergencyResponse Program	Radiological Engineer	Millwright
	Radiological Support Supervisor	
Senior Safety Engineer/Specialist	Technicians	Oiler
Safety Engineer/Specialist I, II, III	Technical Trainee	Painter
Senior Firefighter/Emergency Response Specialist	**Remediation Support Operation (RSO)**	Pipefitter
Fire Prevention Inspector		Planner-Estimator
Firefighter/Emergency Response Specialist I, II, III	Quality Control	Supervisor
Manager Fire Protection/Emergency Response	Inspector	Welder
Senior Fire Protection Engineer/Specialist	Gauge Setup Worker	Utilities Services
Supervisor Fire Protection Engineering		Assist. Pump Operator
Supervisor Fire Protection/Emergency Resp. Svcs.	Facility Engineering & Maintenance	Assist. Water Plant Operator
Emergency Response Planner	Apprentice	Boiler Operator
Fire Protection Engineer/Specialist I, II, III	Carpenter	Boiler Operator Helper
Industrial Hygiene Manager	Electrician	Bulldozer Operator
Industrial Hygienist I, II, III	Engineer	Power Plant Oiler
	Industrial Mechanic	Pump Operator

CHAPTER 4.0 (cont.)

TABLE 4-3
RESPIRATOR PROGRAM JOB CLASSIFICATIONS FERMCO PERSONNEL (cont.)

Utilities Services (cont.)	**Support Services**	
Stationary Engineer	Laundry Worker	
Utility Engineer	Laundry Supervisor	
Waste Treatment Operator	**Materials Management**	
Water Plant Operator	Heavy Equipment Operator	
	Laborer	
Operations	Motor Vehicle Operator	
Chemical Operator	Transportation Supervisor	
Decontaminator	**Logistics Administration & Inventory Control & Warehousing**	
Degreaser	Inventory Control Supervisor	
Engineer	Storeroom Attendant	
Haz Wat	**Construction**	
Industrial Cleaner	Construction Management Personnel, Construction Field Worker	
Laborer	**CERCLA/RCRA Units (CRU) 1 through 5**	
Machine Setup Operator	CRU Health & Safety Officer	
Machine Tool Operator	Other employees as authorized by supervision and Industrial Hygiene	
Packer	**SUBCONTRACTORS, VENDORS AND VISITORS**	
Site Service Worker	Subcontractors, Vendors and Visitors as determined by Industrial Hygiene depending on activity/job.	
Supervisor		
Technical Trainee		

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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 Fit tests shall be conducted for all tightly sealing respirator facepieces which are worn in both negative and positive pressure modes. Fit tests for positive pressure facepieces will be conducted using the facepiece in the negative pressure mode. An acceptable fit factor of at least 100 must be obtained to ensure the wearer does not have excess leakage of air when in positive pressure mode.

4.3.4 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.

4.3.5 During the fit test and before each time a respirator user enters a contaminated atmosphere, the following steps must be performed:

4.3.5.1 Inspect the respirator.

4.3.5.2 If an air purifying type, install specified cartridges.

4.3.5.3 Don and adjust the respirator.

4.3.5.4 Perform a negative and/or positive field fit check as described in Section 4.4 for all tightly sealing facepiece respirators.

4.3.6 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. Employees who wear respirator spectacles or contacts shall wear them during the fit test if they will be worn when using the respirator.

4.3.7 Employees shall not be fit-tested when facial hair is present in face sealing area (see Section 6.6).

4.3.8 A fit test shall be repeated whenever an employee has a significant change in the face seal as might be caused by significant weight change, scaring in the face seal area, dental changes, or reconstructive or cosmetic surgery.

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.

CHAPTER 4.0 (cont.)

4.4 FIELD OR SELF-FIT CHECK METHODS (cont.)

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.

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.

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.

CHAPTER 4.0 (cont.)

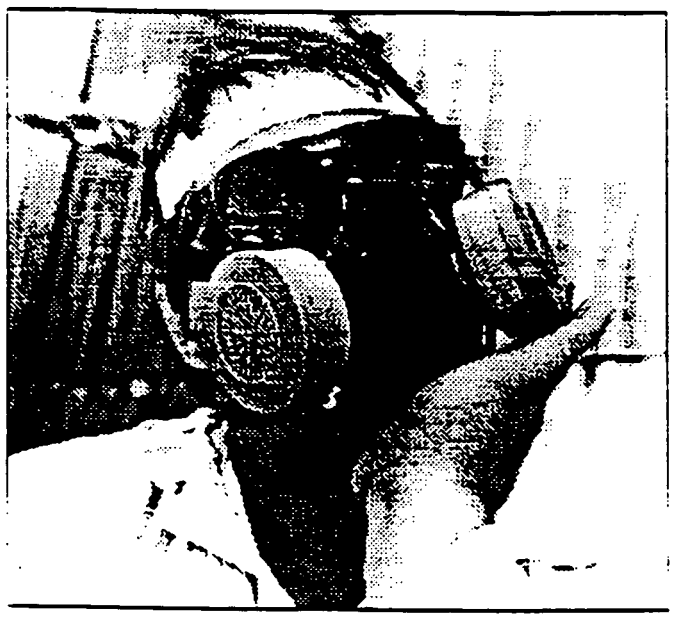


Figure 4-1
POSITIVE PRESSURE TEST DEMONSTRATION

CHAPTER 4.0 (cont.)

4.4 FIELD OR SELF-FIT CHECK METHODS (cont.)

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.

4.4.6 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 for 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 not correctable.
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 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.

CHAPTER 4.0 (cont.)

Figure 4-2
NEGATIVE PRESSURE TEST DEMONSTRATION

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 Plus 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 Plus 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.

CHAPTER 4.0 (cont.)

4.5 Other Fit Test Methods (cont.)

4.5.2.4 ANSI requires that a FTF of at least 10 times the assigned protection factor be obtained for half-mask and full-face respirators. At the FEMP, a minimum FTF of 100 for half-mask and 500 for full-face respirators must be obtained, although much higher levels of protection are usually achieved. The OSHA asbestos standard fit test acceptance criteria require that a FTF of 100 be obtained for half-masks and 1000 for full-faces.

Figure 4-3
TSI PORTA COUNT COMPUTER-CONTROLLED FIT-TEST UNIT

CHAPTER 4.0 (cont.)

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, successfully attending the "Basic Principles of Respiratory Protection" training class, and achieving a successful fit with the facepiece (see Section 4.3.3).

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(s), and employee and fit tester signatures. 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 and a specific listing of respirator brands, types, styles, or sizes.

4.6.5 Employees are only allowed to wear the negative or positive 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.

4.6.6 Fit test cards are valid only at the FEMP.

4.6.7 On the back of fit test cards, are general FERMCO 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 either return it to the employee or else return the card to the employee's fit test file.

4.6.10 If a fit test card is lost, Industrial Hygiene should be contacted so that a replacement card can be made.

4.6.11 Industrial Hygiene maintains copies of all fit test forms and portaCount Plus printouts, as well as copies of pictures of program participants taken at the fit test and manages these records in accordance with DOE Order 1324 requirements.

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 devices only.

Name:	Badge:
Expiration Date (Regular Work):	Expiration Date (See Below *):

* Qualified for: ☐ Asbestos ☐ Arsenic ☐ Cadmium ☐ Lead

THIS CARD IS VALID ONLY AT THE FEMP

FS-F-2591 (REC. 03/07/94)

GENERAL FEMP RESPIRATOR USE RULES

1. Store respirators and cartridges issued to you in bags inside boxes with your name on them. Bagged respirators must be in boxes if stored 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 (towelettes available) 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-2591 (REVERSE REV. 03/07/94)

Figure 4-4
FEMP FIT TEST CARDS, FRONT (TOP) AND BACK (BOTTOM) DESIGN

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 radioactive airborne contaminants, including dust, mists, fumes, gases, and vapors.

5.2 Radiological Controls personnel shall be responsible for ensuring proper selection of respiratory protection equipment for potential hazards from radioactive airborne contaminants. Unless required for other safety reasons (e.g., for increased peripheral vision), use of half-mask respirators for protection against airborne radioactive contaminants shall be discouraged.

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. Respirator Selection shall be performed according to SP-P-41-056, "Respirator Selection". This is a logical process similar to Figure 5-1.

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

5.5 Respirators shall be issued to wearers by supervisors or designees who have attended the class "Respiratory Protection for Supervisors".

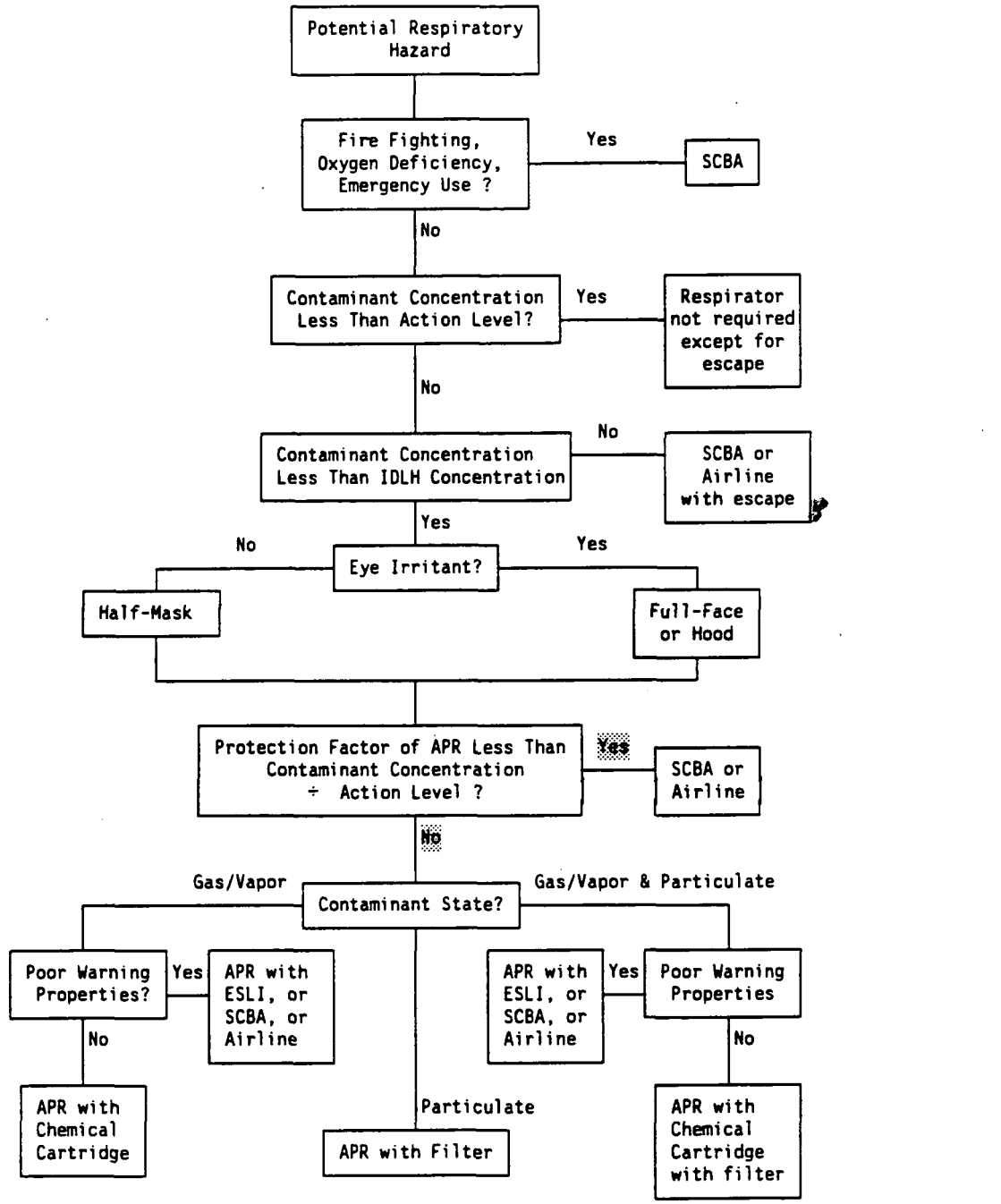
5.5.1 The supervisor (or designee) is responsible for ensuring the following:

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

Figure 5-1
INDUSTRIAL HYGIENE AND RADIOLOGICAL CONTROLS RESPIRATOR SELECTION CHART GUIDE

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.

5.5.1.5 If a respirator is worn with a hard hat, the respirator straps shall be worn underneath the hard hat. If skullcaps or hair nets are worn, they shall not be allowed to extend beneath the faceseal.

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 Controls.

TABLE 5-1
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
Air-Purifying Respirators & Cartridges	
North Respirators & Cartridges	
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 & Cartridges	
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

CHAPTER 5.0 (cont.)

TABLE 5.1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
MSA Respirators & Cartridges (cont.)	
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-81
MSA Magenta/Yellow Cartridge	M-573
MSA Dual Cartridge Adapter for UltraVue (Dogbone)	M-852
MSA Paint Spray Prefilter, 20 each	M-511
MSA Paint Spray Prefilter Cover	M-512
MSA Orange Cartridge	M-714
MSA Orange/Magenta Cartridge	M-851
MSA Green/Orange 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 Protector for Full-Face Respirators	M-635A
MSA Nose Cup for Full-Face Respirators, Medium	M-813
MSA Nose Cup for Full-Face Respirators, Large	M-814

CHAPTER 5.0 (cont.)

TABLE 5.1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
MSA UltraVue Full-Face OptimAir MM Powered Air-Purifying Respirator (PAPR)	
MSA Silicone UltraVue Full-Face, Small for OptimAir MM PAPR	M-885
MSA Silicone UltraVue Full-Face, Medium for OptimAir MM PAPR	M-886
MSA Silicone UltraVue Full-Face, Large for OptimAir MM PAPR	M-887
MSA OptimAir MM PAPR Magenta Cartridge	M-876
MSA OptimAir MM Motor/Blower Assembly	MU-912
MSA OptimAir MM PAPR Blower Inlet Plastic Cover	M-883
MSA OptimAir MM PAPR Blower Outlet Plastic Cover	M-882
MSA Welder's Adapter for UltraVue or UltraTwin Full-Face Respirators and Parts	
MSA Welder's Clip-On Adapter for Full-Face Respirators	M-645
MSA Welder's Glass Cover for Welder's Clip-On Adapter	M-646
MSA Spring Lens Welder for Welder's Clip-On Adapter	M-647
MSA Welder's Clip-On Adapter Filter Plate, Shade 6	M-812
MSA Welder's Clip-On Adapter Filter Plate, Shade 10	M-648
MSA Welder's Clip-On Adapter Filter Plate, Shade 12	M-649
Nomex Hood with Shoulder Cowl for MSA Welder's Clip-On Adapter	M-644
General Air-Purifying Respirator 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 for wiping Full-Face Lenses	M-756
Free Chlorine Test Paper	C-564
MSA Cleaner-Sanitizer II	M-699
Plastic Storage Bags 8 x 6 x 20 inches for airline and full-face respirators	M-531
Ties for Plastic Storage Bags	S-255
Reconditioned Respirator Cards, Green	K-778
Alcohol wipes for wiping respirator facepieces, 100 per box	M-888

CHAPTER 5.0 (cont.)

TABLE 5.1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
MSA Air-Purifying Respirator Repair Parts	
MSA Half-Mask Respirator Exhalation Valve	M-527
MSA UltraVue Full-Face Respirator Canister Adapter	M-758
MSA Thick Plastic Lens for Full-Face Respirators	M-635
MSA UltraTwin Cartridge Receptacle	M-853
MSA UltraTwin Inhalation Valve Seat	M-895
MSA UltraTwin or Comfo II Inhalation Valve	M-546
MSA UltraTwin/UltraVue Speaking Diaphragm	M-896
MSA UltraTwin Speaking Diaphragm Housing	M-897
MSA UltraTwin ESP Microphone and Amplified Speaker Chin Housing (9 volt transistor battery required for operation)	M-904
MSA Cartridge Receptacle Gasket for Comfo & UltraTwin	M-854
MSA UltraVue Inhalation Valve Spider Gasket	M-865
MSA UltraVue Inhalation Valve	M-870
MSA Respirator Exhalation Valve Cover	M-868
MSA Full-Face Nose Cup Inhalation Valve	M-889
Belt-Mounted Cartridge Receptacle Parts	M-713
North Air-Purifying Respirator Repair Parts	
North Headbands for North Silicone Half-Mask Respirator	M-815
North Silicone Half-Mask Inhalation Valve	M-470
North Silicone Half-Mask Exhalation Valve	M-471
North Silicone Half-Mask Exhalation Valve Cover	M-816
Airline Respirators & Parts	
North Airline Respirators & Parts	
North Hooded Airline Respirator 85300 Series Complete	M-735
North Replacement Hood for 85300 Series	M-734
North 25-foot Airline Hose	M-784
Coupling, Female Schraeder to Male 1/4" NPT for North Airline	M-758

CHAPTER 5.0 (cont.)

TABLE 5.1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
MSA Airline Respirators & Parts	
MSA Welder's Half-Mask Continuous Flow Airline, Small	M-782
MSA Airline Respirators & Parts (cont.)	
MSA Welder's Half-Mask Continuous Flow Airline, Medium	M-549
MSA Welder's Half-Mask Continuous Flow Airline, Large	M-783
MSA Full-Face Continuous Flow Airline, Small	M-764
MSA Full-Face Continuous Flow Airline, Medium	M-765
MSA Full-Face Continuous Flow Airline, Large	M-766
MSA Full-Face Pressure-Demand "DuoFlo" Airline, Medium	M-891
MSA Full-Face Pressure-Demand "DuoFlo" Airline, Large	M-890
MSA UltraVue Pressure-Demand Full-Face Medium, Facepiece Only	M-892
MSA UltraVue Pressure-Demand Full-Face Large, Facepiece Only	M-893
MSA "DuoFlo" Continuous Flow 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
Corrugated Breathing Tube for MSA Airline Respirator	M-711
High Pressure (35 to 40 psig for 8 to 300 ft. hose) Flow Control Valve with Schraeder fitting for MSA Continuous Flow Airline Respirator	M-855
Plastic Sleeve 3 ft long for MSA airline breathing tubes	M-866
Demand/Pressure-Demand Switchable Exhalation Valve for "DuoFlo" Pressure-Demand Airline	M-908
Plastic Screw to Repair Switchable Exhalation Valve	M-909
Clamp for MSA respirator corrugated breathing hose	M-710
Diaphragm for regulator for MSA Pressure-Demand Airline	M-911
Bullard Airline Respirators & Parts	
Bullard Hooded Continuous Flow Airline Respirator, Complete	M-619

CHAPTER 5.0 (cont.)

TABLE 5.1 (cont.)
STORES NUMBERS FOR RESPIRATORS

ITEM DESCRIPTION	STORES NUMBER
Bullard Hooded Airline Respirator with Hard Hat, Complete	M-810
Bullard Replacement Hood for item No. M-619 or M-810	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
Bullard Airline Respirators & Parts (cont.)	
Coupling 3/8" Female NPT x 1/4" Male NPT for Bullard Hoses	M-817
General Airline Station Items	
Compressed Breathing Air, 244 cu. ft cylinder, Grade D Quality	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
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 Protection 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 that 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 check 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 replaceable mylar scratch protector sheet is available to keep the visor clean. This should be used for spray painting operations where paint overspray will rapidly coat the main visor and be difficult or impossible to clean properly.

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. If using the MSA ESP microphone/speaker chin assembly, turn it on and verify that it transmits properly.

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 fittings (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.

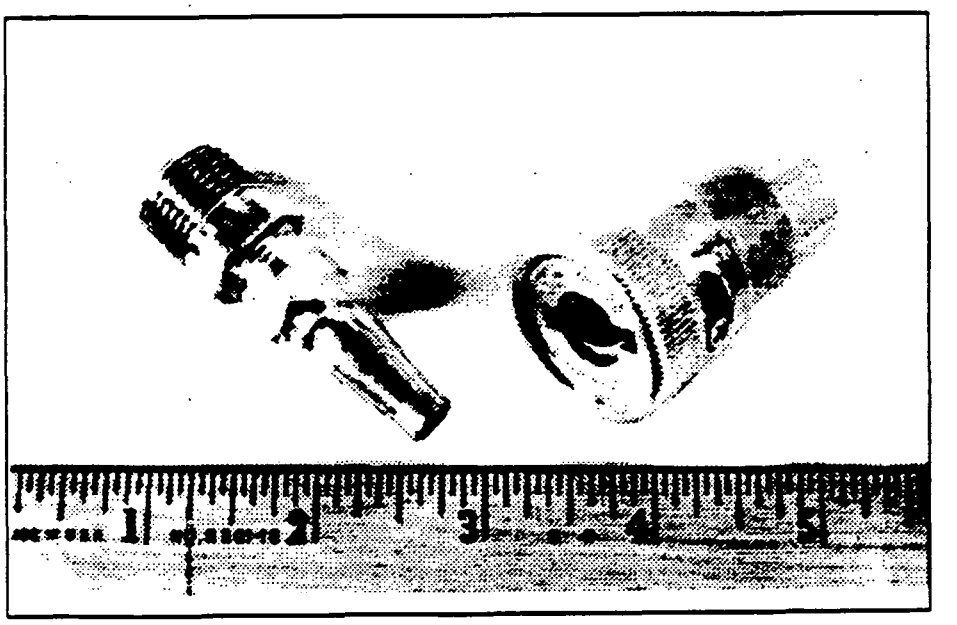


Figure 6-1
SCHRAEDER MALE (LEFT) AND FEMALE (RIGHT) QUICK DISCONNECT AIRLINE RESPIRATOR HOSE FITTINGS

CHAPTER 6.0 (cont.)

Stores No.	M-
Size (circle):	S M L
Date Cleaned:	
Cleaner Initials:	
IH Inspector Initials:	
Radiation Smear No.:	

FS-F-3446 (REV. 02/08/94)

Use This Side to Report Deficient Respirators	
Missing/Defective Part:	
Problem Description:	
Area Found:	Date:
Name:	Badge:

FS-F-3446 REVERSE (REV. 02/08/94)

Figure 6-2
EXAMPLE OF RECONDITIONED RESPIRATOR TAG (FRONT AND BACK) (STORES K-778)

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, they should be noted on the back side of the green "Reconditioned Respirator Tag" (Figure 6.2) which comes with each reconditioned respirator, the respirator bagged with the tag and 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 "Reconditioned Respirator Tag", the respirator user should write which respirator part is defective or missing.

6.1 RESPIRATOR INSPECTION (cont.)

6.1.6.1 If the part is defective, a brief description of how the part is defective should be written on the rear of the tag.

6.1.6.2 The area where the respirator was found should be listed on the tag, as well as the inspector's name, 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, thus ensuring that corrective measures (if necessary) are taken. This will ensure that the FERMCO respirator cleaning and sanitizing facility's quality service is maintained.

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 as described in Section 4.4) 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, unless the user is experiencing medical problems such as choking, vomiting, hyperventilation, dizziness, lightheadedness, fainting or a potentially life threatening hazard (i.e., imminent danger) exists.

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 particular job. Respirators shall not be stored in a locker, toolbox, or vehicle where they may be subject to crushing, but shall be stored inside a box. Reconditioned respirators are supplied in plastic bags. Newly purchased respirators are supplied with a plastic bag in their cartons. Empty boxes for respirator storage are available from Stores as Stock No. S-271. Respirators to be reused shall be identified with the user's name and badge number.

6.2.4 If respirators used in airbore contamination areas are to be re-used, they shall be surveyed after each use for surface contamination in accordance with RC-RDA-010 "Radiological Contaminations Surveys". If detectable levels of contamination are discovered on either the inside or outside of the respirator, the respirator shall not be re-used. For some jobs, respirators will be required to be recycled each time they are removed when the user is leaving the contaminated area.

6.2.5 Upon removal of the respirator intended for reuse, it must be wiped down with a single-use, pre-moistened towelette (Stores Stock No. M-888). If cartridges require removal, they must also be removed and discarded at this point.

NOTE: Respirators being recycled after asbestos work shall be bagged with an asbestos warning label.

6.2 GENERAL REQUIREMENTS (cont.)

6.2.6 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.

6.2.7 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. If washed/dried at an asbestos hygiene facility, respirators shall be bagged and recycled as non-asbestos respirators.

6.2.8 Respirators shall not be left lying out in the workplace. Respirators to be reused shall be properly stored so that they are not subject to contamination for the rest of the work shift, e.g., a storage cabinet.

6.2.9 Users may leave a respirator area at any time for relief from respirator use in the event of equipment malfunction, detection of contaminant leakage inside the facepiece, 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 or causing skin irritation.

6.2.10 Users of spray paint, which generates clouds of overspray, should grease all outside surfaces of respirators by applying a water soluble gel such as K-Y jelly to facilitate removal of spray paint from the facepiece by the cleaning cycle. Oil-based products (e.g., grease/oil lubricants or petroleum jelly) must not be used, because they are difficult to remove and may damage the facepiece. K-Y jelly or similar materials shall NOT be applied to the facepiece faceseal to enhance or achieve respirator fit.

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, non-radioactive dusts, and mists are present, or are likely to be present, in low concentrations that could constitute a potential health hazard. Unless required for other safety reasons, such as increased peripheral vision, use of half-mask respirators for radioactive airborne contaminants shall be discouraged.

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.

CHAPTER 6.0 (cont.)

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 or leak, sound of exploding valve, or sight of escaping gas).

6.4.6 Caution tags (which should be stored in respirator storage cabinets near airline respiratory protection equipment and stocked by Stores as S-260) 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.

O

CAUTION

DO NOT
DISCONNECT

AIRLINE RESPIRATOR
IN USE

NAME:	
BADGE NO:	DATE:

FMPC-OS&H-3100-(2/18/90)

Figure 6-3
AIRLINE CAUTION TAG
(Stores #S-260)

CHAPTER 6.0 (cont.)

Figure 6-4
A VORTEX COOLING OR HEATING TUBE TO COOL AIR GOING INTO A BULLARD HOODED AIRLINE RESPIRATOR
CHAPTER 6.0 (cont.)

CHAPTER 6.0 (cont.)

6.4 AIRLINE RESPIRATOR USAGE

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.

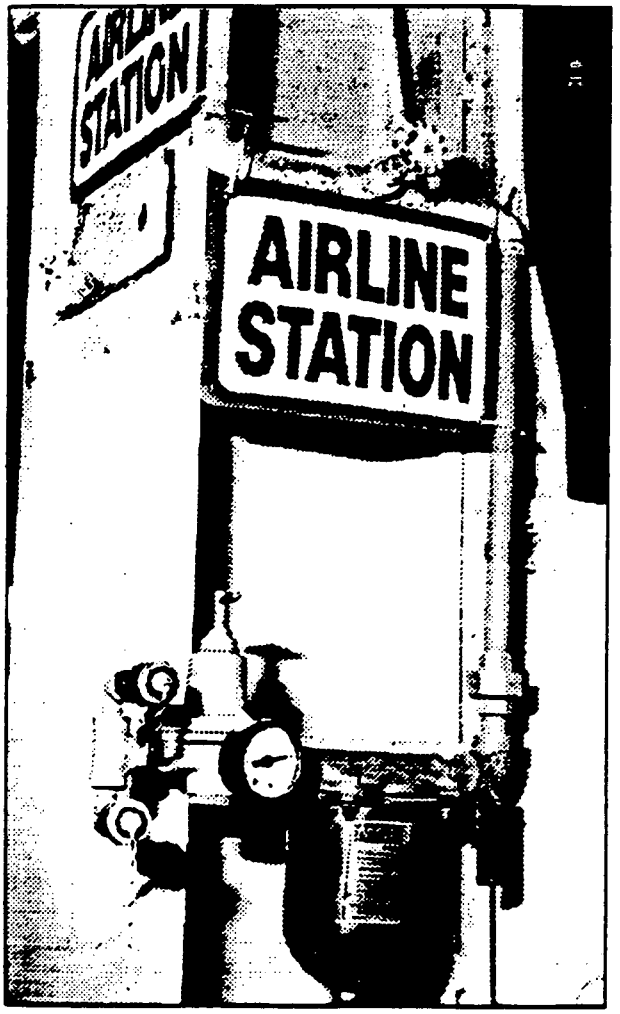


Figure 6-5
GREEN AND WHITE LABELLED AIRLINE STATION

CHAPTER 6.0 (cont.)

TABLE 6-1
MINIMUM PRESSURE SETTINGS FOR AIRLINE RESPIRATORS

AIRLINE RESPIRATOR	PRESSURE SETTING (psig)*
MSA Welder's Continuous Flow	35-40
MSA Full-Face Continuous Flow "DuoFlo"	35-40
MSA Pressure-Demand "DuoFlo"	65-85
MSA Pressure-Demand with Escape Cylinder	65-85
Bullard Airline Continuous Flow Hood	12-45
Bullard Airline Continuous Flow 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 AIRLINE RESPIRATOR USAGE (cont.)

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 Z86.1-1989 (Compressed Gas Association Commodity Specification for Air, G-7.1, 1989) 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. In addition to meeting Grade D requirements, SCBA cylinder air shall be tested to ensure it has less than 25 ppm water vapor or a dewpoint below -65°F.

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 so 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.

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. If a contractor or vendor brings in a cascade system filled with reconstituted air, all cylinders shall be checked for percent oxygen content.

6.4.22 Under no circumstances shall pure oxygen be used to supply airline respirators, because 100% oxygen presents an extreme fire hazard. Only Grade D quality breathing air is allowed.

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 Emergency Response 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 SCBA and ELSA cylinders shall only be filled with Compressed Gas Association (CGA) G-7.1-1989, Grade D Type I quality breathing air. Under no circumstances shall pure oxygen be used to supply SCBA respirators, due to the extreme fire hazard presented by 100% oxygen.

6.5.5 SCBA and ELSA cylinders shall be hydrostatically tested by an outside vendor once every 3 years for composite wrapped aluminum cylinders and every 5 years for steel cylinders. Passing cylinders shall be marked with a stamp on the cylinder.

6.5.6 Only specially trained personnel shall use SCBA. (See Section 5.4.)

6.5.7 Use of SCBA and ELSA units is subject to the capabilities and limitations listed in Section 3.0 of this manual.

6.5.8 SCBAs shall only be used with nose cups. FM radio walkie talkie units which mount inside the SCBA facepiece are available for use in situations such as IDLH work or where high noise makes communication difficult.

CHAPTER 6.0 (cont.)

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 day's 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.

Figure 6-6
HALF-MASK RESPIRATOR FACE-SEALING AREA

6.6.5 The full-face respirator sealing area is shown as the shaded region in Figure 6-7.

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. Any worker who has facial hair which intrudes into the area where the respirator seals against the face shall not be fitted with a respirator. Additionally, any worker who is not clean shaven shall not be allowed to wear a respirator, even though he/she has previously obtained a satisfactory fit with the particular device.

Figure 6-7
FULL-FACE RESPIRATOR FACE-SEALING AREA

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 FERMCO. To obtain spectacle kits for a respirator, employees should order a kit from Inventory Control and Warehousing (Stores stock number M-609) and provide it and a current lens prescription (less than 2 years old) to Safety and Fire Protection Engineering.

NOTE: Spectacle kits necessary for use with air-purifying and airline full-face respirators are different from the ones used in SCBA units. Contact Safety and Fire Protection Engineering for the SCBA spectacle kit.

6.7.3 As an option, contact lenses, regardless of type, can be worn inside full-face respirators provided the FEMP Medical 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.

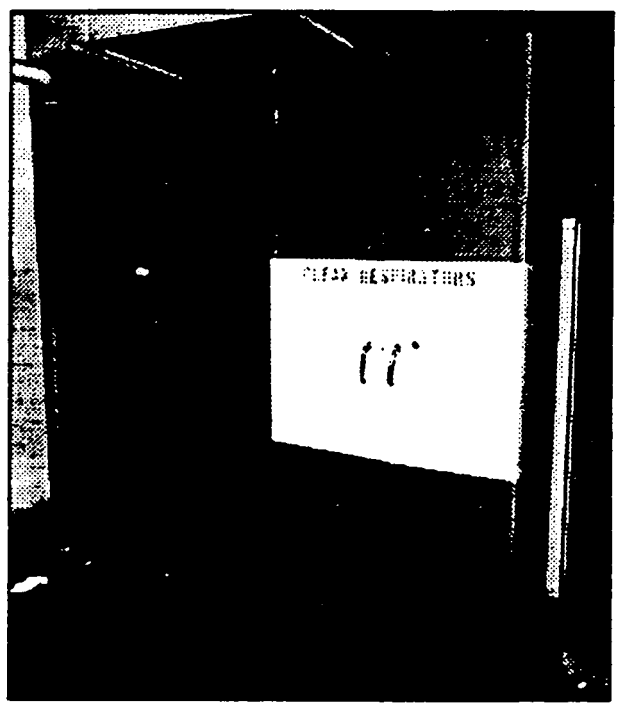


Figure 7-1
FEMP RESPIRATOR STORAGE CABINET

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. Single-use, premoistened towelettes (Stores Stock No. M-888) shall be stocked in the cabinets.

7.1.8 If desired current fit test result summaries for a group of employees may be obtained from Training Records Management. These may be posted in cabinets by supervisors to serve as reminders for employees of which types and sizes of respirators they are authorized to use.

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 Emergency Response 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 issuance 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.

Figure 7-2
RESPIRATOR STORAGE CABINET ISSUANCE SIGN

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.

7.4 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 Emergency Response shall be notified (Radio 303 E2 or x6235) 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, and shall not be left on continuous charge longer than manufacturer's directions specify.

7.5.3 PAPR batteries which have failed testing shall be properly disposed of per RCRA requirements.

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.

Figure 8-1
RESPIRATOR RECYCLING RECEPTACLE

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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 by the RSO department laundry, per 46-C-301 "Cleaning, Inspecting, and Reconditioning Respirators.

9.3 Reconditioned respirators shall be placed in clean, sealed plastic bags for reissuance along with a Reconditioned Respirator Tag (Figure 6.2). They shall be visually reinspected by Industrial Hygiene and checked for possible fixed and removable radioactive contamination by Radiological Controls before 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 ES&H assigned personnel 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).

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. FERMCO'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. FERMCO 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 non-FERMCO organizations of their own choice to be medically certified, trained, and/or fit tested. They may also arrange to use FERMCO facilities for this purpose. FERMCO personnel who request the services or presence of subcontractors, vendors, and visitors shall be responsible for providing the appropriate documentation (see Section 10.2) 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. Training Records shall maintain a computerized summary of these records as it does for FERMCO employees.

10.1.3 Industrial Hygiene shall forward all subcontractor medical approval and records to FERMCO Medical for review and approval.

10.1.4 Industrial Hygiene shall notify the responsible subcontractor or FERMCO supervisors of whether or not the documentation has been approved and of what further actions are necessary, if any.

10.1.5 If FERMCO facilities will be required to provide medical certification, training, or fit testing, Industrial Hygiene shall be contacted well in advance to allow for the necessary scheduling. FERMCO will accommodate schedules whenever possible.

10.1.6 If non-FEMP respiratory protection equipment is to be used onsite by any subcontractor, vendor or visitor, Industrial Hygiene approval shall be obtained before it is brought onsite. Only NIOSH-approved equipment shall be used onsite. Use of FEMP respiratory protection equipment is preferred.

10.1.7 Only FERMCO-trained personnel shall be permitted to use FERMCO 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

FERMCO Medical Services shall determine what constitutes acceptable respirator medical review for all FERMCO, subcontractor, and vendor medical employees in accordance with SPR 7-5, "Respirator Wearer Medical Qualification", and will notify Industrial Hygiene in writing of medical approval for such use with the Medical Approval/Training/Fit Test Form.

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 on Emergency Response Vehicles 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 Designated ES&H Department personnel 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 Controls. 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 Controls (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.

CHAPTER 12.0 - MEDICAL SURVEILLANCE

12.1 FEMP Medical 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. Medical Services shall be contacted for further information on medical surveillance studies.

12.2 Industrial Hygiene and/or Radiological Controls 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.

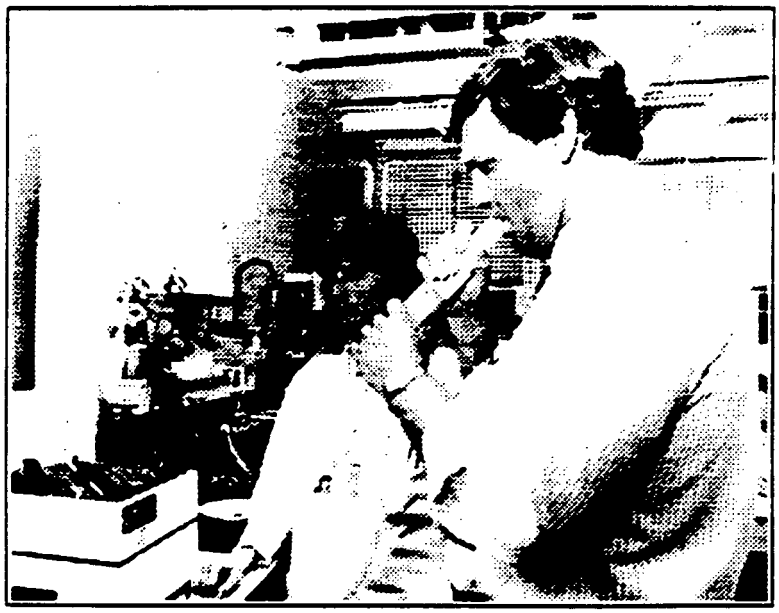

Figure 12-1
EMPLOYEE PERFORMING SPIROMETRIC TEST TO ASSESS LUNG FUNCTION FOR RESPIRATOR USE

CHAPTER 13.0 - HAZARD SURVEILLANCE

13.1 Industrial Hygiene routinely monitors for potential non-radioactive respiratory hazards in the workplace as part of the FERMCO general air sampling program. Radiological Controls also routinely monitors for potential airborne radioactive contaminants 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 Controls for radiological 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 Controls 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 Controls for radiological concerns.

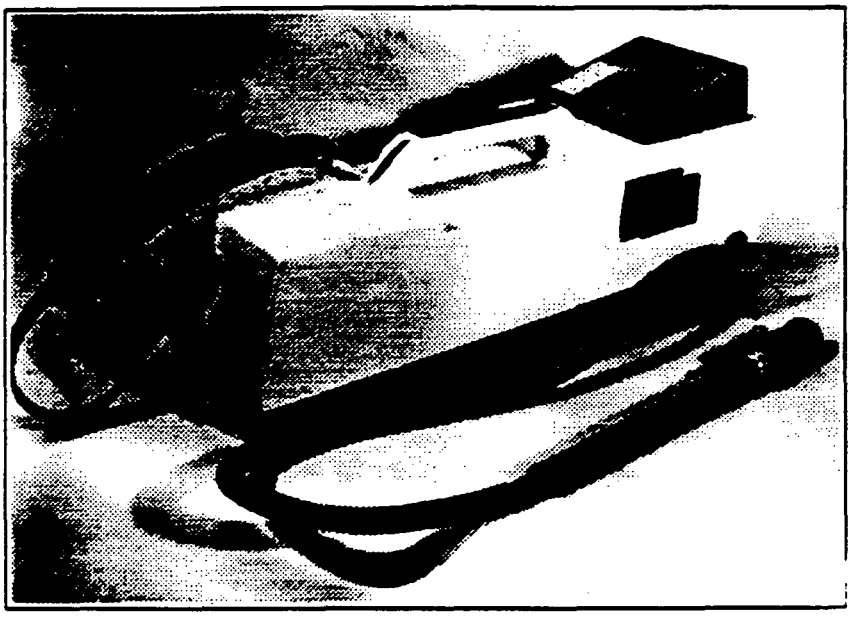

Figure 13-1
MIRAN 1B INFRARED ANALYZER

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CHAPTER 13.0 (cont.)

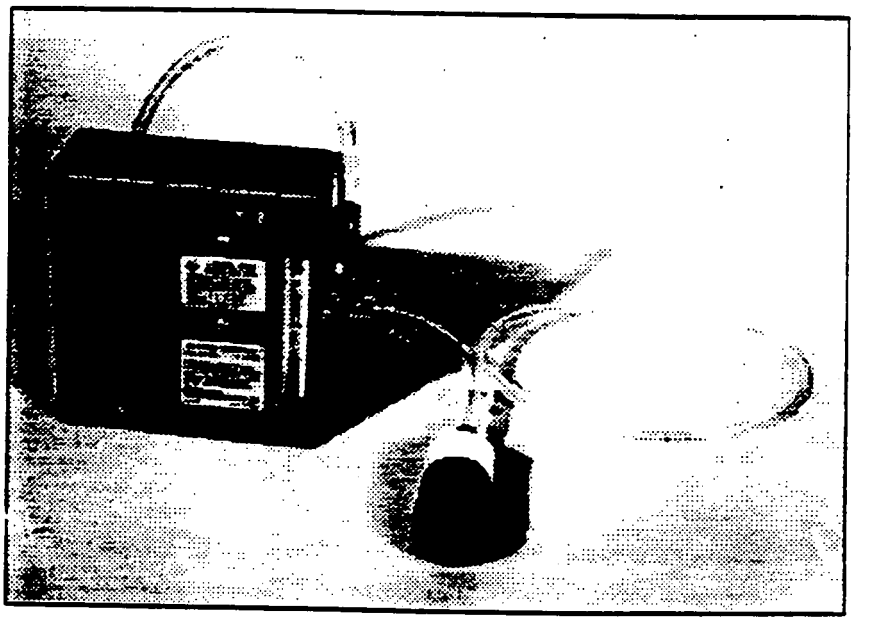

Figure 13-2
PERSONAL SAMPLING PUMP WITH FILTER

CHAPTER 14.0 - REFERENCES

14.1 ANSI Z88.2-1980, "American National Standard for Respiratory Protection"

14.2 Compressed Gas Association (CGA), G-7.1-1989, "Commodity Specification for Air"

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

14.4 NRC 10 CFR 20, "Standards for Protection Against Radiation"

14.5 NRC Regulatory Guide 8.15, "Acceptable Practices for Respiratory Protection"

14.6 OSHA, 29 CFR 1910,134, "Respiratory Protection"

14.7 OSHA, 29 CFR 1926.58, Appendix C, "Quantitative Fit Testing"

14.8 Bureau of Mines, 30 CFR 11, "Respiratory Protective Devices; Tests for Permissibility; Fees"

14.9 OSHA, 29 CFR 1910.1001, "Asbestos", (g), "Respiratory Protection", Appendix C, "Qualitative and Quantitative Fit Testing Procedures"

14.10 OSHA, 29 CFR 1926.58, "Asbestos", (h), "Respiratory Protection", Appendix C, "Qualitative and Quantitative Fit Testing Procedures"

14.11 OSHA, 29 CFR 1910.1017, "Vinyl chloride", (g), "Respiratory Protection"

14.12 OSHA, 29 CFR 1910.1018, "Inorganic arsenic", (h), "Respiratory Protection"

14.13 OSHA, 29 CFR 1910.1025, "Lead", (f), "Respiratory Protection", Appendix D, "Qualitative Fit Test Protocols"

14.14 OSHA, 29 CFR 1926.62, "Lead", Appendix D, "Qualitative and Quantitative Fit Test Protocals"

14.15 OSHA, 29 CFR 1910.1028, "Benzene", (g), "Respiratory Protection", Appendix E, "Qualitative and Quantitative Fit Testing Procedures"

14.16 OSHA, 29 CFR 1910.1027, "Cadmium", (g), "Respiratory Protection", Appendix C, "Qualitative and Quantitative Fit Testing Procedures"

14.17 OSHA, 29 CFR 1910.1043, "Cotton dust", (f), "Use of Respirators"

14.18 OSHA, 29 CFR 1910.1044, "1,2-dibromo-3-chloro propane", (h), "Respirators"

14.19 OSHA, 29 CFR 1910.1045, "Acrylonitrile", (h), "Respiratory Protection"

14.20 OSHA, 29 CFR 1910.1047, "Ethylene oxide", (g), "Respiratory Protection and Personal Protective Equipment"

14.21 OSHA, 29 CFR 1910.1048, "Formaldehyde", (g), "Respiratory Protection"

-6943

CONTROL NO. FER-0400

FEMP
SITE DOCUMENT SYSTEM

SDC No.	SC95-002
Effective Date:	01-20-95
Expiration Date:	07-20-95

SITE DOCUMENT CHANGE

(For Questions Contact SME Walt Mengel, 738-6231)

1. AFFECTED DOCUMENT NUMBER	2. AFFECTED DOCUMENT PAGE NUMBER
RM-0007	66

3. TITLE OR SUBJECT:
FEMP Respiratory Protection Requirements Manual

4. ACTIVITY AND AREA AFFECTED:
References

5. APPROVAL SIGNATURE:
Stu Hinnefeld — Stu Hinnefeld, Division Mgr. — Date 1/18/95

6. CHANGE:

Chapter 14.0, Reference number 14.10 to read as follows:

14.10 OSHA, 29 CFR 1926.1101, "Asbestos", (h), "Respiratory Protection", Appendix C, "Qualitative and Quantitative Fit Testing Procedures"

RECEIVED
JAN 27 1995
Ans'd_____

7. DOCUMENTATION CONTROL REQUIRED ACTION

[ ] No Procedure Action (Temporary Change) [X] Revise affected procedure per this document.

FILING INSTRUCTIONS: File facing page 66, Document No. RM-0007 (Effective Date: 10-14-94, Revision No. 1)

-6943

CONTROL NUMBER: FER-3018
SITE PROCEDURE: EM-0020 (SSOP-0077)
REVISION NO. 4

BUILDING EMERGENCY PROCEDURE

NON-CONTROLLED COPY

Effective Date: 09/27/94

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: Stuart L. Hinnefeld 3/17/95
Stuart L. Hinnefeld, FAM, Emergency Preparedness and Management — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

-0543

CONTROL NUMBER: FER-1018
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0077
REVISION NO. 4

BUILDING EMERGENCY PROCEDURE

SSOP-0077

Effective Date: 09-27-94

AUTHORIZED BY: _____ 17 Sept 1994
D. Ofte, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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Fernald Environmental FERMCO Restoration Management Corporation	Title: **BUILDING EMERGENCY PROCEDURE**
	DOCUMENT NO: SSOP-0077 REVISION NO: 4
	Effective Date: 09-27-94 — Page 1 of 20

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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.
07-14-93	1	Changes to procedure required per Request No. S93-074, initiated by Sam Duley and to update procedure format to reflect current changes.
02-16-94	2	Minor revision to reflect latest changes to procedure per Request No. S93-219, initiated by Sam Duley. This document supersedes SSOP-0077, dated 07-14-93, Rev 1.
06-09-94	3	Minor revision to address the additional structures on site per Request No. S94-069, initiated by Sam Duley. This document supersedes SSOP-0077, dated 02-16-94, Rev. 2.
09-27-94	4	Minor revision to add Table 1 and a reference to physically challenged employees, per Request No. S94-112, initiated by Sam Duley. This document supersedes SSOP-0077, dated 06-09-94, Rev. 3.

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 Manual."

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 onsite 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 Fernald Environmental Restoration Management Corporation (FERMCO), 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 gases or vapors.

FEMP Employees - Personnel employed by FERMCO, the DOE, and subcontractors employed by either FERMCO or the 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).

Building Evacuation Siren - A rising and falling electronic emergency signal, activated by the Communications Center to alert building occupants to evacuate.

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 sitewide 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 (RDA) System - Air horns and rotating red lights that are activated when the radiation level exceeds 80 mR/hr.

Subcontractors - Direct employees of companies other than FERMCO, 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 FERMCO 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 extinguishers and safety shower/eye bubblers in their immediate work area.
  - 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.)

- Assists physically challenged employees during evacuations, if necessary.
- Assigns/designates employees to perform specific tasks relating to an individual building during an emergency situation.

AEDO

- Complies with SSOP-0089, "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 Sitewide Accountability if more than 50 employees are evacuated from a building or area, Rally Point Accountability for those persons evacuated to rally points and an In-Place Accountability for the remainder of site personnel.
- Complies with all site procedures relating 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 no Fire Alarm Box nearby, use a portable radio or phone 738-6511 and report to the Communication 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 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 as shown in IM-7006, "Incident Building Evacuation Manual" for information concerning evacuation routes, location of Fire Alarm Boxes, and specific information relevant to their individual buildings.

6.0 PREREQUISITES

This "Building Evacuation Procedure" (SSOP-0077) must be used with IM-7006, "Incident Building Evacuation Manual."

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 738-6511 or use a portable radio.

> **WARNING**
>
> **USING THE WRONG TYPE OF EXTINGUISHER CAN BE HAZARDOUS. DO NOT USE WATER TO EXTINGUISH ELECTRICAL, LIQUID, OR METAL FIRES.**

2. If trained to use fire fighting equipment and you can do so without endangering yourself, combat the fire cautiously until the ERT arrives.

   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.

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 by contacting the Communication Center by telephone or portable radio.

> **WARNING**
>
> **DO NOT LOCK FIRE OR EXIT DOORS**

5. Close all Fire and Exit doors after building has been evacuated.

7.1 FIRE (cont.)

6. After evacuation, report to your Primary Rally Point.

   NOTE: Management shall account for personnel per SSOP-0089.

   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.

6. Instruct all persons in transit to avoid the building and surrounding area.

   NOTE: Management shall account for personnel per SSOP-0089.

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 738-6511 or use a portable radio.

2. After evacuating the building, proceed to the appointed Primary Rally Point or as directed by the EMS.

3. Instruct all persons in transit to avoid the building and surrounding area.

   NOTE: Management shall account for personnel per SSOP-0089.

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 an 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 SSOP-0089.

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.

2. If the release is minor in nature and can be controlled by personnel present, notify your supervisor or AEDO if your supervisor is not present.

3. If the hazardous material release presents any danger to personnel, pull the lever on a Fire Alarm Box if one is available.

4. Notify the Communication Center by phoning 738-6511 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 SSOP-0089.

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.

7.6 MEDICAL EMERGENCIES (cont.)

3. Notify the Communication Center by either phoning 738-6511, or 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.

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 SSOP-0089.

7.8 TORNADO WARNING ANNOUNCEMENT

NOTE: Tornado has been sighted in or near the vicinity of the FEMP.

1. All personnel in temporary structures (e.g., trailers, smoking shelters, and TSSs) are to evacuate these structures and seek shelter in permanent structures (see Table 1).

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.

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 an announcement over the EMS.

7.10 SEVERE WEATHER (HIGH WINDS AND THUNDERSTORMS AND/OR LIGHTNING)

WARNING

AVOID WORKING IN HAZARDOUS SITUATIONS SUCH AS HIGH, UNPROTECTED AREAS OR AREAS WHERE MATERIALS MAY BE BLOWN BY WIND.

1. When the announcement of severe weather approaching is made do one of the following:

   a. If in an isolated area, secure equipment/material and leave the area.

TABLE 1
ASSIGNED PERMANENT STRUCTURES

All personnel in temporary structures (e.g., trailers, smoking shelters, and TSSs) during Severe Weather or a Tornado Warning shall go to the nearest assigned permanent structure.

NOTE: Trailers are indicated by a "T" in the table below.

ADMINISTRATIVE AREA			
Service Building T-24 T-17 T-77 T-103 T-25 T-18 T-78 T-14 T-73 T-79 T-15 T-75 T-80	**Administrative Building** T-23 T-109 T-43 T-303 T-44 T-304 T-108 T-305	**ES&H Building** T-7 T-11 T-38 T-8 T-29 T-39 T-9 T-30 T-82 T-10 T-35 T-83	
Lab Building T-20 T-46 T-45 T-21 T-61 T-22 T-62	**Security Building** T-1 T-19 T-2 T-50	**Industrial Relations Building** T-3 T-5 T-4 T-6	**Building 51** T-511 T-520 T-227
FORMER PROCESS AREA			
Building 3045 T-512 T-514 T-532 T-513 T-519	**Garage** T-33 T-36	**Boiler Plant** TSS-1 TSS-3 T-31 TSS-2 T-27	**Plant 1A** TSS-4 TSS-6 T-28 TSS-5 T-12 T-301
Service Building T-42 T-91 T-89 T-92 T-90	**ES&H Building** T-49 T-84 T-87 T-71 T-85 T-72 T-86	**Building 12** T-508 T-533 T-517 T-623	**Building 69** T-505 T-506

NOTE: Personnel seeking shelter in the Service Building should assemble in the locker rooms.

7.10 SEVERE WEATHER (HIGH WINDS AND THUNDERSTORMS AND/OR LIGHTNING) (cont.)

OR

b. If in an external storage areas, secure loose materials (e.g., empty drums and boxes) by tying, weighing down, reducing stack height, or sheltering; move into a permanent structure; and continue procedure.

OR

c. If outside, secure all equipment/material and move into a permanent structure and continue procedure.

OR

d. If indoors, continue procedure.

OR

e. If in a trailer, smoking shelter, or Tension Support Structure (TSS), seek shelter in a permanent structure and continue procedure.

2. Close and secure windows, doors, and other openings through which wind or rain could enter.

3. Move away from windows.

4. Shut down equipment that is unsafe to operate during wind or rainstorm.

5. Move valuable equipment and materials to a sheltered location.

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 (738-6511) immediately.

2. Give details of person(s) involved, the incident and location.

3. Isolate the incident as much as possible.

4. Await arrival of Security personnel and provide any information, details and assistance if requested.

7.11 ACTS OF VIOLENCE (cont.)

5. All personnel in the immediate a: 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 section is performed in response to an RDA signal.

1. Upon hearing the RDA, respond in one of the following ways:

   a. If inside a building emitting an RDA, immediately leave the building by the nearest exit and continue procedure.

   OR

   b. If inside a building other than the one emitting an RDA, remain inside until the all-clear message is sounded.

   OR

   c. If outside of a building emitting an RDA, enter the nearest non-alarmed building and remain inside until the all-clear message is sounded.

   OR

   d. If you are in a vehicle, please park your vehicle and go into a non-alarmed building and wait until the all-clear message is sounded.

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.

7.12 CRITICALITY (cont.)

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 Rally Point #1.

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 738-6511 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 was 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. Supervisors of non-alarmed buildings should conduct an In-place Accountability.

7.13 RECEIVING BOMB THREATS

NOTE: Anyone who receives a threat or finds a suspicious object in his/her area shall immediately notify the Security Communication Center (738-6511).

1. By Telephone:

   a. Signal someone to listen to the call.

   b. If another line is available, have another employee call the Communication Center (738-6511).

7.13 RECEIVING BOMB THREATS (cont.)

NOTE: Keep the line open to Communication Center.

c. Keep the caller on the line as long as possible. Ask that the message be repeated.

d. Write down every word spoken by the person.

e. If the caller does not reveal the location of the bomb or the time of possible detonation, ask for the information.

f. Inform the caller that the building is occupied and the detonation of a bomb could result in death or serious injury to many people.

g. Listen for background noises, such as motors running, background music, and any other sounds that give a clue to the location.

h. Pay close attention to the voice characteristics of the caller.

NOTE: Listen for the following characteristics: sex, age, emotional state, accent, speech impediments, intoxication.

i. Immediately after the caller hangs up, take over the open line and report to the Communication Center (738-6511).

2. In Writing

CAUTION

HANDLE MATERIALS AS LITTLE AS POSSIBLE TO PRESERVE THE CONDITION AND ANY FINGERPRINTS.

a. Save all materials, including any envelope or container.

b. If possible, place the message between sheet of clear plastic or on a clipboard.

c. Record where the message was found and/or how delivered, by whom, and at what time.

d. Notify the Communication Center (738-6511).

7.13 RECEIVING BOMB THREATS (cont.)

e. Release the message only to a Security Officer.

3. Personal Contact

CAUTION

DO NOT ATTEMPT ANY PHYSICAL ACTIONS TOWARD THE INFORMANT.

a. 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.

b. Determine where, when, under what circumstances, and from whom did the informant learn about the explosive.

c. Ask the informant how he rates the reliability of the person alleged to have planted the bomb.

d. Verbally attempt to detain the informant. If possible, get the informant's license plate number and vehicle description.

e. If the informant can not be detained, attempt to obtain the informant's name, address, and a good physical description.

f. Immediately notify the Communication Center (738-6511) 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.

a. Call the Communication Center (738-6511) immediately and notify the AEDO of the location of the object. State your name and extension number.

b. Follow instructions given by AEDO or supervisor.

7.13 RECEIVING BOMB THREATS (cont.)

5. Searching Area For a Bomb

NOTE: Action to be taken by the Manager or Department Head.

WARNING

DO NOT USE RADIOS DURING THE SEARCH. RADIOS MAY CAUSE DETONATION.

a. 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 unusual size, shape, or audibility.

NOTE: Employees not involved in the search shall evacuate as directed and await instructions.

b. Inform the searchers that they are not to move, jostle, jar, or touch the object or anything attached to it.

c. If a suspicious object is found, notify the Communication Center of the location. Describe the object briefly and accurately.

d. Open windows and doors to minimize primary blast damage.

e. Move hazardous materials from the surrounding area if time permits.

f. 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.

7.14 EMERGENCY SHUTDOWN ANNOUNCEMENT (3-3 SIGNAL) (cont.)

5. Turn off electrical equipment.

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.

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. Check equipment, unit by unit, in accordance with applicable SOPs.

b. Check materials for damage.

c. Check with Boiler Plant to ensure the availability of steam.

7.15 POST DISASTER (cont.)

d. Check with Water Treatment to ensure that water is available.

e. Check with Utilities engineer to ensure that electrical power is available.

f. Check product supplies for damage.

g. Ensure that Fire and Safety, Industrial Hygiene and Radiological Safety have checked the area.

h. 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"
- DOE Order 5480.9 "Conduct of Operations"

8.2 REFERENCES

- PL-3020, "FEMP Emergency Plan"
- SSOP-0089, "Personnel Accountability"
- IM-7006, "Incident Building Evacuation Manual"

-6943

CONTROL NO. FEZ-0018
SITE PROCEDURE QA-0002 (SSOP-0036)
REVISION NO. 0

QUALITY ASSURANCE PROJECT PLANS

Effective Date: 11-14-91 NON-CONTROLLED COP

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: Richard E. Kline 3/13/95
Richard E. Kline, FAM of Quality Assurance Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

-6943

CONTROL NO. FER-0018
SITE PROCEDURE OP-0003 (SSOP-0716)
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CONTROL OF PROCESSES

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APPROVED BY: Don Paine, FAM _____ 3/22/95
Don Paine, FAM Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
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SITE PROCEDURE QA-0001 (SSOP-0023)
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PROCESSING DEVIATION AND CORRECTIVE ACTION REPORTS

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

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SSOP-0023

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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Fernald Environmental FERMCO Restoration Management Corporation	Title: **PROCESSING DEVIATION AND CORRECTIVE ACTION REPORTS**
	DOCUMENT NO: SSOP-0023 REVISION NO: 5
	Effective Date: 02-16-95 — Page 1 of 30

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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 and reviews per Request No. P91-220, initiated by M. A. Malone.
02-04-92	1	Minor revision to incorporate temporary revisions T91-021 through T91-025 per Request Nos. S92-012 through S92-016, initiated by M. Malone. This document supersedes SSOP-0023, dated 06-27-91, Revision 0.
06-25-92	2	Minor revision to reflect organizational changes per Request No. S92-048, initiated by M. Malone. This document supersedes SSOP-0023, dated 02-04-92, Revision 1.
10-13-93	3	Major revision to reflect organizational changes per Request No. S93-119, initiated by Linda Lockerd. This document supersedes SSOP-0023, dated 06-25-92, Rev 2.
12-16-94	4	Major revision to incorporate SSOP-1020, "QA/QC Tagging," into this procedure and reflect the latest changes in the DR and CAR process per Request No. S94-074, initiated by Linda Lockerd. This document supersedes SSOP-0023, dated 10-13-93, Rev. 3.
02-06-95	5	Minor revision to add Unreviewed Safety Question (USQ) information per Request No. S94-214, initiated by L. Lockerd. This document supersedes SSOP-0023, dated 12-16-94, Rev. 4.

NOTE: Change bars and shading from the previous revision have been removed. The latest changes to this document are indicated by a "change bar" (▌) in the right margin. Changes are also shaded in the text when needed to help identify changes.

1.0 PURPOSE

This document describes the process to ensure that conditions and potential conditions adverse to quality at the Fernald Environmental Management Project (FEMP) are documented on Deviation Reports (DRs) and Corrective Action Reports (CARs), controlled, analyzed, evaluated for significance, corrected in a timely fashion, brought to the attention of management, and tracked.

DRs and CARs are tools used by management to control conditions adverse to quality and reviewed as a means of improving processes and systems.

2.0 SCOPE

This procedure applies to all FERMCO personnel and subcontractors who identify a deviation from applicable requirements and all FERMCO personnel involved in the correction process.

3.0 DEFINITIONS

Administrator of Deviation and Corrective Action Reports (DRs and CARs) - The Quality Assurance (QA) Representative responsible for maintaining the database and records for the DR and CAR programs.

Condition Adverse to Quality - An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and nonconformances. A significant condition adverse to quality is one which, if uncorrected, could have a serious effect on safety or operability.

Corrective Action - Measures taken to rectify significant conditions adverse to quality, violations of regulatory requirements, or deviations from specified requirements, to preclude repetition of the condition identified.

Corrective Action Report (CAR) - A form used by the QA Division for the identification, disposition, verification of corrective action, and closure of a condition identified as significantly adverse to quality, a recurring nonconformance, or a programmatic breakdown.

Deviation - A departure from specified requirements.

Deviation Report (DR) - A form used to document the identification, disposition, verification of resolution, and closure of a specific deviation.

Disposition - The quality control term describing action necessary to resolve a specific nonconformance, which includes the following:

3.0 **DEFINITIONS** (cont.)

- Accept-As-Is - A disposition permitted when it can be established that the item is satisfactory for its intended use. (Written justification by a cognizant engineer must be submitted with this disposition.)

  NOTE: An unsupported belief, opinion, or recommendation is not an acceptable technical justification.

- Reject - The disposition declaring an item either economically or technically infeasible to accept-as-is, rework, or repair. Rejected items shall be scrapped, identified or altered so as to be inapplicable for their original use, or returned to the supplier.

- Repair - The disposition of restoring a nonconforming characteristic to a condition such that the item functions reliably and safely, even though that item still does not conform to the original requirement. (Written justification by a cognizant engineer must be submitted with this disposition.)

- Rework - The disposition by which an item is made to conform to original requirements by completion or correction.

- Other - The disposition to describe the specific actions to be taken (e.g., revise procedure, develop procedure, provide training) to resolve the nonconformance when none of the above dispositions are applicable.

Evaluator - A qualified individual who works for QA and/or supports the QA function and physically verifies acceptable completion and resolution of a DR or CAR. This person shall be trained in accordance with this document and technically competent in the specific area he/she is evaluating. The verifier should be the preparer of the DR or CAR whenever possible.

Event - Any real-time occurrence or significant deviation from planned or expected behavior that could endanger or adversely affect people, property, or the environment (see ED-0001).

External Audit - A formal examination of FEMP activities, planned and conducted by an organization other than FERMCO (e.g., the DOE or Fluor Daniel).

Group Tagging - Placing a material or item(s) in a controlled, segregated, and clearly identified hold area; erecting barriers around a material, item(s), or system and affixing a tag to the barrier or mounting the tag on a post or placard within the barrier.

3.0 **DEFINITIONS** (cont.)

Hold for QA/QC Release Tag (commonly called Hold Tag) - A tag that is affixed to material, an item(s), or a system by QA personnel as part of the DR process to preclude its use at the FEMP, FERMCO offsite locations, or vendor locations because it deviates from specified requirements or procedures or its continued use or installation would create unsafe work conditions.

Nonconformance - A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

Occurrence Report (OR) - A documented evaluation of an event or condition that is prepared in sufficient detail to enable the reader to assess its significance, consequences, or implications and to evaluate the actions being proposed or employed to correct the condition or to avoid recurrence. (Currently, Safety and Health (S&H) implements the OR program per ED-0001, "Event Notification and Occurrence Reporting Procedure.")

Overdue - The status of a DR or CAR when the forecast date for action has expired or action is not complete and no request for extension has been submitted to QA.

Quality Representative - An employee of the QA division (or a person matrixed to QA as a Lead Auditor) trained according to procedure SSOP-0023 and responsible for writing, processing, verifying closure of DRs and CARs.

Root Cause - The reason for an effect that, if corrected, will prevent recurrence of that effect.

Stand-alone Document File - A complete record of events from the date a nonconformance is identified through verification of closure of the DR or CAR. The stand-alone document file has all supporting evidence and documentation that explains what happened, what decisions were made by whom and why, and what evidence exists to show that corrective action took place and was effective. When supporting documentation is too voluminous to include in the document file, it shall be referenced in such a way that an auditor or manager reviewing the file can find the document without extensive research.

Technical Justification - Documentation provided by a cognizant engineer to validate the acceptance of a nonconforming item that has been dispositioned "REPAIR" or "USE AS IS." For facilities or activities that have a DOE approved authorization basis document including Safety Analysis Reports (SARs), Basis for Interim Operations (BIOs), Technical Safety Requirements (TSRs), and Operational Safety Requirements (OSRs), the technical justification must include information pertaining to Unreviewed Safety Question (USQ) pre-screening, screening, or safety evaluation (per SSOP-1035) prior to the approval of a design change.

3.0 **DEFINITIONS** (cont.)

Verification - The act of reviewing, monitoring, inspecting, testing, checking, or auditing "objective evidence" to ensure that the corrective action taken conforms to the corrective action proposed.

4.0 **RESPONSIBILITIES**

Employees

- Identify and report any condition adverse to quality to responsible management or a Quality Representative.
- Stop work and report condition to Supervisor if the condition adverse to quality affects personnel safety.

All Divisions

- Designate a DR/CAR Tracker to track DRs and CARs for the division, act as a Point of Contact, and support the DR/CAR program.
- Supply QA with the name of their Division DR/CAR Tracker.

Quality Assurance (QA) Division

- Develops and maintains the DR and CAR program.
- Trains and qualifies Quality Representatives in accordance with this procedure.
- Performs audits, appraisals, surveillances, inspections, acceptance tests, and observations made during day-to-day activities that may result in issuing a DR or CAR.

Administrator of Deviation and Corrective Action Reports

- Issues DR and CAR control numbers with the help of alternates.
- Maintains and updates DR and CAR databases.
- Maintains document control for DRs and CARs and files them with QA records.
- Maintains a qualified Quality Representative list and a current list of Division Trackers.
- Issues status reports to responsible Quality Representatives, Responsible Managers, FERMCO Senior Management, and the Department of Energy - Fernald Field Office (DOE-FN).

4.0 **RESPONSIBILITIES** (cont.)

- Performs trend analysis of DRs and CARs, which is reported to Senior Management quarterly.

Quality Representative

- Documents nonconformances by employee notification, audit, surveillance, appraisals, inspection, assessment, or observation made during day-to-day activities in DRs and CARs.
- Applies tags to and removes tags from hardware or items that have DRs written against them, if practical.
- Writes and processes DRs and CARs.
- Tracks DRs and CARs assigned to them to conclusion.
- Verifies corrective action identified on a DR or CAR when completed.
- Contacts Occupational Safety and Health (OS&H) if notified of unsafe work condition.

Responsible Person/Manager

- Responds to DRs and/or CARs.
- Ensures that corrective measures are effectively implemented in a timely manner and within the time frame agreed upon with the Quality Representative.
- Identifies and addresses root cause for a nonconformance noted on a CAR in order to prevent recurrence of the nonconformance.
- Provides resources to implement DR disposition and CAR corrective actions in a timely manner.
- Ensures that JUSTIFICATION for "Accept-As-Is" or "Repair" resulting in design changes includes appropriate documentation of USQ pre-screening, screening, and, if necessary safety evaluation (per SSOP-1035).

5.0 **GENERAL**

- Isolated one-time nonconformances are generally documented on a DR. Recurring nonconformances or programmatic breakdowns shall be documented on a CAR. If, during the life of a DR, a nonconformance qualifies as an occurrence according to ED-0001, the DR shall be closed and the OR number referenced on the DR as reason for closure.

5.0 **GENERAL** (cont.)

- Requests for extensions of completion date shall be sent to the Quality Representative in writing with justification, noting the DR or CAR number. The Quality Representative must then sign the request documenting concurrence for the request to be granted.

- Should a DR or CAR remain overdue for more than 30 days, the Quality Representative shall issue a memo transferring action/responsibility to the next level of management for the organization receiving the DR or CAR and the QA counterpart.

- Blatant disregard for quality, requirements, or unsafe work condition shall be grounds for stop work per SSOP-1019, "Quality Assurance Stop Work Authority."

- If the Responsible Organization does not implement its approved Corrective Action as committed, a memo shall be sent from the Director of QA to the receiving Division Manager, informing him/her of the situation and requesting a response. If this request is ignored or deemed not satisfactory, QA reserves the right to stop work per SSOP-1019.

- Any FERMCO employee or subcontractor may document a nonconformance on a DR form; however, only the QA organization can issue the DR. Similarly, only QA management may issue, approve corrective action for, or close a CAR.

- Should a DR or CAR change ownership due to the Responsible Person/Manager leaving the company or changing department/division, the Quality Representative shall coordinate a DR or CAR ownership transfer. Transfers shall be documented, signed, and dated by managers of both the sender and receiver. If there is a dispute as far as ownership is concerned, the dispute will be elevated to the next level of management for resolution.

- DRs and CARs shall be filled out using black ink. White-out is prohibited on original DRs and CARs. If an error is made, draw a line through the text, initial, date, and write in the correction.

- Nonconformances resulting from nonconforming purchased items may be documented on a DR form and issued to FERMCO Procurement. Procurement may contact the Requisitioner for disposition. The Requisitioner may select "Accept-As-Is" (with technical justification) or "Reject" to disposition the nonconforming order. The DR shall be flagged "Supplier DR" in the DR database.

- A DR or CAR may be closed by the Administrator of DRs/CARs at the request of a QA Manager (Level 3 or higher) by memo with justification. When a DR or CAR number has been taken from the database in error, the DR or CAR may be cancelled by the Administrator of DRs/CARs by noting the error on a blank DR or CAR form and filing it in the QA files.

5.0 **GENERAL** (cont.)

- If a DR or CAR form is lost while it is active, the Quality Representative shall obtain a copy, stamp "ORIGINAL" in red ink on the copy, and write "ORIGINAL LOST. THIS COPY TO SERVE AS ORIGINAL." on the copy.

- Revisions of DRs and CARs may be issued at the discretion of the Quality Representative when the disposition of a DR or the corrective action of a CAR is rejected by QA and a new response is required or if the corrective action cannot be verified as committed.

- DRs and CARs are issued as Revision 0; subsequent revisions shall be marked Revision 1, 2, and so on. In all cases, the original or previous revision shall be forwarded to the Administrator of DRs and CARs to be filed. A cover memo shall be issued with the revised DR or CAR to explain the need for the revision and the next action required.

6.0 **PREREQUISITES**

6.1 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

None

6.2 TRAINING REQUIREMENTS

The QA Division shall provide training on SSOP-0023 to managers, supervisors, Division Trackers, and others interested or involved in the DR/CAR program.

Quality Representatives shall successfully complete training to this procedure before writing a DR or a CAR.

7.0 **PROCEDURE**

7.1 PROCESSING DEVIATION REPORTS (DRs)

ALL EMPLOYEES

1. Do one of the following:

   a. Notify QA of a suspected nonconformance.

   or

   b. Do the following:

      (1) Obtain a DR form (see Figure 1) from QA.

7.1 PROCESSING DEVIATION REPORTS (DRs) (cont.)

ALL EMPLOYEES

(2) Prepare it per this procedure

(3) Submit it to QA for review or issue.

QUALITY REPRESENTATIVE

2. Evaluate the nonconformance for significant condition adverse to quality.

   a. If criteria for a CAR are met, proceed to Section 7.2.

   or

   b. If criteria for a CAR are not met, continue procedure.

   NOTE: The Quality Representative has 10 business days from the date of discovery to issue the DR.

3. Fill out Section 1 of the DR, referencing audit, surveillance, or inspection number in the "ACTIVITY" space of Section 1, if applicable.

4. Evaluate the nonconformance for requirement violation(s).

   a. If a written FERMCO requirement specified in a FERMCO procedure, plan, or contract, describing how work shall be performed has been violated, cite it on the DR in the "REQUIREMENT" space of Section 2.

   NOTE: If there are similar nonconformances, they may be grouped into one DR. The DR should reflect the number of occurrences for trend analysis purposes.

   or

   b. If no FERMCO requirement exists for known applicable regulatory requirements, discontinue DR and proceed to Section 7.2 so that a CAR can be issued to the Responsible Manager.

5. Write nonconformance in appropriate space of Section 2.

6. Determine response date and enter in the "PLEASE RESPOND BY" space of Section 2.

7.1 PROCESSING DEVIATION REPORTS (DRs) (cont.)

QUALITY REPRESENTATIVE

NOTE: Allow 10 business days from the date of issue for the Responsible Person/Manager to respond unless extenuating circumstances require more time.

7. Obtain unique DR number from the DR database.

8. Enter DR number at the top left of the form.

9. Stamp "ORIGINAL" in red ink on the DR form.

10. Determine if tagging is necessary.

    a. If the use or installation of materials and/or equipment conforms to Hold Tag criteria, such as design, specifications, or project requirements, do the following:

        (1) Check "TAGGING REQUIRED? Yes" box in Section 2.

        (2) Complete the Hold Tag (see Figure 2), including the following information:

            - DR number
            - Quality Representative's name
            - Quality Representative's phone number
            - Date
            - Description of the nonconforming material, item(s), or system.
            - Assigned tag number and total number of tags (e.g., 1 of 2).

        (3) Tag, control, or segregate the material, item(s), or system (i.e., individual or group tagging).

    or

    b. If the nonconformance does not meet Hold Tag criteria, check the "TAGGING REQUIRED? No" box in Section 2 and continue procedure.

11. Sign the "PREPARED BY" space in Section 2 and date.

7.1 PROCESSING DEVIATION REPORTS (DRs) (cont.)

QUALITY REPRESENTATIVE

12. Verbally notify Responsible Person/Manager of forthcoming DR and the date response is due.

13. Inform Responsible Person/Manager to include the Administrator of DRs/CARs, Mailstop 81-1, when responding to the DR.

14. Identify person notified in the "VERBALLY NOTIFIED" space in Section 2 and date.

15. Issue DR including the following distribution (minimum):

    - Original to Responsible Person for disposition
    - Copy to Responsible Person's Manager/Supervisor
    - Copy to the Administrator of DRs/CARs
    - Copy to Division/CRU tracker

RESPONSIBLE MANAGER

NOTE: It is recommended to establish clear lines of communication and avoid misunderstandings that the Responsible Person/Manager contact the Quality Representative and obtain verbal concurrence on a resolution and completion date before documenting in Section 3 of the DR form. Resolution may be aided by a knowledgeable technical expert, if necessary.

16. Check the appropriate block of Section 3 that addresses the action to eliminate the nonconformance.

17. Write disposition in the appropriate space of Section 3.

COGNIZANT ENGINEER

a. If disposition is "Accept-As-Is or "Repair," complete "JUSTIFICATION" space of Section 3.

or

RESPONSIBLE MANAGER

b. If disposition is not "Accept-As-Is" or "Repair," write "N/A" in the "JUSTIFICATION" space of Section 3.

7.1 PROCESSING DEVIATION REPORTS (DRs) (cont.)

RESPONSIBLE MANAGER

NOTE: Additional pages may be used, if necessary.

18. Enter projected completion date in the "PROJECTED COMPLETION DATE" space of Section 3.

19. Sign and date original DR in the appropriate space of Section 3.

20. Return original DR to Quality Representative.

QUALITY REPRESENTATIVE

21. Send copy of DR to the Administrator of DRs/CARs to log response.

22. Evaluate disposition within 10 business days of receipt.

    a. If acceptable, sign and date in Section 4 of the original DR.

    or

    b. If unacceptable, revise and return to step 15 of Section 7.1

23. Send original DR to Responsible Person/Manager and copy to the Administrator of DRs/CARs.

RESPONSIBLE MANAGER

24. Provide resources to implement DR disposition as scheduled.

25. Implement disposition.

26. When disposition is complete, sign and date Section 5 of DR.

27. Send original to Quality Representative with any pertinent supporting documentation.

QUALITY REPRESENTATIVE

28. Verify completion of DR disposition action within 10 business days of notice from the Responsible Person/Manager.

    a. If closure is verified, do the following:

        (1) Complete Section 6 of DR including verification action.

7.1 PROCESSING DEVIATION REPORTS (DRs) (cont.)

QUALITY REPRESENTATIVE

(2) Ensure that the DR contains information necessary to make the DR a stand-alone document.

<u>or</u>

b. If closure cannot be verified, do the following:

(1) Send memo to all parties explaining the situation.

(2) Request that Responsible Person/Manager address the situation.

(3) Complete Section 6 of DR when closure is verified.

29. Forward original DR and all documentation to Administrator of DRs/CARs.

ADMINISTRATOR OF DEVIATION AND CORRECTIVE ACTION REPORTS

30. Perform final check of DR for completeness, accuracy, and legibility.

a. If complete, accurate, and legible, continue procedure.

<u>or</u>

b. If not complete, accurate, and legible, obtain correct or missing information.

31. Stamp original DR form "VALIDATED QUALITY RECORD."

32. Inform all parties including nonconformance identifier (if applicable) of DR closure by memo.

33. File completed, original DR as official QA record.

QUALITY REPRESENTATIVE

34. Ensure DR tag(s) is removed, item(s) is released from "hold status," or item(s) is reintegrated if item(s) was tagged, held, or segregated.

7.2 PROCESSING CORRECTIVE ACTION REPORTS (CARs)

NOTE: Per SSOP-0049, "The FEMP Quality Assurance Audit Program," CARs stemming from audits are to be issued with the Final Audit Report; CARs not stemming from audits are to be issued within 10 business days from the date of discovery.

QUALITY REPRESENTATIVE

1. Complete Section 1 of the CAR (see Figure 3), referencing audit, surveillance, or inspection number in the "ACTIVITY" space in Section 1, if applicable.

2. Evaluate the nonconformance for requirement violation(s).

   a. If a written FERMCO requirement specified in FERMCO procedures, instructions, work plans, project specific plans, program plans, or contracts describing how work shall be performed has been violated relative to the requirement, cite it in the "REQUIREMENT" space in Section 2 on a CAR.

      NOTE: Regulatory Requirements may be referenced as support documents only.

   or

   b. If no FERMCO requirement exists for known applicable regulatory requirements, cite that on the CAR, addressed to the procedure owner or the manager responsible for the Functional Area.

3. Document nonconformance in appropriate space in Section 2.

4. Sign the "PREPARED BY" space in Section 2 and date.

5. Determine response date and enter it in the "PLEASE RESPOND BY" space in Section 2.

   NOTE: Allow 10 business days from the date of issue for the Responsible Manager to respond unless extenuating circumstances require more time.

6. Submit the CAR package to a QA Manager.

QA MANAGER

7. Evaluate the CAR.

   a. If conclusion is that the condition is a programmatic breakdown or a significant condition adverse to quality, do the following:

7.2 PROCESSING CORRECTIVE ACTION REPORTS (CARs) (cont.)

QA MANAGER

(1) Sign "QUALITY MANAGER" space in Section 2 and date.

(2) Inform Quality Representative.

or

b. If it is an isolated incident requiring disposition only, do the following:

(1) Reduce to a DR.

(2) Proceed to Section 7.1.

QUALITY REPRESENTATIVE

8. Verbally notify Responsible Manager of forthcoming CAR and the date response is due.

9. Inform Responsible Manager to include the Administrator of DRs/CARs, Mailstop 81-1, when responding to the CAR.

10. Identify person notified in the "VERBALLY NOTIFIED MANAGER" space in Section 2 and date.

11. Obtain unique CAR number from the Administrator of DRs/CARs (or alternate).

12. Enter in on the top, left-hand side of the form.

13. Ensure original CAR form is stamped or marked "ORIGINAL" with red ink.

14. Issue CAR including the following distribution (minimum):

- Original to Responsible Manager for disposition
- Copy to the Administrator of DRs/CARs Reports
- Copy to the audit file
- Copy to Division/CRU tracker
- Copy to the DOE-FN QA counterpart

7.2 PROCESSING CORRECTIVE ACTION REPORTS (CARs) (cont.)

QUALITY REPRESENTATIVE

15. Evaluate the CAR to determine the root cause using the "Suggestions for Evaluating a Root Cause" (Figure 4) and the "Matrix of Root Causes" (Figure 5) and enter it in the "ROOT CAUSE" space in Section 3 of the CAR.

RESPONSIBLE MANAGER

16. Check for similar breakdowns in your division and include in the "SIMILAR WORK INVESTIGATED" space in Section 3, if applicable.

    NOTE: It is recommended to establish clear lines of communication and avoid misunderstandings that the Responsible Manager contact the Quality Representative and obtain verbal concurrence on a resolution and completion date before documenting in Section 3 of the CAR form. Resolution may be aided by a knowledgeable technical expert, if necessary.

17. Enter action needed to correct original problem, prevent recurrence, and correct any other deficiencies discovered in the "CORRECTIVE ACTION PROPOSED" space in Section 3.

    NOTE: Use additional paper, if necessary.

18. Enter the "PROPOSED COMPLETION DATE" in the appropriate space in Section 3.

19. Sign and date Section 3.

20. Return original CAR complete with corrective action to the Quality Representative within the requested time frame.

21. Send copy of CAR to the Administrator of DRs/CARs to log response.

QUALITY REPRESENTATIVE

22. Evaluate proposed corrective action within 10 business days of receipt.

    a. If the proposed corrective action is acceptable, sign and date Section 4.

    or

7.2 PROCESSING CORRECTIVE ACTION REPORTS (CARs) (cont.)

QUALITY REPRESENTATIVE

b. If the proposed corrective action is unacceptable, do the following:

(1) Document the reason for rejection.

(2) Issue revision requesting new corrective action.

(3) Send first CAR (original or previous revision) to Administrator of DRs/CARs.

(4) Send new, revised CAR to Responsible Manager and return to either step 15 or 17 of Section 7.2, depending on the reason for rejection.

23. Return CAR to Responsible Manager with copy to DR/CAR Administrator.

RESPONSIBLE MANAGER

24. Provide resources to implement corrective action.

25. Implement corrective action.

26. When corrective action is complete, sign and date Section 5.

27. Forward original CAR with supporting documentation to Quality Representative with copy to DR/CAR Administrator.

QUALITY REPRESENTATIVE

28. Verify completion of CAR corrective action within 10 business days of receipt from the Responsible Organization.

a. If closure is verified, do the following:

(1) Sign and date Section 6.

(2) Fill in verification action.

(3) Forward original CAR and all documentation to Administrator of DRs/CARs.

<u>or</u>

7.2 PROCESSING CORRECTIVE ACTION REPORTS (CARs) (cont.)

QUALITY REPRESENTATIVE

b. If closure cannot be verified, do the following:

(1) Call the Responsible Manager explaining why.

(2) Send memo to all parties explaining the situation.

(3) Request Responsible Manager address the situation and proceed to step 25 of Section 7.2.

QA MANAGER

29. Perform final check of CAR for completeness, accuracy, and legibility.

a. If complete, accurate, and legible, continue procedure.

<u>or</u>

b. If not complete, accurate, and legible, obtain correct or missing information.

30. Sign and date Section 6.

QUALITY REPRESENTATIVE

31. Inform all parties of CAR closure by memo.

32. Send original CAR and all supporting documentation to the Administrator of DRs/CARs.

ADMINISTRATOR OF DEVIATION AND CORRECTIVE ACTION REPORTS

33. Review CAR for completeness.

a. If complete, continue procedure.

<u>or</u>

b. If not complete, obtain missing information.

34. Stamp original CAR with "VALIDATED QUALITY RECORD."

35. File completed, original CAR as official QA record.

7.2 PROCESSING CORRECTIVE ACTION REPORTS (CARs) (cont.)

ADMINISTRATOR OF DEVIATION AND CORRECTIVE ACTION REPORTS

36. Do one of the following:

    a. If the CAR is tied to an external audit, proceed to SSOP-1068, "The FERMCO External Audit Management System," for instruction.

    or

    b. If the CAR is not tied to an external audit, end procedure.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE Order 5700.6C
- RM-0012, "Quality Assurance Program Description"

8.2 REFERENCES

- ED-0001, "Event Notification and Occurrence Reporting Procedure"
- SSOP-0049, "FEMP Quality Assurance Audit Program"
- SSOP-1019, "Quality Assurance Stop Work Authority"
- SSOP-1035, "Unreviewed Safety Question (USQ) Determination and Safety Evaluation System"
- SSOP-1068, "The FERMCO External Audit and Appraisal Management System"
- NQA-1, "Quality Assurance Program Requirements for Nuclear Facilities"

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DEVIATION REPORT

DR NUMBER:	REVISION:

SECTION 1 - BACKGROUND INFORMATION

DATE DISCOVERED:	RESPONSIBLE ORGANIZATION:
RESPONSIBLE PERSON/MANAGER:	
ACTIVITY:	LOCATION:

SECTION 2 - NONCONFORMANCE

REQUIREMENTS:

NONCONFORMANCE:

PLEASE RESPOND BY:	TAGGING REQUIRED? ☐ Yes ☐ No
PREPARED BY (QUALITY REPRESENTATIVE):	DATE:
RESPONSIBLE PERSON/MANAGER VERBALLY NOTIFIED:	DATE:

SECTION 3 - DISPOSITION

DISPOSITION: | | Accept-As-Is | | Rework | | Repair | | Rework | | Other (e.g., Procedure or Training method

TECHNICAL JUSTIFICATION (ACCEPT-AS-IS OR REPAIR):

PROJECTED COMPLETION DATE

RESPONSIBLE PERSON/MANAGER:	DATE:

SECTION 4 - CONCURRENCE WITH DISPOSITION

QUALITY REPRESENTATIVE: ☐ ACCEPT ☐ REJECT	DATE:

SECTION 5 - COMPLETION OF DISPOSITION

RESPONSIBLE PERSON/MANAGER	DATE:

SECTION 6 - VERIFICATION OF DISPOSITION

ALITY REPRESENTATIVE	DATE:

VERIFICATION ACTION:

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Figure 1 - Deviation Report (Sheet 1 of 2)

DEVIATION REPORT (cont.)
INSTRUCTIONS

QUALITY REPRESENTATIVE - COMPLETE SECTIONS 1, 2, AND TOP LINE AS FOLLOWS:	
ITEM	**INSTRUCTIONS**
DR NUMBER	Enter DR Number on the DR Form (obtained from the DR database or from the DR and CAR Administrator).
REVISION	Enter the current revision number (e.g. 0, 1, or 2).
DATE DISCOVERED	Enter date that nonconformance was discovered.
RESPONSIBLE ORGANIZATION	Enter the organization responsible for the item or activity in which a nonconformance was discovered.
RESPONSIBLE PERSON/MANAGER	Enter name of the person or manager responsible for disposition.
ACTIVITY	Enter activity being performed when nonconformance was discovered, if applicable. (i.e., Audit I89-1)
LOCATION	Enter location of the activity (i.e., Plant 6)
REQUIREMENTS	Enter the procedure, instruction, standard, or code that establishes the acceptance criteria for the activity or item being evaluated.
NONCONFORMANCE	Fully describe the nonconformance as it relates to the requirements.
PLEASE RESPOND BY	Enter date proposed disposition outline is due.
TAGGING REQUIRED	Check whether nonconformance requires items to be tagged or not.
PREPARED BY (QUALITY REPRESENTATIVE)	Sign and date indicating who prepared the form.
RESPONSIBLE PERSON/MANAGER VERBALLY NOTIFIED	Enter the person/manager who was verbally notified of the nonconformance and the date of notification.

RESPONSIBLE PERSON/MANAGER - COMPLETE SECTION 3 AS FOLLOWS:	
DISPOSITION	Check the appropriate block for Accept-As-Is, Rework, Repair, Reject or Other and indicate the appropriate disposition in the space provided.
TECHNICAL JUSTIFICATION (ACCEPT-AS-IS/REPAIR)	If disposition is Accept-As-Is or Repair, provide a technical justification.
PROJECTED COMPLETION DATE	Enter the agreed on completion date for the disposition.
RESPONSIBLE PERSON/MANAGER	Sign and date upon completion of determining disposition.

QUALITY REPRESENTATIVE - COMPLETE SECTION 4 AS FOLLOWS:	
QUALITY REPRESENTATIVE	Sign and date indicating concurrence with proposed disposition.

RESPONSIBLE PERSON/MANAGER - COMPLETE SECTION 5 AS FOLLOWS:	
RESPONSIBLE PERSON/MANAGER	Sign and date indicating disposition completion.

QUALITY REPRESENTATIVE - COMPLETE SECTION 6 AS FOLLOWS:	
QUALITY REPRESENTATIVE	Sign and date indicating verification of the disposition completion.
VERIFICATION ACTION	Enter verification action including tags removed, if applicable.

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Figure 1 - Deviation Report (Sheet 2 of 2)

HOLD

FOR QA/QC RELEASE

DO NOT REMOVE THIS TAG

TAG NUMBER: _____

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Figure 2 - "Hold for QA/QC Release" Tag

CORRECTIVE ACTION REPORT

CAR NUMBER:	REVISION:

SECTION 1 - BACKGROUND INFORMATION

DATE DISCOVERED:	RESPONSIBLE ORGANIZATION:
RESPONSIBLE MANAGER:	
ACTIVITY:	LOCATION:

SECTION 2 - NONCONFORMANCE

REQUIREMENTS:

NONCONFORMANCE:

PREPARED BY (QUALITY REPRESENTATIVE):		DATE:
PLEASE RESPOND BY:	QUALITY MANAGER:	DATE:
RESPONSIBLE MANAGER VERBALLY NOTIFIED:		DATE:

SECTION 3 - PROPOSED CORRECTIVE ACTION

ROOT CAUSE:

SIMILAR WORK INVESTIGATED:

CORRECTIVE ACTION PROPOSED:

PROPOSED COMPLETION DATE:

RESPONSIBLE MANAGER:	DATE:

SECTION 4 - EVALUATION OF CORRECTIVE ACTION

QUALITY REPRESENTATIVE: ☐ ACCEPT ☐ REJECT	DATE:

SECTION 5 - COMPLETION OF CORRECTIVE ACTION

RESPONSIBLE MANAGER:	DATE:

SECTION 6 - VERIFICATION OF CORRECTIVE ACTION

QUALITY REPRESENTATIVE:	DATE:
VERIFICATION ACTION:	
QUALITY MANAGER:	DATE:

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Figure 3 - Corrective Action Report (CAR) (Sheet 1 of 2)

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CORRECTIVE ACTION REPORT (cont.)
INSTRUCTIONS

QUALITY REPRESENTATIVE - COMPLETE SECTION 1, 2, AND TOP LINE AS FOLLOWS:	
ITEM	**INSTRUCTIONS**
CAR NUMBER	Enter the CAR Number obtained from the Administrator of DRs/CARs or the database.
REVISION	Enter the current revision number.
DATE DISCOVERED	Enter date nonconformance was discovered.
RESPONSIBLE ORGANIZATION	Enter the organization responsible for item(s) or activity for which corrective action is required.
RESPONSIBLE MANAGER	Enter name of the manager responsible for corrective action.
ACTIVITY	Enter activity (e.g., Audit I89-1) when nonconformance was discovered, if applicable.
LOCATION	Enter the location of the activity (e.g., Plant 6).
REQUIREMENTS	Enter the procedure, instruction, standard, or code that establishes the acceptance criteria that has been violated.
NONCONFORMANCE	Describe the nonconformance as it relates to the requirements.
PREPARED BY (QUALITY REPRESENTATIVE)	Sign and date indicating who prepared the form.
PLEASE RESPOND BY	Enter the date the disposition action outline is due.
QUALITY MANAGER	Sign and date indicating nonconformance is a programmatic breakdown.
RESPONSIBLE MANAGER VERBALLY NOTIFIED	Enter the responsible manager who was verbally notified of the nonconformance and date.

RESPONSIBLE MANAGER - COMPLETE SECTION 3 AS FOLLOWS:	
ROOT CAUSE	Enter the underlying (root) cause of the problem.
SIMILAR WORK INVESTIGATED	Identify other areas that have or may have the same root cause problem. The intention is to correct them all at the same time.
CORRECTIVE ACTION PROPOSED	Enter the action proposed to correct the root cause and prevent recurrence of the nonconformance.
COMPLETION DATE	Enter the scheduled completion date for corrective action.
RESPONSIBLE MANAGER	Sign and date indicating manager proposing corrective action.

QUALITY REPRESENTATIVE - COMPLETE SECTION 4 AS FOLLOWS:	
QUALITY REPRESENTATIVE	Evaluate the proposed corrective action to determine its adequacy for solving the problem identified in the report and sign, signifying acceptance of the proposed corrective action.

RESPONSIBLE MANAGER - COMPLETE SECTION 5 AS FOLLOWS:	
RESPONSIBLE MANAGER	Sign signifying corrective action completed.

QUALITY REPRESENTATIVE AND QUALITY MANAGER - COMPLETE SECTION 6 AS FOLLOWS:	
QUALITY REPRESENTATIVE	Verify that the actions taken to correct the nonconformance have been completed satisfactorily, sign, and date.
VERIFICATION ACTION	Enter the verification action performed.
QUALITY MANAGER	Check CAR for completeness, accuracy, and legibility; sign; and date. Transmit original and supporting documents to Administrator or DRs/CARs.

FS-F-2909-1 (REV. 12/08/94)

Figure 3 - Corrective Action Report (CAR) (Sheet 2 of 2)

SUGGESTIONS FOR EVALUATING A ROOT CAUSE

- Work in groups of two or more and brainstorm ideas. This produces more objective and productive results.

- Ask "why" the nonconformance occurred. When you arrive at an answer to that question, ask "why" that happened. Repeat this exercise, commonly known as The Five Whys," as needed. This gets beyond the superficial or obvious response and to the root cause of the problem.

  NOTE: The interim answers to the "why" questions may also be candidates for improvement.

- Ask the question, "Is this an isolated incident or are there similar, or the potential for similar, incidents?" (See Section 3 of the Corrective Action Report Instructions.)

- Consider Work Environment and the Five M's (Manpower, Materials, Machines, Methods, and Management) as possible areas that may be contributing to the problem.

  Work Environment - e.g., lighting insufficient or work area dirty or unsafe.

  Manpower - e.g., operator error or disregard for instructions.

  Materials - e.g., concrete defective, drum leaks, or new type glove or Personal Protective Equipment (PPE) needed.

  Machines - e.g., pump broken, fork lift with higher reach needed, higher capacity electrical service required.

  Methods - e.g., database to collect information needed, improved forms needed, new or revised procedures needed.

  Management - e.g., employee training needed or enforcement of requirements needed, resources needed.

Figure 4 - Suggestions for Evaluating a Root Cause (Sheet 1 of 2)

SUGGESTIONS FOR EVALUATING A ROOT CAUSE (cont.)

The following are typical types of actions taken to correct a problem, finding, or nonconformance:

Immediate Action Action taken to correct the specific condition immediately, e.g., seal an unsealed container, repair a broken instrument, or rewrite an incorrect report.

NOTE: Findings documented on a DR are isolated incidents and require only Immediate Action. If the nonconformance is an isolated incident, this action may be sufficient. If Immediate Action does not correct the problem, it may not be an isolated incident and may require further investigation to find the Root Cause.

Interim/Remedial (Temporary) Action Action taken in the interim, pending a permanent (long-term) system/program action, that will eliminate the Root Cause. For example, a procedure is modified to control the problem until a new process can be developed to eliminate the problem (Root Cause).

Permanent Action Action taken to eliminate the Root Cause of the nonconformance and prevent recurrence of the problem, finding or nonconformance.

NOTE: Generally, this is a system or program action that not only addresses the specific nonconformance, but also all other similar nonconformances as well. (See CAR Form, Section 3.C. "ACTION TAKEN TO PREVENT RECURRENCE")

Figure 4 - Suggestions for Evaluating a Root Cause (Sheet 2 of 2)

MATRIX OF ROOT CAUSES

1.0 EQUIPMENT/MATERIAL PROBLEM

A. Defective or Failed Parts:
i) Correct part unavailable; ii) Inadequate form, fit/function; iii) Failed in normal use; iv) Excessive wear or stress; v) Inadequate quality control; vi) Other

B. Defective or Failed Material:
i) Material unavailable; ii) Inadequate for job; iii) Failed in normal use; iv) Excessive wear/stress; v) Inadequate quality control; vi) Other

C. Defective Weld, Braze or Solder Joint:
i) Poor workmanship; ii) Failed in normal use; iii) Wrong materials used; iv) Inadequate quality control; v) Other

D. Manufacturer Error in Shipping/Marking:
i) Manufacturer error; ii) Inadequate instructions to manufacturer; iii) Other

E. Electrical or Instrument Noise:
i) Inadequate equipment; ii) Failed equipment; iii) Calibration not performed; iv) Other

F. Contamination:
i) No control procedures; ii) Procedures not followed; iii) Procedure requirement not identified; iv) Other

2.0 PROCEDURE PROBLEM

A. Defective or Inadequate Procedure:
i) Inaccurate or inconsistent; ii) Not effective; iii) Out of date; iv) No controls or enforcement; v) Other

B. Lack of Procedure:
i) No procedure; ii) Informal, undocumented; iii) No requirement; iv) Requirement unclear; v) Requirement ignored; vi) Not distributed; vii) Other

3.0 PERSONNEL ERROR

A. Inadequate Work Environment:
i) Deficient work area temperature; ii) Work area noise problem; iii) Work area space problem; iv) Other

Figure 5 - Matrix of Root Causes (Sheet 1 of 3)

MATRIX OF ROOT CAUSES (cont.)

B. Inattention to Detail:
i) Physical distraction in work place; ii) Personnel problem; iii) Other

C. Violation of Requirement or Procedure:
i) Unaware of requirement; ii) Procedure/written instruction ignored; iii) Inappropriate use of procedure; iv) Deficient written instructions; v) Other

D. Verbal or Communication Problem:
i) Message content inadequate; ii) Message media inadequate; iii) Inattention of receiver; iv) Received but ignored; v) Other

E. Other Human Error:
i) Errors unrelated to work environment, attention, requirement violations and communications

4.0 DESIGN PROBLEM

i) Inadequate calculations or analysis; ii) Inadequate QA of design effort; ii) Inadequate documentation or configuration control; v) Other

5.0 TRAINING DEFICIENCY

A. No Training Provided:
i) No training program available; ii) No requirement; iii) Requirement unclear or not identified; iv) Other

B. Insufficient Practice or Hands-On Experience:
i) Lack of On-the-Job Training (OJT); ii) Inadequate OJT; iii) Inadequate testing; iv) Other

C. Inadequate Content:
i) Inadequate or missing material; ii) Poor lesson plan design; iii) Inexperienced subject matter expert; iv) Other

D. Insufficient Refresher Training:
i) No requirement; ii) Requirement unclear/not identified; iii) Schedules not communicated well; iv) Attendance not enforced; v) Other

E. Inadequate Presentation or Materials:
i) Materials or presentation unclear; ii) Materials incomplete for requirements; iii) Inadequate communication; iv) Other

Figure 5 - Matrix of Root Causes (Sheet 2 of 3)

MATRIX OF ROOT CAUSES (cont.)

6.0 MANAGEMENT PROBLEM

A. Inadequate Administrative Control:
i) Authority not delegated/documented/communicated; ii) Ineffective/missing document controls; iii) Other ineffective management control systems

B. Work Organization/Planning Deficiency:
i) Goals/objectives not well defined; ii) Ineffective work planning; iii) Ineffective work scheduling; iv) Work backlog problem; V) Information flow problem

C. Inadequate Supervision:
i) Lack of direct supervision; ii) Ineffective supervision techniques; iii) Supervisory communications problem; iv) Lack of or ineffective feedback/lesson learned mechanism

D. Improper Resource Allocation:
i) Goals/objectives not well defined; ii) Priority problem; iii) Personnel qualifications status unknown; iv) Equipment status unknown

E. Policy Not Adequately Defined, Disseminated, or Enforced:
i) Inadequate policy/requirements definitions; ii) Inadequate communications of requirements; iii) Lack of enforcement of requirements; iv) Management unaware of requirements

F. Other Management Problem:
i) Management attitude problem; ii) Organization culture problem; iii) Low priority; iv) Other

7.0 EXTERNAL PHENOMENA

A. Weather or Ambient Condition:
i) Weather event beyond control of reporting organization; ii) Ambient conditions beyond control of the reporting organization

B. Power Failure or Transient:
i) Power loss attributed to outside supplied power

C. External Fire or Explosion:
i) External fire event beyond control of organization; ii) Explosion/chemical release event beyond control of reporting organization

D. Theft, Tampering, Sabotage/Vandalism:
i) External theft beyond control of the reporting organization; ii) Tampering, vandalism, or sabotage not prevented by reporting organization

Figure 5 - Matrix of Root Causes (Sheet 3 of 3)

CONTROL NO. FER-0400

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FERMCO OPERATIONAL READINESS MANUAL

SM-0005

NON-CONTROLLED COPY

Revision No. 3

Effective Date: 02/27/95

AUTHORIZED BY: Richard E. Kline 2/15/95

Richard E. Kline Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
11/19/93	0	New manual to provide an Operational Readiness Manual, initiated by Dick Kline and Carol Kilberg.
12/20/93	1	Revised to incorporate the Operational Readiness Assessment and Routine Restart Processes, initiated by Dick Kline and Carol Kilberg. This document replaces SSOP-0100, dated 9/3/93, Revision 1.
11/18/94	2	Revised to incorporate multiple changes, initiated by Carol Kilberg and Richard Kline per Request No. 94-133. This document supersedes SM-0005, dated 12/20/93, Revision 1.
02/27/95	3	Revised to incorporate changes made in the DOE-FN Operational Readiness Review Manual, initiated by Carol Kilberg and Richard Kline. This document supersedes SM-0005, dated 11/18/94, Revision 2.

1.0 INTRODUCTION

The Operational Readiness Manual establishes the conditions and/or requirements to be used by Fernald Environmental Restoration Management Corporation (FERMCO) for identifying, selecting, and conducting Operational Readiness Reviews (ORRs) and Readiness Assessments (RAs). Both processes provide a uniform and consistent strategy which include an independent overview of startup and restart activities. The ORR and RA processes provide a systematic approach for verifying that planned actions are complete and are recorded to demonstrate that a state of readiness to proceed has been achieved. The U. S. Department of Energy, Fernald Field Office (DOE-FN) monitors all ORRs and RAs.

1.1 Purpose

The purpose of an Operational Readiness Program is to obtain assurance that an activity:

- Can be started up and performed safely and properly.
- For shutdowns or decommissioning, except for Safe Shutdown activities, the facility, process, and equipment are returned to a stable and environmentally sound state.
- Will be operated, maintained, and supported by trained, qualified, and authorized personnel.
- Will be operated in conformance with applicable DOE Orders and regulatory requirements.
- Is prepared for startup/restart and is properly and adequately documented.
- Has adequate plant equipment, structures, and other hardware.
- Includes adequate procedures that incorporate Conduct of Operations to an appropriate degree.
- Has the sitewide support systems identified, in place and functional.
- Is in compliance with the commitments made in the applicable safety analysis and any technical safety requirements outlined in the safety analysis.
- Will be operated so that no undue risk to employees, the public, or the environment results.

In accomplishing the above purpose, it should be noted that readiness reviews are not to be used by line management to achieve readiness, but as a verification that readiness has been achieved.

The Readiness Methodology Selection Process establishes the methodology used to evaluate all FERMCO activities to determine if a readiness determination process (ORR and RA) is applicable to the proposed activity.

2.0 APPLICABILITY

2.1 Applicability Considerations

2.1.1 The ORR and RA Processes are applicable to all technical aspects of the FEMP organizations that are responsible for the startup, safety, design, engineering, operations, maintenance, and construction of nuclear/radiological facilities and activities.

2.1.2 The ORR and RA Processes apply to all facilities, operations, or activities that desire initial startup or restart after a shutdown. Types of shutdowns are:

- Unplanned shutdown by DOE management because of safety or other reasons.
- Shutdown because of operations outside the safety basis.
- Shutdown for enhanced safety which requires changes in a DOE approved safety basis.
- Shutdown for extensive modifications
- Extended Shutdown (Hazard Category 2 = 12 months; Hazard Category 1 = 6 months)

2.1.3 The ORR and RA Processes apply to all FERMCO and Subcontractor startups and restarts.

2.1.4 The type of review and approval levels are contained within this manual.

2.1.5 The ORR and RA processes do not approve foundation documents (like SARs, environmental documents, or DOE program documents); they only verify that they are approved and have been properly implemented.

2.1.6 The ORRs and RAs use the results of design reviews and safety analysis reports; however, they do not take the place of these documents.

2.2 Exclusions

2.2.1 Activities identified by the Safety Analysis Department as "Standard Industrial Hazard" or non-nuclear/non-radiological activities are exempt from this manual.

2.2.2 The readiness review will not apply to activities that are bounded by the Safe Shutdown Program Field Activity Safety Assessment 92-1060.

2.2.3 The readiness review process does not apply to construction work that is considered to involve standard industrial/ construction hazards (i.e., new facility or facility modification construction).

2.2.4 The readiness review process does not apply to construction dismantlement/demolition projects where the facility has gone through a safe shutdown in which nuclear materials have been removed and the facility is in a stable or de-energized condition. NOTE: Nuclear material removal does not require removal of fixed contamination (i.e., contaminated piping or building steel).

3.0 DEFINITIONS

Activity - A facility, operation, process, system, or project.

Administrator of the Operational Readiness Program - Appointed by the Manager of Readiness/Safety Review. The Administrator will manage the administrative attributes of both the ORR and RA processes.

Approval Authority - The minimum level of management signature required to grant the authorization to proceed after a readiness review has been successfully completed. If other DOE orders (e.g., DOE 4700.1) require a higher level of startup authorization than this order, the official described in this order will recommend startup to the higher level official.

Checklist - An itemized list of all identified startup/operational or shutdown criteria (e.g., hardware, personnel, administrative controls) to be satisfactorily resolved in order to achieve a specified state of readiness. Each criterion must be documented on a certification statement as to resolution and acceptance (based on acceptance criteria or performance objectives) prior to the readiness determination.

Closeout Report - The Closeout Report is used in the ORR process and includes closure of any open findings from the Final Report.

Criteria - A formalized listing of prerequisite detailed conditions or issues which must be satisfactorily resolved to achieve a specific state of readiness.

DOE-ORR - A DOE Operational Readiness Review conducted according to DOE 5480.31 that verifies the adequacy of the FERMCO ORR and the effectiveness of the contractor's preparation for operation.

Final Report - A formal report that contains a brief summary of the review activities, the conclusions reached, the basis for the conclusions, and confirmation of any pre-start findings that were resolved along with explanations of any deviations as well as open findings with the corrective action proposals. The Final Report will include a lessons learned section. The report may also identify observations that would not impact startup and restart.

Finding - A departure from a specified requirement that is a deficiency in characteristic, documentation, procedure, personnel training, and/or qualification or design that renders the item or activity unacceptable or indeterminate. The severity and potential consequences should be addressed in describing the deficient condition.

Graded Approach - A process by which the level of analysis, documentation, and actions necessary to comply with a requirement are commensurate with:

- The relative importance to safety, safeguards, and security.
- The magnitude of any hazard involved.
- The life cycle of an activity.
- The programmatic mission of an activity.
- The particular characteristics of an activity.
- Any other relevant factor. (DOE 5480.31)

Hazard Categories - The consequences of unmitigated releases of radioactive and/or hazardous material are evaluated (by site processes) as required by DOE 5480.23 and DOE-STD-1027-92, and classified by the following hazard categories (Nuclear Facilities): (DOE 5480.31)

- Category 1. The hazard analysis shows the potential for significant offsite consequences.
- Category 2. The hazard analysis shows the potential for significant onsite consequences.
- Category 3. The hazard analysis shows the potential for only significant localized consequences.

An additional hazard category used at the FEMP is Category 4 which is defined as:

- Category 4 (Radiological Facility). Are those facilities that do not meet or exceed the hazard category 3 threshold quantity values published in DOE-STD-1027-92 but still contain some quantity of radioactive material (above those discussed in Appendix B to 40 CFR 302). (DOE-EM-STD-5502-94)

Nonreactor Nuclear Facility - Those activities or operations that involve radioactive and/or fissionable materials in such form and quantity (see DOE-STD-1027-92) that a nuclear hazard potentially exists to the employees or the general public. Included are activities or operations that:

- Produce, process, or store radioactive liquid or solid waste fissionable materials, or tritium;

- Conduct separation operations;

- Conduct irradiated materials inspection, fuel fabrication, decontamination, or recovery operations;

- Conduct fuel enrichment operations; or

- Perform environmental remediation or waste management activities involving radioactive materials.

Incidental use and generating of radioactive materials in a facility operation (e.g., check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and x-ray machines) would not ordinarily require the facility be included in this definition. (5480.31)

Observations - Items identified during the ORR and RA process that are not required for startup, but if resolved would lead to excellence in operations. A discussion of the observations should be included in the final report. The ORR and RA Teams are not required to track the completion of observations.

Operational Readiness Review (ORR) - A disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that an activity will be operated safely within its approved safety envelope as defined by the activity safety basis. The Operational Readiness Review scope is defined based on the specifics of the activity and/or the reason for the shutdown as related to a minimum set of core requirements. A graded approach will be used in defining the depth of the Operational Readiness Review based on these core requirements. (DOE 5480.31)

ORR Breadth - The set of core requirements which will be evaluated by the Operational Readiness Review Team during the conduct of the Operational Readiness Review. (DOE 5480.31)

ORR Depth - The level of analysis, documentation, and/or actions necessary to evaluate an applicable core requirement. (DOE 5480.31)

ORR Implementation Plan - The plan developed by the Operational Readiness Review Team describing the specifics of approach, schedule, methodology, team members and their qualifications, and reporting requirements of the Operational Readiness Review. The Operational Readiness Review Implementation Plan is used by the ORR Team Leader to execute the ORR. (DOE 5480.31)

ORR Scope - The overall magnitude of the Operational Readiness Review as defined by the breadth of core requirements selected and the depth of evaluation of these core requirements during conduct of the Operational Readiness Review. (DOE 5480.31)

ORR Team Leader - The leader chosen by the FERMCO Office of the President to be responsible for planning, staffing, and conducting an ORR. An ORR Team Leader will be assigned for each ORR after the determination has been made indicating that an ORR is required.

ORR Team - The ORR Team is appointed by the ORR Team Leader to conduct the ORR. The ORR Team is a multi-disciplined group that is assembled to judge an activity's "Readiness to Proceed" by conducting an ORR. Qualification requirements include technical expertise in the area being evaluated and experience in conducting assessments, but the members should not be directly responsible for the activity being reviewed. Members may be assigned to the ORR Team on a full or part-time status. The ORR Team does not approve the startup of the activity; they only make a recommendation to the approval authority.

Performing Organization - Senior line manager that reports directly to the FERMCO Office of the President and is responsible for the activity.

Plan of Action - The high level document describing the breadth and prerequisites of the Operational Readiness Review, the composition of the team performing the review, and the designated startup or restart authority. (DOE 5480.31)

Post-Start Finding - A finding that must be corrected, but may be corrected after the start of the activity. Post-start findings are addressed by a corrective action plan which includes any compensatory measures taken.

Pre-start Finding - A finding that must be corrected before an activity can be started. (DOE 5480.31)

Program Work - Work in a nonreactor nuclear facility or reactor that is accomplished to further the goals of the facility mission and/or the program for which the facility is operated. Program work does not include work that would be required to maintain the facility in a safe shutdown condition or to accomplish modifications and correct deficiencies required before program work can recommence. This also excludes demolition work of or within the facility that has been safely shut down and the nuclear material removed. (DOE 5480.31)

Readiness Assessment (RA) - A review that is conducted to determine an activities readiness to start up or restart when the activity has a hazard category assigned and an ORR is not required. (DOE 5480.31)

RA Implementation Plan - The RA Implementation Plan is a graded approach of the ORR Implementation Plan. See definition of ORR Implementation Plan.

RA Team Leader - The leader chosen by the Approval Authority to be responsible for planning, staffing, and conducting an RA. An RA Team Leader will be assigned for each RA after the determination has been made indicating that an RA is required. The RA Team leader may be from the performing organization but cannot review his/her own work.

RA Team - See ORR Team definition.

Readiness - When the plant, equipment, personnel, procedures, and administrative systems are in place and verified to be at the required state to support operation, a demonstrated capability to proceed to the next program or project phase.

Readiness Methodology Selection Process - A systematic method that compares the hazard category against the activity classification (new start or restart) as a way of selecting the readiness determination method (ORR or RA). This selection process also determines the appropriate Approval Authority.

Readiness to Proceed Memorandum - The formal document submitted by the FERMCO President which certifies the conclusion that the activity is prepared to start or resume operations. This document will initiate the DOE ORR. A small manageable list of pre-start items may exist.

Ready to Operate - A documentation by FERMCO Line Management that the activity has completed all pre-operational requirements and is ready to start operations. This document must be submitted prior to commencing the FERMCO ORR/RA.

Restart - Recommencing reactor critical operations and/or program work in nonreactor nuclear facilities. (DOE 5480.31)

Routine Restart - A routine restart is when the activity occurs as a normal part of an activity and is covered by an approved procedure which includes a mechanism for verifying the activity can be restarted safely. An ORR or RA is not required for routine restarts.

Safe Shutdown - An effort to mitigate potential sources of contamination to the environment and personnel and to stabilize, isolate, and/or treat any existing contamination to prevent release or migration. The effort will prepare the process facilities for either removal or remediation.

Safety Basis - Combination of information relating to the control of hazards at a nuclear facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility be conducted safely. (DOE 5480.23)

Standard Industrial Hazard - Hazards that are routinely encountered in general industry and for which national consensus codes and/or standards (e.g., OSHA, transportation Safety, etc.) exist to guide safe design and operation without the need for special analysis to define safe design and/or operational parameters.

Start (Startup) - Commencing a specific predetermined step that is considered the beginning of an activity that has resulted in the hazard category for that activity.

Startup Notification Report - A periodic report by FERMCO to identify all known future remediation or other program activity new starts and restarts. The report will identify the activity and, based on the criteria of DOE 5480.31 specify whether an ORR or a RA is required. For activities requiring an ORR or RA, the startup approval authority will be identified. The report is submitted to the approval authority for approval and should receive semi-annual updates.

Technical Scope - The boundary of technical criteria used to develop, design, and operate a component, system, structure or facility.

4.0 RESPONSIBILITIES

4.1 Office of the President (OP) - The OP has overall responsibility for the ORR and RA Processes to ensure compliance with procedures and DOE orders. The responsibilities include:

4.1.1 Establishes the FERMCO ORR and RA Process.

4.1.2 Appoints the ORR Team Leader.

4.1.3 Approves FERMCO ORR and RA recommendations (where the OP is the approval authority) for activity starts/restarts.

4.1.4 Issues the Readiness to Proceed Memorandum to DOE-FN.

4.1.5 Issues the Startup Notification Report.

4.1.6 Interfaces with DOE-FN/HQ.

4.2 Performing Organization - The Performing Organization has the following responsibilities:

4.2.1 Defines the technical scope of the ORR and RA.

4.2.2 Requests and documents the Hazard Category that was established by the Safety Analysis Department to the Administrator.

4.2.3 Ensures that all activities under his/her cognizance are identified for inclusion in the Startup Notification Report.

4.2.4 Ensures resources and funding for the reviews are identified, allocated, and included in the schedule and budget of the activity.

4.2.5 Issues written notice to the ORR/RA Team Leader that the activity is ready to operate.

4.2.6 Ensures that actions are taken to correct deficiencies that result in findings identified during the ORR and RA process.

4.2.7 Compiles and retains the RA process records.

4.2.8 Develops routine startup procedures to be followed for the Performing Organization to start a new activity or restart a shutdown activity.

4.2.9 Provides input and resources for developing, ensuring compliance with, and obtaining the approved safety analysis through the Safety Analysis department.

4.3 Administrator of the Operational Readiness Program - Administrator of the ORR is appointed by the Manager of Readiness/Safety Review and supports the ORR Team by performing the following.

4.3.1 Issues ORR and RA control numbers.

4.3.2 Develops the Startup Notification Report and updates on a semiannual basis.

4.3.3 Interfaces with the Performing Organization.

4.3.4 Receives and submits all documentation concerning the ORR and RA.

4.3.5 Maintains and tracks ORR and RA progress, schedules, and open items.

4.3.6 Maintains ORR files.

4.4 Operational Readiness Review Team Leader - The ORR Team Leader is appointed by the OP. The following items are included in the ORR Team Leader's responsibilities but he can delegate responsibilities to the ORR Team Members:

4.4.1 Selects and trains the ORR Team Members.

4.4.2 Estimates the level of effort and schedule requirements including objectives and milestones needed for the activity's review.

4.4.3 Provides startup recommendations to the approval authority concerning activity readiness.

4.4.4 Prepares the ORR Implementation Plan.

4.4.5 Uses analytical techniques (checklists or MORT Analysis) to ensure appropriate coverage of the subject activity.

4.4.6 Develops measurable ORR criteria that fully demonstrate that an activity is ready to start up and proceed to completion.

4.4.7 Identifies the objective evidence that supports the status of readiness for each ORR criteria element.

4.4.8 Integrates issues raised by external committees, previous audits, and reports into the review process.

4.4.9 Verifies compliance with ORR criteria, through interviews, observations, personnel training records, personnel qualification records (if applicable), inspection of hardware, and review of management practices.

4.4.10 Documents all ORR actions and ensures that such documents are included as part of the ORR process permanent record.

4.4.11 Compiles lists of pre-start findings and observations, and defines closure for each finding. Documents recommendations for approvals for readiness notification, pre-start finding closure, and startup authorization.

4.4.12 Serves as FERMCO and DOE point-of-contact for information regarding the ORR.

4.4.13 Resolves ORR Team conflicts.

4.4.14 Prepares and issues the Final Report and Closeout Report.

4.4.15 Interfaces with the DOE ORR Team Leader and the Dispute Resolution Team.

4.5 Readiness Assessment Team Leader - The RA Team Leader is responsible for the overall direction of the RA Process and can delegate responsibilities to team members. It is suggested that the Team Leader maintain a log book of events that occur during the process. The Team Leader performs the following:

4.5.1 Coordinates RA activity and ensures the Administrator of the Operational Readiness Program is informed as required.

4.5.2 Uses a graded approach to develop the RA criteria and RA Implementation Plan using analytical techniques (checklists or MORT Analysis) to ensure adequate coverage of the subject activity. The breadth and depth of the RA will reflect the degree of hazard for the activity, which is assigned by the Safety Analysis department.

4.5.3 Verifies the objective evidence which supports the status of readiness for each of the RA Criteria.

4.5.4 Selects and trains RA Team members.

4.5.5 Estimates the RA resource and schedule requirements, and provides this information to the Performing Organization for budgeting and scheduling.

4.5.6 Verifies compliance with the RA criteria through interviews, observations, records of examination of personnel, inspection of hardware, review of management practices, and overall administrative systems of the activity, as required.

4.5.7 Prepares and issues the final report.

4.5.8 Recommends restart/startup to the Approval Authority.

4.5.9 Serves as FERMCO and DOE management liaison for RA items during the review.

4.5.10 Ensures closure of all pre-start findings prior to startup.

4.6 Readiness Assessment Approval Authority - The Approval Authority for the Readiness Assessment is responsible for the documentation and approval as follows:

4.6.1 Appoints a qualified individual as the RA Team Leader.

4.6.2 Issues letter granting approval for activity start.

4.7 Manager, Safety Analysis Department - The Manager of the Safety Analysis Department is responsible for:

4.7.1 Determining the hazard categories as defined in DOE 5480.23, and documenting them in the Safety Basis (e.g., Safety Assessment, Auditable Safety Record, Safety Analysis Report.)

4.7.2 Assures the Safety Assessment, Auditable Safety Records, and Safety Analysis Reports are completed as required by DOE 5480.23.

4.8 Manager, Readiness/Safety Review - The Manager of Readiness/Safety Review is responsible for the ORR and RA process:

4.8.1 Recommends ORR Team Leaders to the OP.

4.8.2 Performs periodic appraisals of the RA process to ensure compliance with SM-0005.

4.9 Point of Contact - The Point of Contact (usually the project engineer for the activity being reviewed) is the person assigned by the Performing Organization who is responsible for preparing the documentation supporting readiness for submittal to the ORR Team and:

4.9.1 Acts on behalf of the Performing Organization.

4.9.2 Attends the pre- and post-ORR/RA meetings.

4.9.3 Supplies information and acts as an escort during walkthroughs with the ORR/RA Team.

5.0 PROGRAM PLAN

5.1 The FERMCO Operational Readiness Manual is divided into the following sections:

5.1.1 Section 6.0 describes the FERMCO Readiness Methodology Selection Process. The methodology will determine whether an ORR or RA is required and the appropriate approval authority.

5.1.2 Section 7.0 describes the FERMCO ORR Process. A checklist will be developed based on the Minimum ORR Core Requirements in Appendix E (from DOE 5480.31).

5.1.3 Section 8.0 describes the FERMCO RA Process. An activity specific checklist will be developed using the checklist in Appendix F or other methods. The graded approach shall be used to identify applicable criteria.

5.1.4 Section 9.0 describes the Routine Restart Process. If the activity is considered a routine restart and has an approved procedure in place, the activity does not require an ORR or RA.

6.0 READINESS METHODOLOGY SELECTION PROCESS

6.1 General

6.1.1 Readiness determinations conducted by FERMCO will fall into one of three classes: Operational Readiness Reviews, Readiness Assessments, and Routine Restarts.

6.1.2 The flowsheet in Appendix A identifies the minimum approval authority and required review method (ORR or RA).

6.1.3 The flowsheet in Appendix B identifies the methodology process.

6.1.4 Section 9.0 provides additional guidance on routine restarts.

6.2 Procedure

6.2.1 The Performing Organization has identified, described, and bound the activity, and prepared a preliminary activity schedule.

6.2.2 The Safety Analysis Department has determined the hazard categories per site processes.

6.2.3 The Performing Organization determines if the activity is an Initial Start, Restart, or Routine Restart.

6.2.4 The Performing Organization determines the appropriate approval authority and review method by reviewing Appendix A and documents the process flow decision by marking the flowchart itself.

6.2.5 The Performing Organization shall review other factors relating to the activity, such as public perception, personnel radiation exposure, chemical/process hazards, and environmental considerations.

6.2.6 The Performing Organization shall determine the minimum level of review that is appropriate based on Steps 6.2.1 through 6.2.6. The review and approval authority can be raised to a higher level by the OP or DOE-FN, if deemed appropriate.

NOTE: The following steps are used in preparing the Startup Notification Report.

6.2.7 The Administrator of the Operational Readiness Program semiannually submits the Startup Notification Report to the Performing Organization for updating and the addition of new activities.

6.2.8 The Performing Organization reviews and updates the information contained within the Startup Notification Report and adds new activities by following Steps 6.2.1 through 6.2.6. Deviations from this manual must be justified.

6.2.9 As the activity nears the ready to operate date that is identified on the Startup Notification Report, the Administrator contacts the Performing Organization for additional updates and schedule changes.

6.2.10 The Administrator of the Operational Readiness Program compiles the Startup Notification Report and transmits it to the Office of the President.

6.2.11 The Office of the President reviews and approves the Startup Notification Report and submits it to DOE-FN.

7.0 ORR PROCEDURE

7.1 General

7.1.1 The ORR evaluations provide an independent verification of the determination made by FERMCO that an activity is ready to begin.

7.1.2 A formal Plan of Action, Implementation Plan, and Final Report shall be prepared.

7.1.3 The resolution and verification of all findings from the ORR shall be documented and maintained.

7.1.4 The breadth of the ORR is addressed in the Plan of Action. The breadth may be expanded at a later time by the ORR Team if appropriate.

7.1.5 When an activity has been identified as requiring an ORR, the activity shall not start until the ORR process, including the DOE ORR, has been completed and the approval authority specified in the Startup Notification Report has authorized startup in writing.

7.1.6 The breadth of the ORRs will be fairly constant, but may vary if approved by a specific Plan of Action. Due to the many variations in hazard and risk of various activities, the depth of various ORR's will be different; but the breadth and depth of a specific ORR will reflect the hazard and risk of that activity. Focus will be based on the activity's technical scope and criteria needed to demonstrate a satisfactory state of readiness to proceed.

7.1.7 The ORR Team Leader may request assistance from the Independent Safety Review Committee (ISRC) or use the results of an ISRC review in the conduct of an ORR.

7.1.8 The OP will document to DOE-FN in a Readiness to Proceed Memorandum that the FERMCO ORR Team has evaluated all ORR criteria, identified all pre-start findings and observations, and has made a recommendation as to whether the activity is ready to proceed. At the start of the DOE review, all actions required for startup or restart shall be complete with the exception of a manageable list of open pre-start findings that have a well defined schedule for closure to allow review of the results of the closure process.

7.1.9 Phased execution of the ORR process may be considered if the ORR involves the assessment of a number of different processes or systems that may be brought on line at different times or if the ORR will be conducted over an extended period of time. Each phase must be certified ready to start before the next phase can begin.

7.1.10 Appendix C is a flowsheet which identifies the ORR Process sequence of events.

7.2 Plan of Action

7.2.1 The Plan of Action is written by the Performing Organization with assistance from the ORR Team Leader.

7.2.2 The purpose of the Plan of Action is to establish the proposed ORR breadth, identification and description of facility, the prerequisites of the ORR, ORR schedule including estimated start date and duration, proposed team leader, and any other information required by DOE 5480.31 and information unique to the ORR.

7.2.3 Through the Plan of Action, the proper authority within DOE concurs with or approves the planning for the ORR process. The ORR process is then conducted in accordance with the approved elements of the Plan of Action.

7.2.4 The ORR Plan of Action is forwarded via management to the designated approval authority.

7.2.5 The amount of detail in each Plan of Action will vary with the complexity of the facility and situation. As a rule of thumb, the level of detail must be adequate to justify to a skeptical reviewer the decisions being proposed. Detail must be adequate for preparers, reviewers, and the approver to defend the decisions being made.

7.2.6 The elements and content of the Plan of Action will include:

7.2.6.1 Name of the Facility Being Started. The name must be specific to what is to be evaluated and started.

7.2.6.2 Description of Facility. This includes buildings, systems, and processes included within the startup authority.

7.2.6.3 Description of Hazards - States the hazard category and why it was chosen and states the main hazards one should be aware of.

7.2.6.4 Identification of Responsible Contractor. This is the contractor who will certify readiness of the facility to operate.

7.2.6.5 Designation of Action as a New Start/Restart. This is the identification as to whether the facility is being started for the first time or being restarted.

7.2.6.6 New Start/Restart Discussion. Provide discussion to support the decisions.

7.2.6.7 Proposed Breadth of ORR. Set of core requirements to be evaluated. Can be or will be derived from the minimum set of core requirements listed in DOE 5480.31. Should also include basis for the depth which will be included in the implementation plan.

7.2.6.8 ORR Prerequisites. Defining the prerequisite conditions to be met by the facility management prior to the start of the ORR.

7.2.6.9 Estimated Start Date and Duration. The date is for planning purposes only and should be best estimate. The date is not to imply that the ORR start will be schedule driven rather than readiness driven.

7.2.6.10 Proposed Team Leader. The individual must have the necessary independence with the required experience and technical background consistent with the complexity of the facility and the specific ORR.

7.2.6.11 Official to Approve Start of DOE ORR. In most circumstances, this will be the approval authority designated in the approved startup notification plans. Designation of the approval authority will be in accordance with the requirements of DOE 5480.31.

7.2.6.12 Official to Approve Start/Restart of Facility. This is the individual specified in DOE 5480.31 based on a new start or restart circumstances.

7.2.6.13 Reviewers and Approvers. List the individuals by name and title who prepared and will review this document.

7.2.6.14 Distribution. This is a listing of the individual and organizations who will receive copies of the ORR plan of action following approval.

7.3 ORR Implementation Plan

The ORR Team prepares the ORR Implementation Plan in accordance with Sections 7.3.1 through 7.3.3.

7.3.1 An ORR Implementation Plan shall be prepared by the ORR Team with assistance from the Performing Organization. The format will be as follows:

- **Introduction/Background** - Describes the activity to be reviewed and the reason for shutdown (if a restart). This section provides background information concerning the basic process, hazards, and issues associated with the activity to be reviewed.

- **Purpose** - Reason why the review will be conducted, and provides the basic insights for the defined scope of the review.

- **Scope** - Defines the physical and administrative boundaries of the facility, and justifies those defined boundaries and support function reviews relative to hardware, management support, and personnel.

- **ORR Prerequisites** - Identifies the prerequisites for the ORR Team.

- **Overall Approach** - Defines the generic approach by which the review will be conducted, and provides an introduction to the ORR process.

- **ORR Preparation** - Describes any preparations, including team training, team pre-review site visits, document reviews, etc., that will be undertaken prior to the on-site review.

- **ORR Process** - Describes the development of the Criteria and the Review Approaches that will be used in the review.

- **Administration** - Describes the mechanism for the ORR-related meetings, correspondence, communications, and team structure of the review.

- **Reporting and Resolutions** - Detail the methods that the ORR team will use to report review results.

- **Schedule** - Discuss the proposed schedule for any preparation, pre-review, site visits, onsite review, conduct of review, report preparations, and closeout.

7.3.2 The ORR Implementation Plan will also contain ORR Team members and their qualifications, pre-start/post-start finding classification criteria, sample forms, and the full set of criteria and review approaches.

7.3.3 The ORR Implementation Plan shall be approved by the ORR Team Leader and a copy transmitted to the OP, Performing Organization, and DOE-FN.

7.4 Graded Approach

7.4.1 With respect to planning an ORR, a graded approach is used to determine both the breadth and depth of the ORR. The combination of breadth and depth is the scope of the ORR.

7.4.2 The supporting principle governing the use of the graded approach must be that knowledgeable personnel analyze the factors surrounding the activity, determine the breadth and depth of the review needed, and then document the results of the determination.

7.4.3 Application of the Graded Approach should meet the definition in Section 3.0. The graded approach shall be based on the hazards and mitigators described in the applicable safety analysis report and the engineering grading of the facility/operation.

7.5 Development of Criteria and Review Approaches

7.5.1 Methodology

The ORR Team shall determine the criteria and review approaches (CRAs) to be used for the review based on the approved breadth given in the Plan of Action. CRAs consist of the criteria for the review, the approach used to verify the criteria, and appropriate references. CRAs are to be included in the ORR Implementation Plan.

Methods to support the development of the CRAs include:

- The analytical tree method may be used as a basis for the checklist. The Management Oversight and Risk Tree (MORT) analysis is an example of this approach to be used. This method of analysis will provide the ORR Team with a complete and clear picture of areas of vulnerability that require review.

- The Predeveloped Checklist method uses a list of all available information related to the activity and are provided by the ORR Team Leader to the ORR Team. The ORR Team is then to decide which of the items is needed for the activity. A composite checklist for all systems or individual checklists for each system is then generated.

7.5.2 Responsibility Assignments

Each CRA item will be assigned to an ORR Team Member for development and review. During the review, the ORR Team members are responsible for documentng the review of each CRA on a form similar to Appendix J.

7.6 ORR Team Selection, Training and Qualification

7.6.1 The OP documents the assignment of the Team Leader using a letter of designation. The OP shall consider the technical knowledge, experiences, and independence of the Team Leader prior to documenting the designation. The Team Leader's administrative manager shall document concurrence with the selection.

7.6.2 The ORR Team Leader and Member qualifications shall be documented in the ORR Implementation Plan.

7.6.3 Team members shall be individually chosen by the ORR Team Leader to ensure that their collective backgrounds will include the capability of evaluating all aspects required by the ORR based on the specified breadth and depth.

7.6.4 The ORR Team may consist of plant personnel or external experts who have been assigned at the request of the ORR Team Leader. The size and expertise of the team will depend upon a number of factors including the complexity of the activity being reviewed, schedule requirements, and the breadth and depth of the review.

7.6.5 ORR Team members shall be selected from any of the following divisions of FERMCO: Remediation Support Operations, Administration, Special Program Development, Environmental Programs, Environmental Safety and Health, Regulatory Programs, Engineering, and Quality Assurance.

7.6.6 Qualifications of Team members should not be based solely on technical expertise, but should also include skills in assessing, analyzing, and communicating. An individual's knowledge of the particular systems, processes, operating procedures invoked, safety documentation, as well as knowledge of the ORR process will be considered.

7.6.7 In no case shall ORR team members review their own work or work for which they are directly responsible.

7.6.8 Each team member must be verified by the ORR Team Leader as qualified to participate in the ORR. The verification will indicate that training requirements specified in the ORR Implementation Plan have been met and that appropriate independence has been demonstrated.

7.6.9 Training requirements may indicate that the ORR team members visit the activity and/or review appropriate facilities. Activity specific information may be gained through a combination of required reading, assessed training and qualification program attendance, tours, and presentations. Training will be determined by the ORR Team Leader and will be included in the ORR Implementation Plan.

7.6.10 ORR Training consists of SM-0005 familiarization, MORT techniques for checklist development, interview techniques, walkdown techniques, and compliance assessment techniques.

7.7 Prerequisites to Performing the ORR

7.7.1 The Performing Organization has determined that the activity requires an ORR and the activity is documented on the Startup Notification Report and approved by the OP.

7.7.2 The Performing Organization along with the ORR Team Leader has completed the Plan of Action and it has been approved.

7.7.3 The DOE-FN has been notified via the Startup Notification Report that the activity will require an ORR and the anticipated timing of the review.

7.7.4 The ORR Team Leader has identified budget requirements and ORR schedule, and has documented this information to the Performing Organization.

7.7.5 The ORR Team Leader has identified and approved the ORR Team qualifications and members.

7.7.6 The Performing Organization has identified those high priority activities that justify an expedited startup approval.

7.7.7 The Performing Organization ensures the safety basis is approved.

7.7.8 The Performing Organization certifies to the ORR Team Leader that the activity is ready to operate.

7.8 Conducting the ORR - Procedure Steps

7.8.1 All the ORR Prerequisites (Section 7.7) are complete.

7.8.2 The ORR Implementation Plan (Section 7.3) is approved.

7.8.3 The ORR Team Leader and the ORR Team conduct a pre-ORR meeting with the Performing Organization to review the ORR schedule; the ORR Team organization and team members; the ORR methodology; closeout requirements for findings; and details of the ORR Implementation Plan.

7.8.4 The ORR Team commences the ORR in accordance with the ORR Implementation Plan and assigned criteria and review approaches.

7.8.5 The Performing Organization provides documented evidence to the ORR Team as required to complete the ORR Criteria.

7.8.6 The ORR Team Leader will establish routine status meetings. The frequency of the meeting will depend on the intensity of the activity and the need of the ORR Team and Performing Organization to have discussions.

7.8.7 The ORR Team is required to conduct a broad range of tasks including (but not limited to): reviewing "as-built" drawings and other applicable procedures and documents; compiling supporting documentation; providing a determination that the activity complies with applicable environmental requirements and federal and state laws and regulations; executing ORR criteria/performance objectives as assigned by the ORR Team Leader; verifying that all documentation of safety, quality, or environment issues are in place; and concurring with the determination of operational readiness and the conclusions presented in the ORR report in the team members area of assessment. These tasks may be completed through the review and evaluation of presented information and documentation, conducting interviews, and touring the area to evaluate the state of readiness as specified in the CRAs. The ORR Team members document the results of the review on a form similar to Appendix J.

7.8.8 The ORR Team identifies all pre-start findings, post-start findings, and observations and completes the "ORR Deficiency Form" (Appendix G). Appendix I may be utilized to determine whether the deficiency is pre-start or post-start.

7.8.9 The ORR Team Leader issues the completed Deficiency Form to the Performing Organization which identifies deficiencies and whether the deficiency is a finding or an observation.

7.8.10 The Performing Organization reviews the findings and completes a Finding Resolution Form for each finding (see Section 7.9) and identifies the action plan and resolution for each finding. Completed forms are returned to the ORR Team Leader who is responsible for verifying the closure of pre-start findings.

7.8.11 The ORR Team concurs with the determination of operational readiness and the conclusions reached in the team members area of assessment.

7.8.12 The ORR Team Leader conducts a post-ORR meeting with the Performing Organization to discuss all findings from the ORR and status of the Finding Forms.

7.8.13 The ORR Team Leader issues the Final Report in accordance with Section 7.10 and forwards to the approval authority in support of the "Readiness to Proceed Memorandum" (Section 7.11) by following FERMCO's chain of command.

7.8.14 DOE conducts the DOE ORR.

7.8.15 The ORR Team Leader ensures closure of all FERMCO and DOE ORR pre-start items per 7.9 before startup/restart authorization is obtained.

7.8.16 The OP receives written start/restart authorization from the DOE approval authority and documents to the Performing Organization approval to start activity.

7.8.17 The Performing Organization starts activity.

7.8.18 The ORR Team Leader completes the Closeout Report per Step 7.12 and submits to the DOE.

7.8.19 The ORR Team Leader submits all ORR activity files to the Administrator of the ORR.

7.9 Finding Documentation and Closeout

7.9.1 It is imperative that the ORR Team Leader clearly specifies what is required for closure and that the Performing Organization clearly understands the closure requirements.

7.9.2 Auditable documentation must exist to support each ORR criteria's readiness (e.g., audit report, surveillance report, letter, training sheet, test results).

7.9.3 Completion of the work and the preparation of the documentation which demonstrates completion of the finding action is the responsibility of the Performing Organization. The ORR Team Leader closes the finding.

7.9.4 Closure of findings shall be documented by completing the Finding Resolution Form (Appendix H).

7.9.5 In general the closure package will include the following information:

- Documentation of the original evaluation of the checklist items and the evidence supporting the evaluation;
- Identification of pre-start findings, post-start findings, or observations;
- The corrective action plan for each open finding and the date of completion for each corrective action; and

- Documentation supporting the closure.

7.10 Final Report

7.10.1 The ORR Team Leader along with the Team Members write the final report and hold a closeout meeting with the Performing Organization to discuss it. During the meeting, the Team Leader shall discuss the expected action plan development, submittal, and approval requirements, as well as the mechanism by which the finding will be officially closed and documented.

7.10.2 The Final Report documents the results of the ORR and includes the following elements:

- Executive summary including a synopsis of the review, findings, and readiness determination.

- A recommendation as to whether startup or restart can proceed safely.

- Logic of the review, relating findings to the core requirements. Explain how the review addressed the core requirements, criteria used, and methods used to address the criteria.

- A statement as to whether any identified nonconformances or schedules for gaining compliance with applicable DOE Orders, Secretary of Energy Notices, as defined in the Standards/Requirements Identification Documents (S/RIDs) have been justified in writing, have been formally approved, and in the opinion of the ORR Team, maintain adequate protection of the public and worker health and safety, equipment, or the environment.

- Pre-start findings, definition of closure for each finding, schedule for closeout of findings, and request for authorization to start activity are contingent upon closeout of pre-start findings.

- Provide opportunity for team members to include: differing professional opinions; non-judgmental general comments; observations; and dissenting opinions which should be documented and attached to the report.

- A Lessons Learned section shall discuss ways to improve both the activity being reviewed and the ORR process. Lessons Learned provide information concerning problems encountered by the review team, inadequacies concerning the review, design and implementation, expertise, or any other relevant factors or information that may be utilized by future review teams.

- The ORR process may also identify Lessons Learned which are applicable to similar facilities at FEMP or at other DOE sites. Lessons Learned in areas such as operations, procedures, design, or documentation may be identified. The ORR Team should include these Lessons Learned in the report as well. The Performing Organization is responsible for promulgation of these Lessons Learned in accordance with established procedures for Lessons Learned.

7.10.3 The ORR conclusion will be based on:

7.10.3.1 Review of the program to document conformance with applicable DOE requirements, including a process to address new requirements;

7.10.3.2 Extensive use of references to DOE requirements in the Operational Readiness Review documentation.

7.10.4 The final report is submitted to the approval authority as a basis to grant approval of the start or restart of the activity.

7.11 Readiness to Proceed Memorandum

7.11.1 The formal communication from FERMCO to DOE that the facility has been brought to a state of readiness to start operations. The memorandum is a prerequisite to the DOE ORR.

7.11.2 The Readiness to Proceed Memorandum should not be submitted until all actions required for startup or restart have been completed, with the exception of a manageable list of open pre-start items that have a well defined Plan and schedule for closure.

7.11.3 The Final Report should be an attachment to the Readiness to Proceed Memorandum.

7.12 Closeout Report

7.12.1 The ORR Closeout Report is an outgrowth of the Final Report. The Closeout Report shall include the ORR evaluation, all findings closed, observations, and any additional lessons learned.

8.0 READINESS ASSESSMENT PROCEDURE

8.1 General

8.1.1 When an activity has been identified as requiring an RA (Section 6.0), the activity shall not start up until the RA process has been completed and the approval given by the Approval Authority. The major difference between an ORR and a RA is the format of the checklist, the depth of the readiness analysis, and the approval authority level. This includes but is not limited to evaluation of the minimum core requirements identified in DOE 5480.31.

8.1.2 The RA will be conducted using an RA Implementation Plan. By using the graded approach, the requirements may be a simple checklist or a broad based assessment. In either case, the plan will be formal, approved, and executed by the RA Team Leader. The results of the RA will be auditable and retained by the Performing Organization with a record that any findings during the RA were resolved.

8.1.3 Phased execution of the RA process may be considered if the RA involves a number of different processes, phases of a process such as cold startup and hot operation, or systems that must be brought on line at different times. Each phase must be certified ready to start before the next phase can begin.

8.1.4 Preparations for the non-routine startup or restart of an activity shall be disciplined and documented, and shall provide an adequate basis for the RA.

8.1.5 Due to the many variations encountered in activities and their associated risk, the depth of one RA may be different than another RA depending upon the hazard and risk associated with the activity. Focus will be based on the activity's technical scope and the breadth and the depth of RA that is needed to demonstrate a satisfactory state of readiness for a specific activity to proceed. This is called the graded approach.

8.1.6 Auditable and meaningful documentation must exist to support the readiness of each RA criterion (e.g., audit report, surveillance report, letter, training sheet, test results).

8.1.7 The focus of the RA shall be the readiness of all hardware, personnel, procedures, and compliance with the applicable requirements.

8.1.8 An effective RA will provide assurance that these objectives are accomplished and documented. The verification that these objectives are accomplished is by document verification or by performance-based evaluations, which include field observations, interviews, observation of training evolutions, integrated system checkouts or cold run demonstrations, and walkdown of procedures.

8.1.9 Appendix D is a flowsheet which shows the RA process sequence of events.

8.1.10 The Administrator of the ORR shall be copied on all letters concerning the RA.

8.2 RA Implementation Plan

8.2.1 The RA Team prepares the RA Implementation Plan using a graded approach appropriate for the activity in accordance with Section 8.2.2 through 8.2.5.

8.2.2 A RA Implementation Plan shall include the following:

8.2.2.1 A description which bounds the proposed activity, proposed schedule for startup/restart, and organizational responsibilities for readiness preparation tasks.

8.2.2.2 RA Criteria and measurements to determine readiness (i.e., checklist).

8.2.2.3 Reporting requirements.

8.2.2.4 RA Team Leader, RA Team Members, and their qualifications.

8.2.2.5 RA Team training and qualification requirements.

8.2.2.6 RA Schedule.

8.2.3 The RA Checklist shall be attached as part of the RA Implementation Plan.

8.2.4 The RA Team Leader approves the RA Implementation Plan and submits a copy to the Approval Authority for review.

8.2.5 The Approval Authority for the activity reviews the RA Implementation Plan for comments.

8.3 Graded Approach

8.3.1 With respect to planning an RA, a graded approach is utilized to determine the level of depth. The combination of technical scope, breadth and depth forms the envelope within which the RA is conducted.

8.3.2 The supporting principle governing the use of the graded approach must be that knowledgeable personnel analyze the factors surrounding the activity, determine the breadth and depth of the review needed, and then document the results of the determination.

8.3.3 The graded approach is also utilized to determine the type of analysis to be done. This may result in an assessment that may be as short and simple as a determination of the specific reason for the shutdown and that the corrective actions have been satisfactorily completed; or may require a more comprehensive assessment.

8.4 RA Criteria Checklist Development

8.4.1 The RA Team Leader shall review Appendix F, "Readiness Assessment Checklist" and use the graded approach outlined in Section 8.3 to develop a final checklist. NOTE: Appendix F is an example and may require extensive redevelopment for a specific project.

8.4.2 The RA Team Leader shall assign Team members that are responsible for each criteria item and include these assignments in the checklist.

8.5 Team Selection, Training and Qualification

The RA Team consists of, as a minimum, the RA Team Leader. The Performing Organization selects and approves the RA Team Leader. Additional Team members are selected by the Team Leader who is also responsible for conducting preliminary actions which include Team training and familiarization with the proposed activity in accordance with the following requirements.

8.5.1 The RA Team members will be individually chosen by the RA Team Leader to ensure that their collective backgrounds will include the capability of evaluating all required aspects. The size and expertise of the team will depend upon a number of factors including the complexity of the activity being reviewed, schedule requirements, the scope, and depth of the review.

8.5.2 The RA Team members may be selected from Remediation Support Operations, Environmental Programs, Environmental Safety and Health, Regulatory Programs, Engineering, Quality Assurance, and Construction. An individual's knowledge of the particular systems, processes, safety documentation, as well as knowledge of the RA process should be considered.

8.5.3 Qualifications of RA Team members should not be based solely on technical expertise, but should also include skills in assessing, analyzing, and communicating.

8.5.4 In no case shall RA Team members review their own work or work for which they are directly responsible.

8.5.5 Each RA Team member must be qualified by the RA Team Leader to participate in the RA. This qualification would normally follow after training requirements specified in the RA Implementation Plan have been met.

8.5.6 Training of RA Team members may include the activity specific items needed to fully acquaint team members with the technical details of the activity to be assessed. The training will be determined by the RA Team Leader and will be included in the RA Implementation Plan. Activity specific information may be gained through a combination of required reading, tours, and presentations. Training requirements will have the graded approach applied depending on the hazard category that has been determined for the activity.

8.6 Prerequisites

8.6.1 The Performing Organization has determined that the activity requires an RA and the activity is documented in the Startup Notification Report.

8.6.2 DOE-FN has been notified via the Startup Notification Report that the activity will require an RA.

8.6.3 The Performing Organization has defined and bound the activity (normally provided in the safety assessment), identified the anticipated activity preparation schedule, identified activity organizational responsibilities, and provided these to the RA Team Leader.

8.6.4 The Performing Organization and the RA Team Leader have identified budget requirements and the RA schedule.

8.6.5 The RA Team Leader has identified and approved the RA Team members and their qualifications.

8.6.6 The Performing Organization notifies the RA Team Leader that the activity is ready to operate.

8.6.7 The RA Implementation Plan (Section 8.2) is approved.

8.7 Procedure

8.7.1 All RA prerequisites (Section 8.6) are complete.

8.7.2 The RA Team Leader conducts a Pre-RA meeting with the Point of Contact and Performing Organization to review the information contained in the Implementation Plan.

8.7.3 The Point of Contact provides the required documentation to the RA Team Leader.

8.7.4 The RA Team Leader commences the RA in accordance with the RA Implementation Plan.

8.7.5 The RA Team may conduct a broad range of tasks including, but not limited to, reviewing drawings and other applicable procedures and documents; compiling supporting documentation; providing a determination that the activity complies with state laws and regulations; executing RA criteria/performance objectives as assigned by the RA Team leader; and verifying that all documentation is in place. These tasks may be completed through the review and evaluation of information and documentation, conducting interviews and touring the area to evaluate the state of readiness.

8.7.6 The RA Team identifies all pre-start findings, post-start findings, observations, and documents all actions. The ORR Deficiency Form (Appendix G) can be used as an example for documentation. Appendix I may be utilized to determine whether the deficiency is a finding or an observation.

8.7.7 The RA Team Leader reviews and issues findings to the Performing Organization for completion.

8.7.8 The Performing Organization reviews the findings and takes action per Section 8.8.

8.7.9 The RA Team Leader conducts a post-RA meeting with the Performing Organization to discuss all findings from the RA and the status of the Open Items.

8.7.10 The RA Team Leader prepares a memo to the approval authority. This letter identifies pre-start findings, post-start findings, and observations; documents the results of the RA; and provides justification for the Team's recommendation to proceed.

NOTE: If DOE-FN has identified that a DOE-FN RA will be performed, the Final Report must be completed, sent to DOE-FN, and Steps 8.7.11 through 8.7.13 must be followed.

8.7.11 The OP sends notification to the DOE-FN of FERMCO's readiness to proceed.

8.7.12 The DOE-FN conducts their RA.

8.7.13 The Performing Organization resolves all DOE-FN RA comments.

8.7.14 The Performing Organization ensures closure of all FERMCO and/or DOE-FN RA pre-start items.

8.7.15 The Approval Authority issues formal notification to Performing Organization to start the activity.

8.7.16 The Performing Organization starts activity.

8.7.17 The RA Team Leader submits a Final Report to the approval authority within two weeks, signifying closure of the review.

8.7.18 The RA Team Leader transfers all RA files to the Performing Organization.

8.8 Finding Documentation and Closeout

8.8.1 For all RA activities, startup/restart will not occur until all pre-start items have been officially closed and reviewed.

8.8.2 The RA Team Leader closes FERMCO RA pre-start findings and ensures closure of DOE-FN RA findings after the Performing Organization provides sufficient closure documentation. Closure of findings may be documented on a form similar to Appendix H.

8.8.3 In general, the closure package will include the following information.

- Identification of original finding.
- Corrective action taken.
- How the corrective action was verified.
- Documentation of the closure.

8.9 Final Report

8.9.1 The Final Report is written by the RA Team and documents the results of the RA. The Report includes the following elements:

- The recommendation as to whether startup or restart can proceed safely.

- Pre-start findings, post-start findings, observations, the definition of closure for each finding, the schedule for finding closeout, and the request for authorization to start activity.

8.9.2 The Final Report must contain a section concerning lessons learned. Lessons learned should be used to improve the RA process. These items may include problems encountered by the review team, adequacies or inadequacies concerning the review, design and implementation, expertise, or any other relevant factors or information that may be utilized by future review teams.

8.9.3 The RA process may also identify lessons learned which are applicable to similar facilities. Lessons learned in areas such as operations, procedures, design, or documentation may be identified. The RA Team should include these lessons learned in the report as well. The Performing Organization is responsible for promulgation of the lessons learned in accordance with established procedures for lessons learned.

9.0 ROUTINE RESTART PROCEDURE

9.1 Requirements for Authorizing a Routine Restart

9.1.1 The activity does not meet any of the requirements outlined for an ORR or RA defined in Section 6.0 Methodology Determination.

9.1.2 The Performing Organization has identified the activity as a routine restart.

9.1.3 Approved procedures and/or checklists for the activity have been published which ensure a pre-start review be performed to ensure the activity is ready to start safely.

9.1.4 Operators and supervisors conducting the activity are qualified and trained to conduct the evolution.

9.1.5 No oversight or reviewing agency or department has issued a stop work order.

9.2 Examples of Routine Restart Activities

Though certainly not all inclusive, the following provide example activities that are considered routine restart. This list is not intended to be prescriptive.

9.2.1 A normal restart of an activity or process as the result of dictated interruption. This includes such evolutions as cleaning filters, taking inventories, refilling batch processes, or sampling.

9.2.2 A normal restart of an activity as the result of a normal personnel or schedule dictated interruption. This includes such evolutions as lunch breaks, shift changes, startup after a night time, weekend or holiday shutdown.

9.2.3 A normal restart of a facility or process as the result of a shutdown due to directions from the FERMCO supervisor resulting from problems requiring investigation. This includes items such as quality problems, unknown or unusual occurrences or situations.

9.2.4 A construction decontamination and demolition activity that is governed by work plans, or procedures, or safety and or work plans that are developed from procedural requirements.

10.0 RECORDS AND DOCUMENTS

10.1 Records will be maintained to provide documentation of the action taken and information relevant to the ORR. As a minimum, the following ORR records and documents will be maintained by the ORR Administrator.

10.1.1 Approved activity hazard category determination and Safety Analysis Report.

10.1.2 Qualifications and Training status for ORR Team Members.

10.1.3 Approved ORR Implementation Plan with comments and resolution.

10.1.4 Documentation for the evaluation of each checklist item.

10.1.5 ORR Finding Forms demonstrating closure of pre-start finding.

10.1.6 Readiness to Operate Memorandum, Readiness to Proceed Memorandum, and the Startup Approval letters.

10.2 The following RA records and documents will be maintained by the Performing Organization:

10.2.1 Approved activity hazard category determination and reference document.

10.2.2 Qualifications and Training status for RA Team members.

10.2.3 RA Implementation Plan.

10.2.4 Documentation of the evaluation of each checklist item.

10.2.5 Action plan for closure of pre-start findings.

10.2.6 Readiness to Operate Memorandum and the approval authority's notification to start the activity.

10.2.7 Memo to approval authority which identifies recommendation.

10.2.8 Final Report

10.3 Documents and records shall be maintained in accordance with FERMCO procedures for records in accordance with FERMCO SSOP-0609, "Records Management."

11.0 REFERENCES AND DRIVERS

11.1 References

11.1.1 SSOP-0609, "Records Management," dated 3-5-93

11.1.2 DOE-STD-3006-93, "Planning and Conduct of Operational Readiness Reviews" dated November 1993

11.1.3 DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports," dated 12/92

11.1.4 DOE-76-454 (SSDC-4), "MORT User's Manual"

11.1.5 DOE Order 4700.1, Rev. 1 "Project Management Systems," dated 6/2/92

11.1.6 DOE-EM-STD-5502-94, "DOE Limited Standard Hazard Baseline Documentation," dated August 1994

11.1.7 Fernald Area Office, "FEMP Operational Readiness Program Manual" Revision 1 dated January 13, 1995

11.2 External Drivers

11.2.1 DOE Order 5480.31, "Startup and Restart of Nuclear Facilities," 9/15/93

11.2.2 DOE Order 5480.1B, "Environmental, Safety, and Health Program for Department of Energy Operations," dated 5/10/93

11.2.3 DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities," dated 5/18/92

11.2.4 DOE Order 5480.23, "Nuclear Safety Analysis Reports" dated 4/10/92

11.2.5 DOE Order 5481.1B, "Safety Analysis and Review System" dated 5/19/87

11.2.6 Letter, Thomas P. Grumbly to EM Deputy Assistant Secretaries & Operations and Field Office Managers, "Delegation of Review and Approval Authority for Safety Documentation and for Startup/Restart for Environmental Management Field Activities," dated August 8, 1994

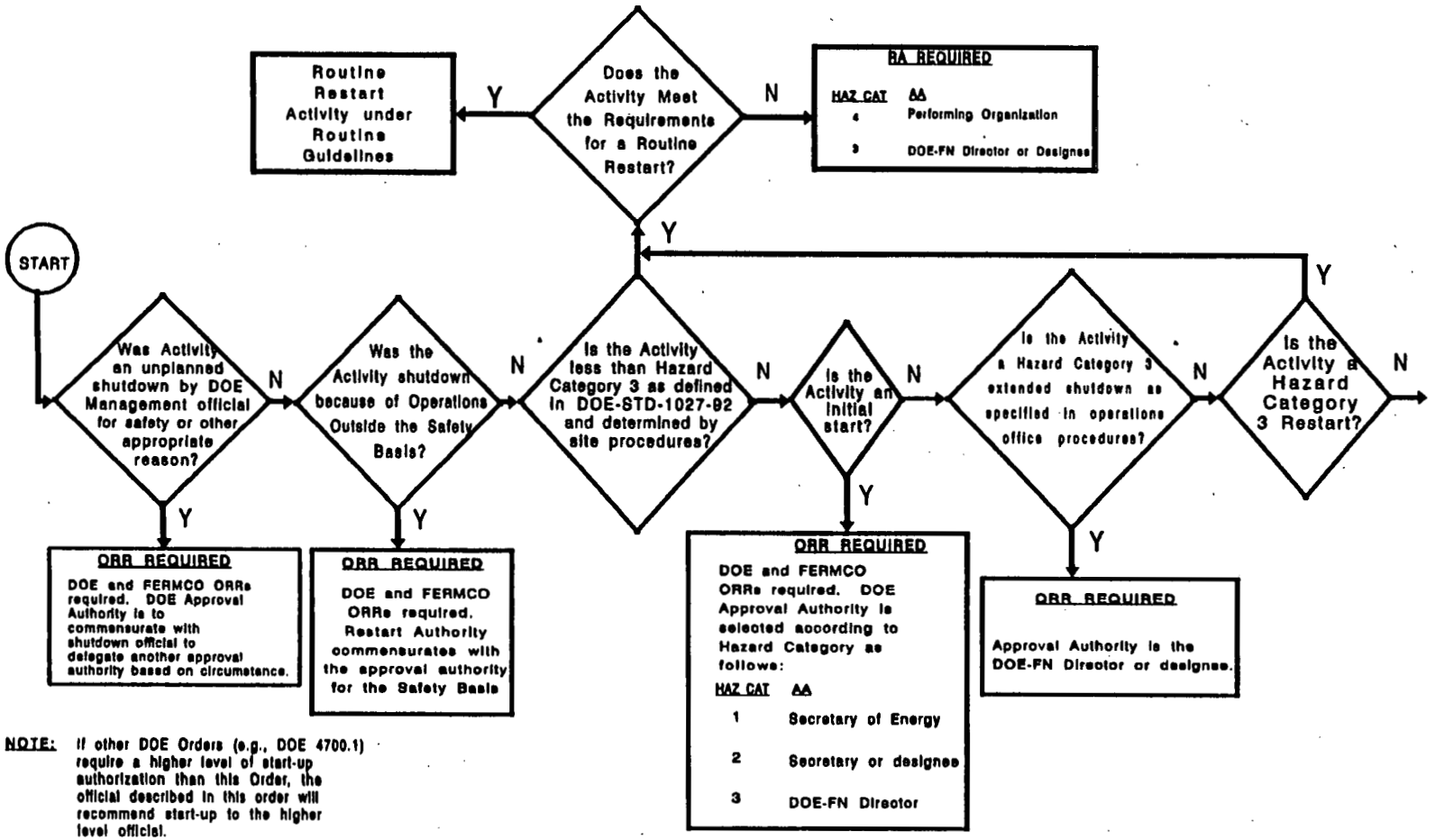
11.2.7 Letter DOE-1682-94, J. Phil Hamric to D. Ofte, "Startup Notification Report Dated April 1, 1994," dated May 25, 1994

APPENDIX A

ORR APPROVAL AUTHORITY AND PROCESS SELECTION FLOWSHEET WITH PROPOSED AUTHORITIES

ORR APPROVAL AUTHORITY AND PROCESS SELECTION FLOWSHEET WITH PROPOSED AUTHORITIES

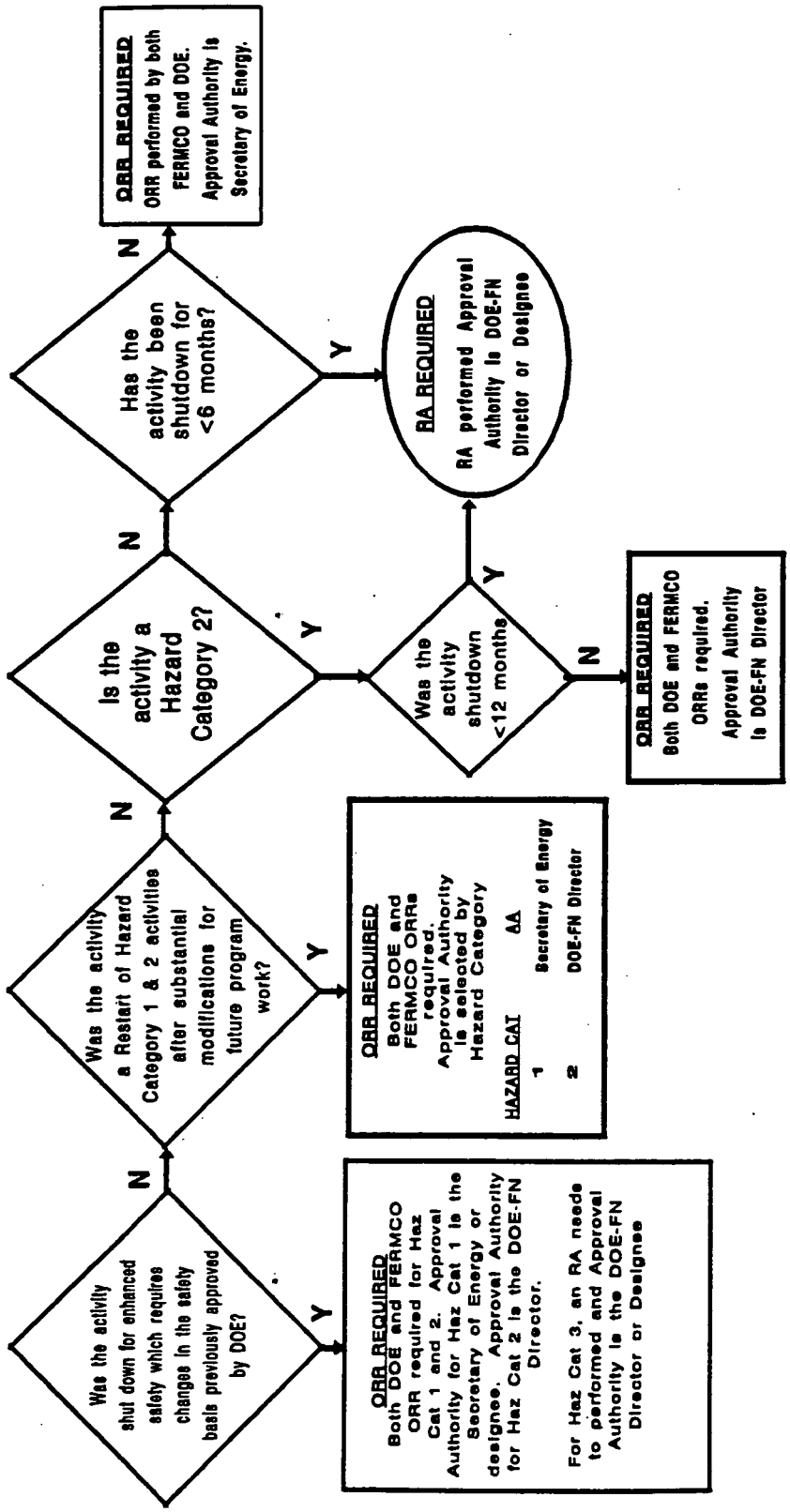
APPENDIX A
Sheet 1 of 2



NOTE: If other DOE Orders (e.g., DOE 4700.1) require a higher level of start-up authorization than this Order, the official described in this order will recommend start-up to the higher level official.

ORR APPROVAL AUTHORITY AND PROCESS SELECTION FLOWSHEET WITH PROPOSED AUTHORITIES

APPENDIX A
Sheet 2 of 2

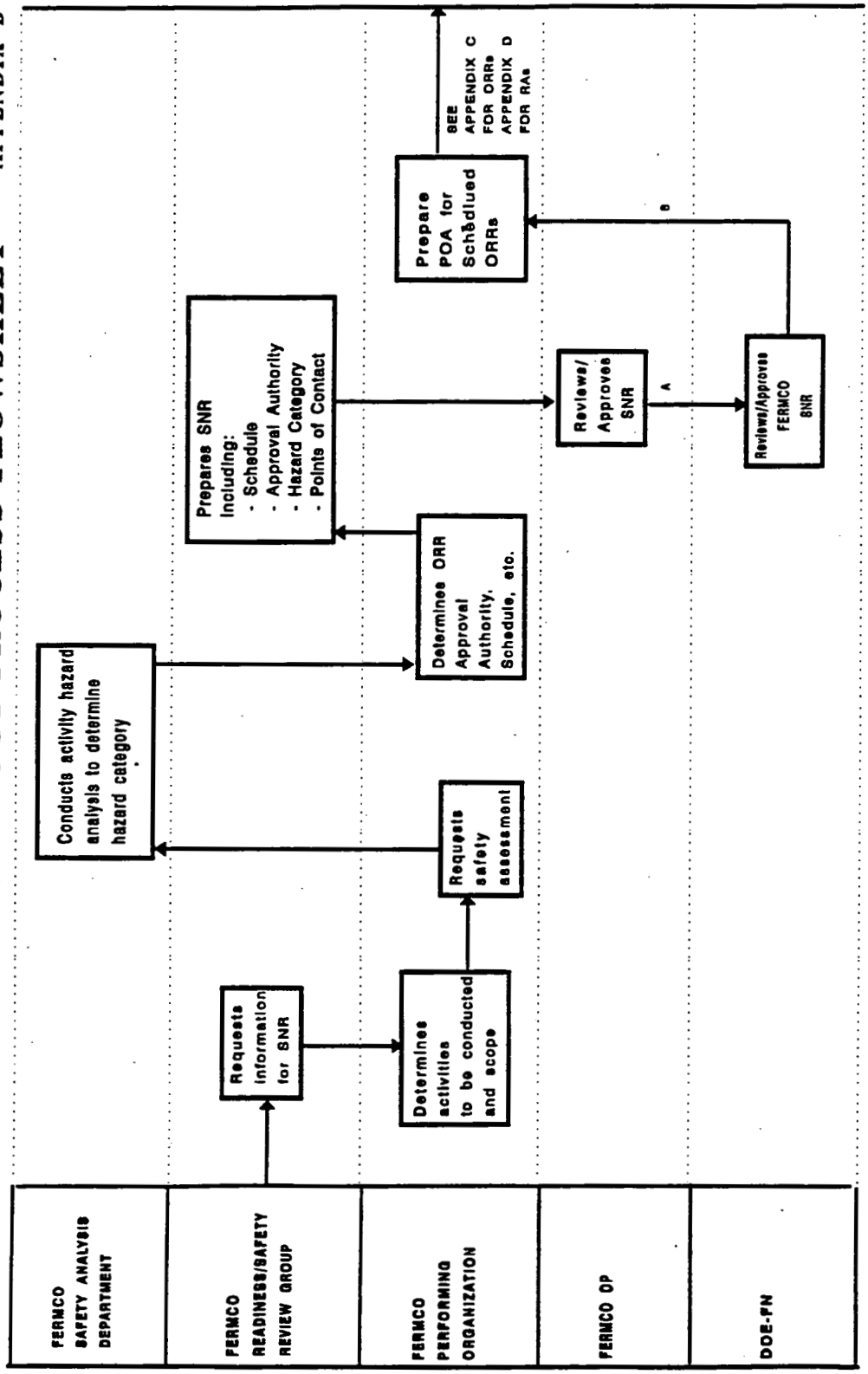


APPENDIX B

FERMCO METHODOLOGY PROCESS FLOWSHEET

FERMCO METHODOLOGY PROCESS FLOWSHEET

APPENDIX B



NOTE: Reference points that correlate to DOE interface are noted with a letter.

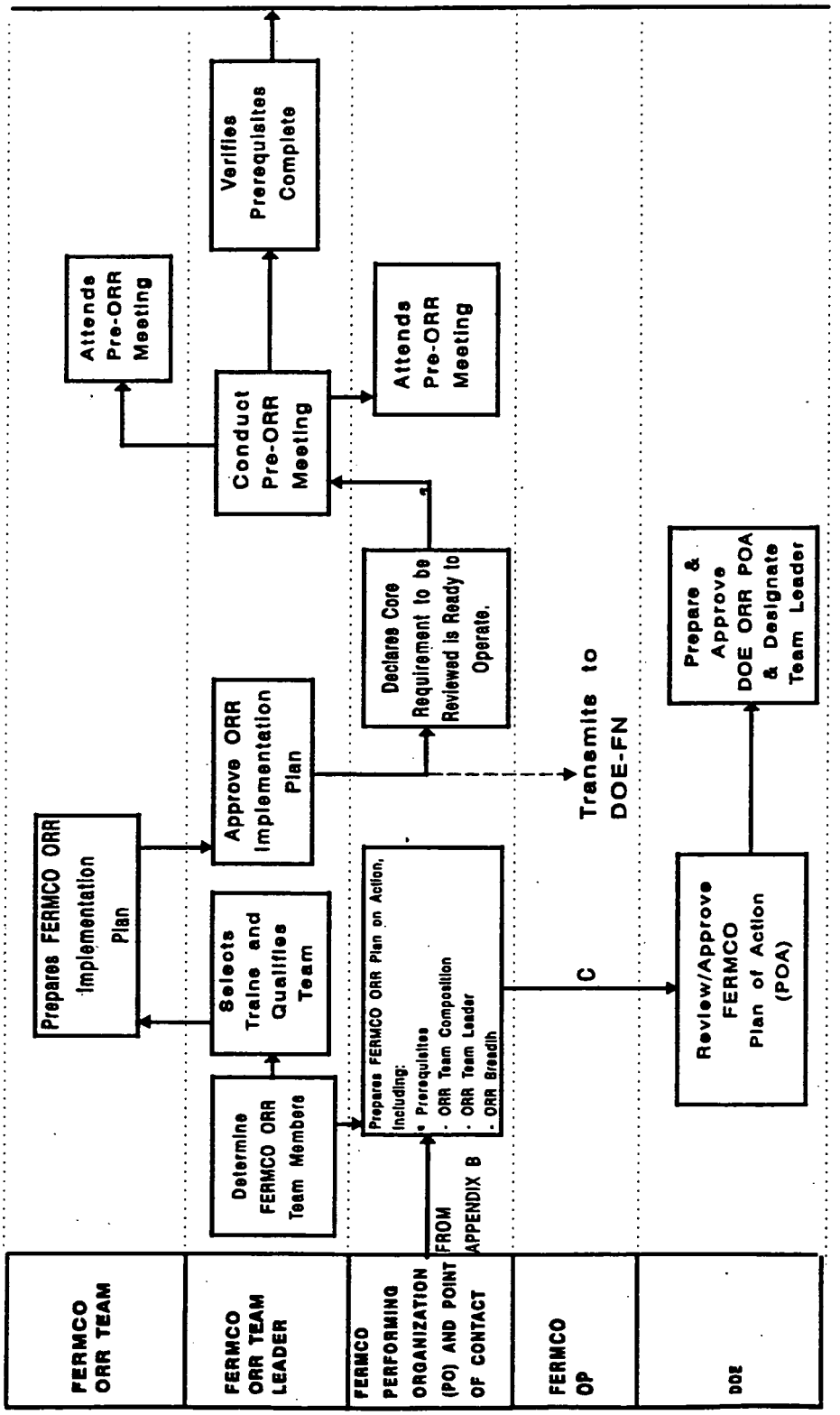
These reference points correspond to actions planned in the DOE ORR Manual.

APPENDIX C

FERMCO ORR PROCESS FLOWSHEET

FERMCO ORR PROCESS FLOWSHEET

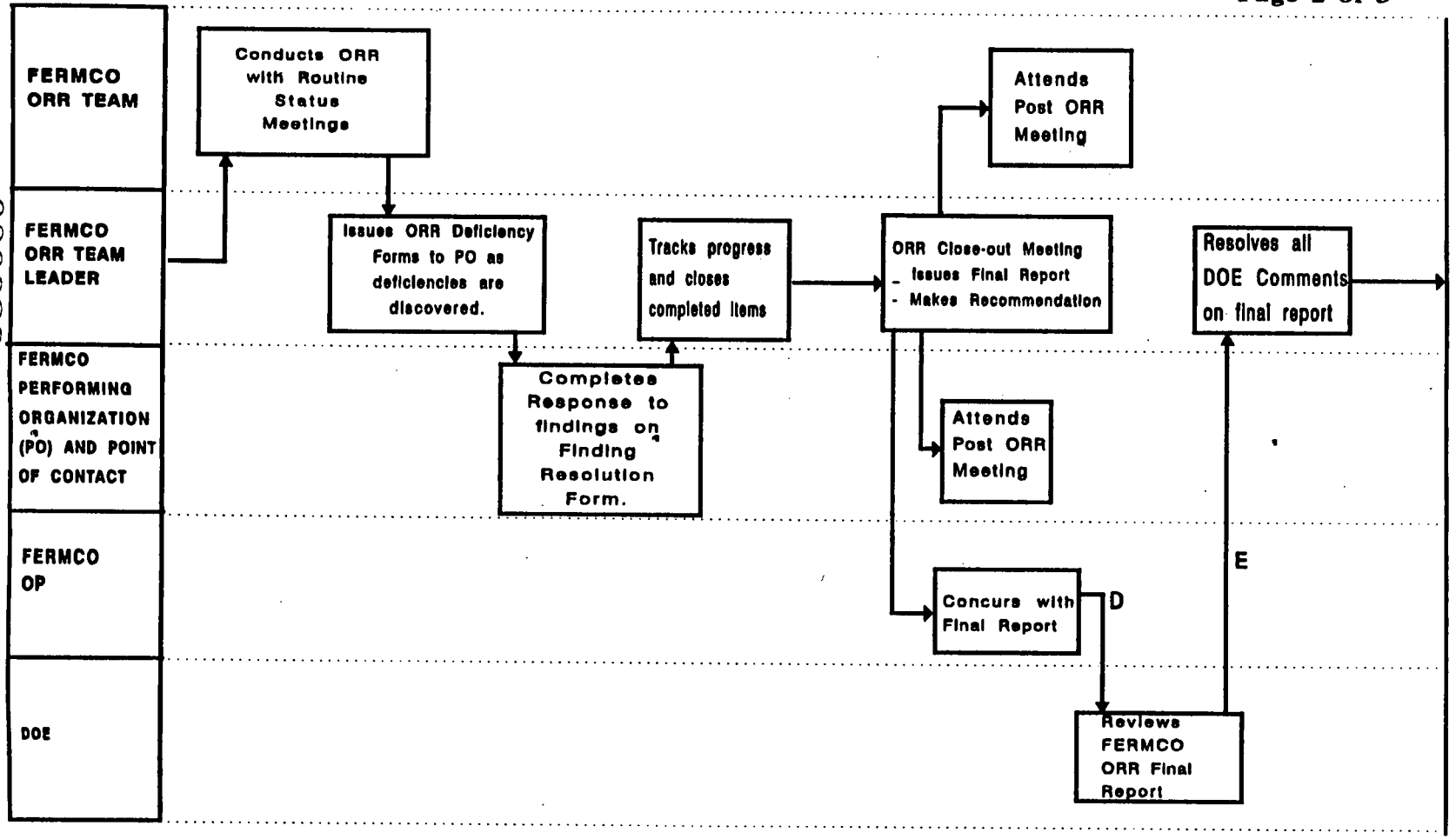
APPENDIX C
Page 1 of 3



NOTE: Reference points that correlate to DOE interface are noted with a letter.
These reference points correspond to actions planned in the DOE ORR Manual.

FERMCO ORR PROCESS FLOWSHEET

APPENDIX C
Page 2 of 3



NOTE: Reference points that correlate to DOE interface are noted with a letter.
These reference points correspond to actions planned in the DOE ORR Manual.

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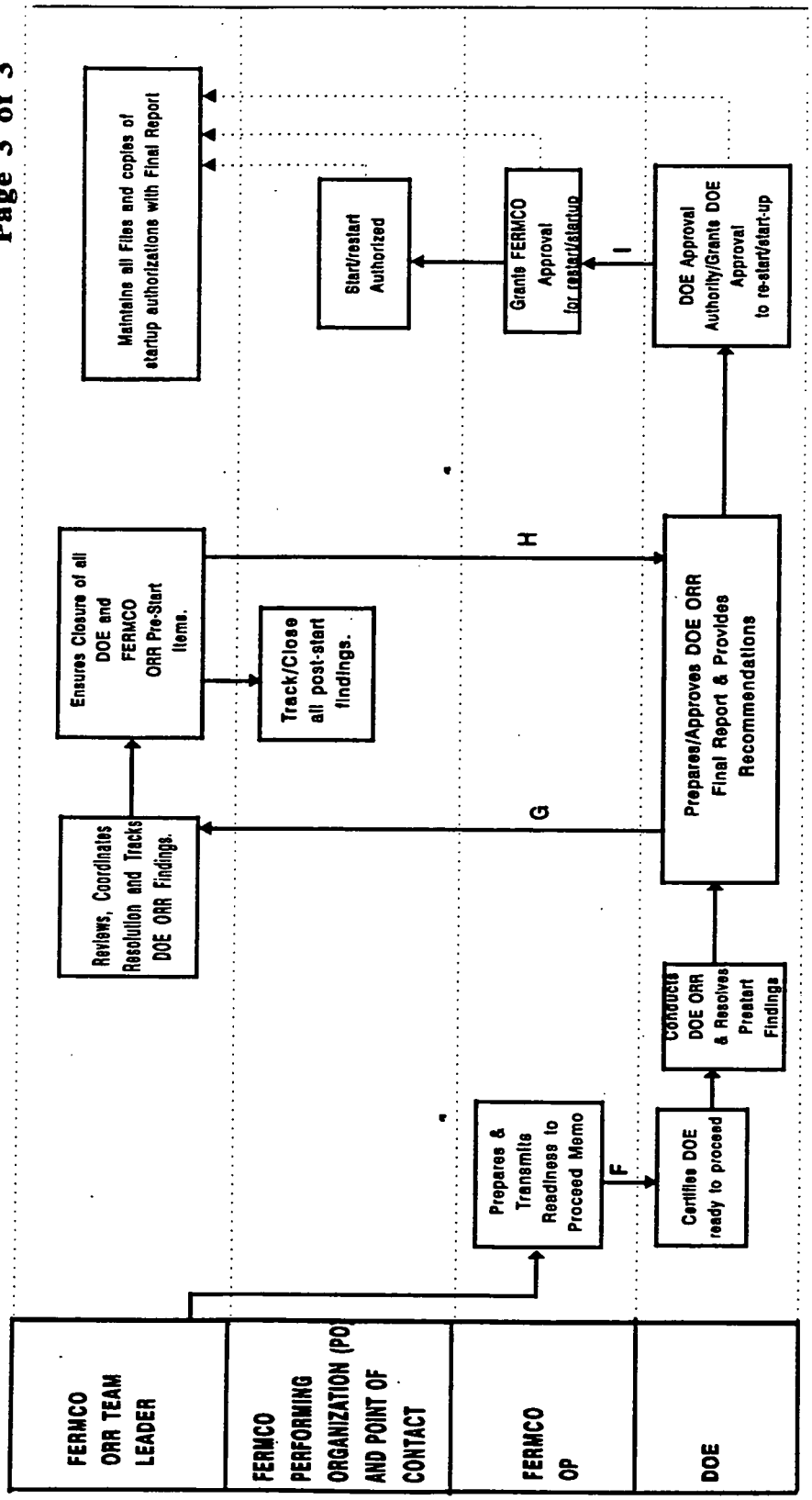
FERMCO ORR PROCESS FLOWSHEET

APPENDIX C
Page 3 of 3



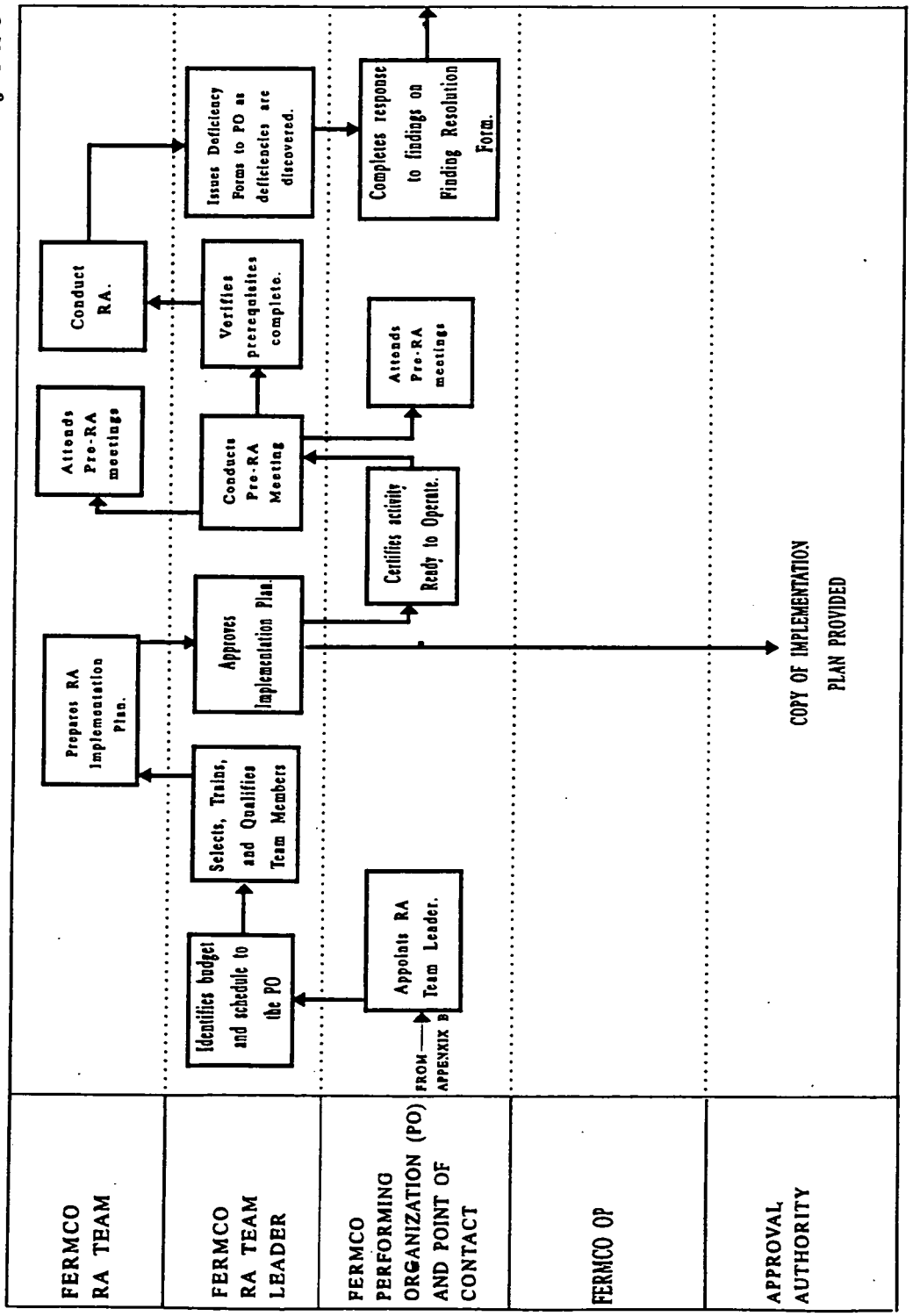
NOTE: Reference Points that correlate to DOE interface are noted with a letter.
These reference points correspond to actions planned in the DOE ORR Manual.

APPENDIX D

FERMCO RA PROCESS FLOWSHEET

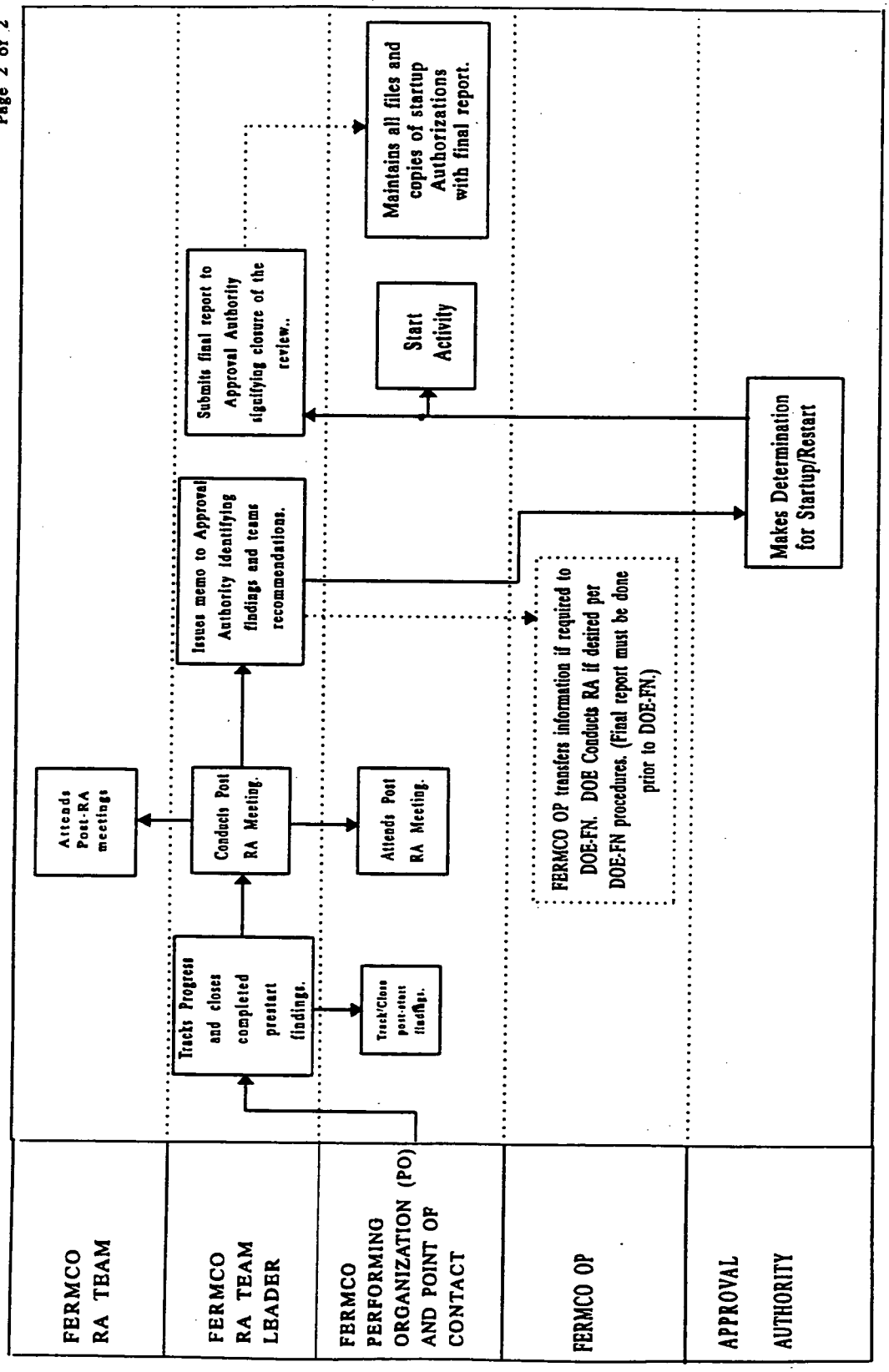
APPENDIX D
Page 1 of 2

FERMCO RA PROCESS FLOWSHEET



APPENDIX D
Page 2 of 2

FERMCO RA PROCESS FLOWSHEET



APPENDIX E

MINIMUM ORR CORE REQUIREMENTS

APPENDIX E

MINIMUM ORR CORE REQUIREMENTS

NOTE: The following requirements are the "Contractor's Core Requirements" taken from DOE 5480.31. An evaluation of these requirements comprise the minimum requirements for a FERMCO ORR. Listed below each core requirement are general consideration that were identified in draft DOE-STD-3006-93. Detailed requirements are identified in applicable DOE orders promulgated by the FERMCO S/RIDS. The core requirements should also be considered for an RA. The RA team leader along with the performing organization will expand these requirements as necessary.

1. There are adequate and correct procedures and safety limits for operating the process systems and utility systems.

   - Response to Design Basis Accidents

2. Training and qualification programs for operations and operations support personnel have been established, documented, and implemented (the training and qualification program encompasses the range of duties and activities required to be performed.)

   - Industrial Hygiene
   - Occupational Safety
   - Fire Protection and Life Safety
   - Transportation Safety
   - Environmental Protection
   - Training and Qualification
   - Maintenance

3. Level of knowledge of operations and operations support personnel is adequate based on reviews of examinations and examination results, and selected interviews of operating and operations support personnel.

   - Personnel Selection
   - Training and Certification
   - Knowledge and Competence
   - Recertification
   - Oral/Written Boards

4. Facility safety documentation is in place that describes the "safety envelope" of the facility. The safety documentation should characterize the hazards/risks associated with the facility and should identify mitigating measures (systems, procedures, administrative controls, etc.) that protect workers and the public from those hazards/risks. Safety systems and systems essential to worker and public safety are defined and a system to maintain control over the design and modification of facilities and safety-related utility systems is established.

   - Facility Safety Review and Safety Analysis
   - Radiation Safety
   - Criticality Safety
   - Adverse Weather Protection
   - Chemical Process Safety
   - Process Hazard Reviews

5. A program is in place to confirm and periodically reconfirm the condition and operability of safety systems, including safety related process systems and safety related utility systems. This includes examinations of records of tests and calibration of safety system and other instruments which monitor limiting conditions of operation or that satisfy Technical Safety Requirements. All systems are currently operable and in a satisfactory condition.

   - Maintenance Program Structure and Management
   - Maintenance Equipment, Facilities, and Technology
   - Work Identification, Planning, and Scheduling
   - Maintenance Procedures
   - Maintenance Information
   - Maintenance Quality Assurance
   - Preventive Maintenance and Evaluation Programs
   - Calibration Programs
   - Facility Performance Measurement and Evaluation

6. A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor.

7. A systematic review of the facility's conformance to applicable DOE Orders has been performed, any nonconformances have been identified, and schedules for gaining compliance have been justified in writing and formally approved.

   - DOE Orders
   - Codes and Standards
   - Environmental Reviews
   - Statutory Requirements
   - Corporate Policies and Procedures

8. Management programs are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure operational support services (e.g., training, maintenance, waste management, environmental protection, industrial safety and hygiene, radiological protection and health physics, emergency preparedness, fire protection, quality assurance, criticality safety and engineering) are adequate for operations.

   - Industrial Hygiene
   - Radiation Safety
   - Nuclear Safety
   - Criticality Safety
   - Occupational Safety
   - Fire Protection and Life Safety
   - Transportation Safety
   - Environmental Protection
   - Operations Quality Assurance
   - Quality Assurance Program Implementation
   - Emergency Preparedness
   - Laboratory Analysis
   - Safeguards
   - Security
   - Transportation
   - Engineering
   - Technical Support of Operations
   - Research and Development Support
   - Waste Management
   - Utilities
   - Materials Control and Accountability
   - Scheduling
   - Quality Control

9. A routine and emergency operations drill program, including program records, has been established and implemented.

   - Emergency Preparedness

10. An adequate startup or restart test program has been developed that includes adequate plans for graded operations testing to simultaneously confirm operability of equipment, the viability of procedures, and the training of operators;

    - Environmental Qualification
    - Analysis of Startup of Facility Operation and Programmatic Aspects

11. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management responsible for control of safety.

    - Process Facility and Site Interfaces

12. The implementation status for DOE 5480.19 CONDUCT OF OPERATIONS REQUIREMENTS FOR DOE FACILITIES, is adequate for operations.

    - Operations Structure and Management
    - Operations Procedures
    - Operations Information
    - Operating Practices
    - Control Systems and Equipment
    - Operations Materials and Supplies
    - Experimental Operations
    - Internal and External Communications
    - Permits
    - Organizational, Responsibilities and Authority

13. There are sufficient numbers of qualified personnel to support safe operations.

    - Staffing Levels

14. A program is established to promote a sitewide culture in which personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements and, through their actions, demonstrate a high priority commitment to comply with these requirements.

    - Adherence to Proper Practice

15. The facility systems and procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis.

    - Maintenance Outage Program
    - Safety Systems and Equipment
    - Configuration Control
    - Technical Control and Data

16. Modifications to the facility have been reviewed for potential impacts on procedures and training and qualifications. Procedures have been revised to reflect these modifications and training has been performed to these revised procedures.

    - Program Definition and Goal Realization

17. The technical and management qualifications of contractor personnel responsible for facility operations are adequate.

APPENDIX F

RA CHECKLIST

APPENDIX F

READINESS ASSESSMENT CHECKLIST

NOTE: The checklist in this attachment is an example and may be used as the basis for an RA checklist. This list is optional and should not be construed as limiting or restricting the scope of the RA. A grading factor may also be applied to RAs with lower approval authority.

HARDWARE

1. Conformance of the design with applicable codes (e.g. fire, electrical, toxic chemical, etc.).

2. Design reviews complete and documented in accordance with PMP-325 and DOE 4700.1. Any nonconformances have been identified and schedules for gaining compliance have been formally approved.

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 on-line.

10. Backup equipment essential to process on hand.

11. Plant Protection Systems installed, checked out, and on-line.

12. Safety related instrumentation identified, calibrated, and preventative maintenance complete.

READINESS ASSESSMENT CHECKLIST (Cont.)

HARDWARE (cont.)

13. Material handling equipment installed.

14. Sampling equipment installed.

15. Quality Control 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 are operable, properly maintained, tested, or taken out of order.

23. Safety signs and barriers in place.

24. Appropriate protective clothing and respiratory protection equipment on hand and stored in a sanitary area. 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.

30. Process control warning system on-line.

READINESS ASSESSMENT CHECKLIST (Cont.)

HARDWARE (cont.)

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.

45. Communication equipment is available.

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.

READINESS ASSESSMENT CHECKLIST (Cont.)

PERSONNEL (cont.)

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.

j. Conduct of Operations

2. Facility, process and safety training complete (current) and level of knowledge adequate 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. QA/Waste Certification

   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).

6. A program is established to promote a sitewide culture in which personnel exhibit an

READINESS ASSESSMENT CHECKLIST (Cont.)

7. The technical and management qualifications of contractor personnel responsible for facility operations are adequate.

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. Required Safety Analysis complete and approved.

4. Operational Safety Requirements (OSR) document complete and approved.

5. Operational constraints, terms and conditions or limiting conditions, if any, identified and visible in Standard Operating Procedures or other documents.

6. Document change procedure in place.

7. Lessons learned input evaluated for the activity.

8. Workability and completeness of all SOPs verified in plant.

9. Maintenance Standards, Standard Operating Procedures, and current forms distributed and available to operating crews.

10. Emergency plan prepared and approved.

11. Evacuation plan prepared.

12. ALARA analysis of anticipated personnel exposure complete.

13. Conduct of Operations program complete.

14. Quality Assurance Plan complete and approved.

15. All expendable equipment parts (seals, bearings, sensors, etc.) have been set up as stores items to minimize downtime and hazards.

16. Housekeeping evaluation of area.

17. Configuration Management safety systems and design features for safety systems identified and established to prevent unauthorized modification.

READINESS ASSESSMENT CHECKLIST (Cont.)

ADMINISTRATIVE (cont.)

18. All necessary federal and state permits (Air/Water PTI/PTO, NESHAP, etc.) are in-place.

19. Relevant Training programs have approved lesson plans and documentation.

20. Notification of regulatory agencies for startup or initiation has been completed as required by the applicable PTI/PTO/permit.

21. Functions, assignments, responsibilities and reporting relationships are clearly defined, understood, and effectively implemented with line management responsible for control of safety.

22. Activity/program environment has been evaluated for weather or adverse conditions impact and appropriate procedural guidance provided to mitigate.

23. Human Factors applications have been evaluated and incorporation into procedures, administrative policies and tested as required.

24. All readiness review criteria open items are complete or have documentation to provide tracking of item to be completed.

25. Review and acceptance by the project manager completed.

26. Maintenance has two (2) copies of all Operator Manuals, Repair Parts Manuals, Manufacturer's Bulletins, etc., for all new equipment, system, or process changes or new installations.

27. Repair parts needed to provide for safety or promote continuity of operations been identified and if necessary been established as FEMP store items.

28. Facility "Pre-Fire Plan" is complete.

29. Determine if a Health & Safety Plan is required and/or complete and approved.

30. All Waste Material has been characterized per SSOP-0002, "Completing the Material Evaluation Form" procedure.

31. Satellite accumulation area established for temporary accumulation of hazardous waste.

32. Storage planning.

READINESS ASSESSMENT CHECKLIST (Cont.)

ADMINISTRATIVE (cont.)

33. Formal notification has been given to DOE.

34. Shift turnover and pass-down log are adequate.

35. A process to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, audit organizations, etc., has been established.

36. A routine and emergency operations drill program including records has been established and implemented.

37. The pre-operations test program includes plans for graded operational testing to confirm the operability of equipment, the viability of procedures and training of operators.

38. The facility systems and procedures, as affected by facility modifications, are consistent with the description of the facility, procedures and accident analysis included in the safety basis.

APPENDIX G

ORR DEFICIENCY FORM

ORR DEFICIENCY FORM
(Typical)

CRA No:	Deficiency No:	Deficiency Date:

Deficiency (Include requirements/references):

Check One:

Observation _____ Post-Start Finding _____ Pre-Start Finding _____

Team Member:	Team Leader:

APPENDIX H

ORR FINDING RESOLUTION FORM

ORR FINDING RESOLUTION FORM
(Typical)

CRA No:	Deficiency No:

Finding Designation: Post-Start _____ Pre-Start _____

Action Plan:

Resolution:

Responsible Individual: _____ _____ _____
Print Name Signature Date

Corrective Action Completion

Certified By: _____ _____ _____
(Performing Org.) Print Name Signature Date

Verified By: _____ _____ _____
(ORR Team Leader) Print Name Signature Date
(for pre-start only)

APPENDIX I

PRE-START AND POST-START CRITERIA

PRE-START AND POST-START CRITERIA

This checklist will be used by the ORR/RA team to evaluate if an issue is either a pre-start or post-start finding.

A. Initial Screening

1. Does this issue involve a safety system?

2. Does this issue involve processes, functions or components identified in the Technical Safety Requirements/Operational Safety Requirements or nuclear safety control procedures?

3. Does this issue involve potential adverse environmental impact exceeding regulatory or site specific release limits?

4. Does this issue impact non-safety processes, functions or components which could adversely impact safety related processes, functions or components?

5. Is this issue non-compliant with a FERMCO or DOE-FN approved startup document?

6. Does this issue indicate a lack of adequate procedures or administrative systems?

7. Does this issue indicate operational or administrative non-compliance with procedures or policy?

8. Has this issue occurred with a frequency that indicates past corrective actions have been lacking or ineffective?

9. Does this issue require operator training not specified in existing facility training requirements?

10. Does the issue involve a previously unknown risk to worker or public safety and health or a previously unknown threat of environmental damage or release?

If the response to any of the above is yes, further evaluation, in accordance with the issue impact criteria below is required. If the response to all of the above is no, the issue may be resolved after restart.

B. Issue Impact

1. Does the loss of operability of the item prevent safe shutdown or cause the loss of essential monitoring?

2. Does the loss of operability of the item require operator action in less than ten (10) minutes to prevent or mitigate the consequences of events described in the Safety Analysis?

3. Does the loss of operability of the item cause operation outside the TSR/OSRs or Safety Analysis?

4. Does the loss of operability of the item result in a reduction of the margin of safety as described in the Safety Analysis?

5. Does the issue indicate a lack of control which can have a near term impact on the operability or functionality of safety related systems?

6. Does the issue involve a violation or potential violation of worker safety or environmental protection regulatory requirements which poses a significant danger to workers, the public, or of environmental release or damage?

If the response to any of the above questions is yes, the item should be considered a startup item.

APPENDIX J

ORR APPRAISAL FORM

ORR APPRAISAL FORM
(Typical)

CRA No:	REVIEW DATE:

Appraisal Results:
(Document personnel contacted, documents reviewed, activities observed, and areas visited. Document the results of the appraisal and make reference to any deficiencies noted.)

Team Member:	Team Leader:

APPENDIX K

ACRONYMS

ACRONYMS

DOE	Department of Energy
DOE-FN	DOE-Fernald
DOE-HQ	DOE-Headquarters
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
ISRC	Independent Safety Review Committee
MORT	Management Oversight Risk Tree
OP	Office of the President
ORR	Operational Readiness Review
PO	Performing Organization
POC	Point of Contact
QA	Quality Assurance
RA	Readiness Assessment
SNR	Startup Notification Report
S/RIDs	Standards/Requirements Identification Documents
TBD	To Be Determined

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CONTROL NO. _____

INFORMATION MANUAL
DOCUMENT NO. IM-6001
REVISION NO. 3

NON-CONTROLLED COPY

SAFE SHUTDOWN PROGRAM PLANNING AND IMPLEMENTATION MANUAL

IM-6001

Effective Date: 05-10-95

AUTHORIZED BY: Dennis Klein for 5/10/95
Steve Houser, CRU3 Director — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

000352

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
12-02-93	0	Manual required for safe shutdown program planning and implementation, per Request No. S93-225 initiated by J. W. Ogg.
11-01-94	1	Revised to reflect organizational changes and update program per Request No. S94-136, initiated by J. W. Ogg.
02-06-95	2	Revised due to the results of a Corrective Action Report (CAR) and to account for minor organizational changes per Request No. S94-198 initiated by Dennis Klein.
05-10-95	3	Site document and procedure numbers were changed to reflect their Division and Department ownership. This change impacted the references cited in this procedure. This procedure has been revised to include a cross reference (Attachment "O") from the original document numbers to the new document numbers refrenced in the Site Document Index Dated May 1, 1995. Initiated by Dennis Klein.

NOTE: Changes are shaded in the text to help identify changes. Shading from the previous revision have been removed.

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1.0 BACKGROUND AND INTRODUCTION

In May 1991, the U.S. 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 the 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). This Removal Action was designated as number twelve (No. 12), termed Safe Shutdown, under the amended Consent Agreement.

Removal Action 12 represents an effort to mitigate potential sources that present a threat of a contamination release to the environment and to stabilize, isolate, and/or treat any existing contamination to prevent release or migration. Work elements are conducted and controlled through a hierarchy of site documentation. Program documentation is prepared to fulfill the driving statutory, DOE, and corporate requirements. The primary driving requirements of Removal Action 12 are (1) CERCLA/RCRA compliance, (2) best management practices, and (3) Conduct of Operations, DOE Order 5480.19, along with Radioactive Waste Management, DOE Order 5820.2A, which is the implementation document that establishes the policies and guidelines for the management, decontamination, and decommissioning of radioactively contaminated facilities.

During the negotiation process, a consensus position was achieved between the agencies and the DOE. This position established that, in lieu of a Removal Action Work Plan, the DOE would submit a compendium of existing procedures and documentation for the ongoing Safe Shutdown Program.

Consistent with the management directives, site level documentation (i.e., documentation governing the conduct of work across the site, as opposed to discrete departments) is compiled to establish the interrelationship and requirements of site organizations. Supporting departments typically prepare specific procedures detailing the conduct of operations to fulfill a program requirement as defined in the site level documentation.

A Programmatic Readiness Review was conducted to document that the Removal Action 12 Safe Shutdown Program Department was ready to proceed with gaining entry to the contaminated process equipment, the removal of hold-up material, and to perform the remainder of the Safe Shutdown activities.

1.0 **BACKGROUND AND INTRODUCTION** (cont.)

Individual readiness assessments for the Safe Shutdown field activities to be performed are conducted by a FERMCO review board if the levels are categorized to be higher than a FEMP Level 4. Readiness assessments are conducted for the remainder of the activities. Project Checklists (Attachment J) are completed and maintained for each activity.

The recommendations from completed assessments are presented to the CRU3/RSO Division Director, who is authorized to approve each activity start. A level of risk has not yet been established through the Safe Shutdown Program for the following:

Plant 1 Safe Geometry Digestion System
Plant 2/3 UNH Stabilization
Plant 4 DHF Material
Plant 8 Caustic Material
Pilot Plant Thorium Nitrate Material

The remainder of the activities have been categorized as FEMP Level 4.

NOTE: The tanks and vessels containing Uranyl Nitrate Hexahydrate (UNH) in Plants 1 and 2/3 are assumed to be taken care of under other authorities. If not, they will be addressed as stated above.

A flow diagram shown in Figure 1 identifies the process for determining a readiness assessment or readiness review requirement.

2.0 **SCOPE**

The Safe Shutdown Program Removal Action 12 was established 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 assure the proper characterization, emptying, deenergization, and isolation of all existing, previously operated production-related equipment with consideration for DOE, U.S. EPA, and Ohio EPA requirements and regulations. The Program is described in the Safe Shutdown schedules and ADS 48-B2.

In the conceptual design of the Safe Shutdown Program, it was recognized that a preliminary assessment was needed to identify the physical state in which previous process equipment and materials were left, since no systematic approach was taken when production ceased. From the preliminary assessment, a database was developed to identify each piece of equipment by a unique file number. Cross-referenced to the file number are applicable maintenance (CMMS) numbers and/or property bar code numbers. The database also contains a description of the hold-up material, location of equipment, and the RCRA determination of the material and/or equipment. A material evaluation is determined or verified prior to the issuance of a task order or during removal of hold-up material. Material that cannot be characterized will be

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2.0 SCOPE (cont.)

transferred to a holding area. Appropriate storage containers for the material are determined after evaluation and satisfying nuclear safety, material compatibility, and regulatory requirements.

One of the major objectives of the Safe Shutdown Program involves the transfer of materials from existing, previously operated production-related equipment to appropriate containers. The disposition of uranium material products and recoverable residues is an integral part of the Safe Shutdown Program. After confirmation of characterization, these materials are transferred to appropriate containers and either stored at approved locations awaiting final disposition under CRU3 or disposed of consistent with the criteria and requirements of Removal Action No. 9, Removal of Waste Inventories. Field activities are tracked through Task/Work Orders (Attachments A through D). All applicable energy sources related to a given piece of equipment are physically isolated to render that piece of equipment non-operational. The equipment also is physically isolated from piping and duct work. Gross decontamination of the equipment is then performed according to established DOE orders and any applicable FEMP policies and procedures. With the transfer of material to storage containers, the potential for an incident or release to the environment is significantly reduced. Inspections of the storage containers and storage areas are performed according to applicable procedures and documents. After the completion of these activities and submission of a removal action, a close-out report is submitted to the U.S. EPA/OEPA for review.

The Safe Shutdown Program does not involve the operation of the plants.

3.0 PROGRAMMATIC APPROVALS

Global permissive documents (Safety Assessment, Risk Assessment Report, Risk Management Plan, Health and Safety Plan, and NEPA Requirements) are used to manage field activities. Notification to regulatory agencies for permitting, agreements, and commitments are managed by the Safe Shutdown Program. An addendum to existing permissive documents and/or separate Safety Assessment, Risk Assessment, and NEPA documents, is prepared to address those areas that are not currently covered under existing permissive documents.

The status of the permissive documents is as follows:

3.1 Safety Assessments

Safety Assessment, 92-1058, "Remove Excess Materials from Process Buildings," covers the removal of excess combustible materials (i.e., waste paper, cardboard boxes, and wood pallets), process supervisory and personnel support equipment (i.e., filing cabinets, desks, stools, and benches), process support equipment (i.e., tools, portable instruments, and process equipment in situ but not installed), process supplies (i.e., parts/materials staged to support production), and process area trash (i.e., floor sweepings, production dross).

3.0 **PROGRAMMATIC APPROVALS** (cont.)

This Safety Assessment was approved by Regulatory Programs on November 3, 1992.

Safety Assessment 92-1060 (5/4/93), "Safe Shutdown Removal Action 12: Removal of Hold-up Materials and Industrial Cleaning", covers activities in Plants 1 (with exception of the Safe Geometry Digestion System), 4, 5, 6, 7, 8, 9, and the Pilot Plant (with the exception of Plant 2/3 and Building 13) for industrial cleaning, gaining entry to contaminated process equipment, transfer of holdup materials to storage containers, sampling and characterizing the contained material by Site Media Sampling and/or other qualified groups, and movement of drummed materials to approved on site storage locations. This Safety Assessment was approved by the FERMCO Independent Safety Review Committee (ISRC) on May 12, 1993.

The Safe Shutdown activities addressed in Safety Assessment 92-1060, "Safe Shutdown Removal Action 12: Removal of Hold-up Materials and Industrial Cleaning", are categorized as low hazard, not requiring a Safety Analysis Report (SAR). The individual activities and removals do not involve enough radioactive material to exceed the threshold of low hazard under procedure SPA-01-013, "Guidelines for the Preparation of Safety Assessments", (written to comply with DOE 5480.1B, Safety Analysis and Review System, which was the governing document when the assessment was written). The quantities also do not exceed the threshold limits for Category 3 as given in DOE-STD-1027, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports."

Addenda or separate Safety Assessments are done on those areas not yet completed prior to initiation of any physical work activities involving removal of hold-up material.

3.2 Risk Assessment Report/Risk Management Plan

Risk Assessment Report number RAR-92-0019-C-0, "Safe Shutdown Program," was approved by the CRU3 Division Director on May 13, 1993. This document identifies and establishes controls and mitigators associated to the risk involved with performing the Safe Shutdown field activities. The Risk Management Plan number RMP-92-0019-C-0, "Safe Shutdown Program", which is a summation of the Risk Assessment, was approved by the CRU3 Division Director on June 7, 1993.

Addenda or separate Risk Assessments is done on those areas not yet completed prior to initiation of any physical work activities involving removal of hold-up material.

3.0 PROGRAMMATIC APPROVALS (cont.)

3.3 Health and Safety Plan

The Health and Safety Plan considers the chemical, physical, biological, radiological, 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. This Health and Safety Plan was approved by Environmental Safety and Health Departments on September 29, 1992. A job safety analysis (see Attachment I) is performed prior to initiation of any physical work.

3.4 NEPA

A limited National Environmental Policy Act (NEPA) document, Categorical Exclusion (CX) document No. 427, covered activities that were performed during calendar year 1993. This CX applied to Plants 1, 4, 7, 8, 9, and related equipment, plus 15 outside dust collectors and 11 hazardous waste management units (HWMU). This CX was approved by DOE-FN on May 10, 1993. A second CX covering Safe Shutdown activities for 1994 (CX 441) was approved by DOE-FN on 01/21/94. U. S. EPA approval on July 22, 1994 of CRU3's Interim Record of Decision (IROD) satisfies future NEPA requirements for the Safe Shutdown activities.

4.0 ORGANIZATION AND FUNCTION

The organization chart for the primary organizations performing the Safe Shutdown work is shown on Figure 2. Figure 3 presents the process of developing and approving the permissive programmatic documents, a process that is complete except for a few areas where the level of risk has not been established. Figure 4 shows the detailed process for the work and a description is provided below. Figure 5 represents condensed steps that the Safe Shutdown Program follows in order to perform a task.

The Safe Shutdown Program Manager is responsible for the Program. The CRU3 Division Director has the overall responsibility for the Safe Shutdown Program. The review/approval process for the Safe Shutdown Implementation Plan and the Project Checklist (Attachment J) clearly define authority, responsibility, accountability and interfaces with support groups for the specified field activities.

Job Briefings include the scope of work to be performed and lessons learned. Individual responsibilities, authority and accountability to complete the assigned task are clearly defined within the Implementation Plan.

4.0 ORGANIZATION AND FUNCTION (cont.)

The Implementation Plan(s) are developed by Program Planning and approved by the Program Planning Manager. The Field Activities Manager's signature is the final signature required prior to initiation, suspension, resumption, and completion of a specific task.

Minor changes to the work package may be made by the Field Activities Manager.

The primary responsibilities of the major groups are:

Program Planning

- Develop Implementation Plans

Field Activities

- Execute bulk removals
- Execute utility disconnects
- Remove equipment

Program Technical

- Provide Field Engineering
- Maintain Nuclear Criticality Compliance
- Develop and maintain H&S support functions
  - -Radiological Control
  - -Respiratory Program
  - -Industrial Hygiene
  - -Permitting

Material and Equipment Disposition

- Verify material characterizations and maintain compliance
- Prepare Excess Government Property forms
- Material Disposition
- Equipment Disposition
- Database development and maintenance
- Issuing Task and Work Orders (Attachments A through D) from database as listed below:

Attachment A - Task Order Work Sheet M
Issued to identify hold-up material. Authorized by Material and Equipment Disposition and Field Activities Managers.

4.0 **ORGANIZATION AND FUNCTION** (cont.)

Attachment B - Task Order Work Sheet T
Issued to remove hold-up material. Authorized by Material and Equipment Disposition and Field Activities Managers.

Attachment C - Task Order Work Sheet EQ
Issued to remove equipment. Authorized by Material and Equipment Disposition and Field Activities Managers.

Attachment D - Safe Shutdown Program FEMP Work Request/Order
Issued to disconnect utilities. Authorized by Field Activities Manager.

- Detailed Implementation Packages consist of the following documents:

Attachment E - Implementation Plan Approval Sheet
Authorizing document to proceed with a specific task after compiling applicable documents. Approval signatures required from respective (assigned) Planning, and Field Activities Manager(s). Suspension, resumption, and completion of field activities are also authorized with this sheet.

Attachment F - Task Description
Task description of specific activity to be performed.

Attachment G - Applicable Procedures Checklist
Check sheet for procedures applicable to a specific task to be performed.

Attachment H - Site "Walk Through" for Task Specific Briefing and Training
Identifies specific task and employees who are to perform a given task. Approval is required by the respective Field Activities Manager, Subject Matter Expert, Supervisor-in-Charge, and training representative.

Attachment I - Job Safety Analysis
This is a written process designed to review job methods, identify hazards, and recommend safe procedures. The Job Safety Analysis is used for establishing a safe approach to performing a task. Final approval is given by Occupational Safety and Health.

Attachment J - Project Checklist
This checklist is completed for each specific task. Ensures that all necessary documents, equipment, and materials are in place. Approval by Field Activities Manager is required.

4.0 **ORGANIZATION AND FUNCTION** (cont.)

Attachment K - Supervisor's Daily Log
Identifies personnel assigned to a specific task on a given shift and the activities accomplished on that shift.

Attachment L - Radiological Work Permit (RWP)
A permit that identifies radiological conditions, establishes worker protection and monitoring requirements and contains specific approvals for radiological work activities. The RWP is part of the FERMCO Work Permit.

Attachment M - FERMCO Work Permit
Identifies hazards in working area and states minimum PPE requirements to work in area.

Attachment N - FEMP Work Request/Order (Field-submitted document)
Identifies equipment, by CMMS number, to be repaired, nature of repair, and person requesting work. Authorized by the Field Activities Manager.

Attachment O - Document Cross Reference
Provides a cross reference between old and new document numbers provided in the Site Document List.

HWMU and Program Support

- Develop, implement and maintain Training Program
- Perform HWMU closures
- Provide requisitioning and expediting of inventory
- Develop and maintain resource requirements

5.0 **IMPLEMENTATION**

5.1 Process

Task orders and work orders (refer to Attachments A through D) are generated from the Safe Shutdown database. These task and work orders are created based on areas that have been approved through a global Safety Assessment, Risk Assessment, Health and Safety Plan, and other permissive documents that are required before any physical work can be performed. After a task order and/or work order has been verified as being complete and signed, it is returned to the Material and Equipment Disposition Section to allow for updating the database and drawings. Copies of completed work orders are transmitted to Drafting for updating historical drawings to current status of equipment and/or structures as part of configuration management.

5.0 **IMPLEMENTATION** (cont.)

The content of the Safe Shutdown Safety Assessment, Risk Assessment, and Health and Safety Plan that is approved is transmitted to the field activities through developed Safe Shutdown implementation plans. Controls and mitigators are implemented through the detailed planning developed from the Job Safety Analysis for each Implementation Plan. The readiness assessment is reviewed to ensure that controls and mitigators are being addressed.

A task order is prepared giving direction as to what field activities are to be performed. These task orders and work orders are prepared based upon the permissives that are applicable to a particular field activity.

The Material and Equipment Disposition Section generates Task/Work Orders for the identification and removal of hold-up material. These orders identify a piece of equipment, potential hold-up material status, characterization description provided by Waste Identification/Characterization and disposition, as applicable.

Additional Task/Work Orders are issued that identify the location of a piece of equipment, required type of utility disconnect, and the equipment's disposition and decontamination requirements.

Safe Shutdown completes an Implementation Plan and a Project Checklist (Attachment J). This plan includes, but is not limited to, task descriptions, job briefings, applicable procedures, and a Job Safety Analysis. Also included are the appropriate site work permits, the authority and responsibility of who will be accountable for the safe performance of field activities, and signatures of those individuals that meet the required training.

A Job Safety Analysis (Attachment I) identifies the potential physical, chemical, and industrial hazards associated with particular field activities.

A Site Work Permit (Attachment M) and Radiological Work Permit (Attachment L) are obtained prior to the initiation of field activities.

Existing plant protection systems, or acceptable alternatives, are used until all energy source isolations are completed within a given structure and all hold-up material and stored enriched material (e.g., Rabbit Hutch) is removed as detailed in job specific task orders. Existing safety equipment is on the Computer Material Management System (CMMS) database and field tagging is complete. Calibration of this equipment is a part of the

5.0 **IMPLEMENTATION** (cont.)

Preventive Maintenance Program. It is a requirement that any new equipment must be added to the CMMS system prior to its use.

Quality Assurance is responsible for performing surveillance and audits of the Safe Shutdown Program. Audits are scheduled at least once a year. Program surveillance are scheduled at least semi-annually. Additional audits and surveillance are scheduled at the discretion of Quality Assurance or as requested by the Safe Shutdown Program Manager.

The Facilities Assessment group in RSO is responsible for performing initial (an assessment of the plan) and final verification (a walk through of the area) assessments for Safe Shutdown Program field activities. The RSO Self-Assessment Program conducts compliance and performance internal assessments. Compliance assessments ensure activity procedures are in compliance with DOE Orders and FERMCO S/RIDs. Performance assessments evaluate personnel conformance to applicable procedures that direct the activities.

5.2 Procedures

The Safe Shutdown Program, Removal Action No. 12, is managed and controlled through site procedures and documents. Only controlled procedures are used. Attachment O provides a cross reference between old and new document numbers provided in the Site Document List. The following list of procedures is divided into three categories: (1) Programmatic, (2) Core, and (3) Task Specific. Individuals assigned to the Safe Shutdown Program are trained to core requirements. Task specific training will be conducted as required for conditions not covered by core training. Programmatic documents are used to facilitate work by trained personnel. Individual responsibilities are clearly indicated in each Implementation Plan Package and in applicable procedures that control field activities.

Job Briefings (Attachment H), which are approved by Supervisor-in-Charge, Training Support, Subject Matter Expert, and Field Activities Manager, are developed for each Implementation Plan. Lessons learned are reviewed during Job Briefings and as required.

It should be recognized that revisions to existing policies and procedures for evolving program needs or unique site conditions are an integral part of a successful program. Annual update submittals to the DOE, U.S. EPA, and OEPA are required.

5.0 **IMPLEMENTATION** (cont.)

- **Programmatic Procedures:**

  - DOE/EH-0256T, DOE Radiological Control Manual
  - RC-DPT-015, ALARA Review and Evaluation
  - SR-2117, Nuclear Criticality Safety Requirements
  - SSOP-0095, Criticality Safety Analysis and Approval Process
  - SOP 1-C-608, Storage of Radioactive Material
  - SSOP-0103, FEMP Site Document System
  - PO-D-007, Document Periodic Review Program
  - ESH-1-1000, Comprehensive Environmental Occupational Safety and Health Program
  - RM-0006, Industrial Safety
  - RM-2086, Chemical Hazard Communication Program
  - RM-0002, Training Department Program Manual
  - RM-0007, FEMP Respiratory Protection Requirements Manual
  - IM-7006, Incident Building Evacuation Manual
  - 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
  - SM-0005, FERMCO Operational Readiness Manual
  - FMPC-2214, Environmental Restoration and Waste Management Site Specific Plan
  - Shutdown/Facility Acceptance and Criteria Plan
  - IM-6001, Safe Shutdown Program Planning & Implementation Manual
  - SSOP-0067, Spill Incident Reporting and Clean-up
  - SSOP-0059, Control and Tracking of Chemical Substances
  - SSOP-0027, Control of Box Type Containers
  - PO-D-023, Shift Orders
  - U.S. Department of Energy Order 5820.2A Radioactive Waste Management
  - SSOP-0002, Completing the Material Evaluation Form
  - Amended Consent Decree
  - SOP 20-C-904, General Nuclear Safety Requirements
  - SOP 20-C-100, Moving and Storing Depleted, Normal, and Enriched Uranium Materials <20% and Thorium Metal and Materials
  - SSOP-0044, Management of Excess Soil, Debris, and Waste from a Project
  - PO-0307, Control and Accountability of Nuclear Materials
  - SSOP-0061, FEMP Work Request/Order Procedure
  - FMPC-0508, Safety Analysis Documentation Program
  - 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
  - ED-0001, Event Notification and Occurrence
  - PO-0518, National Environmental Policy Act (NEPA) Program
  - SSOP-0031, National Environmental Policy Act (NEPA) Document Process
  - PO-D-028, Preparation and Implementation of Work Package
  - FMPC-0516, Control of Permits for Accomplishing Hazardous Work
  - SPR-5-13, Permit-Required Confined Space Program
  - RC-DPT-008, Radiation Work Permits

5.0 **IMPLEMENTATION** (cont.)

- **Programmatic Procedures:** (cont.)

  - SSOP-0609, Records Management
  - SSOP-0096, Document Filing System
  - PP-FMPC-5010, Management of Low Level Waste (LLW)
  - PP-0314, Packaging, On-Site Movement and Off-Site Shipment of Material
  - SSOP-0003, Receiving, On-Site Movement and Off-Site Shipment of Nonradioactive Hazardous Material
  - SSOP-1044, Management of Government Property
  - SSOP-0034, Nuclear Materials Disposition Order Management
  - PO-D-035, Shipment of Low Level Radioactive Waste Requirements
  - RC-RDA-010, Routine Radiological Contamination Survey
  - D10-00-002, Remediation Support Operations Lessons Learned
  - RC-RDA-009, Radiation Surveys
  - RC-DPT-022, Radiological Posting
  - RC-DPT-019, Release of Materials from the Fernald Environmental Management Project
  - RC-DPT-009, Monitoring for Airborne Radioactive Materials
  - RC-DPT-008, Radiological Work Permits

- **Core Training Procedures:**

  - FEMP-2304, FEMP Nuclear Criticality Safety Guide
  - RM-0005, FEMP Lot Marking and Color Coding System
  - SOP 20-C-912, Checking Scale Operation
  - SOP 20-C-917, Hydrogen Monitoring and Removing Nucfil Vent Plugs from Drums
  - SOP 20-C-910, Venting Potentially Explosive Drums
  - SOP 20-C-801, Storage of Enriched Material
  - SSOP-0060, Packaging Radioactive Material For Offsite Shipment
  - SOP 20-C-604, Control and Utilization of Contaminated Trash Dumpsters
  - SSOP-0719, FERMCO Lockout/Tagout Hazardous Energy and Material Control Procedure
  - Safe Shutdown Health and Safety Plan
  - SOP 20-C-606, Hazardous Material Spill Clean-up
  - SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers
  - SOP 20-C-700, Norclean Portable Vacuum Operation
  - 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
  - Task Specific Health & Safety Plan for Decontamination of Various Areas of Existing Fixed or Removal Contamination, June 5, 1991
  - SOP 20-C-709, Baghouse Type Dust Collector Filter Removal/Replacement
  - SOP 20-C-916, Cleaning Sump Systems
  - SSOP-0008, Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area

5.0 **IMPLEMENTATION** (cont.)

- **Task Specific Procedures:**

  - SOP 20-C-011, Physical Inventory of Nuclear Materials
  - SSOP-0039, Handling Containers of Unidentified Material
  - SOP 20-C-625, Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment
  - CIO C94-021, Sampling Waste for Hazard Identification
  - SOP 20-C-918, Preparation for and Movement of Unvented Drums
  - SOP 2-C-923, Trash Baler Operation
  - SSOP-0069, Freon Management
  - SOP 20-C-500, Inspecting RCRA Waste Load/Unload and Staging Areas
  - SOP 20-C-701, Operation of Spencer & Hoffman Portable Dust Collectors
  - SOP 2-C-601, Refinery Sump
  - SOP 20-C-612, Industrial Cleaning
  - SOP 20-C-610, Bird Carcass and Dropping Removal
  - SOP 20-C-600, Overpacking Defective Containers
  - SOP 43-C-413, Handling Waste Materials with the Industrial Vacuum Loader Truck (Supersucker)
  - SSOP-0077, Building Emergency Procedure
  - 20-C-017, Movement of Hazardous Waste
  - SSOP-0028, Controlling Portable Ventilation Devices and Vacuum Cleaners
  - SOP 20-C-603, Removal and Replacement of Nilfisk Portable Vacuum Unit Filters and Dust Bag
  - SOP 8-C-605, EIMCO Filter Operation
  - SSOP-1025, Tank/Sump Contents Removal
  - SSOP-1026, Tank/Sump Removal or Abandonment
  - SOP 20-C-711, Hako Minuteman Portable Vacuum Cleaner Operation

5.3 Training and Staffing

Support personnel are qualified by their respective manager(s), for Safe Shutdown field activities. Qualified workers, which include supervisors, must meet all core training, as well as task-specific training requirements as listed in the Safe Shutdown document. In addition, task specific training, briefings and a walk through for the task to be performed are conducted prior to the start of the field activities. The Safe Shutdown Field Activities Manager is responsible for certifying that the Supervisor-in-Charge is qualified to perform an assigned task by signing the Project Checklist (Attachment J) included in the Implementation Plan assembled for a specific task. The Supervisor-in-Charge determines what personnel are capable of performing the identified task. The Supervisor-in-Charge signs the Safe Shutdown Site "Walk Through" for Task Specific Briefing and Training document (Attachment H).

5.0 **IMPLEMENTATION** (cont.)

The minimum number of operating personnel required to safely complete each Safe Shutdown activity will be maintained as stated per applicable procedure. The Safe Shutdown Program is dependent on the completion of other projects and the availability of space for storage of drummed waste that either must be moved from a building or is generated as part of the field activities. To meet the Safe Shutdown schedules more individuals may be required for a task with a more critical schedule, while fewer personnel may be necessary for a task with a less critical schedule. To ensure the safety of the personnel and protect against material release, the minimum safe crew size determined by the Remediation Support Operations Supervisor will always be maintained.

The classification and home department of the personnel required to perform Safe Shutdown field activities are:

TITLE	DEPARTMENT
Supervisor	Remediation Support Operations
Estimator	Remediation Support Operations
Electrician	Remediation Support Operations
Pipefitter	Remediation Support Operations
Millwright	Remediation Support Operations
Welder	Remediation Support Operations
Chemical Operator	Remediation Support Operations
Industrial Cleaner	Remediation Support Operations
Manager	Remediation Support Operations
Engineer	Remediation Support Operations
Facility Owner	Remediation Support Operations
Motor Vehicle Operator	Remediation Support Operations
Radiation Safety Engineer	Radiological Safety
Radiation Technician	Radiological Safety
Health Physicist	Radiological Engineering
Fire Protection Engineer	Fire Protection Engineering
Industrial Hygienist	Industrial Hygiene & Safety
Industrial Hygiene Technician	Industrial Hygiene & Safety
Information Records Specialist	Materials Control & Accountability
Manager	CERCLA/RCRA 3
Engineer	CERCLA/RCRA 3
Auditor	Quality Assurance
Inspector	Quality Control
Instructor	Training
Environmental Waste Engineer	Waste Programs Management

Organizations responsible in assisting the Safe Shutdown Program attend Management Control meetings to allow for personnel assignments and schedule adjustments as necessary.

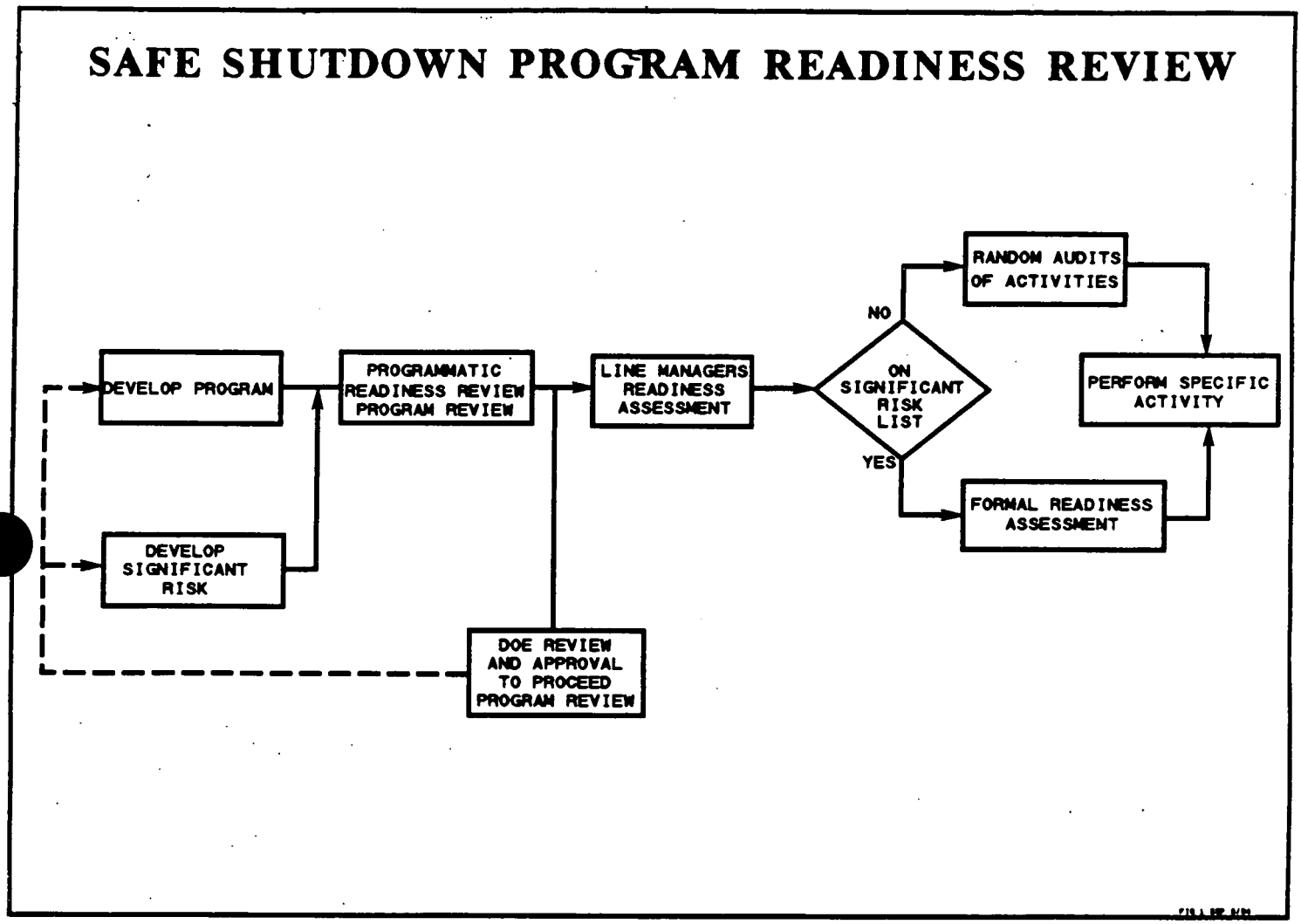
SAFE SHUTDOWN PROGRAM READINESS REVIEW
DEVELOP PROGRAM
DEVELOP SIGNIFICANT RISK
PROGRAMMATIC READINESS REVIEW PROGRAM REVIEW
DOE REVIEW AND APPROVAL TO PROCEED PROGRAM REVIEW
LINE MANAGERS READINESS ASSESSMENT
ON SIGNIFICANT RISK LIST
NO
YES
RANDOM AUDITS OF ACTIVITIES
FORMAL READINESS ASSESSMENT
PERFORM SPECIFIC ACTIVITY

FIGURE 1

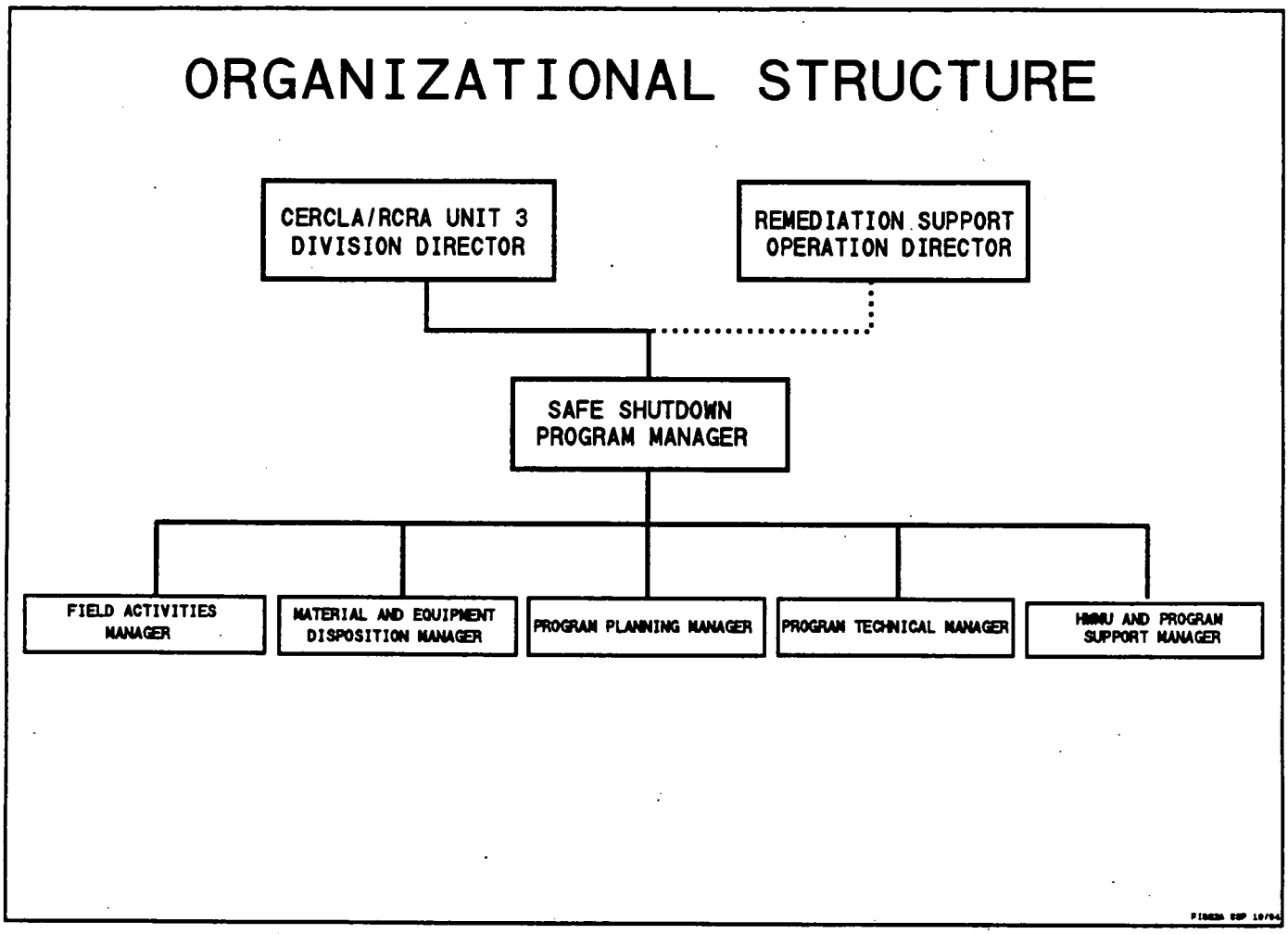
ORGANIZATIONAL STRUCTURE
CERCLA/RCRA UNIT 3 DIVISION DIRECTOR
REMEDIATION SUPPORT OPERATION DIRECTOR
SAFE SHUTDOWN PROGRAM MANAGER
FIELD ACTIVITIES MANAGER
MATERIAL AND EQUIPMENT DISPOSITION MANAGER
PROGRAM PLANNING MANAGER
PROGRAM TECHNICAL MANAGER
HMMU AND PROGRAM SUPPORT MANAGER

FIGURE 2

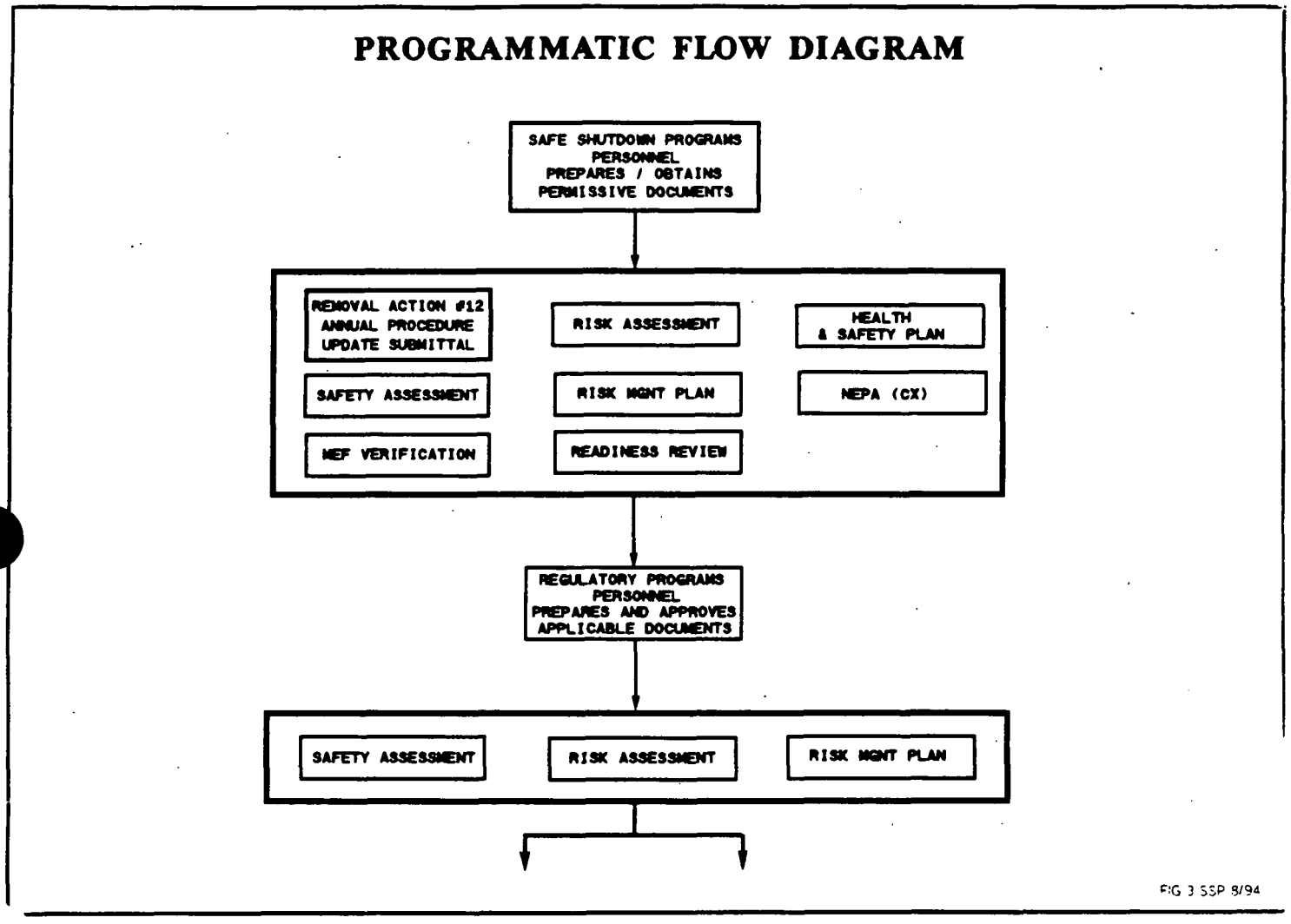

FIGURE 3
(Sheet 1 of 2)

PROGRAMMATIC FLOW DIAGRAM

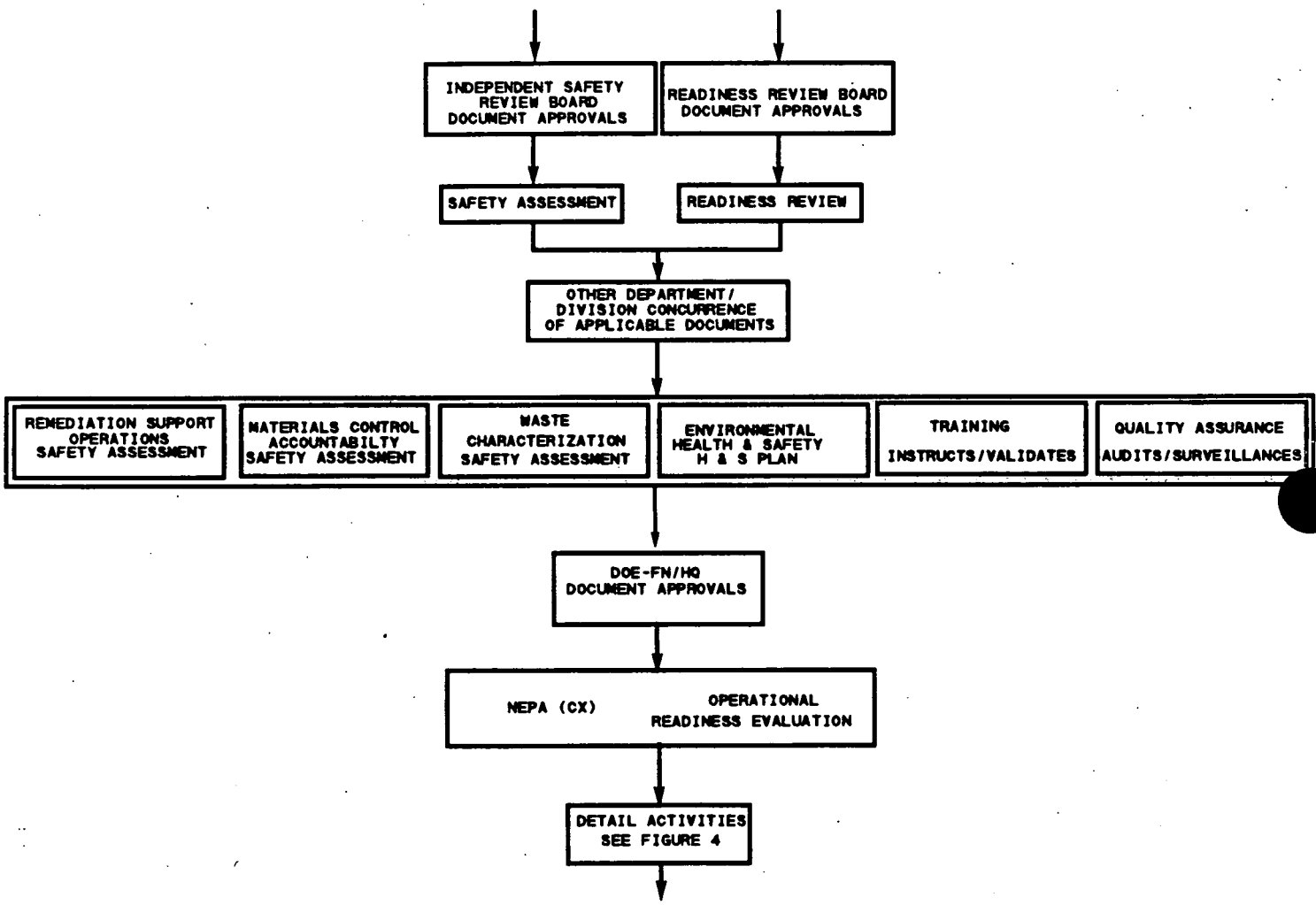

FIGURE 3
(Sheet 2 of 2)

000372

DETAIL FLOW DIAGRAM

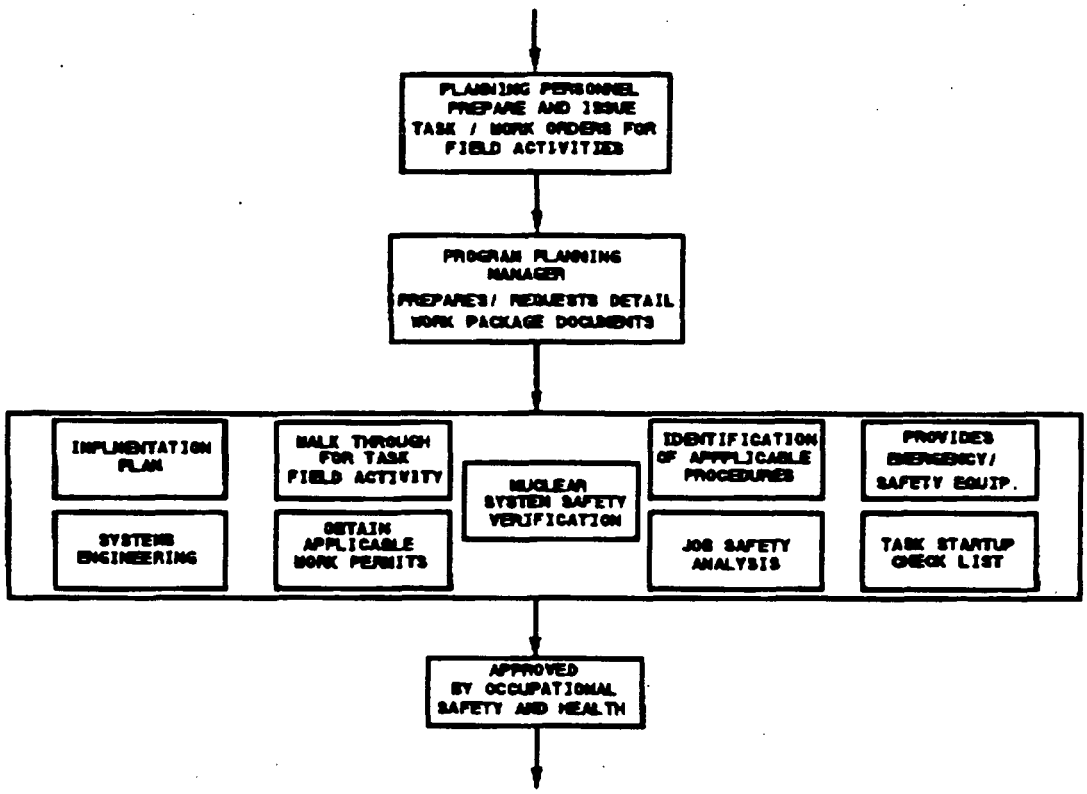

FIGURE 4
(Sheet 1 of 2)

DETAIL FLOW DIAGRAM

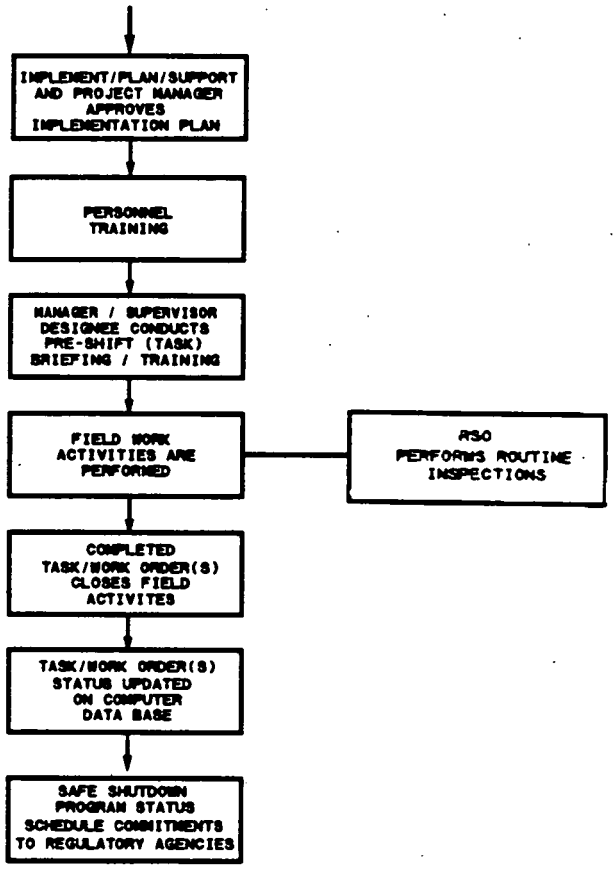

FIGURE 4
(Sheet 2 of 2)

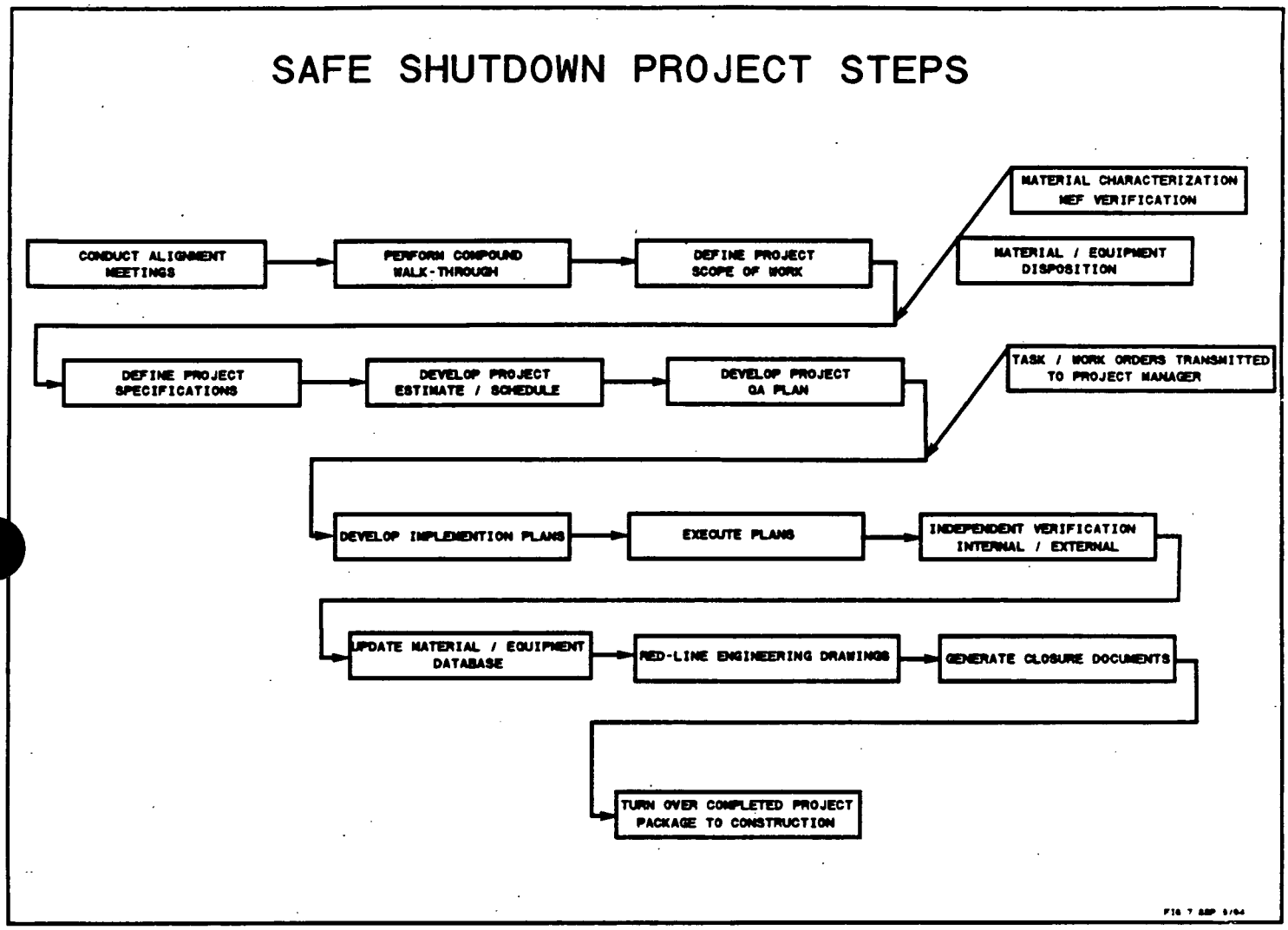
SAFE SHUTDOWN PROJECT STEPS
CONDUCT ALIGNMENT MEETINGS
PERFORM COMPOUND WALK-THROUGH
DEFINE PROJECT SCOPE OF WORK
MATERIAL CHARACTERIZATION MEF VERIFICATION
MATERIAL / EQUIPMENT DISPOSITION
DEFINE PROJECT SPECIFICATIONS
DEVELOP PROJECT ESTIMATE / SCHEDULE
DEVELOP PROJECT QA PLAN
TASK / WORK ORDERS TRANSMITTED TO PROJECT MANAGER
DEVELOP IMPLEMENTION PLANS
EXECUTE PLANS
INDEPENDENT VERIFICATION INTERNAL / EXTERNAL
UPDATE MATERIAL / EQUIPMENT DATABASE
RED-LINE ENGINEERING DRAWINGS
GENERATE CLOSURE DOCUMENTS
TURN OVER COMPLETED PROJECT PACKAGE TO CONSTRUCTION

FIGURE 5

ATTACHMENT A

SAFE SHUTDOWN PROGRAM

Date:	**FEMP MATERIAL IDENTIFICATION TASK ORDER**	M Task Order Work Sheet Number
Schedule: task orders/ mo.	CMMS Number: Barcode Number:	
Charge No:		

Equipment Name: Accounting Control Number:

Building	Floor	Location Description	Loc. Beam	Loc. Dir.

TASK TITLE:
IDENTIFICATION OF HOLD-UP MATERIALS
File No.

EQUIPMENT STATUS

UTILITIES DISCONNECT: WORK REQUEST NO.: STATUS AS OF: COMPLETION DATE:

RCRA DETERMINATION OF EQUIPMENT:

AIR PERMIT INFORMATION: OEPA: FEMPID#: PTO EXPIRATION DATE: COMMENTS: CONTROL EQUIPMENT:

PRELIMINARY RAD DATA: DATE OF SURVEY ALPHA REMOVABLE: BETA/GAMMA REMOVABLE: BETA/GAMMA REMOVABLE PLUS FIXED:

TASK DESCRIPTION

MATERIAL DESCRIPTION

See Attachment.

RELEASE SECTION

Signature Date

COMPLETION SECTION

Signature Date DATE CLOSED:

ATTACHMENT B

SAFE SHUTDOWN PROGRAM

Date:	**FEMP HOLD-UP MATERIALS REMOVAL TASK ORDER**	T Task Order Work Sheet Number
Schedule: task orders/ mo.	CMMS Number: Barcode Number:	
Charge No:		

Equipment Name: Accounting Control Number: File No.:

Manufacturer:	Model/Serial No:	Disposition Code:	Acq. Date:

Building	Floor	Rm-Area	CMMS Location Description	Location Description	Loc. Beam	Loc. Dir.

EQUIPMENT INFORMATION

UTILITIES DISCONNECT: WORK REQUEST NO.: STATUS AS OF: COMPLETION DATE:

RCRA DETERMINATION OF EQUIPMENT:

AIR PERMIT INFORMATION: OEPA: FEMPID#: PTO EXPIRATION DATE: COMMENTS: CONTROL EQUIPMENT:

PRELIMINARY RAD DATA: DATE OF SURVEY ALPHA REMOVABLE: BETA/GAMMA REMOVABLE: BETA/GAMMA REMOVABLE PLUS FIXED:

MATERIAL HOLD-UP DESCRIPTION

DESCRIPTION OF HOLD-UP:
ESTIMATED QUANTITY OF HOLD-UP:
LOT NUMBER FOR HOLD-UP:

COMPLIANCE DATA ON SIMILAR MATERIAL: SEE MEF VERIFICATION FORM SS MATERIAL DETERMINATION: IF, HAZARDOUS WASTE; HAZARD CODES: MEF(S) REFERENCED: EVALUATOR: DATE:

TASK DESCRIPTION

ORIGINATOR'S SECTION

Signature Date

COMPLETION SECTION

Signature Date DATE CLOSED:

taskSS;1

ATTACHMENT C

SAFE SHUTDOWN PROGRAM

Issue Date:	**FEMP TASK ORDER WORK SHEET**	EQ Task Order Work Sheet Number
Charge No.:	CMMS Number: Barcode Number:	
Requested Comp. Date: Mon Day Yr		

Equipment Name:

TASK TITLE:

TASK DESCRIPTION:

EQUIPMENT STATUS

See Attachment.

EQUIPMENT DISPOSITION

RELEASE SECTION

Signature _____ Date _____

COMPLETION SECTION

Signature _____ Date _____ DATE CLOSED

ATTACHMENT D

WORK REQUEST NO.
EQUIP AVAIL

SAFE SHUTDOWN PROGRAM
FEMP WORK REQUEST/ORDER

ORIGINATOR'S SECTION				WORK ORDER NO.			
EQUIPMENT NUMBER				CM (CORRECTIVE)	X		
				AL (ALTERATION)*			
				*QUESTIONNAIRE MUST BE ATTACHED TYPE OF JOB (CIRCLE ONE)			
EQUIPMENT NAME:				S S D FILE NO.			
PRIORITY: [ ] 1 [ ] 2 [X] 3 [ ] 4				QA LEVEL: [ ] 1 [ ] 2 [ ] 3 [X] 4			
REQUESTED COMPLETION DATE: (MM/DD/YY)							
PERSONAL SAFETY (PSS): [ ]YES [X]NO				SAFETY SYSTEM (SSS): [ ]YES [X]NO		PERSONAL/SAFETY SYS. (SPS): [ ]YES [X]NO	
JOB DESCRIPTION:							
SCHEDULE: WORK ORDERS/MONTH					ASSIGN TO: S S D		
BUILDING:	FLOOR:			ROOM/AREA:		CAPITAL EXPENSE: [ ]YES [ ]NO	
NAME:	INITIALS:	DATE:	PHONE:	SIGNATURE:	INITIALS:	DATE:	130
ORIGINATOR (REQ)				FACILITY OWNER (APV)		COST CENTER	OBJ CL

PLANNING SECTION

	JOB ELEMENTS	MAN HOURS CRAFT CODE	No.	EST	ACTUAL
1					
2					
3					
4					
5					
6					
7					
8					

OVERHEAD:	LABOR:	TAX:	TOTAL:	PLANNER'S INITIALS	SHOP	TYPE EST	TOTALS

PERMITS REQUIRED: YES[ ] NO[ ] (IF YES, LIST PERMITS)

APPROVAL SECTION

FACILITY OWNER: (PRE-APPROVAL) Signature / Date	QA/QC: Signature / Date
SAFETY ENGINEERING AND FIRE SERVICE: Signature / Date	ENGINEERING: Signature / Date
CRU: Signature / Date	RESPONSIBLE FIRST LINE SUPERVISOR: Signature / Date
RADIOLOGICAL SAFETY: Signature / Date	FACILITY OWNER: (FINAL RELEASE) - BEGIN WORK Signature / Date
INDUSTRIAL HYGIENE: Signature / Date	DAVIS BACON DETERMINATION: APPLICABLE: [ ] YES [ ] NO NUMBER:
ENVIRONMENTAL COMPLIANCE: Signature / Date	SPECIAL APPROVAL/APPLICABLE: [ ]YES [ ]NO Signature / Date

COMPLETION SECTION

RESPONSIBLE FIRST LINE SUPERVISOR:	FACILITY OWNER:	DATE CLOSED
Signature / Date	Signature / Date	MONTH / DAY / YEAR

CMMSss;R

ATTACHMENT E

SAFE SHUTDOWN IMPLEMENTATION PLAN APPROVAL SHEET

Implementation #_____ Date Prepared_____ Date Released_____

Scheduled Start Date_____ Scheduled Finish Date_____

Scope of Work:
___ Verify holdup material/equipment
___ Utility disconnects
___ Remove excess materials to approved storage location(s)
___ Gain entry to process equipment and remove holdup materials
___ Remove equipment
___ General decontamination of process area and equipment

Charge Time To: _____ Charge Supplies & Equipment To: _____

Location:_____

_____

Description:_____

_____

_____

Description of Materials: • Assigned Lot No._____

• RCRA/Non-RCRA _____ • Packaging Requirements: _____

_____

Approved By:

_____ _____
Program Planning Manager / Date Field Activities Manager / Date

Suspend Field Activities:

_____
Field Activities Manager / Date

Resume Field Activities: ☐ No Correction(s) ☐ Correction(s) as Included

_____
Field Activities Manager / Date

Field Activity Completed:

_____ _____
Program Planning Manager / Date Field Activities Manager / Date

000380

ATTACHMENT F

IMPLEMENTATION DESCRIPTION

IMPLEMENTATION PLAN:

TITLE:

OPERATIONS RESPONSIBILITIES	INITIALS & DATE COMMENTS / ISSUES

ATTACHMENT G
(Sheet 1 of 2)

SAFE SHUTDOWN APPLICABLE PROCEDURES CHECKLIST

#		Task Description
___	FEMP-2304,	FEMP Nuclear Criticality Safety Guide
___	RM-0005,	FEMP Lot Marking & Color Coding System
___	SOP 20-C-912,	Checking Scale Operation
___	SOP 20-C-917,	Hydrogen Monitoring and Removing Nucfil Vent Plugs from Drums
___	SOP 20-C-910,	Venting Potentially Explosive Drums
___	SOP 20-C-801,	Storage of Enriched Material
___	SSOP-0060,	Packaging Radioactive Material For Offsite Shipment
___	SOP 20-C-604,	Control & Utilization of Contaminated Trash Dumpster
___	SSOP-0719,	Energy Control Procedure (Lockout & Tagout)
___		Safe Shutdown Health and Safety Plan
___	SOP-20-C-606,	Hazardous Material Spill Clean-Up
___	SSOP-0035,	Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers
___	SOP-20-C-700,	Norclean Portable Vacuum Operation
___	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
___		Task Specific Health & Safety Plan for Decontamination of Various Areas of Existing Fixed or Removal Contamination, June 5, 1991
___	SOP-20-C-709,	Baghouse Type Dust Collector Filter Removal/Replacement
___	SOP-20-C-916,	Cleaning Sump Systems

ATTACHMENT G
(Sheet 2 of 2)

___	SSOP-0008,	Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area
___	SOP 20-C-602,	Inspection & Operation of Nilfisk Portable Vacuum
___	SPR 5-13,	Permit-Required Confined Space Program
___	SOP 20-C-603,	Removal & Replacement of Nilfisk Portable Vacuum Unit Filters & Dust Bag
___	SOP 20-C-711,	Hako Minuteman Portable Vacuum Cleaner Operation
___	SOP 20-C-011,	Physical Inventory of Nuclear Materials
___	SSOP-0039,	Handling Containers of Unidentified Material
___	SOP 20-C-625,	Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment
___	SOP 20-C-805,	Sampling Drummed Waste for Hazard Identification
___	SOP 20-C-918,	Preparation for and Movement of Unvented Drums
___	SOP 2-C-923,	Trash Baler Operation
___	SSOP-0069,	Freon Management
___	SOP 20-C-500,	Inspecting RCRA Waste Load/Unload and Staging Areas
___	SOP 20-C-701,	Operation of Spencer & Hoffman Portable Dust Collectors
___	SOP 2-C-601,	Refinery Sump
___	SOP 8-C-605,	EIMCO Filter Operation
___	SOP 20-C-612,	Industrial Cleaning
___	SOP 20-C-610,	Bird Carcass and Dropping Removal
___	SOP 20-C-600,	Overpacking Defective Containers
___	SOP 43-C-413,	Handling Waste Materials with the Industrial Vacuum Loader Truck (Supersucker)
___	SSOP-0077,	Building Emergency Procedure
___	SOP 20-C-017,	Movement of Hazardous Waste
___	SSOP-0028,	Controlling Portable Ventilation Devices and Vacuum Cleaners
___	SSOP-1025,	Tank/Sump Contents Removal
___	SSOP-1026,	Tank/Sump Removal or Abandonment

ATTACHMENT H
(Sheet 1 of 2)

SAFE SHUTDOWN SITE "WALK THROUGH" FOR PLAN SPECIFIC BRIEFING AND TRAINING

Title: _____

Implementation Plan: _____ **Date:** _____

Start: _____ **Completion** _____

Details stressed:
- Stress personal safety.
- Review emergency for plant area.

The employees have been advised of the Hazards, Tasks and Health and Safety concerns associated with this task order. Their signature signifies acceptance for performing in accordance with applicable Procedure, Task Order and the Safe Shutdown Hazard Analysis Form.

Instructor/Supervisor : _____ **Badge #:** _____

Employees' Name / Badge #:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

The personnel that have signed above, have demonstrated an understanding of the task to be performed and are proficient in performing the task as outlined, therefore are qualified to perform this assignment.

_____ /Date _____
Supervisor-In-Charge

_____ /Date _____
Training Support

_____ /Date _____
Subject Matter Expert

_____ /Date _____
Field Activities Manager

000384

ATTACHMENT H
(Sheet 2 of 2)

SAFE SHUTDOWN SITE "WALK THROUGH" FOR PLAN SPECIFIC BRIEFING AND TRAINING

Employees' Name / Badge #:

ATTACHMENT I

FEMP

JOB SAFETY ANALYSIS

JOB:	DATE:	H&S APPROVAL:	
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 ACCIDENT OR HAZARDS	RECOMMENDED SAFE JOB PROCEDURE
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.	7.	7.

JSA:

000386

ATTACHMENT J
(Sheet 1 of 4)

SAFE SHUTDOWN - IMPLEMENTATION CHECKLIST

Implementation Plan: _____ Date: _____

Supervisor-In-Charge: _____

Title: _____

Expected Start Date: _____ Expected Completion Date: _____

ITEM	DESCRIPTION	COMPLETED				
		YES		NOT REQUIRED		COMMENTS
		DATE	INITIALS	DATE	INITIALS	
1.0	Safety & Regulatory Issues					
	• Safety Assessment					
	• Risk Management Plan					
	• Health & Safety Plan					
	• NEPA Catex					
	• ORA					
	• Notify Reg. & Tech. Programs (M&MUs)					
	• Notify Waste Comp. & Field Imp. (M&MUs)					
	• NSOA/CSA					
	• Notify MC&A					
	•					
2.0	Material / Equipment Disposition Task Order					
3.0	Preparation of Safe Shutdown Imp. Plan					
	• Identify, characterize and quantify holdup material and where material is located in the system.					
	• Verify the Maintenance work Orders to disconnect utilities corresponds with the system being worked.					
	• Define the system being worked. process lines, vents and ducts are included from source to termination point.					
	• Define where process lines are physically separated from the source.					
	• Identify capacitance (stored) energy, electrical, mechanical and/or fluid is released or controlled.					
	• Identify specific points of entry to system.					
	• Identify use of secondary containment at each point where the system is opened.					
	• Identify where glove bags installed at pipe, vent or duct break points.					
	• Identify final storage location for containerized waste.					
	• Identify maintenance work instructions in describing utility disconnects or process line isolations.					
	• Identify use of tags to identify potential residuals in disconnected process lines.					

ATTACHMENT J
(Sheet 2 of 4)

ITEM	DESCRIPTION	COMPLETED				
		YES		NOT REQUIRED		COMMENTS
		DATE	INITIALS	DATE	INITIALS	
3.0 (Cont)	• Identify where enclosures installed as applicable to prevent spread of contamination.					
	• Identify where monitoring for gases and other potential hazards, air contamination.					
	• Identify boundaries for work area & laydown area.					
	• Alpha/Beta/Gamma Monitors functional.					
	• PCM (Friskers) functional.					
	• Fire alarms functional.					
	• Fire extinguishers accessible.					
	• RDA functional.					
	• Eye wash functional.					
	• Safety shower functional.					
	• Air monitors functional.					
	• PA system functional.					
	• Liquid containment established.					
	• Dry containment established.					
	•					
4.0	Implementation Plan Process					
	• NSS Review					
	• Applicable SOPs					
	• MSDS Sheets					
	• Completed Maintenance Work Order for utility disconnects.					
	• Maintenance Work Order for task support.					
	• List of qualified workers, including supervisors.					
	• Hazard Assessment/Work Permits					
	• Task Specific Job Briefing					
	• Approval Signatures					
	• Scheduled and released for work					
5.0	Supervisor-In-Charge: Pre-task Review					
	• Field verify utilities disconnected.					
	• Walk system down and review against the Implementation Plan.					
	• Determine resource availability.					
	• Determine special equipment availability.					
	• Establish tentative start date.					
	• Identify work team.					
	• Verify work team has been trained to applicable SOPs.					
	• Notify facility owner.					
	•					

ATTACHMENT J
(Sheet 3 of 4)

ITEM	DESCRIPTION	COMPLETED				
		YES		NOT REQUIRED		COMMENTS
		DATE	INITIALS	DATE	INITIALS	
6.0	Supervisor-In-Charge: Requirements prior to start of field activities:					
	• Work boundaries, control zones, laydown areas established.					
	• Supplies and equipment in place.					
	• Pre-task radiological surveys in place.					
	• Perform pre-use inspections of equipment.					
	• Verify applicable PMs are current.					
	• Notify support groups of start date.					
	• Maintenance					
	• Safety Engineer					
	• Industrial Hygiene					
	• Rad. Techs					
	• MC&A					
	• DOE-FN Facility Representative					
	• Site Media Sampling					
	• Heavy Equipment Operators					
	•					
	• Verify electrical and/or mechanical energy is released and/or controlled.					
	• Secondary containment in place.					
	• Conduct Task Specific Training					
	• Finalize work permits.					
	• Monitoring equipment in place.					
	•					

Based upon this final review of the state of readiness, including site preparation, supplies, equipment and personnel, the supervisor may proceed with the work as described in the Implementation Plan _____.

The work evolution shall not deviate from the approved plan. Necessary changes to work conditions will be incorporated after the appropriate review/approval process.

_____
Program Planning Manager / Date

_____
Field Activities Manager / Date

ATTACHMENT J
(Sheet 4 of 4)

ITEM	DESCRIPTION	COMPLETED				
		YES		NOT REQUIRED		COMMENTS
		DATE	INITIALS	DATE	INITIALS	
7.0	Supervisor-In-Charge: During work evolution, conduct daily pre-shift meetings with work team to discuss safety issues, work assignments and work status. Document in daily log sheets.					
8.0	Supervisor-In-Charge: Post task requirements					
	• Verify containerized waste removed from job site.					
	• System has been closed to atmosphere to contain radiological contamination.					
	• Abandoned process lines are identified to possible residual contamination.					
	• Abandoned utilities are identified.					
	• Abandoned vent lines and duct work identified.					
	• Obtain post task radiological surveys. Re-clean if necessary.					
	• Remove supplies, equipment and store.					
	• Remove work zones and barriers.					
	•					
	•					

000390

ATTACHMENT K
(Sheet 1 of 2)

SUPERVISOR'S DAILY LOG

DATE _____

PROJECT #_____ TITLE _____

PERSONNEL ASSIGNED (Including support personnel; IH, Rad Tech, etc.)

NAME	BADGE NO.	NAME	BADGE NO.
1.		7.	
2.		8.	
3.		9.	
4.		10.	
5.		11.	
6.		12.	

PRE-SHIFT BRIEFING/SAFETY TOPIC:

_____

_____

_____

ACTIVITIES:

_____

_____

_____

_____

_____

Continued on other side . . .

SUPERVISOR'S SIGNATURE _____ BADGE NO. _____

REVIEWER'S SIGNATURE _____ BADGE NO. _____

Page of

ATTACHMENT K
(Sheet 2 of 2)

ACTIVITIES - CONTINUED FROM OTHER SIDE:

ATTACHMENT L

FEMP
RADIOLOGICAL WORK PERMIT
This permit is only valid when attached to a FERMCO WORK PERMIT.

(1) WORK PERMIT NUMBER:	PAGE: 1 OF

PART I - RADIOLOGICAL CONTROL REQUIREMENTS

(2) TODAY'S DATE:	(3) TIME:	(4) ESTIMATED COMPLETION DATE:	
(5) BUILDING/PLANT:	(6) LEVEL:	(7) COORDINATES:	(8) PLANT JOB NUMBER:
(9) SUPERVISOR IN CHARGE:		(10) PHONE EXT./RADIO:	(11) ESTIMATED JOB MAN-HOURS:

(12) STAY TIME:	(13) STAY TIME BASIS (Determined by Radiological Engineering):		
	☐ SKIN	LIMITING DOSE RATE	mrem/hr
	☐ WHOLE BODY	IF AIRBORNE	%DAC
	☐ EXTREMITY	SURVEY I.D. NUMBER	
HOURS/WEEK	☐ AIRBORNE		

NOTICE *Post most recent survey data at the work site.* *NOTICE*

(14) COVERAGE REQUIREMENTS	(15) AIR MONITORING REQUIREMENTS	(16) CONTAMINATION CONTROL
☐ INTERMITTENT COVERAGE	☐ CONTINUOUS AIR MONITOR (Type:)	☐ HEPA VENTILATION: #
☐ CONTINUOUS COVERAGE	☐ BREATHING ZONE AIR SAMPLER (PAS)	☐ HEPA VACUUM: #
☐ NOTIFY RC EACH SHIFT WHEN RWP IS USED	☐ GENERAL AREA AIR SAMPLING	☐ AREA ISOLATION
☐ OTHER:	☐ OTHER:	☐ CONTAINMENT DEVICE
☐ OTHER:	☐ OTHER:	☐ OTHER:

(17) COMPLETE AN ALARA ASSESSMENT AS PER SP-P-35-067, ALARA REVIEW AND EVALUATION.
Is an ALARA Review Required? ☐ YES ☐ NO (if YES, THEN attach form)

(18) PRE-JOB BRIEF REQUIRED? ☐ YES ☐ NO

(19) DOSIMETRY		(20) REQUIRED TRAINING	
☐ Special Bioassay *(See Comments)*	☐ Job Specific TLD	☐ Rad Worker I	☐ Respirator Training
☐ Direct Reading Dosimeter	☐ Extremity Dosimetry	☐ Rad Worker II	☐ Other: *(Specify Below)*

(21) COMMENTS:

(22) WORK PERMIT PPE REQUIREMENTS ATTACHED:
☐ YES ☐ NO

APPROVALS *Signee verifies FERMCO Work Permit, PPE Requirements, Health & Safety Plan, or other additional documentation have been reviewed and approves of the requirements of the RWP.*

(23) RCT SUPERVISOR:	DATE:	(24) RADIOLOGICAL ENGINEERING:	DATE:
(25) RADIOLOGICAL COMPLIANCE:	DATE:	(26) REQUESTOR (CONCURRENCE):	DATE:

(27) RCT SIGNATURE:	RCT OFFICE LOCATION:	DATE ISSUED:	TIME ISSUED:
RCT PRINTED NAME:	RCT PHONE:		

PART II - BRIEFING GUIDANCE SHEET *(APPLICABLE ONLY IF BRIEFING IS REQUIRED)*

SCOPE OF WORK TO BE PERFORMED	RADIOLOGICAL CONTROL HOLD POINTS
RADIOLOGICAL CONDITIONS OF THE WORKPLACE	COMMUNICATION AND COORDINATION WITH OTHER GROUPS
PROCEDURAL AND RWP REQUIREMENTS	PROVISIONS FOR HOUSEKEEPING AND FINAL CLEANUP
SPECIAL RADIOLOGICAL CONTROL REQUIREMENTS	EMERGENCY RESPONSE PROVISIONS
RADIOLOGICALLY LIMITING CONDITIONS (Radiation and/or contamination levels that may void the RWP)	PROVISIONS FOR HOUSEKEEPING AND FINAL CLEANUP

NO.	DISTRIBUTION OF COPIES
1.	JOB SITE
2.	RCT SUPERVISOR
3.	DOSIMETRY MANAGER

FS-F-1372 (REV. 11/19/93)

☐ RWP CONTINUED ON NEXT PAGE

ATTACHMENT M

FERMCO
WORK PERMIT

WORK PERMIT NUMBER:

SECTION A - BACKGROUND INFORMATION *(Completed by Supervisor-In-Charge)*

MMIC NUMBER:	JOB START DATE:	ESTIMATED COMPLETION DATE:
CONSTRUCTION WORK ORDER NUMBER:	COMPANY:	EXACT LOCATION:
EXACT DESCRIPTION OF WORK:		
SUPERVISOR-IN-CHARGE NAME:	BADGE NUMBER:	PHONE/RADIO NUMBER:
PROJECT ENGINEER/CONSTRUCTION COORDINATOR:	BADGE NUMBER:	PHONE/RADIO NUMBER:

SECTION B - TYPES OF PERMITS REQUIRED *(Completed by Supervisor-In-Charge)*

☐ OUTAGE	☐ PENETRATION	☐ ASBESTOS (posted)	☐ CHEM/HAZ MATERIAL (posted)
☐ CONFINED SPACE (posted)	☐ OPEN FLAME/WELDED (posted)	☐ HAZARDOUS WORK (posted)	☐ RADIOLOGICAL (posted)

SECTION C - GENERAL PRECAUTIONS *(Completed by Supervisor-In-Charge)*

PRELIMINARY	REQ'D.	DNA	AREA ISOLATED	REQ'D.	DNA
1. Check for Utilities	☐	☐	20. Area barricades	☐	☐
2. Health & Safety Plan	☐	☐	21. Signs (PPE)	☐	☐
3. Work Plan	☐	☐	22. Signs (Warning)	☐	☐
4. Working surface safe for load (espec. roof wk)	☐	☐	23.	☐	☐
5.	☐	☐	24.	☐	☐
ENERGY CONTROL (Lock & Tag)			**OTHER CONTROLS**		
6. Electrical	☐	☐	25. Exhaust Ventilation	☐	☐
7. Chemical	☐	☐	26. Supplied Air Ventilation	☐	☐
8. Mechanical	☐	☐	27. GFCI	☐	☐
9. Other (Steam, etc.)	☐	☐	28. Screen/Shield	☐	☐
10. Specific Equipment Plan Required	☐	☐	29. Non-Sparking Tool	☐	☐
11.	☐	☐	30. Intrinsically Safe Equipment	☐	☐
ACCIDENT PREVENTION	☐	☐	31.	☐	☐
12. Fire Extinguisher	☐	☐	**EGRESS/FALL PROTECTION**		
13. Safety Shower Operable & Less Than 100 ft.	☐	☐	32. Ladder	☐	☐
14. Eye Wash Operable & Less Than 100 ft.	☐	☐	33. Scaffolds/Railings	☐	☐
15. Protection	☐	☐	34. High Lift Platform	☐	☐
16. Communications	☐	☐	35. Safety Belt	☐	☐
17. Magnetic Survey for Buried Utilities/Objects	☐	☐	36. Safety Harness	☐	☐
18.	☐	☐	37. Safety Line	☐	☐
19.	☐	☐	38. Tripod/Retrieval System	☐	☐

SUPERVISOR-IN-CHARGE:	BADGE NUMBER:	DATE:

WORK TASK REVIEWED, APPROVAL TO PERFORM WORK

FACILITY OWNER'S SIGNATURE:	BADGE NUMBER:	DATE:

NO.	DISTRIBUTION OF COPIES
1	Post at Job *(ES&H Copy)*
2	Supervisor-In-Charge
3	ES&H Field Copy

IN CASE OF EMERGENCY: CALL "CONTROL" BY RADIO PHONE 6511, OR USE NEAREST FIRE ALARM BOX

PERMIT TERMINATION (WORK COMPLETED/JOB CONDITIONS HAVE CHANGED)

SUPERVISOR-IN-CHARGE SIGNATURE:	DATE:

Return Copy 1 to ES&H (MS-31)

FS-F-2939 (REV. 08/31/94)

ATTACHMENT N

FEMP WORK REQUEST/ORDER

ORIGINATOR'S SECTION | **WORK ORDER NO.**

CM (Corrective)

AL (Alteration)*

EQUIPMENT NUMBER

*Questionnaire must be attached
TYPE OF JOB (CIRCLE ONE)

EQUIPMENT NAME:

PRIORITY: ☐ 1 ☐ 2 ☐ 3 ☐ 4 | QA LEVEL: ☐ 1 ☐ 2 ☐ 3 ☐ 4

REQUESTED COMPLETION DATE: (MM/DD/YY) ____/____/____

PERSONAL SAFETY (PSS) ☐ YES ☐ NO | SAFETY SYSTEM (SSS) ☐ YES ☐ NO | PERSONAL & SAFETY SYS. (SPS) ☐ YES ☐ NO

JOB DESCRIPTION:

ASSIGN TO:

BUILDING | FLOOR: | ROOM/AREA: | CAPITAL EXPENSE ☐ YES ☐ NO

NAME: | INITIALS: | DATE: | PHONE: | SIGNATURE: | INITIALS: | DATE:

ORIGINATOR (REQ) | FACILITY OWNER (APV) MS: _____ | COST CENTER | OBJ. CL.

PLANNING SECTION

	JOB ELEMENTS	MAN HOURS: CRAFT CODE	NO.	EST	ACTUAL
1					
2					
3					
4					
5					
6					

OVERHEAD: | LABOR: | TAX: | TOTAL: | PLANNER'S INITIALS | SHOP | TYPE EST | TOTALS

PERMITS REQUIRED: ☐ YES ☐ NO *(IF YES, LIST PERMITS)*

APPROVAL SECTION

FACILITY OWNER:(PRE-APPROVAL) SIGNATURE / DATE

QA/QC: SIGNATURE / DATE

SAFETY ENGINEERING AND FIRE SERVICE: SIGNATURE / DATE

ENGINEERING: SIGNATURE / DATE

CRU: SIGNATURE / DATE

RESPONSIBLE FIRST LINE SUPERVISOR: SIGNATURE / DATE

RADIOLOGICAL SAFETY: SIGNATURE / DATE

FACILITY OWNER: (FINAL RELEASE) - BEGIN WORK SIGNATURE / DATE

INDUSTRIAL HYGIENE: SIGNATURE / DATE

DAVIS BACON DETERMINATION:
APPLICABLE: ☐ YES ☐ NO NUMBER: _____

ENVIRONMENTAL COMPLIANCE: SIGNATURE / DATE

SPECIAL APPROVAL/APPLICABLE ☐ YES ☐ NO SIGNATURE / DATE

COMPLETION SECTION

RESPONSIBLE FIRST LINE SUPERVISOR: SIGNATURE / DATE

FACILITY OWNER: SIGNATURE / DATE

DATE CLOSED: MONTH / DAY / YEAR

FS-F-2532 (REV. 04/27/94)

ATTACHMENT O
(Sheet 1 of 3)

DOCUMENT CROSS REFERENCE

D10-20-015, Timely Orders to Operators (number changed from PO-D-023, Shift Orders

EM-0010, Event Notification and Occurrence Reporting (number changed from ED-0001)

EM-0018, Spill Incident Reporting and Clean-up (number changed from SSOP-0067)

EM-0020, Building Emergency Procedure (number changed from SSOP-0077)

EP-0001, National Environmental Policy Act (NEPA) Document Process (number changed from SSOP-0031, also replaces PO-518, National Environmental Policy Act (NEPA) Program)

EW-0001, Initiating Waste Characterization Activities Using the Material Evaluation Form (MEF) (number changed from SSOP-0002)

EW-0003, Nuclear Materials Disposition Order Management (number changed from SSOP-0034)

EW-0004, Satellite Accumulation Areas for Hazardous Wastes (number changed from SSOP-0035)

EW-0005, Handling Containers of Unidentified Material (number changed from SSOP-0039)

EW-0006, Management of Soil, Debris, and Waste from a Project (number changed from SSOP-0044)

EW-0009, Control and Tracking of Chemical Substances (number changed from SSOP-0059)

EW 0012, Tank/Sump Contents Removal (number changed from SSOP-1025)

EW-0013, Tank/Sump Removal or Abandonment (number changed from SSOP-1026)

EW-0018, Management of Low Level Waste (LLW) (number changed from PP-FMPC-5010)

IM-6001, Safe Shutdown Program Planning and Implementation Manual (replaces PO-D-028, Preparation and implementation of Work Package)

IM-6020, FEMP Nuclear Criticality Safety Guide (number changed from FMPC-2034)

MS-08-0001, FEMP Site Document System (number changed from SSOP-0103)

MS-0002, Records Management (number changed from SSOP-0609)

MS-0003, Document Filing System (number changed from SSOP-0096)

MT-0003, FEMP Work Request/Order Procedure (number changed from SSOP-0061)

NS-0001, Criticality Safety Analysis and Approval Process (number changed from SSOP-0095)

000396

ATTACHMENT O
(Sheet 2 of 3)

OP-0002, Controlling Portable HEPA Filtration Devices (HFDs) (number changed from SSOP-0028)

OP-0003, Control of Processes (number changed from SSOP-0716)

OP-0004, FERMCO Lockout/Tagout Hazardous Energy and Material Control Procedure (number changed from SSOP-0719)

OP-005, Disposition of Safe Shutdown Excess Personal Property (replaces SSOP-1021)

PM-0001, Management of Government Property (number changed from SSOP-1044)

PO-SE-02, Materials Control and Accountability (replaces PO-0307, Control and Accountability of Nuclear Materials)

PT-0001, Receiving, On-Site Movement and Off-Site Shipment of Nonradioactive Hazardous Material (number changed from SSOP-0003)

PT-0002, Packaging and Transferring Uncharacterized Waste to the Controlled Holding Area (number changed from SSOP-0008)

PT-0003, Control of Box Type Containers (number changed from SSOP-0027)

PT-0004, Packaging and Loading Radioactive Material For Offsite Shipment (number changed from SSOP-0060)

PT-0005, Packaging Low Level Radioactive Waste (LLRW) In Drums for Shipment to the Nevada Test Site (number changed from SSOP-0075)

PT-0006, Packaging Low Level Radioactive Waste (LLRW) into ISO Containers for Shipment to the Nevada Test Site (number changed from SSOP-0078)

PT-0007, Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Shipment to the Nevada Test Site (number changed from SSOP-0079)

PT-0008, Packaging, On-Site Movement and Off-Site Shipment of Material (number changed from PP-0314)

PT-0012, Shipment of Low Level Radioactive Waste Requirements (number changed from PO-D-035)

QA-0001, Processing Deviation and Corrective Action Reports (number changed from SSOP-0023)

QA-0002, Quality Assurance Project Plan (number changed from SSOP-0036)

QA-0006, Quality Improvement (number changed from SSOP-0082)

ATTACHMENT O

(Sheet 3 of 3)

RM-0021, Safety Performance Requirements Manual (replaced RM-0006 Industrial Safety)

RM-2116, Safety Analysis Program Requirements (replaces FMPC-0508, Safety Analysis Documentation Program)

RP-0009, Unrestricted Release of Materials from FMPC (number changed from RC-DPT-019)

SOP 8-C-608, East EIMCO Filter Operation and SOP 8-C-609, West EIMCO Filter Operation (replace SOP-8-C-605)

SOP 20-C-806, Sampling Waste for Hazard Identification (number changed from SOP-20-C-805 and earlier number C10 C94-021))

SOP 20-C-623 Receipt and Storage of Low Level Radioactive Waste and Nuclear Material (number changed from SOP-1-C-608)

SP-P-35-023, Routine Radiological Contamination Surveys (number changed from RD-RDA-010)

SPR 2-8, Work Permits (replaces FMPC, Control of Permits for Accomplishing Hazardous Work)

-6943

CONTROL NO. FER-0010
SITE PROCEDURE EP-0004 (SSOP-0067)
REVISION NO. 1

NON-CONTROLLED COPY

SPILL INCIDENT REPORTING AND CLEAN-UP

Effective Date: 03-17-94

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: _____ 3/23/95
T. Hagen, FAM of Environmental Compliance Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0067
REVISION NO. 1

SPILL INCIDENT REPORTING AND CLEAN-UP

NON-CONTROLLED COPY

SSOP-0067

Effective Date: 03-17-94

AUTHORIZED BY: _____ _____
J. A. Rasile, Executive Vice President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 398704
Cincinnati, Ohio 45239-87042

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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.
03-17-94	1	Revision to the "Spill Incident Reporting and Cleanup" per Request No. S93-076, initiated by Ted Spradlin. This document Supersedes SSOP-0067, dated 11-20-92, Revision 0.

1.0 PURPOSE

This procedure provides instructions for Fernald Environmental Management Project (FEMP) Management to maintain a policy at the Fernald Environmental Restoration Management Corporation (FERMCO) by which all spill incidents are contained, cleaned up, classified, reported to responsible FEMP organizations, and reported to offsite 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 onsite disposition for spill incidents at the FEMP.

3.0 DEFINITIONS

Assistant Emergency Duty Officer (AEDO) - The AEDO is the onsite 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.

Clean Water Programs Release Evaluator (CWP/RE) or (RE) - A designated individual with the responsibility for ensuring that FEMP notifications and reporting in response to an environmental event comply with federal and state environmental laws.

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.

Emergency Chief (EC) - This is the person in the field that represents the Fire Protection and Emergency Response Team. This person is in charge of the Emergency Response Team and reports to the AEDO during emergency events.

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 emergency event mitigation, including emergency response to fire, hazardous materials release, radiological release and medical emergencies. Members must meet special physical, medical, and training requirements.

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).

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.

3.0 **DEFINITIONS** (cont.)

Loggable Event - A non-routine event which is not required to be reported to the Department of Energy (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 the DOE and contractor management for trend analysis and review as a part of the functional appraisal process.

Notification Report - The initial documented report to the DOE of an event or condition that meets the reporting criteria defined in DOE Order 5000.3B. 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 per DOE Order 5000.3B.

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.

Regulated Material - For the purposes of this procedure, a regulated material is any material that is regulated by the USEPA, OEPA, OSHA or DOT.

Release - For the purposes of this procedure, a release is defined as a spill incident or emission (air release) of a regulated material. A release and a spill are interchangeable in this procedure.

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 the Release Evaluator (RE).

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 and/or EPA permits, are not considered spill incidents until they exceed an amount equal to the respective RQ for any one constituent.

4.0 RESPONSIBILITIES

Assistant Emergency Duty Officer (AEDO)

- Reports to and communicates with the EDO and initiates actions necessary to stabilize and minimize the results of an event/incident.

- Classifies each event and determines if it is reportable to DOE following DOE-FN incident classification guidelines established in "FEMP Emergency Plan" (PL-3020).

  NOTE: The DOE-FN incident classification system classifies an event as an emergency or a non-routine event.

  NOTE: All emergency and reportable non-routine events must be reported to DOE-HQ.

- Provides necessary information to the EDO and the designated Release Evaluator (RE) to determine if a spill incident or abnormal discharge event is reportable to regulatory agencies and directs emergency event activities.

- Communicates with DOE and recommends that DOE notify appropriate agencies within the time specified by regulation(s), and confirms that DOE has made this notification.

- Reports emergency events to the Local Emergency Coordinator and Planning Committees as directed by the EDO or the EOC and logs each event to ensure that all original reports, forms, and logs are placed in Emergency Preparedness files.

Best Management Practices (BMP) Committee

- Reviews periodically those Occurrence Reports (ORs) which result from spill incidents or events and formulates recommendations to FEMP management to prevent the recurrence of similar incidents or events.

Communications Center Operator

- Receives reports of events from employees, supervisors, or by alarm circuits, and promptly contacts the 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.

4.0 **RESPONSIBILITIES** (cont.)

Emergency Chief

- Directs the ERT, 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.
- Contacts the designated RE, if the event is a spill or release, who advises the EDO if the spill incident is reportable to regulatory agencies.
- Notifies the FERMCO President, Office of Counsel, Director of Public Affairs, and DOE Manager of regulatory reportable events.

Emergency Operations Center (EOC)

- Notifies DOE to ensure that local agencies are notified as required by regulation.
- Prepares the Fact Sheet with input as needed from appropriate personnel.

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 Supervisor or Area Supervisor (or AEDO through the Communications Center Operator in supervisor's absence), in accordance with departmental procedures, FEMP site procedures, and/or the FEMP Emergency Plan, PL-3020.

Manager or Facility Owner of Affected Building or Area

- 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 ERT can aid in spill containment and clean-up.

4.0 **RESPONSIBILITIES** (cont.)

Manager or Facility Owner of Affected Building or Area

- 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.

Public Affairs

- Assists the AEDO in determining the event classification, and whether to report information to the public and/or plant neighbors.

- Coordinates news releases, announcements, statements prepared in response to queries, and information to be provided to neighbors of the plant with permission of FEMP Management and the DOE-FN Assistant to the Manager for Public Information.

Release Evaluator (RE)

- Evaluates release for reportability per the "Release Evaluation, Reporting and Documentation" procedure (EP-FFM-002) and applicable section(s) of 40 CFR 110, 112, 263, 264 or 265, 302, 355 and 761.

- Assists as needed with disposition of spilled material and identifies and corrects any current practice that is not acceptable from a compliance standpoint.

Environmental Safety & Health (ES&H)

- Conducts analyses and monitoring of spilled substances in accordance with ES&H procedures and reports analytical results to the AEDO or the Release Evaluator.

- Determines the exposure risk and appropriate personal protective equipment.

4.0 **RESPONSIBILITIES** (cont.)

Supervisor

- Reports the incident immediately to the AEDO through the Communications 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 Supervisor or Building Owner.
- Conducts an incident critique after the spill is cleaned up and maintains a log of such events.

Division 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 ED-0001, "Event Notification and Occurrence Reporting Procedure", after the spill is cleaned-up.
- Assign written follow-up report for incident spill required by regulatory agencies.

  NOTE: The Release Evaluator 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 plant area shall be provided with a phone clearly marked with the emergency reporting phone number, as an alternative mode of communication with the Communications Center Operator for spill notification purposes.

5.2 All plant employees shall be familiar with the use of the applicable departmental and FEMP emergency procedures. Employees shall provide 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 FMPC-2128, "FMPC Industrial Hygiene and Safety Manual"; and ESH-1-1000, "Comprehensive Environmental, Occupational, Safety and Health Program Manual".

- All spill incidents shall be reported to the Release Evaluator.

6.2 PERSONNEL REQUIREMENTS

- Supervisors shall be responsible for contacting Industrial Hygiene for chemical air contaminants, or Radiological Control for radioactive contaminants.

- 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 Radiological Work Permit (RWP) from Radiological Control prior to commencing work as required. All employees are responsible for complying with safety requirements as specified by Radiological Control."

- Personnel shall review applicable project specific health and safety plans, work permits, etc., for health and safety requirements.

- Employees are responsible for complying with additional requirements as specified by the Radiological Control 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.

6.3 TOOLS AND MATERIAL REQUIRED (cont.)

- Respirators shall be made available by supervision for each employee working with waste materials and shall be used in accordance with ESH-1-1000, Comprehensive Environmental, Occupational, Safety and Health Program Manual".

  NOTE: In the event of a spill incident refer to SOP 20-C-606, "Hazardous Material Spill Clean-up".

7.0 PROCEDURE

7.1 REPORTING A SPILL INCIDENT

EMPLOYEE

1. Immediately alert nearby workers and leave the area of the spill incident.

2. Promptly notify Immediate Supervisor or Area Supervisor (or AEDO through the Communications 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 Communications Center Operator at: Ext. 6295
   Or telephone: Ext. 6431
   Radio: Unit 202
   Cellular Phone: 535-1365 or 535-2197

COMMUNICATIONS CENTER OPERATOR

5. Receive reports of events from employees, supervisors, or by alarm circuits, and promptly contact the Assistant Emergency Duty Officer (AEDO).

7.1 REPORTING A SPILL INCIDENT (cont.)

COMMUNICATIONS CENTER OPERATOR

6. Notify the Emergency Chief (EC) of the event, if directed to do so by the AEDO.

   NOTE: The EC may receive notification by alarm.

7. Make local regulatory and other notifications, as directed by the AEDO.

8. Complete a shift report of activities and events and submit this report to manager or facility owner.

MANAGER OR FACILITY OWNER (OF AREA WHERE EVENT OCCURS)

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 division manager.

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

12. Log and classify the event following the PL-3020, "FEMP Emergency Plan"; ED-0001, "Event Notification and Occurrence Reporting Procedure" and DOE Order 5000.3B "Occurrence Reporting and Processing of Operations Information".

13. Provide the necessary spill incident information to the EDO and the designated RE. The EDO and the RE will determine if the event must be reported to the offsite regulatory agencies.

14. Notify the EDO of a reportable non-routine or an unusual event. Activate the EOC in an emergency event.

15. Issue the one-page Notification Report within 24 hours of the event categorization. The report shall also identify the division Manager who will complete the OR reporting requirements.

7.1 REPORTING A SPILL INCIDENT (cont.)

ES&H TECHNICIAN

16. Sample and monitor the spilled substance, including the spill area, soil, etc., in accordance with ES&H procedures.

17. Report the monitoring results to the AEDO.

EMERGENCY DUTY OFFICER (EDO)

18. Advise the AEDO and oversee the spill response.

19. Contact the designated RE, to determine if the event is reportable to regulatory agencies.

RELEASE EVALUATOR (RE)

20. Evaluate release for reportability and, report per the "Release Evaluation, Reporting and Documentation" procedure (EP-FFM-002) and applicable section(s) of 40 CFR 110, 112, 263, 264 or 265, 302, 355 and 761, based on information received from the EDO and AEDO. All of these regulations and information needed to evaluate a release is available in the Release Evaluator's Manual (REM).

    NOTE: The RE 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.

21. Advise the AEDO and EDO of this determination.

    NOTE: In events when the reportability requirements are difficult to determine, the Clean Water Program Manager and the Effluent Monitoring & Control Manager and/or FEMP Legal department will jointly make the reportability determination.

EMERGENCY DUTY OFFICER (EDO)

22. Communicate the determination of reporting requirements for the spill event to the AEDO.

23. Notify the DOE Site Manager, FEMP President, Office of Counsel, and Director of Public Affairs of a reportable event.

7.1 REPORTING A SPILL INCIDENT (cont.)

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

24. Communicate management's determination and recommendation of spill event regulatory reporting requirements to DOE.

25. Confirm that DOE has made appropriate notifications to regulatory agencies.

26. Instruct the Communications Center Operator to notify local authorities, as directed by the EDO or the EOC.

PUBLIC AFFAIRS

27. 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

28. Complete a critique of the event and maintain a log up to the end of the shift when the incident occurred.

DIVISION MANAGER

29. Review the 24-Hour Notification Report.

30. Direct an investigation of any 24-Hour Notification Report to determine sequence of events causing the incident.

31. Complete an Occurrence Report in accordance with ED-0001, "Event Notification and Occurrence Reporting Procedure", within ten days after the occurrence of the event and follow-up action.

32. Initiate any necessary corrective action(s).

33. Assign written follow-up reporting for spills, as required by regulatory agencies and/or specified by the RE. Ensure that the written follow-up reports are completed and submitted within the regulatory deadlines.

7.1 REPORTING A SPILL INCIDENT (cont.)

BEST MANAGEMENT PRACTICES COMMITTEE

34. Convene meetings, when necessary, to determine resolution of problems and trends related to spills, leaks, and abnormal discharges.

35. Recommend corrective actions to management, as necessary, to prevent recurrence of similar events.

7.2 CLEAN-UP OF A SPILL INCIDENT

CAUTION:

WHEN A SPILL OCCURS FROM A VEHICLE ONTO A STREET LOCATED IN THE PROCESS AREA, IT MUST NOT 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 RE CAN PROVIDE WASTE DISPOSITION GUIDANCE IN MANY CASES.

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.

2. Conduct clean-up as directed by supervision.

SUPERVISOR

3. Determine the nature and magnitude of the incident.

4. Secure and isolate the affected area.

5. Direct clean-up efforts according to appropriate procedures and regulations as listed in step 12.

7.2 CLEAN-UP OF A SPILL INCIDENT (cont.)

ASSISTANT EMERGENCY DUTY OFFICER (AEDO)

5. Direct ES&H to assign Industrial Hygiene and/or Radiological Safety technicians to perform monitoring and analyses of the spill, as necessary.

6. Classify the event and determine if it is reportable to DOE following DOE-FN incident classification guidelines established in "FEMP Emergency Plan" (PL-3020).

7. Activate the ERT, if necessary, by contacting the Control Center Operator and the EC.

EMERGENCY CHIEF

8. Assemble and direct the ERT to the incident area in an emergency event, based on the information provided by the Communications Center Operator or the AEDO.

9. Direct and coordinate the emergency field response.

10. Supervise efforts to contain the spill, leak, or discharge in accordance with established requirements and site/departmental procedures.

ES&H TECHNICIAN

11. Sample and monitor the spilled substance in accordance with ES&H procedures.

MANAGER

12. Assure that spill incident clean-up efforts are conducted and completed in accordance with the following guides, procedures and regulations as appropriate:

    - PL-2194, FERMCO Spill Prevention Control and Countermeasure (SPCC) Plan

    - SOP-20-C-606, Hazardous Material Spill Clean-up

    - Regulatory Compliance Guide H-1, Spill Evaluation, Reporting and Documentation

7.2 CLEAN-UP OF A SPILL INCIDENT (cont.)

- Regulatory Compliance Guide H-2, PCB Record keeping Requirements
- Regulatory Compliance Guide N-1, PCB Disposal Requirements
- Regulatory Compliance Guide N-2, Satellite Accumulation Areas

MANAGER

- PCB Spill Clean-up, Reference Code of Federal Regulations(CFR) - 40 CFR 761.125(b) & (c) and 40 CFR 761.130. This specific clean-up guidance is listed in the ERT Manual #001. Also, a copy of the referenced regulations can be found in the REM.

  NOTE: 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.

13. 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.

14. The spill incident area shall remain isolated and secured until ES&H 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.

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE (cont.)

GENERATOR OF THE WASTE

1. Mercury Spills:

   NOTE: 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.

   NOTE: No specific containerization is required.

   a. Contact Remedial Support Operations prior to movement, so they will know the waste is coming.

   b. Place waste in an accumulation drum in this warehouse.

   c. Mark the container "Mercury Contaminated Waste."

2. Gasoline or Motor Oil Spills:

   a. If gasoline or oil is spilled, clean it up by using either absorbent pads or oil dry-type absorbent and take it directly to building 79 (it is preferred that pads be used to absorb the spill in the interest of waste minimization and segregation).

      NOTE: Either a self-closing safety can or a sealed drum is required for transport.

   b. Contact Remedial Support Operations prior to movement, so they will know the waste is coming.

   c. Place waste in an accumulation drum in Building 79.

   d. Use WEMCO: EM(FME): 92-195 and MEF #1501 as a reference to indicate the Material Evaluation number on the accumulation drum.

3. Hydraulic Fluid or Diesel Fuel Spills:

   a. If hydraulic Fluid or Diesel Fuel is spilled, clean it up by using either absorbent pads or oil dry-type absorbent and take it directly to Plant 1. (It is preferred that pads be used to absorb the spill in the interest of waste minimization and segregation).

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE (cont.)

GENERATOR OF THE WASTE

b. Contact the supervisor since it has previously been characterized as "Non-Hazardous Waste."

c. Place waste in an accumulation drum in Plant 1.

d. Use WEMCO: EM(FME) : 92-126 and MEF #1293 as a reference to indicate Material Evaluation number on the accumulation drum.

4. Antifreeze Spills:

a. If Antifreeze is spilled, clean it up by using either absorbent pads or oil dry-type absorbent and take it directly to Plant 1. (It is preferred that pads be used to absorb the spill in the interest of waste minimization and segregation).

b. Contact the supervisor since it has previously been characterized as "Non-Hazardous Waste."

c. Place waste in an accumulation drum in Plant 1.

d. Ensure that the word "Antifreeze: is indicated on the outside of the drum.

NOTE: The RE is available to assist in the disposition of spilled generated waste. It is expected that other similar waste, not specifically listed will be encountered. If it is an item that is different from these already listed, the RE will work with Facilities & Materials Evaluation (F&ME) to expedite the proper guidance needed for disposition.

5. PCB Spills

NOTE: As indicated earlier, clean-up must be per ERT #001 Manual, Section 7.3, Attachment A, and 40 CFR 761.125 and 761.130. This describes step-by-step clean-up and is conducted under direction of the Industrial Hygiene Department. SOP 20-C-606 gives further clean-up guidance.

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE (cont.)

GENERATOR OF THE WASTE

a. The above references indicate the required, specific clean-up for PCB spills. This clean-up is usually done by the Maintenance Services Section of RSO.

b. Once clean-up is complete and the container is properly prepared per SSOP-0035, the container must be managed in accordance with SSOP-1027, Managing PCBs and PCB Items, and SSOP-1040, Managing PCB and non-PCB Fluorescent Light Ballasts, as revised.

6. Other Spills

If the spill does not fall into one of the categories above then the generator is responsible for proper disposition of the waste following the guidelines below:

a. Materials must be properly containerized. This will usually be a 55-gallon drum. However, other containers may be applicable. The RE can advise you on this.

b. Containers must have a lot ID number. Obtain this from Material Control & Acquisition (MC&A). Sometimes, the RE can help you obtain this number.

c. Call Waste Characterization, to see if similar material has been previously characterized, which might 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.

d. Initiate an MEF, per SSOP-0002, "Completing the Material Evaluation Form," if still required after above step (the original is submitted to F&ME).

- A copy of the submitted MEF must accompany the container to storage to verify characterization has been done or is in progress.

7.3 DISPOSITION OF SPILL/RELEASE-GENERATED WASTE (cont.)

GENERATOR OF THE WASTE

- 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.

e. Contact MC&A to find out where waste may be sent for interim or permanent storage.

f. Complete a 65 card, available from MC&A. Administrative area maintenance and the lab facility owner also have these forms.

g. Complete a 68/69 card, also available from MC&A, or fill out an Interplant Transfer Record. Check with MC&A for which card applies. These are also available from maintenance lab.

h. Complete a pre-transfer checklist. This is only required if waste is known to be RCRA. It is also available from MC&A.

i. 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.

j. Contact transportation to arrange for shipment.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE 5000.3B, "Occurrence Reporting and Processing of Operations Information"
- 40 CFR 110, 302, 355, 264 or 265 and 761.125

8.2 REFERENCES

- ED-0001, "Event Notification and Occurrence Reporting Procedure"
- FMPC-2128, "FMPC Industrial Hygiene and Safety Manual"

8.0 **APPLICABLE DOCUMENTS** (cont.)

- PL-2194, "FERMCO Spill Prevention Control & Countermeasure (SPCC) Plan"
- FMPC-SUB-011, "Best Management Practices Plan"
- PL-3020, "FEMP Emergency Plan"
- PP-0314, "Packaging, On-Site Movement and Off-Site Shipment of Material"
- ESH-1-100, "Comprehensive Environmental, Occupational, Safety and Health Program Manual"
- SSOP-0002, "Completing the Material Evaluation Form"
- SSOP-0003, "Receiving, On-Site Movement and Off-Site Shipment of Material of Non-Radioactive Hazardous Material"
- SSOP-0088, "FEMP Offsite Emergency Warning System"
- SOP 20-C-606, "Hazardous Material Spill Clean-up"
- SOP 20-C-615, "Controlled Holding Areas"
- SOP 20-C-630, "Receipt, Inspection, Storage, and Storage Inspection of Hazardous Waste"
- SOP 20-C-711, "HAKO "Minute Man" Portable Vacuum Cleaner Operation"
- SOP 20-C-904, "General Nuclear Safety Requirements"
- ORC 3750.06 (Notice of Release of Hazardous Substances)
- OAC 1301
- OAC 3750-25-01

-6943

CONTROL NO. FGR-0018
SITE PROCEDURE EW-0009 (SSOP-0059)
REVISION NO. 0

CONTROL AND TRACKING OF CHEMICAL SUBSTANCES

NON-CONTROLLED COPY

Effective Date: 05-26-92

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: _____ 2/15/95
Terence D. Hagen, Manager of Environmental Restoration and Waste Management — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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-6943

CONTROL NUMBER: FEA-006
SITE PROCEDURE PT-0003
REVISION NO. 0

CONTROL AND MOVEMENT OF CONTAINERS AT THE FEMP

NON-CONTROLLED COPY

Effective Date: 03-28-95

Originator (Subject Expert): J. Stoffer — 3-22-95 Date

Checker Concurrence: S. Stierhoff — 3-22-95 Date

APPROVED BY: M. West, Vice President, Waste Programs Management — 3-22-95 Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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Title: CONTROL AND MOVEMENT OF CONTAINERS AT THE FEMP	DOCUMENT NO: PT-0003	
COMPLIANCE WITH THIS PROCEDURE IS MANDATORY DURING THE EXECUTION OF ACTIVITIES WITHIN ITS SCOPE	Effective Date: 03-28-95	Revision No. 0
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ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	03-28-95	New procedure for the control and movement of containers at the FEMP. This procedure replaces SSOP-0027, dated 02-07-92, Rev. 0.

1.0 PURPOSE

1.1 This document provides instructions for controlling and moving containers received at the Fernald Environmental Management Project (FEMP) for onsite storage and offsite shipment of materials.

2.0 SCOPE

2.1 This procedure is applicable to all containers received at the FEMP to be used for storing and shipping project waste.

3.0 REFERENCES

3.1 PT-0001, Receiving On-Site Movement and Off-Site Shipment of Non-Radioactive Hazardous Material

3.2 PT-0005, "Packaging Low Level Radioactive Waste (LLRW) in Drums for Off-Site Shipment"

3.3 PT-0006, "Packaging Low Level Radioactive Waste (LLRW) Into ISO Containers For Offsite Shipment"

3.4 PT-0007, "Packaging Low Level Radioactive Waste (LLRW) In Metal Boxes For Offsite Shipment"

3.5 PT-0008, Packaging On-Site Movement and Off-Site Shipment of Material

4.0 RESPONSIBILITIES

4.1 Container Distribution Facility (CDF) Supervisor manages the activities of the CDF, including the following:

- Receives container request forms and evaluates for approval.
- Submits requisition to MC&A for issuance of empty containers.

4.2 Low Level Waste Packaging Support (LLWPS) personnel coordinate the movement of containers from the CDF and waste generating projects. The LLWPS Supervisor will act as the backup to the CDF Supervisor

4.3 Receiving checks the containers received, against the shipping report.

4.4 Performance/Quality Assurance (P/QA)

- Inspects waste containers to verify container integrity.
- Audit container packaging operations.

4.0 RESPONSIBILITIES (cont.)

4.5 Waste Generators

- Load waste containers in accordance with applicable requirements.
- Coordinate with Low Level Waste Packaging Support and Material Control and Accountability (MC&A) to move containers.

4.6 Material Control & Accountability (MC&A) Maintains inventory and location of waste containers and generates bar code labels for all containers.

4.7 Waste Operations Support Determines storage locations for all containers.

4.8 Waste Operations (Transportation) Moves waste containers around the site.

5.0 GENERAL

5.1 Each waste container shall have a unique inventory and/or serial number for tracking purposes.

5.2 The following are guidelines for container usage:

- Containers shall be used for waste storage and shipping only. Nonwaste storage use is discouraged. Only the CDF Supervisor will be able to approve non-waste container use.
- Containers shall not be modified for other purposes.
- No "prohibited materials" shall be placed in waste containers destined for the Nevada Test Site (NTS). A "Prohibited Materials List" is provided in Attachment A.
- Waste containers shall be filled as close to the weight limits of the container as possible to minimize void space. The weight limits for containers are provided in Attachment B.
- Request containers for immediate needs only.

6.0 PREREQUISITES

None

7.0 PROCEDURE

7.1 RECEIVING WASTE CONTAINERS ONSITE

RECEIVING

7.1.1 Notify CDF Supervisor and MC&A that containers have been received onsite and require inspection for acceptance.

7.1.2 Verify the amount of containers received and container serial numbers against the shipping report. If a discrepancy is noted, contact Acquisitions.

MC&A AND QUALITY ASSURANCE

7.1.3 Verify the stencilled serial number against the stamped metal tag (if applicable). If a discrepancy is noted, contact Acquisitions.

MC&A

7.1.4 Notify heavy equipment operators to off-load containers.

WASTE OPERATIONS (TRANSPORTATION)

7.1.5 Off-load containers at the CDF as directed by MC&A personnel.

MC&A

7.1.6 Affix inventory bar coded labels and record location of containers in Sitewide Information Forecasting and Tracking System (SWIFTS).

7.2 INSPECTING WASTE CONTAINERS

QUALITY ASSURANCE

7.2.1 Inspect the containers for any damage that may have occurred during transit.

a. If no damage is present, tag containers as acceptable.

NOTE: Containers shall not be marked. Only tags shall be used to identify containers condition.

7.2 INSPECTING WASTE CONTAINERS (cont.)

QUALITY ASSURANCE

b. If damage is present, tag containers as not acceptable and notify Acquisitions for corrective action.

NOTE: Any damage to the containers could cancel acceptance of the shipment.

7.3 REQUESTING WASTE CONTAINERS

GENERATOR

7.3.1 To obtain containers, request a "Fernald Site Container Request" form #FS-F-3468, (Attachment C) from the CDF Supervisor. This form consists of information required to obtain containers for a project, such as a cost account number and a Cost Account Manager's (CAM) signature. Request containers for immediate needs only.

NOTE: Waste containers can be transferred from one cost account to another by contacting the CDF Supervisor and submitting a new container request form. The CDF Supervisor will submit this information to MC&A for corrections to SWIFTS. The containers must be inspected for damage before transfer to a new cost account, since ownership and responsibility is transferred to the receiving party.

NOTE: Box type containers may be returned for credit by contacting the CDF Supervisor.

7.3.2 Complete the container request form with the following information:

a. Requestor, phone #, Mail Stop, badge #
b. Project name, date requested, cost account number
c. Container type and number needed
d. Location for delivery, contact person, phone#/radio # date of delivery required.
e. MEF #(s), Material Description/PWID #(s) (for informational purposes only)
f. Cost Account Manager's (signature)

7.3 REQUESTING CONTAINERS (cont.)

GENERATOR

7.3.3 Submit the completed form to the CDF Supervisor.

CDF SUPERVISOR

7.3.4 Review the Fernald Site Container Request form.

a. If approved, proceed to Section 7.4 of this procedure.

b. If not approved, return request form to Generator with an explanation.

7.4 ISSUING WASTE CONTAINERS

CDF SUPERVISOR

7.4.1 Upon approval of a completed "Fernald Site Container Request" form, notify MC&A to release the containers to a project.

7.4.2 Fax a copy of the initialed, dated, and approved container request form to MC&A for their records.

MATERIALS CONTROL & ACCOUNTABILITY

NOTE: MC&A controls access to the CDF pad through a locked gate shared with Security. Security will only allow access for emergencies and approved personnel.

7.4.3 Upon receiving a copy of the "Fernald Site Container Request" form, obtain inventory numbers of containers for a project.

7.4.4 Prepare a list of inventory numbers on a "Empty Container Receipt" form (Attachment D) for delivery to a project.

7.4.5 Notify Low Level Waste Packaging Support (Waste Technicians) to complete the issuance of container(s) to a project and give them a copy of the "Empty Container Receipt" form.

NOTE: The contact person at the project will sign the "Empty Container Receipt" form.

7.4.6 Enter the container type, inventory numbers and/or serial numbers issued to a project into SWIFTS for tracking the container movements.

7.4 ISSUING WASTE CONTAINERS (cont.)

LOW LEVEL WASTE PACKAGING SUPPORT (LLWPS)

7.4.7 Contact Waste Operations (Transportation) to deliver requested container(s) to the project location and verify the delivery of the containers by obtaining a signature.

WASTE OPERATIONS (TRANSPORTATION)

7.4.8 Transport containers to the project location per Waste Technician instructions.

LOW LEVEL WASTE PACKAGING SUPPORT

7.4.9 Verify the delivery of the containers by obtaining the signature of the contact person from the "Fernald Site Container Request" form on the "Empty Container Receipt" form, and return the form to MC&A.

7.5 FILLING WASTE CONTAINERS

GENERATOR

7.5.1 Prepare and package containers(s) per PT-0005, "Packaging Low Level Radioactive Waste (LLRW) in Drums for Offsite Shipment to NTS or DOE-NV, or PT-0006, "Packaging Low-Level Radioactive Waste (LLRW) in ISO Containers for Shipment to NTS OR DOE-NV", or per PT-0007, "Packaging Low-Level Radioactive Waste (LLRW) in Metal Boxes for Shipment to NTS OR DOE-NV", or other established procedures, such as EW-0004, "Satellite Accumulation Areas for Hazardous Wastes".

QUALITY ASSURANCE

7.5.2 Audit container packaging per the procedures referenced in the previous step.

GENERATOR AND SUPERVISOR

NOTE: Only NVO-325, WCPP and W-65 card trained personnel can sign the W-65 card.

7.5.3 Once a container is filled, complete and sign the "Item Production/Certification/Identification Card (Attachment E).

7.5 FILLING WASTE CONTAINERS (cont.)

MATERIALS CONTROL & ACCOUNTABILITY

7.5.4 When a completed W-65 card is received, verify that it has been signed, and enter the card information into SWIFTS.

7.6 MOVING WASTE CONTAINERS TO A NEW LOCATION OR STORAGE

NOTE: Containers moved from an area of higher radiological control to an area of lower radiological control must be surveyed by a Radiological Control Technician.

GENERATOR

7.6.1 Contact Waste Operations Support to obtain the location of the best available hard surface for storage purposes.

7.6.2 Contact Low Level Waste Scheduling for shipment of waste.

7.6.3 Notify MC&A for movement of container(s) to a new location.

MATERIALS CONTROL & ACCOUNTABILITY

7.6.4 Complete and sign a "Nuclear Material Transfer/Receipt/Identification" (W-68/69) card (Attachment F) to document container(s) movement to a new holding location or storage location.

GENERATOR

7.6.5 Sign the W-68/69 card and notify Waste Operations (Transportation) that a container(s) requires transfer to the location designated on the card.

MATERIAL CONTROL & ACCOUNTABILITY

7.6.6 Verify the movement of container(s) from one location to another as specified on the W-68/69 card.

WASTE OPERATIONS (TRANSPORTATION)

7.6.7 Move container(s) to designated location and sign W-68/69 card.

7.6 MOVING WASTE CONTAINERS TO A NEW LOCATION OR STORAGE (cont.)

WASTE OPERATIONS SUPPORT

7.6.8 When containers are received into area, sign W-68/69 card.

MATERIALS CONTROL & ACCOUNTABILITY

7.6.9 Verify the receipt of the container(s) and record the storage location in SWIFTS.

7.7 SHIPPING CONTAINERS OFFSITE

LOW LEVEL WASTE PACKAGING

7.7.1 Prepare containers for offsite shipment and complete shipping documentation per SOP 50-C-111, "Traffic Documentation for Shipment for Shipment of Low Level Radioactive Waste (LLRW) to the Nevada Test Site (NTS)".

WASTE CERTIFICATION

7.7.2 Verify container(s) are ready for shipment offsite per SOP QP-12.07, "Certification of Waste Package Examination and Sealing for Off-Site Shipment."

8.0 DRIVERS

8.1 DOE Order 5480.2A, "Handling, Storage and Disposal of Low Level Radioactive Waste"

9.0 DEFINITIONS

9.1 Container Distribution Facility (CDF) - The CDF is a pad northeast of the RIMIA building. The CDF is used to receive and store empty containers prior to issuance to a project.

9.2 International Standards Organization Containers (ISO) - Containers (previously identified by a trade name, "Sea/Land Containers") utilized for bulk shipment of wastes.

9.3 Sitewide Information Forecasting and Tracking System (SWIFTS) - SWIFTS is a multi-user, waste management database system that allows FERMCO employees to obtain all necessary information concerning sitewide waste quickly and accurately.

9.4 Waste - Material or equipment generated during remediation, construction, demolition, or maintenance activity that is unusable for the project.

9.0 **DEFINITIONS** (cont.)

Waste Container - Any container in which waste is placed for future treatment, storage or disposal.

Waste Generator - Individual or organization who generates and/or packages waste.

ATTACHMENT A

PROHIBITED MATERIALS LIST

NTS Waste Stream -- ONLO-00000007
"Contaminated Trash"

Allowed Items	Restrictions
Certain Batteries	No Lead-Acid (vehicle) or Ni-Cad (rechargeable)
Empty Cans	No Prohibited Item Resi.
Metal	Less than 2 ft. in length. Free from grease, oil, residues, lead-based paint.
Paper/Cardboard	
Personal Protective Equipment (Anti-C's, Boots, Gloves, Tyvek)	Unless specifically restricted by Work Plan
Plasti:	
Rope, Twine, String	
Styrofoam, Rubber	
Wood	Less than 2 ft. in length. Free from creosote, residue, stains, lead-based paint.

Dumpster Usage Instructions:
1. All trash MUST be marked with the building or area or origin.
2. All trash MUST be placed inside the dumpster (except green-bagged Office Trash).

Prohibited Items	Examples	Where to Go	Who to Contact
Asbestos Containing Material	Transite, Pipe Insulation, Floor Tile	—	Leigh Fisher, 738-8638
Batteries	Auto, Ni-Cad Rechargeable	Plant 6	Susan Hoskins, 738-6826
Compressed Gases and Aerosol Cans (unpunctured)	Spray Paint, Deodorant Cans, Spray Disinfectant Cleaner, WD-40, Propane	Plant 1	Sam Laupoia, 738-6052
Glass	Bottles, Jars, Light bulbs	Plant 1	Sam Laupoia, 738-6052
Lead-bearing Material	Lead metal, Pipe dope, Lead flashing, Oil filters	Satellite Accum. Areas	John Grace, 738-8524
Liquids	Water, Coffee, Ice, Pop	Sink	—
Mercury-bearing Material	Switches, Vacuum Pumps	Satellite Accum. Areas	John Grace, 738-8524
Particulates (unbagged)	Ashes, Dust, Pad Sweepings	—	Chris Gilbert, 738-6428
Solvents and Soaked Rags	Kerosene, Toluene, Acerone	Satellite Accum. Areas	John Grace, 738-8524
UNCONTAMINATED TRASH	Office Trash, Paper, Non-radioactive trash	—	Chuck Menche, 738-6428
Wood	Pallets, 2x4's, Lumber	Plant 1	Lori Hurst, 738-8448

If you have any question, please call Waste Generation Control - 738-8444

ATTACHMENT B

CONTAINER WEIGHT LIMITS

DRUM SIZE	TARE WEIGHT	MAXIMUM GROSS WEIGHT
30 gallon	~ 30 pounds	700 pounds
55 gallon	~ 50 pounds	882 pounds
85 gallon	~ 78 pounds	882 pounds

CONTAINER DESIGNATION	NOMINAL EXTERIOR DIMENSIONS (HxWxL)	TARE WEIGHT	MAXIMUM GROSS WEIGHT
Large Metal Box (top loading)	~8'x 8'x 20'	~7,050 pounds	42,000 pounds
ISO Container (end loading)	~8'x 8.5'x 20'	~5,140 pounds	42,000 pounds
White Metal Box	~3.5'x 4.5'x 6.5'	~1,000 pounds	8,000 pounds

ATTACHMENT C

FERNALD SITE CONTAINER REQUEST FORM

REQUESTED BY:	PHONE NUMBER:	MAIL STOP:	BADGE NUMBER:

PROJECT:

REQUEST DATE:	COST ACCOUNT NUMBER:

CONTAINER TYPE

ISO	LWMB	SWMB	30 GAL DRUM	55 GAL DRUM	85 GAL DRUM	110 GAL DRUM	ROLL-OFF

QUANTITY REQUESTED

TO BE SHIPPED TO NTS? ☐ YES ☐ NO | FOR ONSITE STORAGE? ☐ YES ☐ NO

LOCATION FOR DELIVERY:

CONTACT NAME:	PHONE:	RADIO:

DELIVERY DATE REQUIRED?	MEF NUMBER:

MATERIAL DESCRIPTION/PWID

DELIVERY DATE	QUANTITY	DELIVERY DATE	QUANTITY

SIGNATURES REQUIRED

CONTROL ACCOUNT MANAGER (REQUIRED)	DATE:

COMMENTS:

ATTACHMENT D

EMPTY CONTAINER RECEIPT FORM

Requisition #_____ **Project #**_____

LLW Packaging Support (signature) _____ **Date**_____

INVENTORY # [1]	TYPE	INVENTORY #	TYPE

Total_____

[1] If a series of numbers, list the first to last numbers

Contact Signature (as receipt)_____ Date_____

FS-F-4120 (03/10/95)

ATTACHMENT E

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION (W-65) CARD

CARD 65-1 **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION** INV. NO.:

P.O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE	SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.

SEAL NUMBER	SEAL DATE			PACKAGE PHYSICAL CERTIFICATION			PLANT	PROD. MBA	MIX NO
	MONTH	DAY	YEAR		YES	NO			
				EMPTY CONTAINER AT START			DCAS	SURV. NO.	GROSS WEIGHT
WASTE DESCRIPTION AND COMMENTS				RUST HOLES OR DENTS					
				MATERIAL IS AS CODED					
PACKAGE TYPE				PROHIBITED MATERIALS					
PACKAGE SIZE				LIQUIDS IN CONTAINER					TARE WEIGHT
PROJECT				MINIMUM OF VOID SPACE					
				PACKAGE SECURED					
				DRAIN PLUG SECURED					
				OVERPACK					NET WEIGHT
				REPACK					

GENERATOR SIGNATURE SUPERVISOR SIGNATURE DATE

FS-F-1966-1 (REV.11/20/92)

ATTACHMENT F

NUCLEAR MATERIAL TRANSFER/RECEIPT/IDENTIFICATION (W-68/69) CARD

NUCLEAR MATERIAL TRANSFER RECORD

CARD	
PL.	NO.
	68

NEGATIVE	DATE TRANSFERED			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.
	MO.	DAY	YEAR			

P.O. NO.	SOURCE:
MATERIAL CLASS.	MATERIALS 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:

(SHIPPER) (TRANSPORTATION) (RECEIVER)

FS-F-1990 REV. 3/23/95 FBL)

CONTROL NUMBER -0943

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMEDIATION SUPPORT OPERATIONS DOCUMENT SYSTEM	Page 1 of 5 Revision No. 0 Revision Date: N/A

REMEDIATION SUPPORT OPERATIONS PROCEDURE	**Timely Order to Operators (Ref. DOE Order 5480.19 Chap. 15)**	**D10-20-015** **ADMINISTRATIVE PROCEDURE**

(Signature on File) Authorization: J.L. Trujillo, RSO Management Programs Manager	Supersedes: D10-20-015 Dated: 12-12-94	Issue Date: 04-13-95

NON-CONTROLLED COP

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1.0 **PURPOSE**

1.1 This procedure provides a means for Operations management to disseminate essential short-term information and administrative instructions to appropriate personnel. Other means of disseminating guidance to Operators are addressed in D10-20-014, "Required Reading", and D10-20-016, "Operations Procedures".

2.0 **SCOPE**

2.1 This procedure provides a means of transmitting daily management direction to appropriate personnel and a method of periodic review to remove outdated information.

3.0 **APPLICABLE DOCUMENTS**

3.1 Source Documents

3.1.1 DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities"

3.1.2 DOE-STD-1034-93, "Guide to Good Practices for Timely Orders to Operators"

3.1.3 D10-00-020, "Remediation Support Operations Division Document System"

3.2 Reference Documents

None

4.0 **DEFINITIONS**

4.1 Cognizant Manager - The individual having authority and responsibility for control of a facility, process, or other project.

4.2 Daily Orders - Orders whose information is relevant to that day's (or two days) operations.

4.3 Long-Term Orders - Orders whose information is relevant to several days', weeks', or months' operations.

4.4 Non-routine Operations - Special, short-term, or one-of-a-kind activities that are not performed as part of a normal routine.

4.5 Operator Orders Book - A binder or logbook containing the current Operator Orders.

5.0 **RESPONSIBILITIES**

5.1 **Facility Owner/Managers** are responsible for issuing Timely Orders to Operators. This responsibility may be delegated to an appropriate level of management.

5.2 **Shift Supervisors** are responsible for reading and complying with Operato Orders issued and ensuring that Operators under their cognizance read, understand, and comply with Operator Orders.

5.0 **RESPONSIBILITIES** (cont.)

5.3 Operators are responsible for reading and complying with Operator Orders issued by their Managers.

6.0 **GENERAL**

6.1 Warnings, Cautions, and Notes shall precede the Section, Sub-Section, Item, Step, or Sub-Step to which they apply.

6.2 The changing needs and requirements of facility operations at the FEMP necessitate that a program be implemented to disseminate information to Operations personnel in a timely manner. To ensure that this information remains current, periodic reviews to remove outdated information is included in this program.

7.0 **PROCEDURE**

7.1 Content

7.1.1 Timely Operator Orders shall be issued by the Cognizant Facility Owners/Managers or their designees, whenever necessary to communicate with shift personnel. Information such as special operations, administrative directions, special data-collection requirements, plotting process parameters, work priorities, announcements of policy information, and other similar short-term matters may be included.

7.1.2 The information in Operator Orders shall not conflict with or change procedures, however they may be used to notify personnel of a procedure change or revision, or issuance of a new procedure.

7.2 Format

7.2.1 Operator Orders should be clearly written and dated. They should include the length of time the order is to be applicable or a cancellation. Provisions should be made to document review by appropriate personnel.

7.2.2 Operator Orders may be written in a bound logbook or on looseleaf forms as appropriate, or may be in the form of a posted notice.

7.3 Issuing, Segregating, and Reviewing Orders

7.3.1 Shift Orders should be segregated into Daily and Long-Term Orders to facilitate review by shift personnel. Daily Orders that are postponed or prolonged should have a daily review or updates until complete. Reviews of long-term orders may not be required on a daily basis but should be made periodically and when changes occur.

7.3.2 Appropriate Operations personnel should review the orders early in the shift and document their review by initialing the log or notebook sheet.

7.0 **PROCEDURE** (cont.)

7.4 Removal of Orders

7.4.1 Orders that are no longer applicable or are outdated should be promptly removed or cancelled. The Operations Supervisor should periodically review the Operator Orders to ensure that only applicable and current orders remain in effect.

-6943

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
12-12-94	0	Procedure requirement for Timely Order to Operators per Request No. P94-0574, initiated by Joel Bradburne.
04-13-95	0	Reissued to conform to current program requirements per Request No. P95-0109, initiated by J. Bradburne.

-6943

CONTROL NUMBER: FER-0018
SITE PROCEDURE: RP-0003 (SSOP-0086)
REVISION NO. 1

PERFORMING PERSONNEL MONITORING

Effective Date: 10/14/94

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: Stuart L. Hinnefeld 3/17/95
Stuart L. Hinnefeld, FAM, Radiological Protection — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

-6943

CONTROL NO: FER-0018
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0086
REVISION NO. 1

PERFORMING PERSONNEL MONITORING

NON-CONTROLLED COPY

SSOP-0086

Effective Date: 10-14-94

AUTHORIZED BY: _____ 5 Oct 94
D. Ofte, President — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corp.
P.O. Box 538704
Cincinnati, Ohio 45253-8704

000448

Fernald Environmental FERMCO Restoration Management Corporation	Title: PERFORMING PERSONNEL MONITORING
	DOCUMENT NO: SSOP-0086 REVISION NO: 1
	Effective Date: 10-14-94 — Page 1 of 11

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ATTACHMENT	TITLE	PAGE
A	PCM-1B USER INSTRUCTIONS	A-1
B	FRISKING INSTRUCTIONS	B-1
C	HAND AND FOOT MONITOR USER INSTRUCTIONS	C-1
D	BERTHOLD CONTAMINATION MONITOR USER INSTRUCTIONS	D-1

Fernald Environmental FERMCO Restoration Management Corporation	Title: **PERFORMING PERSONNEL MONITORING**	
	DOCUMENT NO: SSOP-0086 REVISION NO: 1	
	Effective Date: 10-14-94	Page 2 of 11

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
04-08-93	0	Procedure required to establish personnel monitoring procedures per Request No. S92-185, initiated by K. H. Arp.
10-14-94	1	Major revision to procedure per Request No. S94-084, initiated by R. Daniels. This document supersedes SSOP-0086, dated 04-08-93, Rev. 0.

Fernald Environmental FERMCO Restoration Management Corporation	Title: PERFORMING PERSONNEL MONITORING	
	DOCUMENT NO: SSOP-0086 REVISION NO: 1	
	Effective Date: 10-14-94	Page 3 of 11

1.0 PURPOSE

This procedure provides instruction on methods and actions to be taken by personnel who monitor themselves upon exiting any radiologically controlled area at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure applies to all individuals who require access to, and are trained for entry into controlled areas that require monitoring upon exit.

3.0 DEFINITIONS

Berthold Contamination Monitor (BCM) - A hand and foot monitor made by Berthold, calibrated to detect alpha and/or beta radiation. In addition to the hand and foot monitoring capabilities, the Berthold Contamination Monitor is equipped with a hand-held frisker probe to provide whole-body monitoring capability as needed.

Frisker - A portable contamination monitor consisting of a rate-meter and a hand-held detector. These instruments are capable of detecting either alpha or beta-gamma radiation, depending on calibration.

HFM - A hand and foot monitor made by Eberline, capable of detecting alpha and beta-gamma contamination.

LED - Light Emitting Diode.

Monitoring - A technique used to check, regulate, or control potential contamination.

PCM-1B - A micro-processor based radiation detection system manufactured by Eberline, that provides a quick whole body indication of radioactive contamination on personnel.

Pictogram - A schematic illustration showing the exact position of the 14 channels by means of a LED (light emitting diode).

4.0 RESPONSIBILITIES

Manager(s) of personnel required to perform monitoring per this procedure shall ensure that affected personnel complete Radiological Worker I training, or are escorted by a Radiological Worker prior to performing this procedure.

Radiological Control Department

- Properly post all radiological personnel monitoring areas or stations.
- Properly remove or place out of service faulty instrumentation.
- Immediately respond to potentially contaminated personnel.
- Calibrate and maintain all radiological monitoring instruments.

All Personnel obey all radiological postings and perform personnel monitoring in accordance with established procedure.

5.0 GENERAL

Personnel monitoring is required as directed by the Radiological Work Permit or the Radiological Control Organization. Monitoring requirements shall be posted at the egress point for each specific radiologically controlled area. At a minimum, personnel whole-body monitoring is required under the following conditions:

a. Immediately upon exiting contamination, high contamination, or airborne areas.

b. Immediately upon entering an uncontrolled area after exiting the Radiologically Controlled Area.

Hand and foot monitoring, at a minimum, is required under the following conditions:

a. Entering designated break areas within the controlled area boundary.

b. Immediately upon exiting Radiological Buffer Areas.

Personnel frisking can be accomplished using a beta-gamma frisker, alpha frisker, or the Berthold beta frisker (probe) attached to the Berthold Contamination Monitor. The beta-gamma frisker and Berthold probe must be held within 1/2 inch from the surface being frisked and moved along the surface at about 2-3 inches per second. The alpha frisker must be held within 1/4 inch of the surface being frisked and moved along the surface at about 1 inch per second. PCM-1Bs, HFMs, and BCMs provide automated personnel monitoring.

5.0 **GENERAL** (cont.)

Limited hand-carried items (notebooks, papers) may be frisked by exiting personnel at Control Point exits using the methods described in Section 7.2 of this procedure. Refer to U.S. Department of Energy RADIOLOGICAL CONTROL MANUAL, Section 338, "Monitoring for Personnel Contamination."

Monitoring instructions for operating personnel monitoring equipment shall be posted at all personnel monitoring stations. Instructions shall include phone and radio numbers needed to contact Radiological Control in the event of equipment failure or indication of personnel contamination. Examples of monitoring instructions are provided in Attachments A, B, C, and D of this document.

6.0 **PREREQUISITES**

6.1 **Environmental Safety and Health Requirements**

All personnel shall observe and obey all radiological postings and perform monitoring in accordance with training and applicable procedures.

6.2 **Personnel Requirements**

All site personnel who require access to radiologically controlled areas, or areas in which personnel radiological monitoring is required, shall be trained on the use of radiation monitoring equipment.

7.0 **PROCEDURE**

7.1 PCM-1B WHOLE BODY MONITORING

PERSONNEL

1. Observe monitor to ensure that there are no trouble or alarm lights on (display will read "Out of Service").

> **CAUTION**
>
> **DO NOT PLACE ITEMS WHICH MAY PUNCTURE THE PROBES ON THE MONITOR (i.e., HIGH-HEEL SHOES).**

2. Step into the monitor, right side first.

7.1 PCM-1B WHOLE BODY MONITORING (cont.)

3. Place right foot on foot panel and up against the back edge, to ensure that the light beam for the foot is broken.

4. Insert the right arm deeply into the arm receptacle to ensure that the light beam for the arm is broken.

5. Press the red button (located on the left exterior detector column) with the left hand and maintain pressure to initiate counting. The display will read **"COUNTING RIGHT SIDE"** and the red LED in the left detector column will begin flashing. If no alarm levels are detected, the unit beeps and the display reads **"RIGHT SIDE OK -- INSERT LEFT ARM"**. At this time the LED in the right detector column starts flashing, and the left side LED extinguishes.

   NOTE: Premature arm withdrawal causes the alarm tone to sound and cause the message **"COUNT INCOMPLETE **RECOUNT**"** to be displayed. Reinsertion restarts the count.

   NOTE: Contamination in excess of alarm levels is signaled at the end of right or left side counting, or both, as appropriate, by the alarm sonalert and display messages : i.e., **"ALARM: ZONE 1 - ZONE 2 - ZONE 3,"** etc.

   NOTE: After the alarms have been displayed for the specified alarm hold time, the message **"CONTAMINATED -- PLEASE STEP OUT"** appears.

6. Step into monitor with the left side.

7. Place left foot on foot panel, ensure that the light beam for the foot is broken. The red LED in the right detector panel will be flashing.

8. Insert the left arm deeply into the arm receptacle to properly engage it and ensure that the light beam for the arm is broken.

PERSONNEL

9. Press the red button (located on the opposite side of the panel facing the user) with the right hand and maintain pressure to initiate counting. The display will read **"COUNTING LEFT SIDE"**. At the end of the counting time the unit displays **"COUNT COMPLETE, YOU MAY PASS"**, accompanied by a chime if no alarms are triggered. At this time the red LED extinguishes.

7.1 PCM-1B WHOLE BODY MONITORING (cont.)

a. If the alarm sounds, reenter the PCM-1B for a second whole-body count after the unit completes the "Mandatory Background Count" and goes into the "Counting Background" mode.

NOTE: The PCM-1B will force a mandatory background count immediately after an alarm.

b. Contact Radiological Control at the phone number designated on the monitor if the monitor alarms during or after the second count.

7.2 FRISKING

PERSONNEL

1. Be sure the frisker is turned on, the audio is turned on (is audible), and the scale is set on "X1".

2. Ensure calibration is current by noting the "calibration due" date on the affixed sticker. The sticker date should be no less than the current date.

3. Ensure source check is current and initialed on the Source Check sticker.

4. Check the background counts per minute (CPM).

   a. **IF** background exceeds the value specified on the posted frisking instructions for the meter in use (Attachment B), **THEN** do not use the instrument and contact Radiological Control.

   b. If it is acceptable, proceed to step 5.

5. Frisk hands using detector before touching the probe.

6. Pick up the probe with the frisked hand and proceed with frisking.

   a. Hold probe over the area to be scanned at the distance specified on the posted frisking instructions.

   b. Scan at the specified rate.

7. Watch meter and listen for audible response.

   a. **IF** the frisker indicates an audible or scalar increase in count rate, **THEN** hold the frisker in place over the suspect area for a minimum of 15 seconds to verify an actual increase versus fluctuation in background.

   b. **IF** the frisker alarms or the count rate exceeds the limit stated in the frisking instructions for that station, **THEN** contact Radiological Control.

7.2 FRISKING (cont.)

8. Complete monitoring and return probe, facing up, so the next individual may frisk his/her hand before touching the probe.

   NOTE: Friskers shall also be used for all hand-held personal items. If a Hand and Foot or Contamination Monitor is not available, a frisker can be used to monitor the hands and feet. If a Personnel Monitor is not available, a frisker can be used for whole-body monitoring.

7.3 HAND AND FOOT MONITORING (Eberline HFM)

PERSONNEL

1. Check the monitor to ensure it is in proper working condition and is not in alarm (the display message should alternate between **"READY FOR NEXT"** and **"COUNTING BACKGROUND"** every few seconds).

> **CAUTION**
>
> **DO NOT PLACE ITEMS WHICH MAY PUNCTURE THE PROBES ON THE MONITOR (i.e., HIGH-HEEL SHOES).**

2. Step on the foot probes of the monitor. Feet should be centered directly over the probes.

3. Insert hands into the slots in the front of the monitor. Press down with both hands. (The display will read **"COUNTING"**)

4. Continue pressing hands down until count is complete. (The display will read **"COUNT COMPLETE...ALL OK...READY FOR NEXT"**)

   a. **IF** the monitor alarms or beeps and the display reads **"COUNT INCOMPLETE...RECOUNT"**, **THEN** place hands back into the monitor and press down again. Maintain pressure until the count is complete.

   b. **IF** the monitor alarms and the display indicates contamination is detected, proceed with a second attempt.

   c. **"DO NOT LEAVE AREA"** if the monitor alarms on the second attempt. Contact Radiological Control.

7.4 BERTHOLD CONTAMINATION MONITORING

PERSONNEL

1. Check the monitor to ensure it is in proper working condition.

   NOTE: The signal lamp located on top of the monitor must light up green, the display will show **"READY FOR USE!"** or another message such as:

   - **"Do not enter!"** indicates a background measurement is currently being measured. After 4 seconds the display will read **"READY FOR USE!"**.
   - **"Wait, background fluctuates"** indicates that the monitor is measuring the background radiation and is waiting for stable conditions. The following display will indicate either **"READY FOR USE!"** or **"Background too high"**.
   - **"Background too high"** indicates that the instrument is not ready for use; notify Radiological Control.
   - **"Probe Failure"** indicates that the instrument is not yet ready for use. If the display indicates **"Probe Failure"** along with pictogram diodes indicating a red light at a failed probe location(s), the instrument is not ready for use; contact Radiological Control.

2. Step on the monitor's pedestal, place feet in parallel position, making sure that the tips of shoes touch the stopper. Light beams for feet must be broken.

   NOTE: If feet are not in the proper position, the display shows: **"Position foot left"**, or **"Position foot right"**.

   NOTE: Once feet are in proper position, the display will read **"Ident. card?"**. An identification card is not required and this request can be ignored.

3. Insert hands into both boxes until fingertips touch the stopper, then press against the stopper.

   NOTE: The detectors for measuring the back-of-hands move toward the hands as soon as the fingertips press against the stopper.

4. Press against the stopper until the contact switches of both outer detectors touch hands and are switched on with an audible click. This initiates the measurement.

7.4 BERTHOLD CONTAMINATION MONITORING (cont.)

NOTE: Both feet must be in proper position before the hand monitors will begin to measure.

5. Stay in this position for entire measurement, so that the contact switches remain turned at all times. Otherwise the measurement will be stopped. If you release one or both hand contacts prematurely, an acoustic signal sounds, the measurement stops and the display shows the request **"Insert hands!"**.

   NOTE: The start of the measurement is indicated in the display by showing the time to be measured in seconds, **"Running 10"**. The end of the measurement is indicated by **"Running 0"** followed by the result **"not contaminated"**. (The diodes on the pictogram should be green.) Monitoring is then complete.

   NOTE: Green diode lights indicate **"not contaminated"**.

6. Contamination is first indicated by the contamination pictogram and then by an alarm signal. If the programmed beta limit value has been exceeded, the display will show **"Beta contamination"**. Contact Radiological Control.

   a. **Red** diode lights indicate **"contaminated"**.

   b. **Red flashing** diode indicate **"contaminated/channel with highest value"**.

7.5 BERTHOLD CONTAMINATION MONITOR FRISKER PROBE

PERSONNEL

1. Remove frisker from the hook to activate it for measurement.

   NOTE: The frisker probe is attached to a hook and enables one to check for radiation on clothing.

2. Hold the probe approximately 1/2 inch from the surface being monitored and move it along the surface at a rate of 2-3 inches per second.

   NOTE: An audible loudspeaker will discern counts.

   - Acoustic signal: short, crackling noises = beta counts

7.5 BERTHOLD CONTAMINATION MONITOR FRISKER PROBE (cont.)

NOTE: During the measurement the count rate of the beta radiation is continuously indicated in the display.

- Example: **"cps 0.1a 7b"**. (This indicates the new count rate in counts per second, **"cps"**, **"a"** alpha, **"b"** beta)

NOTE: The rate count is also indicated by a circular **"trend display"**. If the lights on the diodes travel clockwise (+), the rate is increasing. If the lights travel counter-clockwise (-), the rate is decreasing.

3. Continue monitoring suspect areas until completed or until alarm occurs.

4. Place frisker back on the monitor hook.

5. Contact Radiological Control if an audible alarm sounds.

NOTE: If radiation is detected above the preset alarm level thresholds, the audible alarm will sound and the display will indicate detectable levels of contamination.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE/EH 0256T, U.S. Department of Energy Radiological Control Manual

8.2 REFERENCES

- SP-P-35-025, Radiological Posting
- FEMP Radiation Worker Training, "Hands-on" Practicum
- Eberline Personnel Contamination Monitor Technical Manual, PCM-1B/Revision/March 1990.
- Eberline Hand and Foot Monitor Technical Manual, Model HM-6/HFM-6, 2564A/Revision/November 1984.
- EG&G Berthold OPERATING MANUAL, CONTAMINATION MONITOR LB 1043 AS, January 29, 1990, 3rd Edition.

PCM-1B User Instructions

1. Face unit, read display, and ensure that there are no trouble or alarm lights on. Display would read **"OUT-OF-SERVICE"**. If there are no trouble or alarm lights, the display will read **"STEP-UP -- INSERT RIGHT ARM"**.

2. Step into the monitor, right side first, then:

   a. Place right foot on right foot panel, ensuring that the light beam for that foot is broken.

   b. Insert the right arm into the arm receptacle and ensure that the beam for the arm is broken.

   c. Press the red button (located on the left exterior of the detector column, opposite side of the panel which the user is now facing) with left hand to initiate counting. The display will read **"COUNTING RIGHT SIDE"**. If no alarm levels are detected, the unit will beep and the display will read **"RIGHT SIDE OK -- INSERT LEFT ARM"**. At this time the LED in the right detector column starts flashing , and the left side LED extinguishes.

3. Step into the monitor with the left side. Repeat steps 2a, 2b, and 2c using the left foot, left arm, and pressing the red button located on the right exterior detector column. If no alarm levels are detected the unit displays **"COUNT COMPLETE, YOU MAY PASS"**, accompanied by a chime.

4. If the unit alarms and the display reads **"CONTAMINATED"**, prior to completing both sides, continue the process until complete (through step 3). The unit will do a mandatory background count. Repeat steps 1 through 3. If the unit alarms on the second attempt, contact Radiological Control.

DO NOT LEAVE THE IMMEDIATE AREA!

RADIOLOGICAL CONTROL TECHNICIANS CAN BE CONTACTED AT:

TELEPHONE EXTENSION: _____

RADIO: _____

000460

ATTACHMENT B

FRISKING INSTRUCTIONS

1. Be sure the frisker is turned on, the audio is turned on (is audible) and the scale is set on "X1".

2. Check the background (CPM). If background exceeds ___ CPM, do not use instrument and contact Radiological Control.

3. Frisk hands before touching the probe. Hold probe within ___ inch(es) of surface being frisked, and scan at a rate of ___ inch(es) per second.

4. Watch meter and listen to audible response. If the frisker alarms or indicates an audible or scalar increase in count rate, hold the frisker in place (15 seconds for an Alpha frisker) to verify an actual increase versus fluctuation in background.

5. Complete monitoring and return probe, facing up, so the next individual may frisk his/her hand before touching the probe.

6. If the meter alarms or indicates a reading greater than _____ CPM above background, contact Radiological Control.

DO NOT LEAVE THE IMMEDIATE AREA!

RADIOLOGICAL CONTROL TECHNICIANS CAN BE CONTACTED AT:

TELEPHONE EXTENSION: _____

RADIO: _____

HAND AND FOOT MONITOR USER INSTRUCTIONS

1. Ensure that monitor is in proper working condition, is not in alarm, and the display alternates between **"READY FOR NEXT"** and **COUNTING BACKGROUND"**.

> **CAUTION**
>
> **DO NOT PLACE ITEMS WHICH MAY PUNCTURE THE PROBES ON THE MONITOR (i.e., HIGH-HEEL SHOES).**

2. Step on the monitor. Place each foot in the center of the foot probes.

3. Insert hands into the slots in the front of the monitor. Press down with both hands. The display will read **"COUNTING"**. Continue pressing hands down until the count is complete. The display will read **"COUNT COMPLETE ... ALL OK ... READY FOR NEXT"**.

4. If the monitor alarms or beeps and the display reads **"COUNT INCOMPLETE ... RECOUNT"**, place hands back into the monitor and press down again, maintaining pressure until the count is complete.

5. If the monitor alarms and states "...**CONTAMINATION**...", remonitor. If the monitor alarms on the second attempt, contact Radiological Control.

DO NOT LEAVE THE IMMEDIATE AREA!

RADIOLOGICAL CONTROL TECHNICIANS CAN BE CONTACTED AT:

TELEPHONE EXTENSION: _____

RADIO: _____

ATTACHMENT D

BERTHOLD CONTAMINATION MONITOR USER INSTRUCTIONS

1. Face Monitor and read display. The display should read **"READY FOR USE!"** and the signal lamp must light up green. If the display reads **"Background too high"** or **"Probe Failure"**, do not use the Monitor.

2. Place feet on Monitor foot pedestals as indicated on pedestal diagram. Position tips of shoes against the stopper in order to break the light beam. If display reads **"Position foot left"** or **"Position foot right"**, reposition foot. If feet are in proper position, the display will read **"Ident. card?"**. (An identification card is not required and can be ignored).

3. Insert hands into Monitor. Press fingertips against the stopper until contact switches of both outer detectors touch hands and are switched on with an audible click. This initiates measurement. If hands are removed before the measurement is complete, the display will read **"Insert hands"**.

   (One-hand Mode). Press the area labeled **"One-hand"** to enable a measurement using only one hand. Position feet and hand as indicated above. Continue with Step 4. Upon completion of the count the monitor automatically returns to the normal operation mode.

4. The display will indicate the time required for the measurement in seconds beginning with **"Running 10"** and ending with **"Running 0"**. When the count is complete, diodes will light up green and the display will show **"not contaminated"**.

5. Contamination is indicated by red diode light, an alarm, and a display reading of **"Beta contamination"**. If contamination is detected, repeat steps 1-4. If contamination is detected on the second attempt, contact Radiological Control. **DO NOT LEAVE THE IMMEDIATE AREA!**

BERTHOLD CONTAMINATION MONITOR FRISKER USE

1. Remove frisker from hook to activate it for measurement. Activation is indicated by a short, crackling noise (beta counts).

2. Hold frisker 1/2 inch from surface being frisked and move it along the surface about 1 inch per second.

3. The display panel will show a circular **"trend display"**. If the lights on the diode travel clockwise (+), the rate is increasing, if the lights travel counterclockwise (-), the rate is decreasing. An audible loudspeaker will indicate Beta counts.

4. The digital display will indicate the net count rate in counts per second (cps). For example, **"cps 0.1a 7b"** indicates: counts per second, 0.1 alpha, 7 beta. An audible alarm will sound if radiation is detected above the preset alarm level thresholds. If contamination is detected, repeat steps 1-3. If contamination is detected on the second attempt, contact Radiological Control. **DO NOT LEAVE THE IMMEDIATE AREA!**

RADIOLOGICAL CONTROL TECHNICIANS CAN BE CONTACTED AT:

TELEPHONE: _____
RADIO:

Control No. -6943

Document No. M-108
Issue Date: 01-16-95
Rev. No.: 0

NON-CONTROLLED COPY

SAFE SHUTDOWN PROGRAM MANAGER'S

STANDING ORDERS

Effective Date: 01-16-95

Authorized By: (Signature on File)
D. Klein, Safe Shutdown Program Manager

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT PROJECT
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
REMEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
04-11-94	0	Requirement for Project Manager's Standing Orders; Safe Shutdown Implementation per Request No. P94-0120, initiated by E. Henry.
01-16-95	0	Reissued to reflect changes to the Safe Shutdown Organization and Project Planning and Execution process per Request No. P94-0591, initiated by D. Klein.

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CHAPTER 1 - INTRODUCTION

1.1 Purpose

1.1.1 The purpose of this document is to provide direction to all Safe Shutdown personnel for the safe conduct of Safe Shutdown field activities. These Standing Orders specify requirements and guidelines which all Supervisors, Operators, Technicians and Craft workers shall follow in the execution of their Safe Shutdown duties and responsibilities.

1.1.2 These Standing Orders implement the performance standards promulgated in the Remediation Support Operations (RSO) Division Conduct of Operations Policy (D10-20-001) dated December 12, 1994. This policy directs compliance with the concepts and guidelines promulgated by Department of Energy (DOE) Order 5480.19, "Conduct of Operations Requirements for DOE Facilities (CONOPS)."

1.2 References

1.2.1 IM-6001, Safe Shutdown Program Planning and Implementation Manual

A. IM-6001 provides information for administering, planning, and managing the decommissioning and removal of material, equipment, and systems that are the responsibility of the Safe Shutdown Program. The manual contains a detailed list of site controlled procedures and documentation applicable to Safe Shutdown planning and implementation.

B. A Supervisor Directive is used to amplify the procedures in IM-6001. Safe Shutdown tasks are generally planned and executed so that the field activity required is limited in scope. If a more complex or high risk assignment is received that does not meet the scope of controlled site procedures, instructions, or directives, a Supervisor Directive using the procedures in Section 8.0 of these Standing Orders will be issued to provide the necessary guidance.

1.2.2 **Safe Shutdown Energy Isolation Procedure**

A. D10-05-001, Safe Shutdown Program Energy Isolation Procedure provides the requirements for isolating energy connected to and/or releasing energy contained within systems, equipment and utility connections while placing them in a safe shutdown configuration.

1.3 Applicability/Compliance

1.3.1 **All Safe Shutdown personnel** are responsible for fully complying with these Standing Orders. If at any time in the performance of their duties a conflict between these orders and other written or verbal direction is recognized or perceived, the Worker shall place his/her work place in a safe condition, stop work, and seek resolution of the conflict from the Safe Shutdown Program Manager or his assigned designee.

CHAPTER 1 - INTRODUCTION (cont.)

1.4 Safety Requirements

1.4.1 A Supervisor is required to stop work when safety requirements in a controlled site procedure, instruction or any directive are not fully implemented. He/she will notify his/her Supervisor of the unsafe condition and attempt to obtain a resolution or permission to proceed.

1.4.2 A Worker will not start or continue work that he/she understands is in conflict with approved site safety procedures, instructions or directives and/or work that he/she recognizes (or perceives to be) unsafe. He/she will notify his/her Supervisor of the unsafe condition and wait for a resolution or permission to proceed.

1.4.3 All Safe Shutdown Program safety issues shall be referred to the Safe Shutdown Field Activities Manager or his/her designee for resolution.

1.4.4 The Field Activities Manager will establish and supervise a program that conducts a weekly walkdown of each facility assigned to the Safe Shutdown Program. The purpose of these walkdowns is to look for general housekeeping and safety hazards. They will be conducted by Safe Shutdown Section Managers, Implementation and Operations Supervisors. Assignments will be made on a rotating basis by the Field Activities Manager.

1.4.5 The assigned Managers and Supervisors will generate a detailed list of deficient items they note during their walkdown. The lists will be forwarded to the **Field Activities Manager** who will maintain a record of the walkdown results. He will also be responsible for assigning action to correct deficiencies and for monitoring the effectiveness of the results.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION

NOTE: The Safe Shutdown Program is organized within the CRU3 and RSO Divisions. The following paragraphs describe (See Figure 1) each of the key positions in the Safe Shutdown organization.

2.1 Program Manager

2.1.1 The **Safe Shutdown Program Manager** is responsible for all aspects of the Safe Shutdown Project. He is responsible for the training, qualification and certification of Safe Shutdown personnel and their supervision during the execution of Safe Shutdown Field Activities in support of Removal Action 12.

2.1.2 The Safe Shutdown Program Manager reports directly to the CRU 3 Project Director and the Remediation Support Operations Division Vice President.

2.2 Project Controls Manager

2.2.1 The **Project Controls Manager** reports to the Program Manager. His/her duties and responsibilities are:

A. Supervising the members of the Project Control Team.

B. Developing and implementing project control procedures.

C. Coordinating and directing estimating, cost control, planning and scheduling for the Safe Shutdown Program.

D. Coordinating and exchanging information between engineering, construction, supervision and purchasing during the execution of Safe Shutdown goals.

E. Evaluating and preparing presentations on Safe Shutdown performance in comparison with budget and schedule.

2.3 Planner/Scheduler

2.3.1 The **Planner/Scheduler** reports to the Project Controls Manager. His/her duties and responsibilities are:

A. Efficiently using resources during Safe Shutdown planning. Prepares Safe Shutdown Program schedules.

B. Preparing schedule and cost analysis and reports for measuring Safe Shutdown performance and progress.

C. Assisting the Control Account Managers (CAMs) with variance analysis and corrective planning.

D. Assisting with the preparation of change proposals.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.4 Cost Analyst

2.4.1 The **Cost Analyst** reports to the Project Controls Manager. His/her duties and responsibilities are:

A. Preparing Performance Measurement Baselines (PBM).

B. Maintaining actual Safe Shutdown costs within current budget limits using cost controls.

C. Reporting on Safe Shutdown cost performance and progress.

D. Verifying the accuracy of costs charged to the Safe Shutdown Program.

E. Assisting Control Account Managers (CAMs) with variance analysis and corrective planning.

F. Assisting with the preparation of change proposals.

G. Maintaining estimates of completion forecasts.

2.5 Planning Manager

2.5.1 The **Planning Manager** reports to the Program Manager. His/her duties and responsibilities are:

A. Directing Safe Shutdown personnel in the development of Implementation Plans.

B. Providing independent verification of completed Task Implementation Plans.

C. Assisting the Program Manager in scheduling and prioritizing field activities.

D. Assuming the duties and responsibilities of the Program Manager in his absence, when designated.

2.6 Plan Writer

2.6.1 The **Plan Writer** reports to the Planning Manager. His/her duties and responsibilities are:

A. Preparing standard operating procedures and implementation plans in accordance with IM-6001, Safe Shutdown Program Planning and Implementation Manual.

B. Walking down process systems and equipment to determine safe and efficient methods of removing holdup material.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.6 Plan Writer (cont.)

C. Preparing field drawings in support of Implementation Plans.

D. Interfacing with Field Activities and Safety Department personnel to obtain more accurate plan inputs.

E. Coordinating and incorporating comments on Implementation Plans.

F. Routing Implementation Plans for approval.

2.7 Field Activities Manager

2.7.1 The **Field Activities Manager** reports to the Program Manager and is responsible for the overall supervision of Safe Shutdown field activities. His/her duties and responsibilities are:

A. Conducting task specific job briefings, lessons learned and qualifies personnel assigned to the task.

B. Ensuring that only qualified personnel are assigned to work the task.

C. Ensuring that all task/work orders for field activities are conducted in accordance with IM-6001, Safe Shutdown Program Planning and Implementation Manual and all applicable standard operating procedures.

D. Ensuring that implementation plans are prepared and released for work in a manner which allows schedules to be met.

E. Coordinating with the Planning Manager on all Safe Shutdown field activities.

F. Interfaces with other divisions, departments and sections concerning Safe Shutdown field activities.

G. Reviews and approves all implementation plans, briefings, lessons learned, and project checklists.

H. Assuming the duties and responsibilities of the Program Manager in his absence, when designated.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.8 Implementation Supervisor

2.8.1 The **Implementation Supervisor** reports to the Field Activities Manager. His/her duties and responsibilities are:

A. Conducting or attending task specific job and lessons learned briefings. Qualifies personnel assigned to the task and ensures that an adequate number of qualified personnel with the required disciplines are assigned to each task group conducting field activities.

B. Overseeing Operations Supervisors that conduct field activities and resolves day-to-day conflicts with personnel, supplies, and equipment.

C. Performing the administrative functions for hourly personnel assigned to Safe Shutdown task teams.

D. Assisting the Field Activities Manager in scheduling and prioritizing field activities.

E. Stopping work and notifying the Field Activities Manager when work instructions require clarification, or when unexpected/unsafe conditions are encountered at the work site.

F. Assisting the Operations Supervisors with the presentation of task specific job briefings and lessons learned.

G. Reviewing all implementation plans.

H. Ensuring that the requirements of implementation plans and standard operating procedures are followed.

I. Ensuring that field activities are safely completed.

J. Reporting daily on the status of field activities to the Field Activities Manager.

K. Completing basic supervisor qualifications as directed by the Program Manager.

L. Assuming the responsibilities and duties of the Safe Shutdown Field Activities Manager in his absence, when designated.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.9 Operations Supervisor

2.9.1 The **Operations Supervisor** reports to the Implementation Supervisor. His/her duties and responsibilities are:

A. Assembling implementation plans and obtains the required approval signatures.

B. Tracking and reporting status of the implementation plan preparations and all related maintenance work orders.

C. Completing basic Supervisor qualifications as directed by the Program Manager.

D. Assisting in executing the detailed plans for implementing tasks under the supervision of the Implementation Supervisor.

E. Participating as a member of the Health and Safety Team in the preparation of job safety analyses for implementation plans.

F. Conducting task specific job briefings and lessons learned. Qualifies personnel and insures that only qualified personnel are assigned to work tasks.

G. Supervising field activities and insures that all work is performed in accordance with approved implementation plans.

H. Making entries into the Implementation Supervisor's Daily Log.

I. Stopping work activities and notifying the Implementation Supervisor when work instructions require clarification, or when unexpected or unsafe conditions are encountered at the work site.

J. Managing all equipment and sensitive property issued for performing a task and for returning the items to storage at the conclusion of the task.

K. Resolving day-to-day conflicts with personnel, supplies, and equipment.

L. When designated by the Field Activities Manager, responsible for assuming the duties and responsibilities of the Implementation Supervisor.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.10 Operator

2.10.1 **Operators** are matrixed to the Safe Shutdown Implementation Supervisor as dedicated workers. The **Operator** reports to the Operations Supervisor. His/her duties and responsibilities are:

A. Completing Safe Shutdown core and task specific training specified by the Program Manager.

B. Completing the specific project qualifications specified by the Program Manager.

C. Performing all tasks assigned by the Implementation/Operations Supervisors necessary to complete work in accordance with Safe Shutdown task/work orders.

D. Complying with all standard operating procedures and work permits for tasks assigned in the implementation plans.

G. Obtaining permission from the Operations Supervisor prior to leaving the job site area.

F. Immediately reporting any procedural conflicts, unplanned circumstances affecting the performance of assigned tasks, unsafe conditions, and/or abnormal job site or work conditions to his/her immediate Supervisor.

2.11 Utility Disconnect Supervisor

2.11.1 The **Utility Disconnect Supervisor** reports to the Field Activities Manager. His/her duties and responsibilities are:

A. Completing basic supervisor qualification as directed by the Program Manager.

B. Ensuring that an adequate number of qualified crafts personnel are assigned to each group conducting field activities.

C. Overseeing maintenance personnel conducting field activities.

D. Resolving day-to-day conflicts with personnel, supplies, and equipment.

E. Performing the administrative functions for personnel assigned to Safe Shutdown Task Teams.

F. Ensuring maintenance activities are conducted in accordance with implementation plans and any other applicable documents.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.11 Utility Disconnect Supervisor (cont.)

G. Stopping work activities and notifies the Implementation Supervisor when unexpected conditions are encountered, or when it is necessary to clarify a work instruction.

H. Scheduling and tracking all Safe Shutdown utility disconnections.

2.12 Maintenance Worker

2.12.1 **Maintenance Craft personnel** are matrixed to the Safe Shutdown program as Maintenance Workers. The **Maintenance Worker** reports to the Utility Disconnect Supervisor. His/her duties and responsibilities are:

A. Completing basic maintenance qualification as directed by the Maintenance Section Manager.

B. Completing the Safe Shutdown Core and Task Specific Training specified by the Project Manager.

C. Completing specific project qualifications as designated by the Project Manager.

D. Completing all tasks assigned by the Utility Disconnect Supervisor necessary to complete work directed by the Project Manager.

E. Complying with procedures, maintenance work orders, maintenance work instructions, and work permits for tasks assigned in the implementation plans.

F. Obtaining permission from the Utility Disconnect Supervisor prior to leaving the job site area.

G. Immediately reporting any procedural conflicts, unplanned circumstances affecting the performance of assigned tasks, unsafe conditions, and/or abnormal job site or work conditions to the Utility Disconnect Supervisor.

2.13 Technical Manager

2.13.1 The **Technical Manager** reports to the Program Manager. His/her duties and responsibilities are:

A. Developing, adapting, or modifying methods for the removal of holdup material and the performance of gross decontamination.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.13 Technical Manager (cont.)

B. Serving as the primary interface with the Environmental, Safety and Health Division. Directs the activities of radiological control personnel in the development or selection of engineering controls in support of the Safe Shutdown field activities. Integrates radiological control strategies into the assessment and planning of future Safe Shutdown field activities.

C. Coordinating and prioritizing the preparation of Job Safety Analysis (JSA) using SSOP-1063, Conducting a Job and Task Analysis. Serves as the liaison with identified support divisions to obtain approval signatures certifying that JSAs meet personnel, environmental and technical safety standards.

D. Developing and supervising the non-destructive assay system for assessing qualitative and quantitative data on hold material.

E. Ensuring that the Safe Shutdown Program conforms to applicable regulatory standards.

F. Assuming the duties and responsibilities of the Program Manager in his absence, when designated.

2.14 Decommissioning Engineer

2.14.1 The **Decommissioning Engineer** reports to the Technical Manager. His/her duties and responsibilities are:

A. Reviewing all Safe Shutdown work and task orders to insure they are executed in the safest and least cost manner.

B. Locating and reviewing site drawings in support of decommissioning efforts.

C. Assessing work practices used for utility disconnects and addresses discrepancies in drawings and other information used to support the location of utility piping and wiring.

2.15 Non-Destruct Assay (NDA) Engineer

2.15.1 The **Non-Destruct Assay Engineer** reports to the Technical Manager. His/her duties and responsibilities are:

A. Coordinating the Non-Destruct Assay (NDA) Program and assessing the qualitative and quantitative parameters associated with holdup material.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

2.15 Non-Destruct Assay (NDA) Engineer (cont.)

B. Selecting and purchasing assay equipment, and supervising the selection of assay sites, setup of assay equipment and determination of holdup locations within former process equipment.

C. Performing data reduction and assessment and prepares NDA reports.

2.16 Material and Equipment Disposition Manager

2.16.1 The **Material and Equipment Disposition Manager** reports to the Program Manager. His/her duties and responsibilities are:

A. Verifying material characterizations and maintains compliance.

B. Preparing excess government property forms.

C. Identifying and negotiating terms, conditions and schedule for transfer of material and equipment to internal and external sources in the government and private sector.

D. Developing plans and schedules for material packaging and equipment removal.

E. Providing technical support for scheduling, handling and transportation of material and equipment.

F. Generating task orders for the Planning Manager and work orders for the Field Activities Manager.

G. Maintaining the material and equipment data base.

H. Developing and updating Safe Shutdown engineering drawings.

I. Assuming the duties and responsibilities of the Program Manager in his absence, when designated.

2.17 Support Manager

2.17.1 The **Support Manager** reports to the Program Manager. His/her duties and responsibilities are:

A. Reviewing revisions to the core standard operating procedures and revises the associated lesson plans.

B. Coordinating scheduling and tracks the status of core training conducted by the Training Department.

C. Initiating necessary changes to the Safe Shutdown Core Training Program.

CHAPTER 2 - ORGANIZATION AND ADMINISTRATION (cont.)

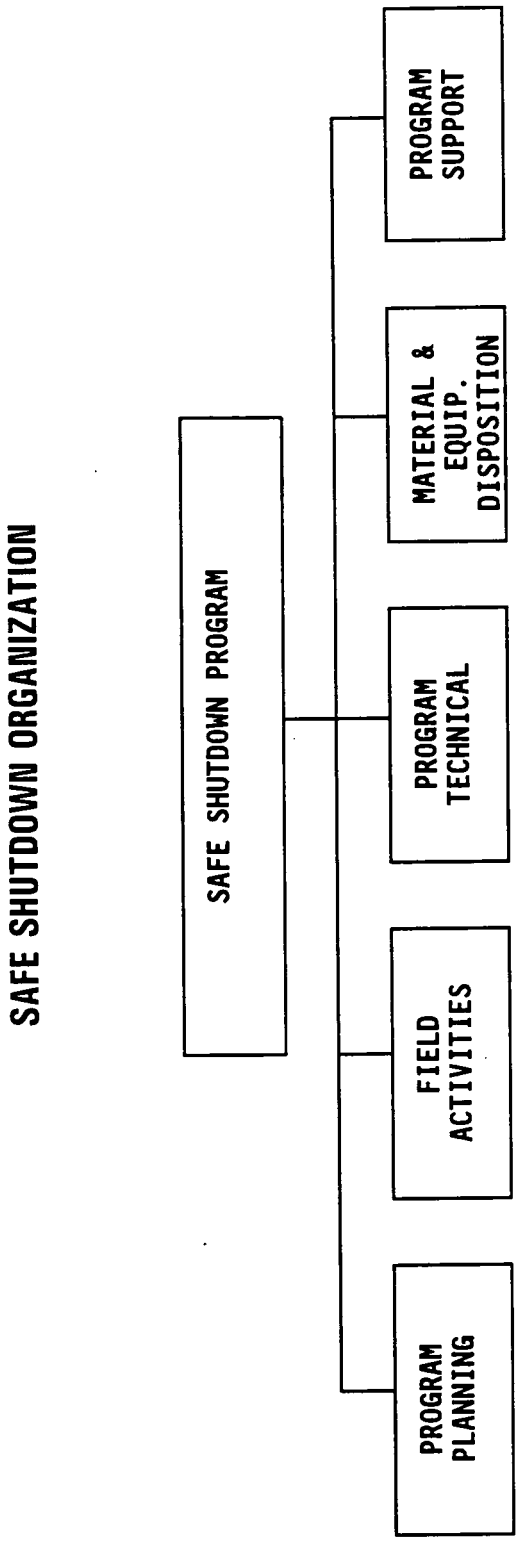
2.17 Support Manager (cont.)

D. Maintaining the Safe Shutdown qualification and certification programs. Documents the qualification of the Safe Shutdown Maintenance Supervisors, Operators, and Craft Workers as specified in the Personnel Qualification section of these Standing Orders.

E. Researching equipment specifications and performance prior to purchasing.

F. Preparing, distributing and maintaining a record of training on Safe Shutdown lessons learned and other appropriate required reading.

G. Assuming the duties and responsibilities of the Program Manager in his absence, when designated.



SAFE SHUTDOWN ORGANIZATION
Figure 2 - 1

CHAPTER 3 - PROJECT PLANNING AND EXECUTION

3.1 Purpose

3.1.1 The following paragraphs describe the flow of a Safe Shutdown work process from initiation to completion as it moves through the Safe Shutdown Program. This supplements and amplifies the instructions in IM-6001, Safe Shutdown Program Planning and Implementation Manual.

3.2 Implementation Plan Initiation

3.2.1 The work process begins when a Task Order or Work Order is issued by the Safe Shutdown Material and Equipment Disposition Manager.

3.2.2 Task Orders are reviewed by the Safe Shutdown Material and Equipment Disposition Manager to determine if appropriate safety and regulatory issues are addressed. He enters Task Orders into the data base and reports project status monthly in the "Summary Sheet - Jobs in Process".

3.3 Implementation Plan Development

NOTE: Task Orders representing various components will be grouped so that field activities will be planned and conducted on related pieces of process equipment.

3.3.1 The Safe Shutdown Planning Manager assigns the tasks specified in a Task Order to a Plan Writer for detailed planning.

NOTE: Drawings and/or schematics must be verified for correctness and adequacy.

3.3.2 The Plan Writer develops a Task Order Implementation Plan using the documents listed in Item 1.0 and the applicable elements of Item 3.0 of the Implementation Checklist (Attachment J to IM-6001, Safe Shutdown Program Planning and Implementation Manual) as a guideline. Using existing documents and field drawings obtained from thorough system walkdowns, he appends the necessary drawings and schematics to the plan.

3.3.3 Additionally, the Plan Writer prepares the following for inclusion in the Implementation Plan:

A. Standard Operating Procedure Summary Sheets to indicate which procedures are required by the Plan.

B. A completed Job Safety Analysis in accordance with SPR 2-4 of ESH-1-1000, FERMCO Comprehensive Environmental Occupational Safety and Health Program.

C. The applicable Material Safety Data Sheets (MSDSs) indicated on the Job Safety Analysis Form.

CHAPTER 3 - PROJECT PLANNING AND EXECUTION (cont.)

3.3 Implementation Plan Development (cont.)

3.3.4 The Safe Shutdown Planning Manager submits the Implementation Plan to the following organizations for review:

A. Nuclear System Safety to determine if a Criticality Safety Analysis is required.

B. Quality Control to determine QC "hold points".

C. Waste Programs Management for waste disposal and movement plans.

D. Radiation Safety.

E. Occupational Safety.

F. Safe Shutdown Maintenance Scheduler and Planning Estimator for work task planning and scheduling.

3.3.5 Following the routing of the Implementation Plan, the Plan Writer incorporates the collected comments into the Implementation Plan, and re-routes it as necessary for approval of the changes.

NOTE: Subsequent to complete routing of the Implementation Plan by the Plan Writer, the plan shall be reviewed and approved by the Safe Shutdown Planning Manager prior to providing it to the Field Activities Manager.

3.3.6 The Safe Shutdown Planning Manager reviews the Implementation Plan to ensure inclusion of the elements listed in Item 3.0 of the Implementation Checklist and, if acceptable, approves the plan and submits it to the Safe Shutdown Field Activities Manager for his acceptance and approval.

3.3.7 The Safe Shutdown Technical Writer receives and reviews the Implementation Plan and adds the following:

A. The Task Specific Job Briefings after preparing and submitting them for approval by the Safe Shutdown Field Activities Manager.

B. A list of Operators who have received the training necessary required by the procedures specified on the Applicable procedures listing.

3.3.8 The Safe Shutdown Implementation Supervisor performs the following:

A. Assembles the Implementation Plan Work Package consisting of the following:

1. Implementation Checklist.

2. Task Order.

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CHAPTER 3 - PROJECT PLANNING AND EXECUTION (cont.)

3.3 Implementation Plan Development (cont.)

3. Task Order Implementation Plan.

4. Job Safety Analysis and Work Permits.

5. Maintenance Work Order.

6. Task Specific Job Briefing.

7. List of Operators trained to the applicable procedures.

8. Material Safety Data Sheets (MSDS).

9. Applicable procedures.

10. Completed Work Orders for Utility Disconnects.

11. Pre-Task Radiological Surveys.

12. Radiation Work Permits.

13. Site Work Permits.

14. Supervisor's Daily Log Sheets.

B. Obtains the Safe Shutdown Field Activities Manager's approval.

C. Tracks and updates the field activities data base.

3.3.9 The Safe Shutdown Operations Supervisor conducts the pre-task reviews indicated in Item 5.0 of the Implementation Checklist.

3.3.10 The Safe Shutdown Operations Supervisor implements the requirements indicated in Section 6.0 of the Implementation Checklist prior to starting field activities.

NOTE: The Task Specific Job Briefing Sheet will be signed by the Safe Shutdown Implementation Supervisor indicating assigned personnel are qualified to perform the task.

3.3.11 When all Implementation Checklist requirements through Item 6.0 have been met, the Safe Shutdown Implementation Supervisor will notify the Safe Shutdown Field Activities Manager.

3.3.12 The Safe Shutdown Field Activities Manager reviews the state of readiness including site preparation, supplies,equipment, and personnel.

3.3.13 The Safe Shutdown Field Activities Manager signs the Implementation Checklist giving final approval for starting the assigned task.

CHAPTER 3 - PROJECT PLANNING AND EXECUTION (cont.)

3.4 Implementation Plan Execution

3.4.1 During the conduct of field activities the Safe Shutdown Operations Supervisor will conduct daily pre-shift job briefings with his work team to discuss safety issues, lessons learned, work assignments, and work status and will document these briefings in the Safe Shutdown Operations Supervisor's Daily Log.

NOTE 1: The work evolution shall not deviate from the approved plan without the written approval of the Safe Shutdown Field Activities Manager. Significant deviations, as determined by the Safe Shutdown Field Activities Manager, will be approved by the appropriate review/approval process.

NOTE 2: Significant findings as the work progresses will be reported to the Implementation Supervisor, Field Activities Manager and Program Manager and noted in the Safe Shutdown Implementation Supervisors's Daily Log.

3.4.2 When the task is completed, the Safe Shutdown Implementation Supervisor will perform the post task requirements indicated in Item 8.0 of the Implementation Checklist.

3.4.3 The Safe Shutdown Implementation Supervisor or his designee will conduct a walk through to independently verify that the assigned Safe Shutdown Task Order is completed as required.

3.4.4 Upon completion of all requirements, the Safe Shutdown Implementation Supervisor will sign the Implementation Plan and forward it to the Safe Shutdown Field Activities Manager.

3.4.5 The Safe Shutdown Field Activities Manager completes the following:

A. Routes copies of the appropriate documents to the Material and Equipment Disposition Manager indicating that the Task Order is complete.

B. Updates the data base for "Summary Sheets - Jobs in Process".

C. Updates the "Work Request/Task Order Listing".

D. Files the completed Work Package.

3.5 Utility Disconnect Maintenance Work Orders

3.5.1 Safe Shutdown Utility Disconnect Maintenance Work Orders are issued to the Safe Shutdown Field Activities Manager by the Safe Shutdown Material and Equipment Disposition Manager. After receipt and the subsequent review of Utility Disconnect Work Orders, the Safe Shutdown Field Activities Manager routes them to the Planner/Scheduler.

CHAPTER 3 - PROJECT PLANNING AND EXECUTION (cont.)

3.5 Utility Disconnect Maintenance Work Orders (cont.)

3.5.2 The Planner/Scheduler enters the Work Order into the database, plans the required work, obtains the appropriate work permits, schedules the activity and reports weekly status on the "Summary Sheet - Jobs in Process."

3.5.3 The Safe Shutdown Decommissioning Engineer, in coordination with the Field Activities Manager, reviews selected Work Orders. He locates and reviews necessary mechanical and field drawings. He resolves questions of configuration control and issues associated with engineering standards and codes.

3.5.4 The Safe Shutdown Utility Disconnect Supervisor supervises utility isolations performed in accordance with D10-05-001, Safe Shutdown Energy Isolation Procedure. He signs the Work Order verifying completion of the disconnects and routes it to the Safe Shutdown Maintenance Scheduler and Planning Estimator.

3.5.5 The Safe Shutdown Maintenance Scheduler and Planner obtains the Facility Owner's signature on the Work Order verifying that the work is completed as described and sends a copy of the completed Maintenance Work Order to the Engineering Support Department for updating basic drawings and schematics. The Scheduler also routes the completed Work Order to the Safe Shutdown Field Activities Manager.

3.5.6 The Safe Shutdown Field Activities Manager routes the completed Work Order to the Safe Shutdown Implementation Supervisor who independently verifies the completion of the utility disconnects.

3.5.7 The Safe Shutdown Implementation Supervisor conducts the independent verifications by visually checking the systems/components involved and returns the independently verified Work Order to the Safe Shutdown Field Activities Manager.

3.5.8 The Safe Shutdown Field Activities Manager completes routing of the Work Order for utility disconnects by conducting the following:

A. Routes a copy of the completed Work Order to the Safe Shutdown Material and Equipment Disposition Manager.

B. Updates the data base for the "Summary Sheet - Jobs in Process".

C. Updates the "Work Request/Task Order Listing".

D. Files a copy of the completed Work Order.

CHAPTER 4 - SHIFT ROUTINES AND OPERATING PRACTICES

4.1 General

4.1.1 All Safe Shutdown personnel are expected to maintain high standards of conduct in the performance of their duties. Their work requires them to be alert and aware of all conditions affecting their job site at all times. The **Safe Shutdown Implementation Supervisor, Operations Supervisor and Utility Disconnect Supervisor as the first-line Supervisors** are responsible for maintaining expected performance standards for themselves as well as their assigned Operators and Workers.

4.2 Safety Practices

4.2.1 Safety is the number one priority for all Safe Shutdown tasks and is the primary focus of Conduct of Operations. All safety precautions required by the site Health and Safety Plan, the Safe Shutdown Health and Safety Plan, and by the safety precautions listed as part of all applicable Standard Operating Procedures will be followed. In any given situation good engineering practice and common sense shall also dictate the actions of all personnel.

4.2.2 Over and above any safety instructions, **"IF YOU DO NOT FEEL THAT YOU CAN SAFELY PROCEED, STOP, PLACE THE SYSTEM OR COMPONENT IN A SAFE CONDITION, AND NOTIFY YOUR SUPERVISOR."** The Supervisor must then resolve the issue and record the situation in the Safe Shutdown Operations Supervisor's Daily Log.

4.3 Personnel Protection

4.3.1 Personnel Protective Equipment (PPE) required by applicable procedures and work permits shall be worn while performing Safe Shutdown tasks. Company issued safety shoes and safety glasses shall be worn at all work sites unless specifically exempted.

4.4 Authority to Operate Equipment

4.4.1 All Safe Shutdown field activities are performed under the supervision of the Safe Shutdown Implementation Supervisor, Operations Supervisor or the Utility Disconnect Supervisor. The degree of supervision will be commensurate with the complexity of the task and the risks involved.

4.4.2 Each member of the task group must have a clear understanding of the Supervisor's expectations as delineated in the daily pre-shift briefing. All non-routine or unusual operations must be conducted under the direct supervision of the appropriate Safe Shutdown Supervisor.

4.5 Potentially Distractive Written Material and Devices

4.5.1 Use of written material such as magazines and newspapers, and entertainment devices such as radios, "walkmans", and televisions that do not relate to the field activity being conducted is prohibited.

CHAPTER 5 - COMMUNICATIONS

5.1 General

5.1.1 For a communication to be effective it must be accurate, complete, and most importantly, understood.

5.1.2 By using formal communications techniques an individual can reliably transmit and receive work instructions, feedback or results of work, and results of data, emergency or safety warnings, and instructions.

5.1.3 Both written and verbal communications must be clear, concise, and correct. Before trying to convey information or instructions, orally or in writing, a sender should plan what to say, then say it to him/herself to ensure that its clarity is what the sender intends. Only then should the sender convey the information or instructions to the intended receiver.

5.2 Clarity

5.2.1 Communications that contain words with multiple meanings or similar sounds may be confusing (e.g., use "raise" and "lower" instead of "increase" and "decrease"). Use only proper noun names and numbers for equipment (e.g., "main power distribution circuit breaker number one"). When verbally communicating information combining both numbers and letters, both sender and receiver should use a phonetic alphabet to ensure clarity (See Attachment 5 - A).

5.2.2 One acceptable exception to the practice of using phonetic characters is the use of approved standard abbreviations such as "ID fan" for inducted draft fan.

5.3 Conciseness

5.3.1 Both oral and written communications that convey information or instructions must be as brief as possible while still effectively communicating the intended message.

5.4 Correctness

5.4.1 Messages intended to convey technical nomenclature should be specific to ensure that the correct unit or component is identified. Noun names and equipment or document numbers should be used together (e.g., "The Safe Shutdown Program Planning and Implementation Manual, IM6001") to ensure that the message transmitted is properly understood by the receiver.

CHAPTER 5 - COMMUNICATIONS (cont.)

5.5 Telephone/Radio/Face-to-Face Communications Format

5.5.1 To ensure that an intended receiver understands exactly what a sender intends; telephone, radio, and face-to-face communications should all use the same well-proven formal radio communications format outlined IN the following steps:

A. Establish communications.

B. Sender convey the message.

C. Receiver repeat back the message.

D. Sender confirm the correctness of the repeat-back.

5.5.2 If a repeat-back is incorrect the sender should reconvey the message as many times as necessary to obtain a correct repeat-back and confirm the message is understood. If a message is long and/or complex, breaking it into segments with a repeat-back between each segment will help the receiver comprehend it sooner.

PHONETIC ALPHABET

A - ALPHA

B - BRAVO

C - CHARLIE

D - DELTA

E - ECHO

F - FOXTROT

G - GULF

H - HOTEL

I - INDIA

J - JULIETT

K - KILO

L - LIMA

M - MIKE

N - NOVEMBER

O - OSCAR

P - PAPA

Q - QUEBEC

R - ROMEO

S - SIERRA

T - TANGO

U - UNIFORM

V - VICTOR

W - WHISKEY

X - XRAY

Y - YANKEE

Z - ZULU

PHONETIC ALPHABET
Attachment 5-A

CHAPTER 6 - CONTROL OF ON-SHIFT TRAINING

6.1 General

6.1.1 Shutdown field activities are only conducted by personnel who are qualified for their on-shift duties. Trainees or unqualified personnel will only be involved in field activities when they are required to complete practical demonstrations of their knowledge in order to complete a required qualification. While in a trainee status, the unqualified worker must be carefully supervised and controlled.

6.2 Training and Qualification Program Participation

6.2.1 Training and qualification will be conducted as an integral part of the Safe Shutdown field activity implementation process. The Task Specific Job Review will be used to define the level of training required to precede the execution of a specific task.

6.2.2 The **Safe Shutdown Operations Supervisor** assigned the responsibility for completing a specific field activity will conduct a task specific briefing and walk through for personnel who are assigned to perform the work. He will insure that they have a thorough understanding about how to safely and correctly perform the work. Any uncertainty about how to proceed will be clarified, with the Implementation Supervisor or the Field Activities Manager, prior to commencing the work.

NOTE: The Supervisor has the right to re-assign personnel who do not understand, or are unwilling to comply with safety and procedural requirements.

6.2.3 A briefing and task walk-through will generally suffice for task specific training. However, for more complex or higher risk tasks, more detailed and extensive rehearsal may be required. The **Safe Shutdown Implementation Supervisor and the Field Activities Manager** are responsible for recommending to the Program Manager increased task specific training requirements when they are necessary.

6.2.4 A Task Specific Job Briefing sheet (See IM-6001) will be used to document satisfactory completion of task specific training.

CHAPTER 7 - CONTROL OF EQUIPMENT AND SYSTEM STATUS

7.1 General

7.1.1 Good engineering practice dictates that the configuration of equipment and systems shall be controlled in such a way that Facility Owners can readily determine the status of their facilities. By its very nature, the Safe Shutdown Program makes changes to facility engineering configuration as equipment and systems are placed in a Safe Shutdown configuration.

7.1.2 Systems and equipment slated for remediation must be safely isolated before entry and physical removal can be accomplished.

7.2 Status Change Authorization and Reporting

7.2.1 Task Orders and Work Orders issued by the Safe Shutdown Material Disposition Manager constitutes authority to make the configuration change required by each task. The configuration change is effected upon completion of action required by the applicable Task Order or Work Order.

7.2.2 The configuration change is reported by sending a copy of the completed Task Order or Work Order to the Engineering Support Department for updating historical drawings to the current status of equipment and/or structures.

7.3 Equipment Locking and Tagging

7.3.1 Locks and tags will be used on components that isolate systems and equipment slated for Safe Shutdown in conjunction with Safe Shutdown field activities.

7.3.2 The use of tags and locks is controlled by the FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure (SSOP-0719) which will be followed without deviation.

CHAPTER 8 - TIMELY ORDERS TO OPERATORS

8.1 Standing Orders for Safe Shutdown Personnel

8.1.1 These Standing Orders for Safe Shutdown personnel shall be read and acknowledged by signature and date on the enclosed required reading list within two weeks of their original promulgation, every six months thereafter as part of the Safe Shutdown required reading program, and when directed by the Safe Shutdown Program Manager.

8.1.2 Newly reporting Safe Shutdown personnel shall initially read and acknowledge them within two weeks of being assigned to the Safe Shutdown project.

8.2 Orders to Operators

8.2.1 Written Orders to Operators is a method for the Program Manager or his designee to communicate daily, job duration, time dependent, or other perishable instructions to Safe Shutdown Operators and Workers.

8.2.2 Compliance with written Orders to Operators is mandatory for all Operators and Workers to whom they are addressed. Only the Program Manager, or his designee, shall issue these orders. Orders to Operators shall be:

A. Written only on Safe Shutdown Shift Orders forms (See Attachment 8-A).

B. Issued directly to the applicable Safe Shutdown Supervisor. He/she shall ensure that they are reviewed and their contents acknowledged by the Operators and Workers who shall initial them following the applicable pre-job or pre-shift briefing.

C. Complied with explicitly without deviation.

NOTE: If it appears that a Oral or Written Order cannot be followed, if it is incomplete, compromises safety or good engineering practices, the Operator or Worker shall stop the action directed by the order, place the work place in a safe condition, notify his/her immediate Supervisor, and await resolution of the problem.

D. Retained in a chronological file which shall be included with the work package to which they are applicable.

Document No. M-108
Issue Date: 01-16-95
Revision No. 0

SAFE SHUTDOWN

SHIFT ORDERS

TO:

FROM:

DURATION: From: _____

To: _____

ORDERS

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Signature) (Time/Date)

SAFE SHUTDOWN SHIFT ORDERS
Attachment 8-A

CHAPTER 9 - LOGKEEPING

9.1 General

9.1.1 The Safe Shutdown Operations Supervisor's Daily Log is a narrative log used to record fully the data necessary to provide an accurate history of the Safe Shutdown Implementation field activity. Events are recorded in a timely fashion to ensure the accuracy of the entry.

9.1.2 The Safe Shutdown Implementation Supervisor and Field Activities Manager will review the log to ensure that its status is current for the particular field activity to which it applies.

9.2 Logkeeping Instructions

9.2.1 The Safe Shutdown Operations Supervisor's Daily Log will contain the following information:

A. Project number and project title for the task in progress.

B. Listing of personnel assigned.

C. Documentation of satisfactory completion of the pre-shift briefing including safety issues discussed, work assignments and work status.

D. Any abnormal configurations.

E. Status changes to safety-related and other major equipment.

F. Occurrence of any reportable events.

G. Out-of-specification process results.

H. Shift reliefs if applicable.

9.2.2 Log entries will be made in a manner such that they can be easily read and understood. Additionally, the log entries will be easily reproducible with standard photocopy machines, in black, waterproof ink. Corrections to erroneous entries will be made by placing a single line through the incorrect entry in such a way that it is not obscured. The correct information is then entered and the correction is initialed and dated.

9.3 Log Disposition

9.3.1 Completed and reviewed Safe Shutdown Operations Supervisor's Daily Log sheets will be filed with the completed Safe Shutdown Implementation Work Package.

CHAPTER 10 - OPERATIONS TURNOVER

10.1 General

10.1.1 Shift turnovers provide oncoming Operators with an accurate picture of the overall facility status. For the purposes of Safe Shutdown field activities, which are normally performed on a one-shift work schedule, turnover consists of a pre-shift briefing by the Safe Shutdown Operations Supervisor for the task work group.

10.1.2 Reassignment or temporary absence of personnel may also require a turnover of responsibilities which must be conducted in a formal manner.

10.2 Document Review

10.2.1 The oncoming Safe Shutdown Operations Supervisor must review all applicable documents, including the Implementation Task Order Work Package and the previous Safe Shutdown Operations Supervisor's Daily Log sheets since the beginning of the current task.

10.2.2 For more complex or long-term Safe Shutdown tasks, further guidance will be provided by the Safe Shutdown Project Manager.

10.3 Shift Crew Briefing

10.3.1 A crew briefing will be conducted by the Safe Shutdown Operations Supervisor before work begins for that shift. Support personnel will attend the briefings with the Safe Shutdown personnel. The briefing will include a review of the status of the task, problems experienced since the task has begun and/or current problems, and evolutions in progress or planned for the shift.

10.3.2 The briefing must provide all shift personnel with the shift priorities and the objectives for that shift's Safe Shutdown field activities.

CHAPTER 11 - PROCEDURAL COMPLIANCE

11.1 General

11.1.1 Standard Operating Procedures, Work Orders, Maintenance Work Permits, Maintenance Work Instructions, safety precautions or notices, and other directional documentation are provided to be used in the conduct of Safe Shutdown Implementation field activities.

11.1.2 Their purpose is to ensure that the field activities are performed safely and without error. They are intended to guide the performance of work in safe, logical, sequential steps.

11.2 Safe Shutdown Basic Procedure

11.2.1 The basic procedure for Safe Shutdown Implementation field activities is the applicable Task Order Implementation Plan written in accordance with the "Safe Shutdown Program Planning and Implementation Manual" (IM-6001). Task Order Implementation Plans specify applicable Standard Operating Procedures, Work Orders, Maintenance Work Permits, Maintenance Work Instructions, and safety precautions for each Safe Shutdown Project.

11.2.2 The "Safe Shutdown Program Energy Isolation Procedure" (D10-05-001), is applicable to all Safe Shutdown projects intended to permanently remove an equipment, system, process, or facility from service. This procedure specifies the safety requirements for isolating equipment, systems, processes, or facilities from all possible sources of energy. All personnel directly involved in Safe Shutdown field activities shall thoroughly understand and comply with the direction provided in this procedure.

11.3 Procedural Compliance

11.3.1 Compliance with Standard Operating Procedures, Site Plans, Work Orders, Work Permits, Radiological Work Permits, safety precautions or notices, or other directional documentation is mandatory. Procedural compliance means that all documentation necessary for the safe conduct of Safe Shutdown work shall be followed specifically as written.

11.3.2 If a procedure or any directional documentation cannot be performed as written:

A. STOP the work in process.

B. PLACE the component, equipment, system, or facility in a SAFE condition.

C. NOTIFY your immediate Supervisor of the problem.

D. DO NOT RESUME the work you stopped until the safety issue is properly RESOLVED and the appropriate Supervisor has given permission.

CHAPTER 11 - PROCEDURAL COMPLIANCE (cont.)

11.3 Procedural Compliance (cont.)

11.3.3 To perform all Safe Shutdown Implementation work experienced workers intimately familiar with the equipment, system, component, or facility shall review the applicable procedure(s), or work directive(s) prior to commencement of the work to re-familiarize themselves with the safety precautions and any specific sequencing of the steps for performing the work.

11.3.4 Workers not intimately familiar with the equipment, system, component, or facility shall take the applicable procedure(s), and/or work directive(s) with them to the work site and refer to it throughout the conduct of their work.

11.3.5 Work involving infrequently used processes, skills, or knowledge; defined as being performed on less than a monthly basis; and work that could have a serious impact if performed incorrectly, shall be performed with the procedures or work directives immediately at hand and followed in a sequential step-by-step manner regardless of the experience level of the worker.

11.3.6 Trainees, or non-qualified workers shall ALWAYS be directly supervised by an experienced/qualified worker and have the applicable procedure, or work directive, with them and follow it in a step-by-step manner.

CHAPTER 12 - PERSONNEL QUALIFICATION

12.1 Qualification Requirements

12.1.1 All safe Shutdown Maintenance Supervisors and Maintenance Craft Personnel shall complete the basic maintenance qualification program promulgated and managed by the Maintenance Section Manager.

12.1.2 Safe Shutdown Maintenance Supervisors, Maintenance Craft Personnel, and other Safe Shutdown Operators and Workers as applicable, shall complete Safe Shutdown project specific qualifications specified by the Safe Shutdown Program Manager. All assigned qualifications shall be completed as required prior to the conduct of work to which the qualifications apply.

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~~CONTROL NO. FEA-0050~~
SITE PROCEDURE EW-0014 (SSOP-1027)
REVISION NO. 0

MANAGING PCBs AND PCB ITEMS

Effective Date: 03-08-94

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: _____ 2/15/95
Terence D. Hagen, Manager of Environmental Restoration and Waste Management — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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-6943

CONTROL NO. FER-0400
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-1027
REVISION NO. 0

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MANAGING PCBs AND PCB ITEMS

SSOP-1027

Effective Date: 03-08-94

AUTHORIZED BY: J. W. Thiesing, Executive Vice President — 2/25/94 Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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Fernald Environmental FERMCO Restoration Management Corporation	Title: **MANAGING PCBs AND PCB ITEMS**
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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
03-08-94	0	New document needed to describe the removal, management, marking, storage, labelling, and disposal of PCBs and PCB items, per Request S93-196, initiated by S. Kaster.

1.0 PURPOSE

This procedure provides instructions for managing Polychlorinated Biphenyls (PCBs) and PCB items at the Fernald Environmental Management Project (FEMP) pursuant to the Fernald Environmental Restoration Management Corporation (FERMCO) PCB policy (Attachment A).

2.0 SCOPE

This procedure applies to all personnel at the FEMP who are required to handle PCBs and PCB items as a result of pre-removal action activities, planned maintenance activities, construction and/or demolition projects, closures, and removal/response actions.

3.0 DEFINITIONS

Administrative Record - An organized collection of records open to public view, that documents FEMP compliance with the requirements set forth by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Capacitor - A device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric. Types of capacitors include:

- small capacitors that contain less than 1.36 kg (3 pounds) of dielectric fluid, or if fluid weight is unknown, it is a small capacitor if the volume is less than 100 cubic inches, or volume is between 1,639 and 3,278 cubic centimeters (100 to 200 cubic inches) and total capacitor weight is less than 4.08 kg (9 pounds).

- large capacitors that contain more than 3 pounds (1.36 kg) of dielectric fluid. If the capacitor operates at 2,000 volts or above, it is considered a high voltage large capacitor and if it operates at below 2,000 volts, it is a low voltage large capacitor.

Compatible Container - A container that meets Department of Transportation (DOT) specifications which is compatible with the characterized material.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - The Act that mandates the development of organizational structure and procedures to respond to releases, or threats of release, of hazardous substances or pollutants/contaminants.

Fixed Contamination - Radioactive contamination that is not readily removable.

3.0 **DEFINITIONS** (cont.)

Hazardous Waste - Waste that is specifically listed as a hazardous waste and/or exhibits one or more of the hazardous waste characteristics (i.e., ignitability, corrosivity, reactivity, or toxicity) as defined in Chapter 3745-51 of the Ohio Administrative Code (OAC) and CFR 261.

Leak - Any instance where PCBs are on the exterior surface of PCB Articles, PCB Containers, or PCB Equipment.

Mark - The descriptive name, instructions, cautions, or other information applied to:

- PCB containers
- PCB transformers
- PCB large high voltage capacitors
- Equipment containing a PCB transformer or a PCB capacitor
- Electric motors using PCB hydraulic fluid
- Heat transfer systems using PCBs
- PCB article containers containing articles or equipment
- Each storage area used to store PCBs and PCB items
- Each transport vehicle if loaded with PCB containers that contain more than 45 kg (99.4 lbs) of PCBs in the liquid phase or with one or more PCB transformers.

MEF - Material Evaluation Form.

Mixed Waste - Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and RCRA, respectively.

One-Year Storage Limit - Any PCB article or container stored for disposal after January 1, 1983 shall be disposed of within 1 year from the date when first removed from service and placed in storage (this includes 9 months for storage and 3 months for actual disposal).

PCB and PCBs - Polychlorinated Biphenyls. A chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees; and is regulated under TSCA (40 CFR 761).

PCB Article - Any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. PCB articles include, but are not limited to, capacitors, transformers, electric motors, pumps, pipes, and other manufactured items.

PCB Article Container - Any package, drum, or other device that contains PCB articles or PCB equipment and whose surface(s) has not been in direct contact with PCBs.

PCB Container - Any package, drum, tank or other device that contains PCBs or PCB articles and whose surface(s) has been in direct contact with PCBs.

3.0 **DEFINITIONS** (cont.)

PCB-Contaminated Electrical Equipment - Any electrical equipment including, but not limited to, transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, and cable that contain 50 ppm or greater, but less than 500 ppm PCB. Oil-filled electrical equipment other than circuit breakers, reclosers, and cable whose PCB concentration is unknown must be assumed to be PCB-contaminated electrical equipment.

PCB Equipment - Any manufactured item, other than a PCB container or PCB article container, that contains a PCB article or other PCB equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

PCB Item - Any PCB article, PCB article container, PCB container, or PCB equipment that deliberately or unintentionally contains or has a part made of any PCB or PCBs.

PCB Transformer - Any transformer that contains 500 ppm PCB or greater.

PCB Waste - Those PCBs and PCB items that are subject to the disposal requirements under TSCA regulations (40 CFR 761).

Project - For the purpose of this procedure, a project is defined as any

- CERCLA removal/response action
- RCRA closure
- Construction project
- Demolition project
- Maintenance activity

ppm - Parts per million.

3.0 **DEFINITIONS** (cont.)

Radioactive Contaminated Waste - Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, and of negligible value considering costs of recovery. Surface contaminated materials with radiation value above DOE Order 5400.5 limits are considered radioactive waste. Surface contaminated materials include metals and other non-porous matrices where the radioactive contamination is limited to the surface of the material and where all surfaces of the material that could have been contaminated can be monitored. Volume contaminated materials that have added radioactivity from DOE activities are also considered radioactive waste. Volume contaminated materials include materials with porous matrices and other materials for which the radioactive contamination is not necessarily limited to the surface, or materials where all surfaces that could have been contaminated can not be monitored.

Removable Contamination - Radiological surface contamination that is readily removed using the filter paper smear technique.

Resource Conservation and Recovery Act (RCRA) - The act that mandates cradle-to-grave control of specified hazardous waste by imposing management requirements on generators, transporters and owners/operators of treatment, storage and disposal (TSD) facilities.

Soil - All vegetation, soils and other ground media including, but not limited to, sand, grass and gravel. Does not include concrete and asphalt.

SPCC Plan - Spill Prevention, Control and Countermeasures Plan

Spill - Both intentional and unintentional spills, leaks and other uncontrolled discharges where the release results in any quantity of PCBs running off, or about to run off, the external surface of the equipment or the PCB source, as well as the contamination resulting from those releases. This policy applies to spills of 50 ppm or greater of PCBs. The concentration of PCBs spilled is determined by the PCB concentration in the material spilled as opposed to the concentration of PCBs in the material onto which the PCBs were spilled.

Storage - PCBs and PCB items being stored that have been designated for disposal are required to meet the requirements specified in 40 CFR 751.60. The following PCB items may be stored temporarily for up to 30 days in an area that doesn't comply with the facility requirements of 40 CFR 761.65 provided that a notation is attached to the item of PCB container (containing the item) indicating the date the item was removed from service; non-leaking PCB Articles and PCB equipment; leaking PCB Articles and PCB equipment if placed in non-leaking PCB containers containing sufficient sorbent materials to absorb any liquid PCBs remaining in the PCB item; PCB containers containing non-leaking PCBs; and PCB containers containing between 50 ppm and 500 ppm.

3.0 **DEFINITIONS** (cont.)

Toxic Substances Control Act (TSCA) - A 1976 Congressional Act that authorizes the EPA to gather information on chemical risks. This act includes the regulation of PCBs.

4.0 **RESPONSIBILITIES**

CERCLA/RCRA Unit 3 provides overall project management and coordination with all support groups involved in managing PCBs and PCB items.

Remediation Support Operations (RSO)

- Coordinates with members of other departments to plan the removal of PCBs and PCB items.
- Maintains and controls access to PCB storage facilities.
- Coordinates the movement of PCB containers.
- Ensures that only trained personnel handle PCBs and PCB items.
- Prepares work orders for projects in which PCBs and PCB items are to be removed.
- Removes PCB items from service.
- Signs the Nuclear Material Transfer Record/Nuclear Material Receipt/Material Identification Record, 68/69 Card, prior to moving the PCBs and PCB items to storage.
- Completes PCB and PCB item identification documentation.
- Notifies the Assistant Emergency Duty Officer (AEDO) in the event of a spill and coordinates spill response activities in accordance with the Spill Prevention, Control and Countermeasures Plan.
- Assists in implementing training requirements for operators handling PCBs and PCB items.
- Receives PCB samples and prepares them for shipment to an offsite laboratory.
- Receives and handles PCB samples and residues from offsite laboratories.

4.0 **RESPONSIBILITIES** (cont.)

- At least monthly, performs inspections of the PCB storage facility (Building 81) to ensure container integrity.
- Provides documentation to identify storage containers that may be used for PCBs and PCB items.
- Prepares Sampling and Analysis Plans.
- Conducts sampling of PCBs and PCB items when requested.
- Identifies and provides storage, characterization, and disposal of PCBs and PCB items.

Regulatory Programs (RP)

- Identifies applicable regulations, DOE Orders, and FERMCO policies.
- Provides CERCLA/RCRA/TSCA integration guidelines.
- Assists departments as needed in the designation of storage areas for PCBs and PCB items for compatibility and storage requirements.
- Provides all departments with a FERMCO PCB policy.

Quality Assurance (QA)

- Monitors to ensure that provisions of the Site-wide Quality Assurance (SQA) Program are implemented.
- Monitors FEMP employees and subcontractors to ensure that all applicable procedures including health and safety requirements are followed.
- Performs surveillance of the site to ensure adherence to this procedure and issues Deviation Reports (DR) and/or Corrective Action Reports (CAR) when applicable.

Quality Control (QC)

- Performs or ensures that surveillance of the project area for the removal of PCB items is performed and that generation records are completed.
- Performs surveillance for the site to ensure adherence to this procedure and issues Deviation Reports (DR) and/or Corrective Action Reports (CAR) when applicable.

4.0 **RESPONSIBILITIES** (cont.)

- Ensures that Department of Transportation (DOT) markings on drums are consistent with the FERMCO PCB policy.

Waste Characterization

- Completes waste determinations through the use of the MEF.
- Revises MEFs when necessary.

Environmental Safety and Health (ES&H)

- Prepares work permits for applicable safety and personal protective equipment (PPE) to be worn for the removal of PCBs and PCB items.
- Performs preliminary surveys to assist in identifying the level of radiological contamination.
- Surveys and prepares radiological data records for PCBs and PCB items generated during a project.
- Monitors and segregates PCBs and PCB items requiring radiological decontamination according to type.
- Assists in establishment of training requirements for operators handling PCBs and PCB items.

Training Department

- Trains employees on the handling of PCB and PCB items.
- Trains employees on the implementation of this procedure.

Materials Control and Accountability (MC&A)

- Maintains a current TSCA Waste Inventory of PCBs and PCB items.
- Co-signs with RSO the Nuclear Materials Transfer, Nuclear Material Receipt/Material Identification Records (Cards 68/69)
- Assigns inventory numbers.
- Records movement of all TSCA Containers.
- Generates TSCA reports.

5.0 GENERAL

Work permits, work plans, or other project documentation shall be reviewed prior to commencement of the project. A meeting (when applicable and feasible) may be scheduled to discuss the project and an area walkdown may be necessary to review the project scope for PCBs and PCB item removal, and sampling and waste characterization. If sampling will be required, a Sampling and Analysis Plan (SAP) shall be prepared.

6.0 PREREQUISITES

6.1 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

Personal protective equipment (PPE), such as eye protection, goggles, face shields, respiratory protection, gloves and rubber aprons shall be worn as specified in the work permit issued by ES&H.

6.2 PERSONNEL REQUIREMENTS

Employees shall have reviewed and be familiar with the information contained in the Material Safety Data Sheets (MSDS) for PCB dielectric fluids or the chemical and/or hazardous material being used.

6.3 TOOLS AND MATERIALS REQUIRED

None

7.0 PROCEDURE

NOTE: Within this section, Warnings and Cautions precede the step to which they apply. Notes follow the steps to which they apply.

7.1 SAMPLING AND ANALYSIS PLAN(S)

RSO

When necessary, prepare Sampling and Analysis Plan(s) in accordance with EM-SM-006.

7.2 TRAINING

TRAINING DEPARTMENT

1. Develop with the assistance of various appropriate support groups, a training program that incorporates the Sampling and Analysis Plan(s) and the directions contained in this document.

7.2 TRAINING (cont.)

TRAINING DEPARTMENT

2. In accordance with the training program, conduct training of personnel who will be doing the work. The training will be based on the task(s) of the scope of work being performed.

7.3 PREPARING PCB AND PCB ITEM CONTAINERS

RSO

1. Weigh the empty container approved for use pursuant to the applicable scale operating procedure.

   NOTE: For PCB transformers, PCB capacitors, PCB contaminated electrical equipment and/or PCB equipment, a 55-gallon (specification 5, 5B, or 17C) container (containers complying with DOE specifications 49 CFR 178.80 will be used) shall be used to accumulate the PCBs or PCB items for transportation to a storage facility. If the item is too large to fit into a 55-gallon container, an alternative container, such as a white metal box shall be used. For liquid PCBs, a 55-gallon (specification 5, 5B without removable head, or specification 17E) closed-head, bung-type drum shall be used. Overpack drums may also be used.

2. Insert two plastic drum liners into the container. Place two layers of oil-absorbent pads between the two drum liners in the container.

3. Place the tared drum into the project area's secondary containment area, if a secondary containment area is required.

7.4 PREPARING THE PROJECT AREA

GENERATOR AND RSO

1. Determine project area requirements as contained in existing work plans, site procedures, and Removal Action 9.

MC&A

2. Assign the FEMP lot marking code.

7.4 PREPARING THE PROJECT AREA (cont.)

GENERATOR AND RSO

3. Obtain concurrence from the facility owner of the project area and the Radiological Control Technician for removal of the PCB or PCB item.

4. Review the work permit requirements for removing the PCB item. Obtain and don proper personal protective equipment (PPE) prior to entrance to the work area.

5. Check the project area to determine if adequate containers and packing materials are available.

   NOTE: PCBs and PCB items, i.e., transformers, capacitors, other PCB contaminated electrical equipment, PCB equipment, PCB liquids, and other PCB contaminated solids (wipes, rags, contaminated PPE, and miscellaneous solids) shall be separated and stored in compatible containers.

6. If sufficient containers and packing materials are not available, contact the supervisor of the project area to obtain the needed materials.

7. Inspect the containers for holes, dents, bulges, or other damage that could affect integrity. If unacceptable, inform the supervisor of the project area who should order replacement containers.

8. Proceed with planned work only when sufficient amounts of necessary materials are available.

9. Designate a staging area to be located in proximity to where the PCB or PCB items are to be removed, accumulated, decontaminated, marked, labelled, and properly packaged before transfer to a storage facility.

   NOTE: The staging area will be temporarily diked (if there is a potential for a spill or leak). Herculite or plastic sheeting and absorbent materials will be provided.

   NOTE: The secondary containment area shall consist of a plastic lined berm area capable of containing 100 percent of the volumetric contents of the disposal drum.

7.4 PREPARING THE PROJECT AREA (cont.)

GENERATOR AND RSO

10. When electrical equipment is involved in the project, contact Electrical Maintenance to conduct lock-out/tag-out procedure(s) to ensure that electrical service has been disconnected.

7.5 REMOVING PCBs AND PCB ITEMS

GENERATOR AND RSO

1. Contact ES&H to monitor the PCB or PCB item for possible radioactive contamination.

> **WARNING**
>
> **IF A PCB ITEM IS LEAKING, IMMEDIATELY GO TO SECTION 7.6.**
> **IF THERE IS NO LEAKAGE, GO TO STEP 2 OF THIS SECTION.**

2. Check for a serial number on the PCB item. If there is no serial number, assign an identification number.

3. Look for any label or mark that indicates whether the item contains PCBs.

   NOTE: If a label or mark is not found, confirming that the item does not contain PCBs, it shall be assumed to contain PCBs and shall be handled pursuant to this procedure until proven otherwise by sampling or by manufacturer information. (See Dielectric Fluid Trade Names and Manufacturers, Attachment B).

> **WARNING**
>
> **RADIOLOGICALLY CONTAMINATED PCBs OR PCB ITEMS MUST BE SEGREGATED FROM NON-RADIOLOGICALLY CONTAMINATED PCBs AND PCB ITEMS.**

4. Remove the PCB item and place it in the designated container.

5. If necessary, wipe the PCB or PCB item with a clean rag to remove any removable radioactive contamination present. If the PCB or PCB item is still radiologically contaminated, repeat the wiping process until the item is clean or it has been determined to have fixed contamination.

7.5 REMOVING PCBs AND PCB ITEMS (cont.)

GENERATOR AND RSO

6. Place any contaminated item(s) on a pallet for transport to Decontamination.

7. Place radiologically clean PCB and PCB items into the disposal container.

   NOTE: Containers of PCBs and PCB items must be placed in the storage facility within 30 days of the PCB items being loaded into the container(s).

7.6 REMOVING LEAKING PCB AND PCB ITEMS

RSO

1. Upon discovery of a leaking PCB or PCB item, report the leak to the AEDO and barricade the immediate work area with caution banners.

2. Request ES&H to survey the area for proper ventilation and safety hazards and to survey for possible radiological contamination.

3. If not previously done, notify Electrical Maintenance to conduct the appropriate lock and tag of electrical equipment to ensure that power has been disconnected from the leaking PCB item.

4. If not previously done, prepare a secondary containment area in the immediate vicinity of the leaking item using a plastic lined berm area into which the leaking PCB item may be taken.

5. Put on rubber gloves that will not absorb PCBs (neoprene, butyl, or nitrile) and wear cover goggles and a rubber apron (if necessary) to help guard against possible exposure to PCBs.

6. Remove the leaking PCB item from service and replace with a non-PCB item, if required.

7. Place a PCB mark on the PCB item.

8. Wrap the leaking PCB item in an absorbent pad.

9. Place the wrapped PCB item in a plastic bag.

7.6 REMOVING LEAKING PCB AND PCB ITEMS (cont.)

RSO

10. Contain the leaking PCB item in the secondary containment area.

11. Because of the physical limitations of surveying inside a PCB item, assume that the leaking PCB item is radiologically contaminated.

RADIOLOGICAL TECHNICIAN

12. Survey the area and the PCB item(s) for radiological contamination.

13. If the PCB item is not radiologically contaminated, mark NON-CONTAMINATED LEAKING on the PCB item inventory sheet and place the wrapped leaking PCB item into an accumulation container marked NON-CONTAMINATED LEAKING PCB ITEM.

14. If there is radiologically contamination, mark CONTAMINATED LEAKING on the PCB item inventory sheet and place the wrapped PCB item into an accumulation container marked CONTAMINATED LEAKING.

15. If the area is radiologically contaminated, take the required actions prior to removing any items or containers from the area.

GENERATOR AND RSO

16. Seal the container containing the leaking PCB item.

17. If the removal involves tagged or untagged electrical equipment, prepare a Property Disposal Request form, FS-F-563.

18. Place the container marked CONTAMINATED LEAKING on a pallet for transport to Storage.

7.7 LABELLING PCB DISPOSAL CONTAINERS

GENERATOR AND RSO

1. Mark or label the container with the required identification for the material to be contained and the tare weight (see Figures 1, 2, and 3).

2. Complete an Item Production/Certification/Identification form, FS-F-1945-4 (65 Card), and a Nuclear Material Transfer Record form, FS-F-1990 (68/69 Card).

3. Insert the 65 Card and 68/69 Card into the plastic envelope on the container lid.

4. Remove the Hazardous Waste Disposal Record form, FS-F-3064, from the plastic envelope on the container lid and record the waste added to the container as follows:

   a. Record material type.

   b. Record the operator's badge number.

GENERATOR AND RSO

5. Return the Hazardous Waste Disposal Record form to the plastic envelope on the drum lid.

6. Complete a PCB Article Tag form (Figure 4) for each PCB item to be removed from service and give to the supervisor to sign and file.

7. Secure the lid on the container.

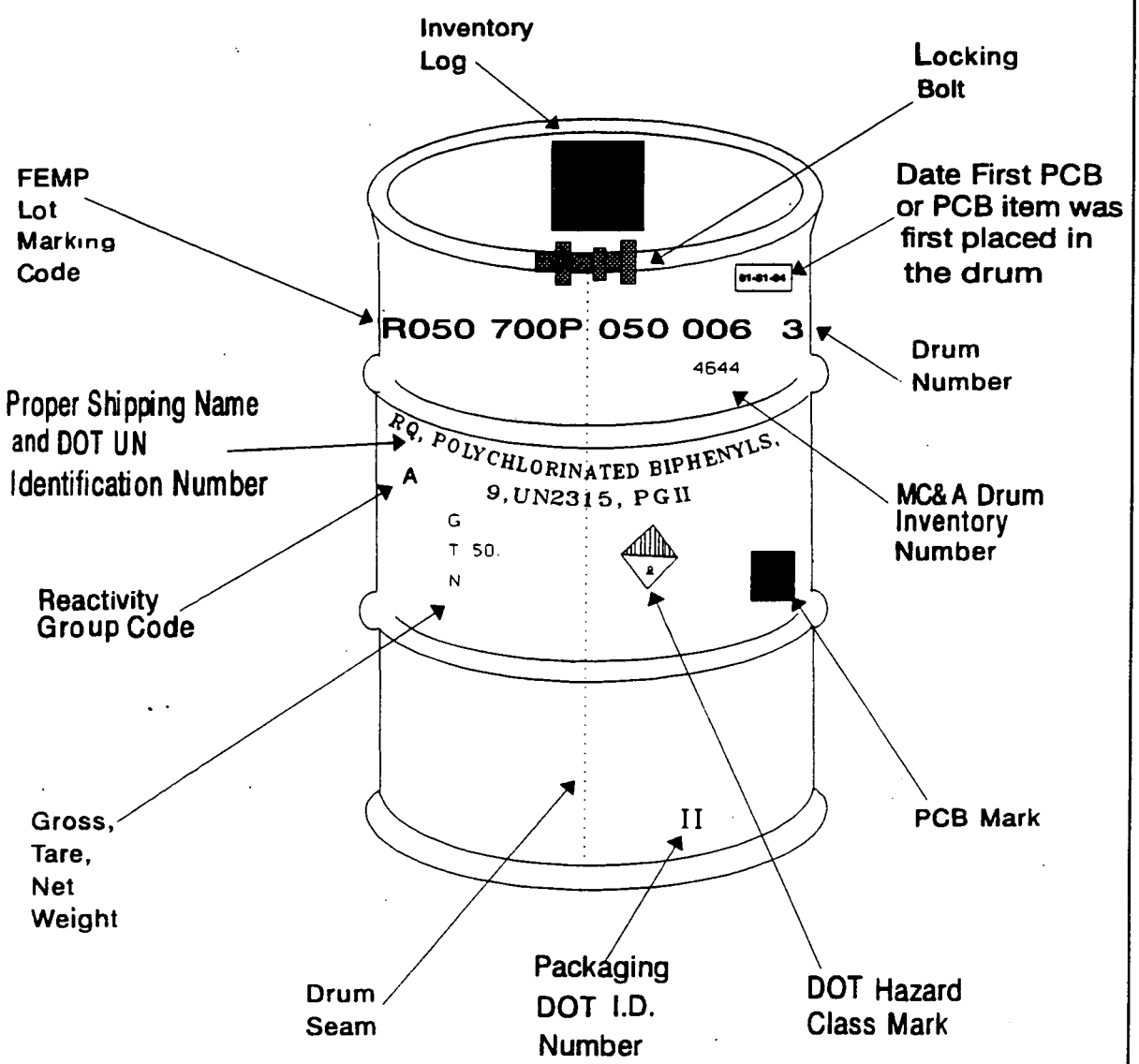
7.8 TRANSPORTING PCB CONTAINERS AND PCB ARTICLE CONTAINERS TO STORAGE

NOTE: PCB containers and PCB article containers must be placed in the storage facility within 30 days of the PCB or PCB items being loaded into the container(s).

SUPERVISOR OF THE PROJECT AREA

1. Verify the arrival of the transported PCB container or PCB article container at the storage facility.

Fernald Environmental FERMCO Restoration Management Corporation	Title: MANAGING PCBs AND PCB ITEMS	
	DOCUMENT NO: SSOP-1027 REVISION NO: 0	
	Effective Date: 03-08-94	Page 17 of 34



NOTE: If the amount of PBCs in the drum does not equal the Reportable Quantity (1 lb.), it is not necessary to place the DOT information and marks on the drum.

Figure 1 - Schematic of PCB Disposal Drum Labeling

CAUTION
CONTAINS
PCBs
(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency Regulations 40 CFR 761-For Disposal Information contact the nearest U.S. E.P.A Office.

In case of accident or spill, call toll free the U.S. Coast Guard National Response Center: 800-424-8802

Also Contact DOE/FEMP - AFDO

Tel. No. (513) 738-6200

PCS Printed by LABELMASTER, Div. of AMERICAN LABELMARK CO., CHICAGO, IL. 60646

Figure 2 - "Caution Contains PCBs" Mark

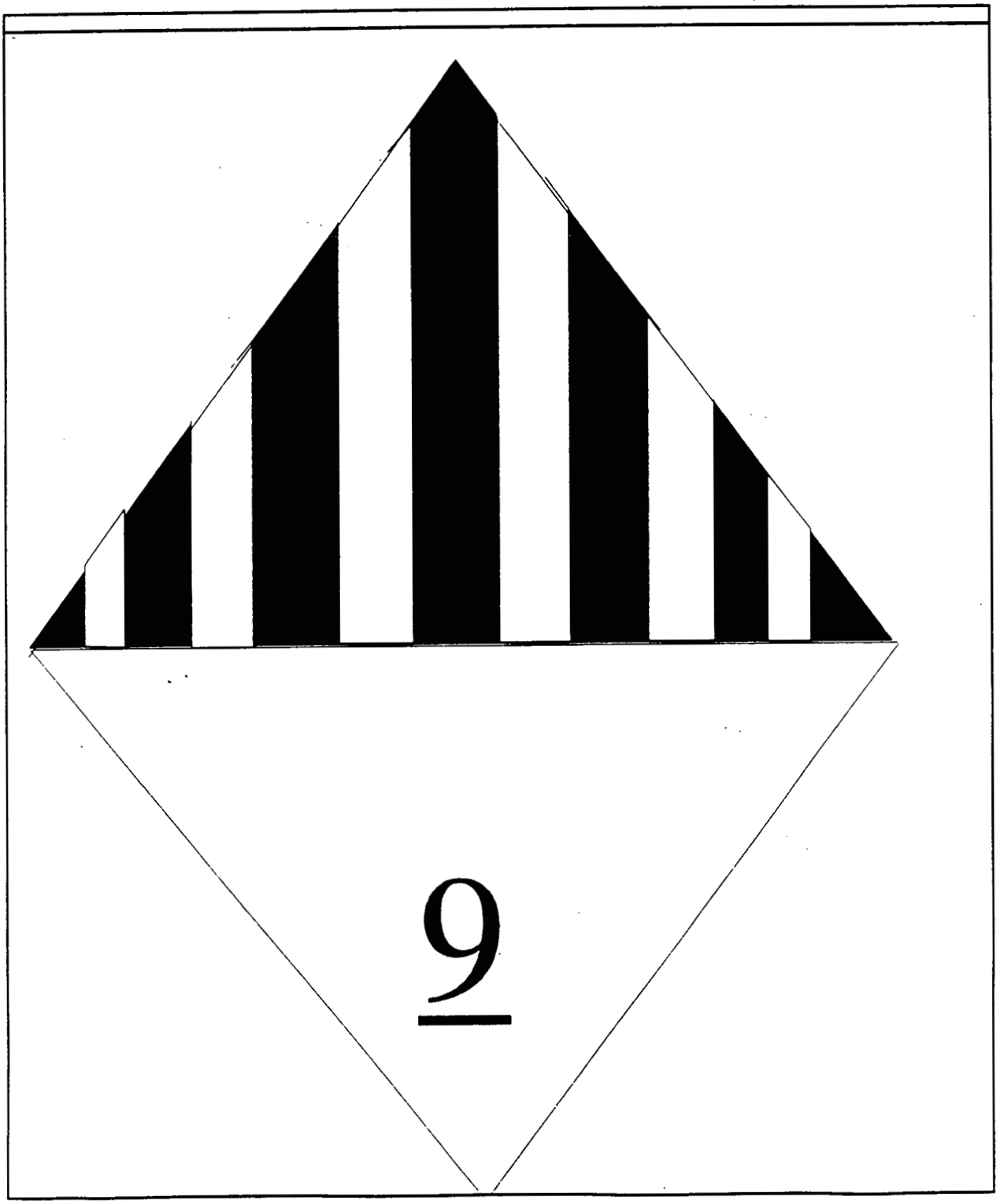


Figure 3 - DOT Shipping Label or Mark for PCB Containers

7.8 TRANSPORTING PCB CONTAINERS AND PCB ARTICLE CONTAINERS TO STORAGE (cont.)

SUPERVISOR OF THE PROJECT AREA

2. Install a lid and bolt-type lock ring on an open-head drum or threaded bung head drum and secure by checking gasket placement and condition of container lid.

   NOTE: Damaged gaskets shall be replaced.

3. Seat lid evenly on open head drum or screw bung plug tightly and evenly into the bung using a bung wrench.

4. Place locking bolt ring or lid of open head container ensuring the flanges point downward from the lock ring.

5. Install locking bolt shaft through the unthreaded flange, the locking nut, and threaded flange, in that order, so that the bolt head rests against the unthreaded flange.

6. Torque bolt to 45 lb-ft using breakaway torque wrench.

7. Manually tighten the locking nut against the thread flange.

8. Using a wrench, tighten the lock nut against the flange an additional one-quarter turn.

9. Move the sealed drum to the weighing station with a fork lift and record the final weight of drum.

   NOTE: Maximum weight per 55-gallon drum is 1,200 pounds gross.

10. Obtain the net weight of the container by subtracting the tare weight of the container from the weight indicated by the scale.

11. Remove the 65 Card from the envelope on the container and record the gross weight, net weight, lot sequence number, and badge number.

12. Return the card to the envelope on the container lid.

13. Stencil the gross weight, net weight, lot sequence number, and drum number on the container.

FEMP
ENVIRONMENTAL COMPLIANCE
PCB ARTICLE TAG - Remove-From-Service Information"

ARTICLE I.D. NO.	MODEL NO.:	SERIAL NO.:	CAPACITY (gal.):
VOLTAGE:	MANUFACTURER:	OTHER I.D. ITEMS:	
DESCRIPTION OF ITEM REMOVED: LEAKING? ☐ YES ☐ NO	ANY SPILLS DURING REMOVAL? ☐ YES ☐ NO	IF YES, DESCRIBE BELOW:	
REMOVED FROM SERVICE BY: Name: _____ Date: ____/____/____		**ADDITIONAL INFORMATION** (SKETCHES, ETC.):	
PLACED IN STORAGE BY: Name: _____ Date: ____/____/____			
SERVICE LOCATION: (PLANT, SPECIFIC AREA, ETC.):		SERVICE OPERATION: (FURNACE, JOLTER, ETC.)	
RADIATION SURVEY RESULTS:		ANALYTICAL RESULTS (IF APPLICABLE):	

NO.	DISTRIBUTION OF COPIES
1	Industrial Hygiene
2	Environmental Compliance
3	Solid Waste Compliance
4	Waste Management
5	Maintenance
6	Transportation

FS-F-2818 (REV. 10/15/92)

Figure 4 - PCB Article Tag - Removal from Service Information, FS-F-2818

7.9 SAMPLING RESIDUES

RSO

Return sample residues to the appropriate containers pursuant to site media sampling procedures.

7.10 MONTHLY INSPECTION OF THE PCB STORAGE FACILITY (BUILDING 81)

RSO

Perform inspection pursuant to SOP 20-C-616.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions
- 49 CFR 178.80, Department of Transportation

8.2 REFERENCES

- EM-SM-006, Sample Plan Development Procedure
- FERMCO PCB Policy
- PL-2194, FERMCO Spill Prevention Control and Countermeasure (SPCC) Plan
- Removal Action 9
- RM-0005, FEMP Lot Marking and Color Coding System
- SOP-20-C-616, Inspection of Hazardous Waste Management Units
- SOP-20-C-912, Checking Scale Operation
- SSOP-0035, Satellite Accumulation Areas and Interim Containers for Hazardous Wastes
- SSOP-0719, Energy Control Procedure (Lockout and Tagout)
- SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers

ATTACHMENT A
Sheet 1 of 11

U. S. Department of Energy
Fernald Environmental Management Project
Letter No. C:OP:93-1413

Mr. J. Phil Hamric, Manager
Department of Energy
Fernald Field Office
P. O. Box 398705
Cincinnati, Ohio 45239-8705

Dear Mr. Hamric:

CONTRACT DE-AC05-92OR21972, FERMCO'S PCB POLICY

This document introduces FERMCO's PCB Policy for managing polychlorinated biphenyls (PCBs), PCB items, and fluorescent light ballasts at the FEMP. This document supersedes and thereby nullifies the pre-existing WEMCO-originated PCB Policy.

Prior to introducing FERMCO's policy, the following background on the WEMCO PCB Policy at the FEMP is presented.

WEMCO PCB POLICY AT THE FEMP

Westinghouse Environmental Management Company of Ohio (WEMCO), as directed by Westinghouse Electric Corporation (Westinghouse), implemented a corporate PCB policy which addressed the issues of handling, storing, and disposition of PCBs and PCB items at all Westinghouse facilities. Westinghouse's corporate policy required any items that contained PCB concentrations of 2 parts per million (ppm) or greater to be managed in accordance with 40 CFR 761. Federal requirements stated in 40 CFR 761 are specifically applicable only to items with a PCB concentration of 50 ppm or greater. At the FEMP, the major category of PCBs impacted by the WEMCO policy are fluorescent light ballasts.

Following is a passage from the Westinghouse PCB Light Ballast Policy:

> "PCB ballasts fall into the small capacitor category as defined in 40 CFR 761.3. While the federal regulations do not have any requirements for disposal unless you manufacture PCB equipment [emphasis added], Westinghouse takes a more conservative approach. As specified in Chapter 9 of the Westinghouse Environmental Manual, Westinghouse facilities [e.g., the FEMP] are to follow the federal requirements for the accumulation of the infrequently generated unit, that is, no specific disposal requirements. However, if any quantity is accumulated during a given year, then it must be incinerated as a PCB waste. In addition, all of the accumulation, labeling, and storage requirements for PCB materials must also be satisfied.

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Sheet 2 of 11

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Potential liability, public opinion and changing regulations are the predominant reasons why Westinghouse's PCB disposal requirements are more stringent than the regulations. Disposal of small PCB capacitors in a sanitary landfill potentially exposes Westinghouse to longer term cleanup liabilities. Also, the public opinion and possible media exposure would not be very favorable if it was ascertained that Fernald was disposing of 'PCBs' into the local sanitary landfill."

FERMCO'S PCB POLICY

Non-radioactive PCBs and PCB items will be managed (including marking, labelling, handling, storing, disposition and reporting) in compliance with the federal requirements as stated at 40 CFR 761, *"Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions"*. Any item containing dielectric fluids at a PCB concentration of 50 ppm or greater will be considered and managed as a PCB item, consistent with 40 CFR 761.

Any nonleaking item or material containing a PCB concentration of 49 ppm or less will be considered and managed as non-PCB and categorized as "excluded PCB products" as defined at 40 CFR 761.3. Excluded PCB products are not subject to the marking, labelling, storing, and administrative requirements (e.g., PCB Document Log, PCB Annual Document Report) for PCBs and PCB items contained in 40 CFR 761. Therefore, administrative requirements such as the preparation and submittal of the PCB Annual Document Log will not be applicable to such excluded PCB products. Electronic and solid state equipment, such as computers, clocks, radios and microwave ovens, are presumed not to contain PCBs and will also be managed as non-PCB items. Small capacitors, such as those contained in fluorescent light ballasts, are not regulated by the federal requirements except when leaking. Any PCB item (e.g, fluorescent light ballast) found to be <u>leaking</u> will be regulated and managed in accordance to 40 CFR 761.

As a Best Management Practice (BMP), fluorescent light ballasts will be stored in a storage area conforming to 40 CFR 761.65 <u>once</u> the drum is full. Building 81 is currently utilized as the designated storage area of PCBs and is in compliance with 40 CFR 761.65 (i.e., adequate roof/walls, containment, etc.).

Any drum(s) containing non-radioactively-contaminated, nonleaking fluorescent light ballasts will be marked on two sides of the drum, "UNREGULATED LIGHT BALLASTS". Any drum(s) containing radioactively-contaminated, nonleaking fluorescent light ballasts will be marked on two sides of the drum,

"RADIOACTIVELY CONTAMINATED LIGHT BALLASTS". For both types of drums of light ballasts, the lettering of the marking on the drums will be at least two (2) inches in height.

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Sheet 3 of 11

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Partially full drums of PCBs and PCB items will be consolidated into full drums as long as the contents are segregated by corresponding type of item (e.g., PCB liquids, PCB transformers, unregulated light ballasts) and radioactive concentration (e.g, non-radioactive items, radioactive items) to ensure no mixing or commingling of waste types during consolidation. Such consolidation should decrease the inventory of PCB drums at the FEMP, reduce the potential for a release to employees and the environment, reduce space occupied by such drums in the designated PCB storage area currently within Building 81 , and allow more cost-effective transport and disposal of these drummed materials.

As a Best Management Practice (BMP), consistent with pollution prevention and waste minimization (PP/WM) principles, all non-radioactively-contaminated, nonleaking fluorescent light ballasts will be disposed of by a FERMCO-approved recycling vendor. FERMCO will initiate a procurement prior to the dismantlement of fluorescent light ballasts with the following technical approach/scope: FERMCO will initially package the fluorescent light ballasts into proper drums ensuring fluorescent light ballasts are not leaking and that they are not radioactive; the vendor will collect the drums of fluorescent light ballasts and transport the drums to the recycling facility; at the facility, the vendor will remove the small capacitors from the ballasts, pack the small capacitors in drums and transport the small capacitors to a TSCA-approved incinerator for disposal, and recycle the remaining materials for valuable metals. The capacitors will not be considered PCB waste since the capacitors are not regulated as PCBs according to 40 CFR 761. In the event that no such responsive/responsible vendor or subcontractor can be located as a result of such procurement action, an acceptable alternate approach is procurement action for disposal via a TSCA- approved incinerator without recycling/reclamation.

All spills of PCBs will be managed in compliance with the federal requirements as stated in 40 CFR 761.120 through 761.135. A spill refers to both intentional and unintentional releases, spills, leaks, and other uncontrolled discharges where the release results in "any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the PCB contaminated material resulting from those releases." Such PCB contaminated material includes cleanup debris (e.g., absorbent), rags, soil, concrete, and rinsate generated from the clean-up affected by the release.

Where a spill of untested mineral oil occurs, the oil is presumed to contain greater than 50 ppm but less than 500 ppm and is subject to the EPA Cleanup Policy.

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ACQUISITION AND SALVAGE OF FLUORESCENT LIGHT BALLASTS

An intact, nonleaking, and structurally sound fluorescent light ballast bought for use before July 1979, may be sold for subsequent use as stated in 40 CFR 761.20(c)(1) for purposes other than resale and may be distributed in commerce only in a totally enclosed manner after that date. FERMCO will request a statement from its vendors prior to purchase of fluorescent light ballasts documenting that the items provided **do not** contain PCBs. In the event that FERMCO salvages any useable fluorescent light ballast for resale or use, such salvage will be limited to only those fluorescent light ballasts which do not contain PCBs.

CONTACTS

If you have any questions and/or comments concerning this letter, or the full policy document presented as Attachment 1, please contact Ken Alkema, of my staff, at (513) 738-9228. Revisions to existing SOPs and other procedures needed to implement this change from pre-existing policy are either in progress or will be initiated shortly.

Very truly yours,

N. C. Kaufman
President

NCK:MJS:jhc
Attachment

c: L. G. Abernathy, FERMCO
J. T. Curtis, FERMCO
N. W. Fraser, FERMCO
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ATTACHMENT A
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FERMCO PCB POLICY

PCBs AND PCB ITEMS

PCBs and PCB items will be managed (including handling, marking, labelling, storing, disposition and reporting) in compliance with the federal requirements as stated at 40 CFR 761, *"Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions"*. Any item containing dielectric fluids at a PCB concentration of 50 ppm or greater will be considered and managed as a PCB item, consistent with 40 CFR 761. Radioactively contaminated PCBs and PCB items will be handled in the same manner regarding PCBs, but with the addition of radioactive waste management considerations and requirements.

EXCLUDED PCB PRODUCTS

Any item or material containing a PCB concentration of 49 ppm or less will be considered and managed as non-PCB and categorized as "excluded PCB products" as defined at 40 CFR 761.3. Excluded PCB products are not subject to the marking, labelling, storing, and administrative requirements (PCB Annual Document Log and Annual Report) for PCBs and PCB items contained in 40 CFR 761. Therefore, administrative requirements such as the preparation and submittal of the PCB Annual Document Log will not be applicable to such excluded PCB products. Electronic and solid state equipment such as computers, radios, clocks and microwave ovens are presumed not to contain PCBs and will be managed as non-PCB items.

FLUORESCENT LIGHT BALLASTS

Fluorescent light ballast, as defined at 40 CFR 761.3, means a device that electrically controls fluorescent light fixtures and that includes a capacitor containing 0.1 kilograms (about 1 to 1.5 ounces) or less of dielectric fluid.

Provided that they are (1) not leaking, and (2) not collected during the manufacture of capacitors or equipment containing capacitors, there are no federal requirements for storage of small capacitors, such as those contained in fluorescent light ballasts. The FEMP is not currently nor has it ever been engaged in the manufacture of either capacitors or equipment containing capacitors.

As a Best Management Practice (BMP), it is therefore FERMCO's policy that fluorescent light ballasts will be stored in a storage area conforming to 40 CFR 761.65 once the drum is full. Building 81 is currently utilized as the designated storage area of PCBs and is in compliance with 40 CFR 761.65.

It is FERMCO's policy that any drum(s) containing non-radioactively contaminated, nonleaking fluorescent light ballasts will be marked on two sides of the drum, "UNREGULATED LIGHT BALLASTS". It is also FERMCO policy that any drum(s) containing radioactively-contaminated, nonleaking fluorescent light ballasts will be marked on two sides of the drum, "RADIOACTIVELY CONTAMINATED LIGHT BALLASTS". The lettering of the marking on the drums will be at least two (2) inches in height for both types of drums of light ballasts.

In the event that other such excluded PCB products are identified, FERMCO will manage such items in a the same manner as light ballasts. FERMCO will assess whether the other such excluded PCB products should be segregated from fluorescent light ballasts.

SMALL PCB CAPACITORS

Non-leaking small PCB capacitors other than those found in light ballasts will also be managed as excluded PCB products. These may be found in electrical equipment or control panels such as circuit breakers, voltage regulators, reclosers and switches. As a BMP, these will be recycled for valuable metals and the PCBs will be incinerated at a TSCA-approved incinerator.

CONSOLIDATION OF PARTIALLY FULL DRUMS

It is FERMCO's policy that partially full drums of PCBs and PCB items will be consolidated into full drums as long as the contents are segregated by corresponding type of item (e.g., PCB liquids segregated from PCB transformers) and radioactive concentration (e.g. non-radioactive segregated from radioactive items) to ensure no mixing or commingling of waste types during consolidation. Such consolidation will decrease the inventory of PCB drums at the FEMP, reduce the potential for a release to employees and the environment, reduce space in Building 81 occupied by drums, and allow more cost-effective transport and disposal of these drummed materials.

ATTACHMENT A
Sheet 6 of 11

DISPOSITION OF EXCLUDED PCB PRODUCTS

The FEMP is not currently nor has it ever been engaged in the manufacture of capacitors or equipment containing capacitors. Provided that small capacitors, such as these contained in fluorescent light ballasts, are not leaking, the FEMP "may dispose of PCB small capacitors (including fluorescent light ballasts) as municipal solid waste ... " [40 CFR 761.60(a)(2)(ii)]. Leak or leaking means any instance in which a PCB Article, PCB Container, or PCB Equipment (e.g., small capacitor, fluorescent light ballast) has any PCBs on any portion of its external surface [40 CFR 761.3].

As a Best Management Practice (BMP) consistent with pollution prevention and waste minimization (PP/WM) principles, it is FERMCO's policy that all non-radioactively-contaminated, nonleaking fluorescent light ballasts will be disposed of by a FERMCO-approved recycling vendor. The vendor will collect the drums of fluorescent light ballasts and transport the drums to the recycling facility. At the facility, the vendor will remove the small capacitors from the ballasts, pack the small capacitors in drums and transport the small capacitors to a TSCA-approved incinerator for disposal, and recycle the remaining ballast materials for valuable metals. The capacitors will not be considered PCB waste since the capacitors are not regulated as PCBs according to 40 CFR 761. In the event that no such responsible and responsive vendor or subcontractor can be located via appropriate procurement solicitation, an acceptable alternative approach is disposal via a TSCA-approved incinerator without recycling/ reclamation.

ACQUISITION AND SALVAGE OF FLUORESCENT LIGHT BALLASTS

An intact, nonleaking, and structurally sound fluorescent light ballast, bought for use before July 1979, may be sold for subsequent use as stated in 40 CFR 761.20(c)(1) for purposes other than resale and may be distributed in commerce only in a totally enclosed manner after that date.

It is FERMCO's policy to request a statement from its vendors prior to purchase of fluorescent light ballasts documenting that the items provided do not contain PCBs. In the event that FERMCO salvages any useable fluorescent light ballast for resale or use, it is FERMCO's policy that salvage will be limited to only those fluorescent light ballasts which do not contain PCBs.

SUMMARY

PCB disposal requirements are presented in the following table.

CONTACTS

Questions and/or comments concerning this document should be referred to FERMCO's Regulatory Programs Division, Ken Alkema, at (513) 738-9228.

ATTACHMENT A
Sheet 7 of 11

FERMCO PCB POLICY
-PCB Disposal Requirements
(Non-radioactive)

Material/Item	Federal Regulations	FERMCO Requirements
I. **Liquids**		
2-49 ppm	Prohibited for use as a dust Incinerate dielectric control agent. Burn in a boiler, fluids at TSCA-TSCA- or RCRA-approved facility.	approved facility approved by FERMCO.
50-499 ppm	Incinerate in approved unit, or Same as federal burn in approved high efficiency except facility boiler or by alternative USEPA-requires approval	approved method by FERMCO.
500 ppm or	Incinerate in TSCA-approved unit Same as federal greater or destroy with equivalent except facility approved method. requires approval	by FERMCO.

ATTACHMENT A
Sheet 8 of 11

FERMCO PCB POLICY
PCB Disposal Requirements
(Non-radioactive)

Material/Item	Federal Regulations	FERMCO Requirements
II. Transformer Carcass Previously Contained		
2-49 ppm	Not regulated.	Drain all free-liquid and dispose as in Section I above. Landfill all parts in approved chemical landfill or salvage parts at facilities approved by FERMCO.
50-499 ppm	Drain all free-liquid and Same as above	dispose as in Section I above, then carcass not regulated.
500 ppm or greater	Drain liquid, fill with solvent and let stand 18 hours; drain again.	Same as federal except facility requires approval by FERMCO as specified in Section I above, landfill carcass in approved RCRA-permitted chemical waste landfill or decommission by other equivalent alternative means approved by USEPA or incinerate entire unit.

ATTACHMENT A
Sheet 9 of 11

FERMCO PCB POLICY
PCB Disposal Requirements
(Non-radioactive)

Material/Item	Federal Regulations	FERMCO Requirements
III. Capacitors		
Small	Not regulated unless facility manufactured PCB equipment, then incinerate dielectric fluids must incinerate in TSCA-approved unit approved facility	Recycle metal and <3 lbs. fluids at TSCA-approved facility approved by FERMCO.
Large	Shred and incinerate in TSCA-approved unit.	Same as federal except >3 lbs. facility must be approved by FERMCO.
2-49 ppm	Not regulated.	Recycle metal and incinerate dielectric fluids at a TSCA-approved facility approved by FERMCO.
50-499 ppm	Incinerate or landfill in TSCA-approved unit	Shred and incinerate in TSCA-approved unit approved by FERMCO.

ATTACHMENT A
Sheet 10 of 11

FERMCO PCB POLICY
PCB Disposal Requirements
(Non-radioactive)

Material/Item	Federal Regulations	FERMCO Requirements
IV. Solids		
Rags, soil, debris, empty containers, etc. (no free liquid)		
2-49 ppm	Not regulated Landfill in TSCA- ("excluded PCB product") approved or RCRA-permitted chemical waste landfill approved by FERMCO.	
50 ppm or greater	Landfill in TSCA-approved chemical waste landfill or incinerate; empty containers can be approved by FERMCO; decontaminated by triple rinsing.	Incinerate at a TSCA-approved facility empty containers can decontaminated by triple rinsing -- dispose of all liquids as in Section I above.

ATTACHMENT A
Sheet 11 of 11

FERMCO PCB POLICY
PCB Disposal Requirements
(Non-radioactive)

Material/Item	Federal Regulations	FERMCO Requirements
V. Hydraulic Equipment		
2-49 ppm	Not regulated ("excluded PCB Drain liquid and product), except liquids as dispose of liquids as in Section I above in Section I and equipment as in Section II above.	
50-999 ppm	Not regulated, except liquids Same as above as in Section I above.	
1000 ppm	Drain free liquid and flush Same as federal except or greater with a suitable solvent, dispose disposal facility must of all liquids as in Section I be approved by FERMCO above, then equipment not regulated (exterior surfaces may have to be cleaned to USEPA spill policy standards).	
VI. Other		
	Any miscellaneous equipment contaminated with PCBs can be handled according to the appropriate categories above. Equipment which will be sold for re-use may have to be decontaminated according to the USEPA Spill Policy Standards (40 CFR 761, Subpart G). Check with FERMCO's Regulatory Programs Division for specific requirements.	

ATTACHMENT B

Dielectric Fluid Trade Names and Manufacturers

1. U.S. Manufactured Dielectrics:

Name	Manufacturer
Aroclor	Monsanto
Aroclor B	Mallory
Askarel (Heavy Duty)	Heavy Duty Corp
Askarel*	Ferranti Packard, Ltd
Askarel	Universal Mfg Co
Chlorextol	Allis Chalmers
Chlorpen	Jard Company
Chlorinol	Sparagoe Electric
Diaclor	Sangamo Electric
Dykanol	Cornell Dubilier
Elemex	McGraw Edison
Eucarel	Electric Utilities Corp
Hyvol	Aerovox
Inerteen	Westinghouse Electric
No Flamol	Wagner Electric
Pyranol	General Electric
Saf-T-Kuhl	Kuhlman Electric

* Generic name used for insulating liquids in capacitors and transformers.

2. Foreign Manufactured Dielectrics:

Name	Manufacturer
Clophen	Bayer (Germany)
Fenclor	Caffaro (Italy)
DK	Caffaro (Italy)
Kennechlor	Mitsubishi (Japan)
Santotherm	Mitsubishi (Japan)
Solvol	USSR
Phenoclor	Prodelec (France)
Pyralene	Prodelec (France)

3. Items that list other dielectrics, or do not bear a manufacturer's identification/service plate, or if the item contains any of the dielectrics commonly referred to as ASKARELS, the item is to be certified as a PCB item and no laboratory analysis is necessary.

REMEDIATION SUPPORT OPERATIONS PROCEDURE	HAKO MINUTEMAN Portable Vacuum Cleaner Operation	SOP 20-C-711 Area: As Applicable

(Signature on File) Authorization: R.L. Gardner, Facilities & Waste Operations Mgr.	Supersedes: 20-C-711 Dated: 10-29-90	Issue Date: 08-05-93

1.0 PURPOSE

The purpose of this document is to establish the procedure for operating HAKO MINUTEMAN Portable Vacuum units.

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2.0 APPLICABILITY

This procedure is applicable to HAKO Vacuum Cleaners in use 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 Division Manager.

3.1.2 Contacting Industrial Hygiene or Radiological Control to determine the appropriate respiratory protection for the process being performed.

3.1.3 Providing operators with the required respiratory protection.

3.1.4 Ensuring that removed filters are disposed of in accordance with the applicable regulations.

3.1.5 Identifying a damaged unit or a unit with a broken/missing/expired DOP Test Label with an OUT-OF-SERVICE tag.

3.1.6 Ensuring that units are labeled to conform with the type waste that the unit will contain.

3.1.7 Contacting Radiological Control to obtain a "Radiation Work Permit" (RWP) before a unit is opened for cleaning.

3.1.8 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

3.2 **Operators** shall be responsible for complying with this procedure.

3.3 **Industrial Hygiene (IH)** shall be responsible for the following:

3.3.1 Coordinating unit cleanup.

3.3.2 Ensuring that in-place DOP tests are performed on HEPA Filters installed in HAKO units in accordance with DOE/OSHA and ANSI requirements.

4.0 DEFINITIONS

4.1 High Efficiency Particulate Air (HEPA) Filter - A pleated paper air filter having the capability to remove minute particles from an air stream.

4.2 DOP (In Place Filter) Test - Using DOP aerosol to determine the efficiency of a HEPA Filter.

4.3 Prefilter - A dacron cloth filter upstream of the HEPA Filter that removes large particles before the particles reach the HEPA Filter.

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 40 CFR series, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities"

5.1.2 OAC 3745-65 series, "Interim Standards for Hazardous Waste Facilities Operating Prior to October 9, 1980"

5.1.3 DOE 5400 series, "Environment, Safety, and Health Directives"

5.1.4 DOE 5420 series, "Radioactive Waste Management"

5.1.5 PO-D-026, "Site Services Document Program"

5.1.6 "FEMP Conduct of Operations Manual"

5.1.7 RM-0012, "Quality Assurance Program Description"

5.2 References

None

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Units that are labelled to designate the type of waste to be picked up shall only be used for the specified waste.

6.3 Hazardous waste shall not be mixed in a vacuum cleaner.

6.4 Electrically operated or air driven units shall not be operated within 50 feet of solvents, thinners, or other flammable or explosive material or vapors.

6.5 Electrical outlets to be used shall have the same configuration as the vacuum cleaner plug. A plug adapter shall not be used.

6.6 Air operated units shall be grounded to prevent static electricity arcs.

6.7 Respiratory protection issued by the supervisor shall be worn when required.

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS** (cont.)

6.8 In case of a mercury spill, a barrier shall be erected around the spill and remain in place until Industrial Hygiene permits removal of the barrier.

6.9 Hands and any other exposed skin areas shall be thoroughly washed after cleaning up a mercury spill.

6.10 If an extension cord is used, the diameter of the cord shall be one size larger than the vacuum cleaner cord, a maximum of 25 feet in length, and be three-wire grounded.

6.11 The unit shall be disconnected from a power source before removing the motor or opening the unit.

6.12 The unit electrical cord and/or extension cord, if used, shall not be laid in standing water if the cord is connected to an electrical outlet.

6.13 Operators shall not stand in water while operating the unit.

6.14 A broom, shovel, or other manual device shall not be used to remove spills of hazardous material. A vacuum shall be used to remove material.

6.15 Units designated for mercury shall not be used for any other material unless the material is contaminated with mercury.

6.16 Mercury units shall be stored in a well ventilated room (preferably vented to outside air) away from the central air circulating system.

6.17 Nitrile gloves, disposable shoe covers, and disposable coveralls shall be worn while cleaning mercury spills.

6.18 Safety glasses shall be worn unless other eye/face protection is specified by the supervisor, ES&H, or posted signs.

6.19 Unless otherwise specified, leather-palm gloves shall be worn while operating vacuum units and when handling sharp-edged or abrasive material.

6.20 Vacuums shall be cleaned in an Exclusion Zone established by Radiological Control.

6.21 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.)

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 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-IRS&T-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.

6.23 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-IRS&T-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 Item or Step to which they apply.

8.0 PROCEDURE

8.1 Prestart Inspection

NOTE 1: Units shall be inspected at the start of the first shift of use each day.

NOTE 2: If operators are changed during a shift or after a shift change, the inspection shall be repeated but not recorded unless a discrepancy is discovered.

8.1.1 Inspect the unit per Table 1 and Figure 1.

8.1.2 Record results on a "HAKO Vacuum Cleaner Inspection Log," FMPC-OPR-3227 (See Figure 2).

NOTE: The supervisor shall record the reason for failure on an OUT-OF SERVICE tag and attach the tag to the unit.

8.1.3 If the unit fails inspection and the discrepancy can not be corrected, notify the supervisor.

8.0 **PROCEDURE** (cont.)

8.2 Electrical Powered HAKO Unit Operation

WARNING:

Do not use the unit if the power cord will be immersed in water.

8.2.1 Check the area for standing water.

8.2.2 Ensure that the ON/OFF switch is set to OFF.

8.2.3 Plug the unit into the electrical outlet being used.

8.2.4 Set the ON/OFF switch to ON.

NOTE: The gage shall be checked at half-hour intervals while the unit is operating.

8.2.5 If the unit is equipped with a Magnehelic Gauge, record the gage reading on the "HAKO Vacuum Cleaner Inspection Log."

NOTE: The supervisor shall tag the unit OUT-OF-SERVICE and arrange for an "In-place DOP Test" to be performed after the HEPA filter is replaced.

8.2.5.1 If the needle on the gage is in the red zone, shut off the unit, notify the supervisor, and replace the HEPA filter.

8.2.6 After a new filter has been installed and tested, check to ensure that a new, current, test label was attached to the unit.

NOTE: The supervisor shall contact IH to test the unit.

8.2.6.1 If the label is not current or no label is attached, notify the supervisor.

8.2.7 Start the unit and check the Magnehelic Gauge.

NOTE: The supervisor shall inform the Instrument Shop that the gauge may require replacement and notify the personnel that performed the DOP Test of the condition.

8.2.7.1 If the needle is at or below zero, shut down the unit and notify the supervisor.

8.2.8 After use, set the ON/OFF switch to OFF.

8.2.9 Remove the plug from the outlet.

8.0 **PROCEDURE** (cont.)

8.3 Air Powered HAKO Unit Operation

8.3.1 Check that a control valve is installed in the air pressure line to be used.

8.3.1.1 If the line does not have a Pressure Control Valve installed, obtain a replacement pressure line.

8.3.2 Connect the air pressure line between the Plant Air Outlet Valve and the Air Inlet Valve on the vacuum.

8.3.3 Open the Plant Air Valve.

8.3.4 Open the Pressure Control Valve on the airline.

8.3.5 Adjust the air pressure to 90 (±10) psi.

8.4 Mercury Designated HAKO Unit Operation

8.4.1 Check the lid for a Test Label.

NOTE: The supervisor shall notify Industrial Hygiene (IH) that a HEPA test is required.

8.4.1.1 If the label is missing, torn, or out of date, notify the supervisor.

CAUTION:

Do not substitute, bypass, or remove any filters.

NOTE: The Mercury Vapor Canister is an activated charcoal filter that absorbs airborne mercury.

8.4.2 Check the lid for a Mercury Vapor Canister inspection label.

WARNING:

Do not use the unit if the canister is missing.

NOTE: The supervisor shall notify IH that the canister requires inspection and tag the unit OUT-OF SERVICE until a Mercury Vapor Canister is installed and tested by IH.

8.4.2.1 If the label is missing, torn, or expired, notify the supervisor.

8.4.3 Ensure that the ON/OFF switch is set to OFF.

8.4.4 Record the timer reading on the "HAKO Vacuum Cleaner Inspection Log," Form FMPC-OPR-3227 (See Figure 2).

8.4.5 Plug the power cord into an electrical outlet.

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8.0 **PROCEDURE** (cont.)

8.4.6 Set the ON/OFF switch to ON.

8.4.7 After use, set the ON/OFF switch to OFF.

8.4.8 Disconnect the plug.

> **WARNING:**
>
> **Because Mercury gives off a harmful vapor, empty and clean the unit after each use.**

8.4.9 Clean the unit as follows (See Figure 1):

NOTE 1: The supervisor shall contact Radiological Control to obtain an RWP.

NOTE 2: The supervisor shall request that IH personnel be present to coordinate unit cleaning.

8.4.9.1 Notify the supervisor that the unit is ready to be cleaned.

8.4.9.2 Move the unit to the contamination control area designated by Radiological Control.

8.4.9.3 Ensure that an RWP is posted in the area.

8.4.9.4 Remove the Lid Assembly from the Tank.

8.4.9.5 Remove the Dacron Filter, Filter Protector, and the Paper Bag from the Tank.

8.4.9.6 Place the Paper Bag and the Dacron Filter, and Filter Protector in a plastic bag.

8.4.9.7 Remove the Separator Assembly from the Tank.

8.4.9.8 Remove the Separator Jar from the Separator.

8.4.9.9 Using damp cloths, clean the Separator Jar and the inside of the Tank until all traces of mercury are removed.

8.4.9.10 Place the cloth used for cleaning in the plastic bag with the filters.

8.4.9.11 Seal the bag.

8.4.9.12 Place the Separator Jar in the Separator.

8.4.9.13 Install the Separator Assembly, a new Paper Bag, Filter Protector, and Dacron Filter in the Tank.

8.0 **PROCEDURE** (cont.)

8.4.9.14 Install the Lid Assembly on the Tank.

NOTE 1: The supervisor shall request IH to inspect and test the Mercury Vapor Canister and the HEPA filter.

NOTE 2: IH shall check the vapor canister and HEPA filter after each use. If the HEPA filter seal/canister label is broken, missing, or expired the unit shall be removed from service. IH shall verify test and acceptance by attaching a HEPA Filter Seal or Vapor Canister Inspection label to the units.

8.4.9.15 Notify the supervisor that the vacuum has been cleaned.

8.4.10 Store the unit in a dry, cool, well ventilated room.

NOTE: The supervisor shall contact Solid Waste Compliance and Waste Technology for RCRA determination of filters.

8.4.11 Give the plastic bag containing filters to the supervisor for disposal.

8.0 **APPLICABLE FORMS**

8.5 FMPC-OPR-3227, "HAKO Vacuum Cleaner Inspection Log"

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TABLE 1
HAKO Inspection Requirements

ITEM NAME	INSPECTION	CONDITION	CORRECTIVE ACTION
Material type	Material to be vacuumed	Unit shall be compatible with residue to be collected in space provided.	If the unit is not compatible with material, obtain a HAKO unit that is labelled for the material.
Housing	Outer Circumference/ Frame/Wheels	Dents	Notify the supervisor and proceed as directed.
		Hole(s), loose/missing rivets or clips or knobs or bolts.	Remove the unit from service and notify the supervisor.
Timer (Mercury designated units only)	Elapsed time	Operating time determines charcoal filter change requirement.	Notify the supervisor of total operating time.
Power cord	Cord	Frayed	DO NOT USE. Notify the supervisor that repair is required. **NOTE**: The supervisor shall tag the unit OUT-OF-SERVICE and notify Maintenance that repair is required.
		Worn/damaged	Notify the supervisor and proceed as directed. **NOTE**: The supervisor shall inspect the unit and decide if repair is required or if the unit may remain in use.
	Connections	Cracked, broken, contact bent	DO NOT USE. Notify the supervisor that repair is required.
		Excessive wear	Notify the supervisor and proceed as directed.

TABLE 1 (cont.)
HAKO Inspection Requirements

ITEM NAME	INSPECTION	CONDITION	CORRECTIVE ACTION
Paper/Dacron filters	Interior of housing	Filters dirty reducing suction	Notify the supervisor and proceed as directed.
Material Label	NFPA Label	Label missing	Contact the supervisor for material identification and label the unit. DO NOT USE without label.
		Listed material on label not compatible.	Notify the supervisor. The supervisor shall contact IH. If material is not compatible, a different vacuum unit shall be selected.
Pressure Gauge	Magnehelic Gauge	Gauge missing	DO NOT OPERATE. Notify the supervisor that replacement is required.
		Out-Of-calibration	Notify the supervisor that calibration is required.
		Gauge damaged	Notify the supervisor and proceed as directed.
		Gauge in high green or red	Replace paper disposal bag, clean the main filter, and recheck gauge reading.
HEPA Housing	Certification Label	Label torn, missing or expired	REMOVE FROM SERVICE and notify the supervisor. The supervisor shall have the unit tested.
	Outer Circumference	Dents, holes, loose clips	
Motor Air Intake	Screen	clogged with dirt	Notify the supervisor and proceed as directed.

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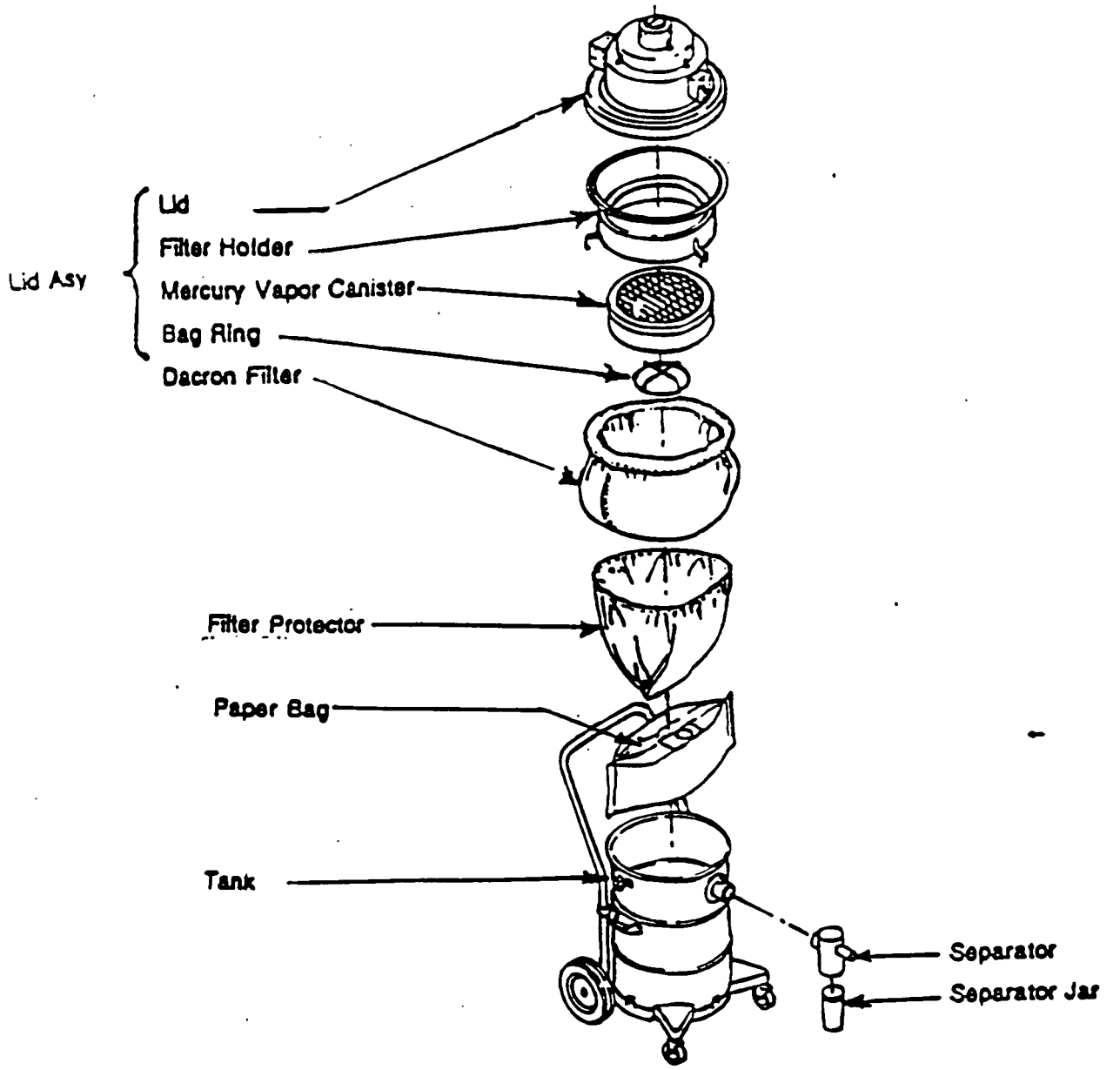

HAKO VACUUM ASSEMBLY
Figure 1

FMPC
OPERATIONS
HAKO VACUUM CLEANER INSPECTION

FACILITY OWNER _____ VACUUM NUMBER: _____ MONTH _____

DATE	TIME	OPERATOR BADGE NUMBER AND INITIALS	MATERIAL TYPE	FILTER BAGS ACCEPTABLE YES	FILTER BAGS ACCEPTABLE NO	HOUSING ACCEPTABLE YES	HOUSING ACCEPTABLE NO	TIMER READING	POWER CORD ACCEPTABLE YES	POWER CORD ACCEPTABLE NO	MATERIAL LABEL PRESENT YES	MATERIAL LABEL PRESENT NO	PRESSURE GAUGE ACCEPTABLE YES	PRESSURE GAUGE ACCEPTABLE NO	GAUGE READING	HEPA TEST LABEL PRESENT YES	HEPA TEST LABEL PRESENT NO	HEPA HOUSING ACCEPTABLE YES	HEPA HOUSING ACCEPTABLE NO	INTAKE SCREEN ACCEPTABLE YES	INTAKE SCREEN ACCEPTABLE NO
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** Applies to mercury designated units only.
* To be done after startup.

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1	PROCESS ENGINEERING

FMPC-OPR-3227 (5/17/93)

HAKO VACUUM CLEANER INSPECTION LOG
FMPC-OPR-3227
Figure 2

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
10-29-90	0	Procedure for HAKO Vacuum cleaner operation required per Request No. P90-202, initiated by C.R. Palmer.
12-07-92	1	Revised to incorporate CIO C92-067 (P92-276) and update to current procedure program requirements.
08-05-93	0	Reissued to update per Request P93-604 initiated by R. Palmer following Periodic Review (R93-080).

CONTROL NO. FER-0018
SITE PROCEDURE EW-0001 (SSOP-0002)
REVISION NO. 5

INITIATING WASTE CHARACTERIZATION ACTIVITIES USING THE MATERIAL EVALUATION FORM (MEF)

Effective Date: 02-13-95

NON-CONTROLLED COPY

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: _____ 2/15/95
Terence D. Hagen, Manager of Environmental Restoration and Waste Management
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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0002
REVISION NO. 5

INITIATING WASTE CHARACTERIZATION ACTIVITIES USING THE MATERIAL EVALUATION FORM (MEF)

NON-CONTROLLED COPY

SSOP-0002

Effective Date: 02-13-95

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D. Ofte, President Date

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
01-11-91	0	Instructions for completing the Material Evaluation form required per Request No. P90-292, initiated by K. Nuhfer.
04-16-91	1	Revised to update form and include steps to allow for an MEF revision per Request No. P91-093, initiated by J. Ogg.
06-20-91	2	Revised to update technical content and form per Request No. P91-235, initiated by R. Henderson.
10-22-91	3	Revised to insert correct form per Request P91-390, initiated by L. Hamblin.
03-29-94	4	Revised to update to current FERMCO requirements and format per Request No. S93-037, initiated by C. S. Waugh. This supersedes and replaces WEMCO Revision 3, dated 10-22-91.
02-13-95	5	Minor revision per Request No. S94-155, initiated by S. McCrotty. This document supersedes SSOP-0002, dated 03-29-94, Rev. 4.

The latest changes to this document are indicated by a "change bar" (▌) in the right margin. Changes are also shaded in the text when needed to help identify changes. Note: Change bars and shading form the previous revision are removed only changes for the latest revision are shown.

1.0 PURPOSE

The Fernald Environmental Management Project (FEMP) Waste Management System provides for appropriate control and management of waste materials from the point of generation, through required interim storage, to final disposition. The functional requirements for this waste management system are established in "driver" documents such as the state and federal hazardous waste rules and negotiated legal agreements (e.g., Stipulated Amendment to the Consent Decree and the Amended Consent Agreement). The FEMP utilizes appropriate document systems, including site and department procedures, to specify activities to satisfy these functional requirements.

All waste managed at the FEMP shall be appropriately characterized to support selection of safe, effective, and least cost management alternatives. This procedure specifies the required activities to initiate waste characterization using the Material Evaluation Form (MEF) and associated generator documentation. A completed MEF establishes a "waste profile" which identifies requirements for managing materials that match the profile. The associated generator documentation (checklists, the MEF Inventory Attachments and the MEF Verification Form) provides a means for relating specifically inventoried material to an established MEF. In order to achieve the most expeditious characterization, it is imperative that the generator contact Waste Characterization (WC) and initiate the MEF **prior to the actual generation of the waste or the start of the project--whenever possible.**

Detailed instructions for using the MEF, the MEF Inventory Attachments, and the MEF Verification Form are provided on the back of each form. They are also included as attachments to this procedure.

2.0 SCOPE

This procedure applies to all waste, containerized and bulk, that is managed by the FEMP Waste Management System. This includes waste generated at the FEMP as well as FEMP-generated waste returned from offsite sources or vendors. FEMP containerized waste management facilities include designated container storage areas as well as container staging areas. FEMP bulk waste management facilities include: tanks, bins, silos, controlled soil stockpiles, the Central Storage Facility (CSF), the Scrap Metal Pad (SMP), the Decontamination Facility Pad (DFP), the Soil and Rubble Pile Cover (SRPC) and other (future) bulk waste management facilities.

2.0 **SCOPE** (cont.)

This procedure is not applicable to site products or excess materials being sold at fair market value to be used for their intended purposes. This procedure is, however, applicable to certain recyclable materials (e.g., certain materials that must be reclaimed prior to reuse). This procedure does not apply to soils returned to their point of excavation or Investigation Derived Waste (IDW) managed at the point of generation with its parent materials. This procedure does apply, however, to excess soils and IDW that require management in the FEMP Waste Management and Inventory Systems.

3.0 **DEFINITIONS**

Checklist(s) - A document applying to a specific container of waste that is used to validate the contents of the container against the physical characterization criteria noted in a completed MEF. Checklist validation is used for high volume, continuously generated wastes such as scrap wood, scrap metal, or scrap light duty vehicles. Checklist validation is controlled by procedure 20-C-625. (Attachment A is a sample checklist.)

Controlled Holding Area - The area designated for holding uncharacterized material (excluding backlog material and material generated from a soil boring activity) for a maximum period of 89 calendar days. Wastes are placed here while awaiting characterization and proper storage.

FEMP Waste Characterization Process - The actions and procedures used to complete the MEF, associated MEF worksheets, and inventory validation documentation.

FEMP Waste Management System - The interaction of physical activities and their associated management facilities as governed by relevant procedures and other documentation that provides for the management of waste materials from the point of generation, through required interim storage, to final disposition.

Generator - A person (or persons) who either directly or indirectly produces a waste stream or supervises/manages projects which produce waste streams requiring waste characterization.

Inventory Validation Documentation - Documents which demonstrate identification and control of waste from the point of generation through characterization and eventually, to final disposition. Within the scope of this procedure, inventory validation allows for the immediate identification of the characterization of any inventoried waste. Verification Form and MEF Inventory Attachment samples are provided in Figures 3 and 4.

3.0 **DEFINITIONS** (cont.)

Material Evaluation Form (MEF) - The FEMP document which identifies unique waste streams. A completed MEF establishes a "waste profile" which identifies requirements for managing materials that match the profile.

MEF Number - A unique identifying numeric string that denotes a waste stream, and its associated waste characterization file.

MEF Verification Form and MEF Container Inventory Attachment - A two-part system of documentation by which discrete material is associated with a specific waste profile documented on an MEF. MEF Verification Form and MEF Container Inventory Attachment shall be used for all wastes generated and containerized.

MEF Worksheets - Forms used by WC personnel to document the basis for decision making which results in the completed Evaluation Section of the MEF. Guidance for completing the worksheets is found in the Waste Characterization Manual.

Re-evaluation Date - Date specified by WC upon which material must be re-evaluated based on waste stream specific factors, generation rates, and waste management practices. At a minimum, continuously generated waste streams must be re-evaluated annually or until sufficient data is collected to justify a longer period between required re-evaluations.

Requestor - Person or persons providing input for the waste characterization system.

Waste - A material that is no longer needed or suitable for its intended use and has been discarded or is intended for discard.

Waste Characterization Manual - A manual that provides an overview of the waste characterization process at the FEMP for external customers (e.g., Nevada Test Site (NTS) or auditors) and provides criteria used by FERMCO's WC activities.

4.0 **RESPONSIBILITIES**

Generator

- Ensuring that the waste stream is characterized in its present generated form. This process begins with submittal of the MEF and concludes upon receipt of the completed MEF and MEF Inventory Attachment.

- Completing the requestor section of the MEF, the requestor section of the MEF Verification Form, and the MEF Inventory Attachment.

4.0 **RESPONSIBILITIES** (cont.)

Generator

- Providing the WC group with all available and relevant information regarding the material which is being evaluated and providing timely response to requests for further information.

- Requesting re-evaluation of a waste stream when the waste stream has changed in composition or when the generating process has changed.

- Arranging for transfer of material to the controlled holding area if necessary (e.g., when waste is generated and requires temporary storage prior to characterization or sampling if required.)

  NOTE: Material may be transferred to the Controlled Holding Area only when sampling and analysis has been requested or when otherwise specified. See SSOP-0008, "Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area."

- For containerized wastes, obtaining complete inventory information, (full 15 digit lot code and drum number, inventory number or container serial number) prior to initiating actions to transfer waste to site management facilities.

- Ensuring that generated wastes are managed in a safe and compliant manner either through the transfer of the waste to appropriate designated storage areas or through pre-designated management methods at the location of generation.

- Maintaining a copy of the completed MEF, MEF Verification Forms, and the MEF Inventory Attachments associated with the waste.

Waste Characterization Personnel

- Maintaining a listing of sequential MEF numbers to be used by the facility to identify waste streams and their associated characterization documentation. MEF numbers are to be provided to generators upon request. However, until the generator submits a completed MEF, the MEF remains on an inactive status with WC.

- Verifying that an MC&A Inventory exists for the material which has been represented to WC on the submitted MEF form.

- Performing necessary actions in compliance with applicable Federal and State regulations, the Waste Analysis Plan and Waste Characterization Manual in order to fully characterize materials documented in the Generator section of each MEF.

4.0 **RESPONSIBILITIES** (cont.)

Waste Characterization (WC) Personnel

- Responding to inquiries regarding the use and completion of the MEF.
- Notifying generators of requirements for re-evaluation of continuous or periodically generated waste streams.
- Maintaining a waste characterization file of the original of each MEF as a part of the FEMP Operating Record.
- Maintaining a waste characterization database which at a minimum provides a summary of information contained in the characterization files and provides a means of tracking required actions to complete waste characterizations.
- Identifying, at any time during the characterization process, unique or previously undocumented health and safety issues related to a specific waste. When identified, forward to Environmental Safety and Health (ES&H) copies of relevant information pertaining to the waste along with a Health and Safety Addendum for completion.
- Distributing copies of the completed MEF paperwork per the distribution noted on the form. This includes the generator who required a copy of the completed MEF in order to gain admittance to a warehouse.
- Maintaining a list of personnel authorized to sign part D of the evaluation section of the MEF and Section C of the Verification Request Form. Changes to this list shall be forwarded per the general distribution shown on the MEF.
- Providing assistance to generators in identifying appropriate MEFs for verification of additionally generated waste inventory. Evaluation of verification forms shall be completed within five (5) working days following their receipt by WC.

Materials Control and Accountability (MC&A)

- Maintaining the site-wide RCRA and All Materials Inventories with the corresponding inventory information for each container documented on the MEF Verification Form and associated MEF Inventory Attachments or Checklists.

4.0 **RESPONSIBILITIES** (cont.)

Materials Control and Accountability (MC&A)

- Providing generators with FEMP lot codes, container numbers and (optionally) inventory numbers for generated wastes when requested.
- Notifying Waste Characterization of discrepancies in the site-wide waste inventories which require assistance to resolve.

Environmental Safety and Health (ES&H) - Providing concurrence on non-radioactive waste classification of materials when required.

Regulatory Programs - Providing regulatory policy guidance/concurrence relative to waste classification of materials when required.

Hazardous Waste Compliance - Maintaining the official site RCRA Operating Record in accordance with all applicable federal and state regulations.

5.0 **GENERAL**

Waste Characterization (WC) maintains a list of the principle technical contacts for each CERCLA/RCRA Unit (CRU). These representatives have been designated as the primary interface between CRU activities and characterization functions within the Waste Management system. When initiating a waste characterization activity, the generators should first contact their respective CRU representative in Waste Characterization.

The generator may also contact WC either in person or at 738-9353 to obtain an MEF number of each waste stream generated or for use of the Verification Form (see the instructions on the back of each form). At this time the generator will be asked to provide a brief description of the waste, the generating organization, generator point of contact, and a cost account charge number to be used for all activities which are required to characterize the waste.

5.0 **GENERAL** (cont.)

Blank forms may be obtained from Waste Characterization. Forms may be copied for the sake of expediency; however, **the user of the form must exercise caution to insure that copies are legible and centered, and contain all required information.** This information includes the instructions on the reverse side of each page. Waste Characterization will **not** accept forms judged to be of insufficient quality to be placed in the site's operating record. Corrections must be made by striking out incorrect entries with a single line, then initialing and dating the correction. Do not use "liquid paper" or "white out" to make corrections.

For wastes which currently exist, all applicable forms must be submitted immediately. For wastes not yet generated, generators are required to forward applicable forms (discussed below) to Waste Characterization within 30 days of requesting the MEF number. Waste Characterization will cancel MEF numbers for which the generator submittals have not been received within this time.

Generators may contact Waste Characterization at 738-9353 if assistance is required in completing the necessary forms.

6.0 **PREREQUISITES**

None

7.0 **PROCEDURE**

7.1 INTRODUCTION

The Material Evaluation Form (MEF) is not only the document by which generators identify materials which require characterization, but also the document on which the Waste Characterization staff records the summary of those characterization efforts. The MEF does **not** reproduce or duplicate the delineation of specific waste as identified in the site inventory system; rather, it maps to a particular waste stream which is uniquely identified via the MEF number. Specific inventories of materials are assigned to a particular MEF using the MEF Verification Form and the Inventory Identification Attachment.

7.2 COMPLETING THE MATERIAL EVALUATION FORM (MEF)

GENERATOR

NOTE: Incomplete entries will not be accepted. "None", "Unknown", and "N/A" (Not Applicable) may be used when appropriate.

1. Obtain the correct MEF form (Figure 1) and an MEF Number from Waste Characterization. Once this procedure is finalized, only the new forms (attached) will be accepted for use--except in those cases in which the generator has as MEF characterization in process using the old forms.

2. Complete each item in the requestor section of the MEF in accordance with the directions provided in Figure 1, Sheet 3 of 3. The directions are also found on the reverse side of each page of the requestor section of the MEF.

3. If there is not sufficient space on the form, prepare an attachment sheet noting the MEF number at the top of sheet.

4. Upon completion of the MEF, attach all relevant information concerning the material (e.g., SOPs, analytical results, narrative describing generating process, etc.) and forward to Waste Characterization for completion.

5. Maintain a copy of the MEF in requestor's files, including the evaluation section (Figure 2) when completed by Waste Characterization.

7.3 USING THE MEF TO RE-EVALUATE A WASTE STREAM

GENERATOR

1. Determine that a revision to the MEF is required due to changes in the composition of the waste or to changes in the generating process.

2. Complete requestor section of the MEF. The MEF number is the same as the original. Indicate "revision" next to the MEF number.

Fernald Environmental Management Project
MATERIAL EVALUATION FORM (MEF)

Requestor Section

page 1 of 2

A. REQUESTOR/WASTE STREAM IDENTIFICATION

1. MEF#: Original: _____ Revision: _____	2. Date Submitted:	3. Material Type and Source Code:
4. Requestor Name:	5. Phone No.:	6. Badge No./Co. Name:

B. GENERATION INFORMATION

1. Provide best descriptive name for material:	2. Does this material originate in a HWMU or SWMU? Unit Name/No.		3. Project, Activity, or Work Area generating waste (include CRU # if applicable).
4. Date of first or expected generation: ☐ estimate; ☐ actual _____	5. Generation Quantity:	6. Generation frequency:	7. Similar waste stream MEF# (or MTC/ERC):

8. Provide a detailed description of what the material is:

9. Provide a detailed description of how and where (specific origin) the waste stream is/will be generated, including any units which manage the material:

(Note: Generator must attach all supporting documentation concerning items 8 and 9.) ○ additional narrative; ○ SOP;

○ MSDS; ○ ARDO Log excerpt; ○ release report; ○ manufacturing spec; ○ Other: _____

FORM GEN.MEF, Revision 2.2, 02/04/94 wcp\forms\gen.frl

Figure 1 - Material Evaluation Form (MEF) Sheet 1 of 3

Fernald Environmental Management Project
MATERIAL EVALUATION FORM (MEF)

Requester Section

page 2 of 2

C. PHYSICAL CHARACTERISTICS

1. Describe Color/Appearance:

2. Phase:
☐ Liquid ☐ Solid debris/rubble
☐ Semi-solid/sludge ☐ Dry solid residue
☐ dry powder/dusty residue ☐ Other, specify:

3. Contains Free Liquids:
☐ yes ☐ no ☐ unknown
based on:
○ PFLT (results attached)
○ Visuals (results attached)
☐ Knowledge of waste

[NOTE: DO NOT SMELL THE MATERIAL]
4. Note Any Incidental Odor:

5. Layers:
☐ single layer
☐ bi-layered
☐ multi-layered

6. pH: specify range or "unknown"
_____
☐ estimate; ○ documentation attached

7. Flash Point: Specify range or "unknown"
_____
☐ estimate; ○ documentation attached

D. MATERIAL COMPOSITION

1. Composition:

	Min	Max:	circle
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
_____	____	____	% (or) ppm
	Total Maximum:	____	%

maximum must equal or exceed 100 %

Basis:
☐ knowledge of the material
○ analytical data attached

2. Does the material contain any of the following?
☐ asbestos ☐ polychlorinated biphenyls (PCBs)
☐ infectious waste
☐ reactives (circle applicable items):
water reactive explosive
cyanide/sulfide shock sensitive
normally unstable
exclude materials which normally produce hydrogen gas.
☐ toxicity characteristic metals (circle applicable items):
arsenic barium
cadmium chromium
lead mercury
nickel selenium
silver thallium
(or)
☐ None of the above
(or)
☐ Unknown

Basis:
☐ knowledge of the material
○ analytical data (attached)

3. Radionuclide Contamination:
☐ material is not contaminated with radionuclides
☐ material contains incidental radionuclide contamination
☐ radionuclide bearing material/residue

Radionuclides of Concern if any:
☐ uranium
☐ thorium
☐ transuranics (TRU)

Basis:
☐ knowledge of the material ☐ RMMA generated
○ analytical data attached ☐ Other: _____

4. Identify the container or repository type(s) in which the waste is (or is exposed to be) managed on-site:
☐ drum ☐ box
☐ Sea/Land ☐ soil/debris pile
☐ small container (5 gal. or less)
☐ landfill, pit, or other land-based unit
☐ discharge to WWTS

FORM GEN.PE1, Revision 2.2, 02/08/94 wcpforms\gen.frl

Figure 1 - Material Evaluation Form (MEF) Sheet 2 of 3

Instructions to Generators for Completing the Material Evaluation Form (MEF), Requestor Section

The Waste Characterization Section is responsible for providing characterization for all wastes generated by FEMP personnel/activities. However, it is the individual generator's responsibility to ensure that his/her waste is properly characterized in its present form.

The Material Evaluation Form (MEF) is the document by which generator identify material which requires characterization and on which the Waste Characterization group summarizes the results of the characterization effort. The MEF does not delineate specific waste as identified in the site inventory system, but refers only to the characteristics of a particular waste stream (identified by MEF #). Specific inventoried material is assigned to a particular using the MEF Verification Request Form and Inventory Identification Attachment.

The following directions have been developed to assist in the completion of the generator's section of the MEF. Each block of the form must be completed for MEF to be accepted. Use of 'None' or 'N/A' is acceptable when appropriate. Checkbox items shown with a "O" require attached documentation. Upon completion of this form submit to Waste Characterization at MS # 46. [Note MEFs will not be accepted with incomplete information or lacking documentation (e.g. MSDS, release report, etc)].

PART A: GENERATOR/WASTE STREAM IDENTIFICATION

1. MEF #: Enter number of the form as received from Waste Characterization (x9353). Check whether this submittal is original or a revision to an existing MEF as appropriate.
2. Date Submitted: Enter the date the form is submitted to Waste Characterization.
3. Lot Marking Code: Enter first the Material Type then the Source Code assigned to the waste if this information is known. Contact Materials Control and Accountability (MC&A), x6275, for assistance in determining this information. Enter "Unknown" if applicable.
4. Generator Name: provide First Name, Last Name and Middle Initial.
5-6. Badge No./Co. Name/Phone No: Self Explanatory

PART B: GENERATION INFORMATION

1. Name: Provide the best descriptive name for the material (e.g. spent acetone, dust collector residues, soil borings, purge water etc.)
2. HWMU: If the material originates from a Hazardous Waste Management Unit please provide unit name and #. If you are unsure please consult your supervisor, Waste Characterization or cognizant CRU representative for assistance.
3. Self-explanatory.
4. Self-explanatory. Always provide at least an estimate. If the waste is "backlogged" or has otherwise already been generated, provide the historical date of generation as an actual date. This information may usually be obtained from existing records or from MC&A. "Unknown" is not acceptable.
5. Generation Quantity: Enter the amount and unit of waste to be generated (i.e. 50 gal). This is generally the amount of waste in a container (or a multiple thereof). If the generation event is one-time only, enter the total amount of waste.
6. Quantity/Frequency: Enter a time period (week, year etc.) during which the amount specified in item 5 will be generated, or "one-time" as appropriate.
7. Similar waste stream: Enter MEF # or Material Type/Source Code for a similar waste stream if known. Otherwise "N/A".
8. Description: Provide a clear concise description of what the waste stream actually is (e.g., residues from dust collector servicing). Include all components of the waste stream and any relevant information concerning packaging, absorbents etc. Be as detailed as possible. *DO NOT REPEAT THE DESCRIPTION CORRESPONDING TO THE MATERIAL TYPE CODE.*
9. Description of Generation: Provide a detailed description of how the waste stream is/will be generated. Include specific process involved, history of waste etc. For containerized wastes include packaging information (e.g. labpacked, packed with absorbent materials) Check and include all relevant supporting documentation (e.g. MSDS, SOP, Manufacturing Specification, Release Reports etc.).

PART C: PHYSICAL CHARACTERISTICS

1. Color/Appearance: Be as detailed as space will allow. What does the waste look like?
2. Phases: Check all that are present in the waste.
3. Free Liquids: If yes, check a "based on" criteria.
4. Odor: DO NOT SMELL THE WASTE! If the waste has a known incidental odor, then describe the odor (e.g., acrid, pungent, solvent, sweet).
5. Layers: Check appropriate box. Single layer means the waste has no distinct separation or layers (e.g., water, or oil, or semi-solid). Bi-layered means the waste is comprised of two distinct layers (e.g., water/dirt or oil/solids). Multilayered means more than two distinct layers (e.g., oil/water/semi-solid).
6. pH: If the waste contains aqueous free liquids, list the range of pH if known. If the pH is not known mark "not known" in the blank. If a pH range is entered, check the basis for the range. Documentation may consist of analytical data, MSDS, or pH paper results. For non-aqueous wastes enter N/A.
7. Flash Point: If the waste contains free liquids list the range of its flash point if known, if the flash point is not known, mark "not known" in the blank. If a flash point range is entered, check the basis for the range. Documentation may consist of analytical data or MSDS.

PART D: MATERIAL COMPOSITION

1. Composition: List all components which make up the waste stream along with the range of the approximate volume in percent or parts per million. Circle the unit (% or ppm) used for each component. Use ppm only if less than 10,000. Assume a value of 1% for any component given in ppm when calculating the "Total Maximum". If only partial knowledge of the components in the waste stream is available, list those components and provide the approximate percentage of the waste which is unknown. Provide basis for the components in this section.
2. Waste Characteristics: Check each box which applies to the waste. Circle items as appropriate. Do not document items "suspected" of being present in the waste. These should be noted in block B8.
   None of the above - Check this when no entries above apply.
   Not Known - Check this when adequate information is not available to answer the questions above.
   Basis - Check the appropriate box when specific items above are checked.
3. Radionuclide contamination: Indicate radionuclide contamination status of the material. If analytical data is available please attach to form. Contact ER&T for information on radionuclide contamination of materials onsite. Indicate the basis for the checked item. Material Accounting information may be attached as analytical data.

Figure 1 - Material Evaluation Form (MEF) Sheet 3 of 3

Fernald Environmental Management Project
MATERIAL EVALUATION FORM (MEF)

Evaluation Section

A. WASTE STREAM IDENTIFICATION

1. MEF #: Revision No.:	2. Date Completed:	3. Material Type / Source Code of original material: Mat. Sro.
4. Evaluator:	5. Phone No.:	6. Badge No./Co. Name:

B. MATERIAL REGULATORY STATUS (check all that apply)

Regulated:	Material Specific Regulation:	Regulated:	Material Specific Regulation:
__ yes __ no	TSCA PCB Waste	__ yes __ no	High Level Radioactive Waste
__ yes __ no	Asbestos Containing-Waste Materials	__ yes __ no	Transuranic (TRU) Waste
__ yes __ no	OAC Infectious waste	__ yes __ no	AEA 11(e)(2) Byproduct Material
__ yes __ no	OAC Solid Waste (RCRA Subtitle D)	__ yes __ no	Source (or) Special Nuclear Material
__ yes __ no	RCRA Solid Waste (RCRA Subtitle C)	__ yes __ no	Low Level Radioactive Waste (LLRW).
__ yes __ no	RCRA Hazardous Waste	__ yes __ no	Non-Radioactive waste. ***

Hazardous Waste Code(s): _____

*** Concurrence, Radiological Assessment- Date: _____

Re-evaluation Date: _____

Note: Waste stream must be re-evaluated by WCS if it is generated after the re-evaluation date listed above or when the stream/generating process changes.

C. MATERIAL MANAGEMENT

1. Waste Form Criteria:	2. Container Specifications:	3. Reactivity Group Code(s):
__ yes __ no Material contains free liquids.		
__ yes __ no Material is a wastewater. (40 CFR 268.2(f)).		
__ yes __ no Material meets physical definition of debris (40 CFR 268.2(g)).		
__ yes __ no Waste meets NVO-325 Waste Acceptance Criteria (See NTS Waste Acceptance Criteria in MEF file).		

D. WASTE CHARACTERIZATION APPROVAL

Name: _____ Signature: _____

E. DISTRIBUTION

__ Generator	_____	__ HW/MW Handling and Disposition	_____
__ MC&A	_____	__ LLW Handling and Disposal	_____
__ Waste Treatment and Storage	_____	__ Waste Characterization Files	
__ Sample Disposition (if sampled)	_____	__ Other _____	_____

FORM EVAL.PRT, Revision 2.4, 02/04/94 wcpformeval.frt

Figure 2 - Material Evaluation Form (MEF) - Evaluation Section

7.3 USING THE MATERIAL EVALUATION FORM (MEF) TO RE-EVALUATE A WASTE STREAM (cont.)

3. Upon completion of the MEF attach all relevant information concerning the material (e.g., SOPs, analytical results, additional narrative describing generating process, etc.) and forward to WC for completion.

4. Maintain a copy of the MEF revision in requestor's files.

7.4 COMPLETING THE MEF VERIFICATION FORM

NOTE: The MEF Verification Form is submitted whenever there is physically identifiable waste that is to be associated with a particular MEF. It may be submitted with the original MEF if the waste has already been generated, or after characterization is completed if the generator's intent is to characterize before generating. It is also submitted when additional waste is generated; or in the case of backlogged production wastes, when additional waste is identified which is believed to match an existing waste profile. **The Verification Form is always submitted with an Inventory Attachment.**

WASTE CHARACTERIZATION

1. Completing the MEF Verification Form and distributing it to the generator within five (5) working days.

GENERATOR

2. Obtain the MEF Verification Form from WC. (Example provided in Figure 3.)

3. Complete each item in the requestor section in accordance with the directions provided in Figure 3. These directions are also provided on the reverse side of the form.

4. Upon completion of the Verification Form, attach all relevant information concerning the material (e.g., SOPs, analytical results, additional narrative describing generating process, etc.) and forward to Waste Characterization for completion.

5. Maintain a copy of the Verification Request in requestor's file.

Fernald Environmental Management Project
MATERIAL EVALUATION FORM (MEF)

Verification Form

A. WASTE STREAM IDENTIFICATION

1. Requestor:	2. Phone:	3. Serial Number:
4. Generation Event: ☐ Original Generation ☐ Additional Generation ☐ Safe Shutdown Generation ☐ Other (Describe):		5. Date Submitted: (see instruction note!)
6. Material Description:		
7. Process Description: ○ Documentation Attached		
8. Generation Location:		

B. WASTE STREAM TO VERIFY AGAINST

1. MEF#:	2. Material Description:	
3. Determination Date:	4. Determination:	5. Hazardous Waste No(s).
6. Rationale: ○ Extra page(s) attached		

Evaluation Section

C. MATERIAL STATUS

1. Evaluator:	2. Date:
3. Summary ☐ Material is characterized by MEF # _____. Inventory is revised to include the inventory shown on the associated inventory attachment.	Material Determination: ☐ RCRA Solid Waste (a.k.a Non-RCRA) ☐ RCRA Hazardous Waste Hazardous Waste No(s).

☐ This material does not match the characterization of the referenced MEF. Submit a new MEF for this material immediately.

Rationale:

Waste Characterization Approval Signature: _____ Date: _____

D. DISTRIBUTION

Requestor:	Waste Characterization File:

FORM VER.PRT, Revision 2.1, 01/14/94 wcpformver.fr

Figure 3 - Material Evaluation Form (MEF) - Verification Form (Sheet 1 of 2)

Instructions to Generators for Completing the MEF Verification Form

The Waste Characterization Section is responsible for providing characterization for all wastes generated by FEMP personnel/activities. However, it is the individual generator's responsibility to ensure that his/her waste is properly characterized in its present form.

The MEF Verification Form must be used whenever there exists discrete waste material which must be associated with a specific waste profile documented on an MEF. This form is accompanied by an MEF Container Inventory Attachment when the discrete waste is containerized. Use of the MEF Verification Form streamlines the characterization process by providing a means of associating uncharacterized waste materials with an existing waste profile documented on an MEF. This eliminates the need to produce a new MEF for each and every generation event. The MEF Container Inventory Attachment then provides the means of associating specific containers (inventory) with a waste profile documented on an MEF. Data quality objectives are the same as for any characterization. The Waste Characterization group may be contacted to determine if any appropriate MEF exists against which a waste may be verified. The information provided by the requestor on this form must show sufficient process control, and/or documentation of waste matrix and constituents to verify that the waste meets the profile specified on the referenced MEF. The Waste Characterization group may request additional visual inspections and/or sampling to confirm the match.

The completed MEF Inventory Attachments along with the parent MEF serve as the characterization documentation required to received waste into a site waste management facility (including the controlled holding area). This documentation provides the key data link for associating MC&A inventory information with waste characterization information (i.e., provides a means for identifying an MEF number for each item in inventory). The following directions have been developed to assist in the completion of the Requestor's section of this form. Please note that each block of the form must be completed in order for form to be accepted. Use of 'None' or 'N/A' is acceptable when appropriate. Do not leave any blocks in the requestor section blank. When the MEF Verification Form is completed, attach the necessary Inventory Identification Attachments and forward to Waste Characterization at MS # 46.

PART A: WASTE STREAM IDENTIFICATION

1. **Requestor:** Provide First Name, Last Name, and Middle Initial.
2. **Phone:** Self Explanatory
3. **Serial Number:** This is a unique four digit alpha-numeric string assigned by Waste Characterization. Examples: "1001"; "SS01". When approved, the Verification Form will be identified as "MEF#-Serial#". Examples: 1978-1001; 20001-SS01. Contact WCS at extension 9353 to obtain this number.
4. **Generation Event:** Check the appropriate item:
   - Original Generation: First quantity of material generated for which MEF was originally submitted
   - Additional Generation: Additional material generated which meets the MEF profile
   - Safe Shutdown Generation: Material generated by Safe Shutdown programs
5. **Date Submitted:** Self explanatory. NOTE: for original generation materials, complete item B1 with MEF number and fill in all remaining requestor section boxes with "N/A".
6. **Material Description:** Provide a clear concise description of what the waste stream actually is (e.g., residues from dust collector servicing). Include all components of the waste stream and any relevant information concerning packaging. DO NOT REPEAT THE DESCRIPTION CORRESPONDING TO THE MATERIAL TYPE CODE.
7. **Process Description:** Provide a clear and concise description of the process generating the waste. The process description and attached documentation (if included) must be of sufficient detail to provide the evaluator in the Waste Characterization Group with enough information to verify that the waste corresponds to the characterization described in the MEF. In general, attached documentation will be required. Examples include project logbooks, AEDO spill reports, Satellite Accumulation Area (SAA) container records, SOPs, analysis data etc. Waste characterization may request additional visual inspections or sampling in order to verify inventory with an existing MEF characterization.
8. **Generation Location:** Be as specific as possible.

PART B: WASTE STREAM TO VERIFY AGAINST

1. **MEF#:** Enter the Material Evaluation Form # of the waste stream against which the material is to be verified.
2. **Material Description:** Enter the material description as found on the Waste Characterization database or MEF.
3. **Determination Date:** Enter the Determination date from the WC Database or the MEF Evaluation Section.
4. **Determination:** Enter the determination from the WC Database or the MEF Evaluation Section (e.g., RCRA Hazardous, Non-RCRA (a.k.a. Non-Hazardous) etc.)
5. **Hazardous Waste No(s).** Enter the Hazardous waste No(s). if applicable.
6. **Rationale:** Indicate your reason for believing the waste described in section A is characterized by the MEF described in section B. Please provide thorough and detailed explanations (use additional sheets if required).

PARTS C & D: ***TO BE COMPLETED BY WASTE CHARACTERIZATION***

Figure 3 - Material Evaluation Form (MEF) - Verification Form (Sheet 2 of 2)

7.5 COMPLETING THE MEF CONTAINER INVENTORY ATTACHMENT

GENERATOR

1. Obtain the Inventory Identification Attachment from Waste Characterization. (Example provided in Figure 4.) The Inventory Identification Attachment is always submitted in conjunction with the original MEF or an MEF Verification Request Form.

2. Complete each item in Sections A and D in accordance with the directions provided in Figure 4. These directions are also provided on the reverse side of the form.

3. Attach the Inventory Identification Attachment to the MEF Verification Form and forward to Waste Characterization at MS-46.

4. Maintain a copy of the Inventory Identification Attachment in requestor's files.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE Order 5820.2A, "Radioactive Waste Management"
- 40 CFR 61, Subpart M, "Protection of the Environment/Asbestos Regulations"
- 40 CFR 261-272, "Protection of the Environment/Solid Wastes"
- 40 CFR 761, "Protection of the Environment/Toxic Substance Control Act (TSCA)-PCB"
- Amended Consent Agreement (ACA)
- FEMP Part B Permit Application - Waste Analysis Plan

Fernald Environmental Management Project
MATERIAL EVALUATION FORM (MEF)

Container Inventory Attachment Page ____ of ____

A. GENERAL INFORMATION:

1. MEF #: Verification Serial #:	2. Date Completed:	3. Completed by:

4. Special Notes: (a) TOTAL NUMBER OF CONTAINERS EQUALS TOTAL IN LOT UNLESS INDIVIDUAL CONTAINERS SPECIFIED.
(b)
(c)

5. Key on Inventory Container Type:
DM = Drum or Over-Pack Drum; SL = Sea-Land; TK = Tank; SM = small container (≤ 5 gal);
MC = Miscellaneous Container; WB = Wood Box; WM = White Metal Box.

B. APPROVAL:

Waste Characterization Name: _____ Signature: _____

C. DISTRIBUTION

Requestor:	Waste Storage:
Materials Control and Accountability:	Waste Characterization File:

D. INVENTORY COUNT BY CONTAINER

ITEM No.	LOT CODE IDENTIFICATION:	Total Number of Containers	Type of Container	Individual Container Identification: (if required)

FORM INV.FRI, Revision 2.1, 02/04/94 wcpforminv.fri

Figure 4 - Material Evaluation Form (MEF) - Container Inventory Attachment (Sheet 1 of 2)

Instructions to Generators for Completing the MEF Container Inventory Attachment

The Waste Characterization Section is responsible for providing characterization for all wastes generated by FEMP personnel/activities. However, it is the individual generator's responsibility to ensure that his/her waste is properly characterized in its present form.

The MEF Inventory Attachment (this form) is submitted in conjunction with the MEF Verification Form. These documents are used whenever there exists quantifiable waste material which must be associated with a particular waste stream profile documented on an MEF (see section 7.3 of SSOP-0002 for applications).
When completed by both the requestor and Waste Characterization, this form serves as the documentation by which the waste is received at a site waste management unit (including the controlled holding area). It also serves as the means for inputting the status of characterization (documented on the MEF) into the site's waste inventory system.

The following directions have been developed to assist in the completion this form by generators. Attach this form to the completed MEF Verification Form and forward to Waste Characterization at MS # 46.

PART A: GENERAL INFORMATION

Upper right: Page __ of __: Complete as appropriate.

1. MEF #: Enter the MEF number from the MEF Verification Form
   Serial Number: Enter the Verification serial number from Block 1 of the associated Verification Form. Contact WCS at x9353 to obtain this number
2. Date Completed: Self-explanatory.
3. Completed by: The name of the person completing Parts "A" and "D" of this form.
4. Special Notes: Note any special identifying information. Material being received from offsite should be noted here.

PARTS B AND C: FOR USE BY WASTE CHARACTERIZATION ONLY

PART D: INVENTORY COUNT BY CONTAINER

Item No. This is a line item number. Start with "1" and number consecutively for each line completed.
Lot Code Information: Enter the 15 digit lot code obtained from MCAA (see section 4.0 of SSOP-0002). Do not enter only a material type and source code.
Total Number of Containers: Enter either the total number of containers in the lot or "1" as appropriate. The use of "1" signifies that not all containers in the lot are applicable. A "1" requires an entry in the "Individual Container Identification" column.
Type of Container: Enter the appropriate code from block A-5.
Individual Container ID: Enter the drum number, inventory number, or container serial number if the "Total Number of Containers" is 1. Otherwise enter "Note 4a" to signify that the total represents all containers in the lot.

Figure 4 - Material Evaluation Form (MEF) - Container Inventory Attachment (Sheet 2 of 2)

8.0 **APPLICABLE DOCUMENTS** (cont.)

8.1 DRIVERS (cont.)

- FEMP Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements (NVO-325-Rev. 1), June 1992 (Rev. 1)
- Ohio Administrative Code (OAC) 3745-20, "Asbestos Regulations"
- Ohio Administrative Code (OAC) 3745-51 to 69, "Hazardous Waste Regulations"
- Stipulated Amendment to the Consent Decree (SACD)

8.2 REFERENCES

- Waste Characterization Manual (Department Document)
- FEMP RCRA Part B Permit Application - Waste Analysis Plan
- FEMP Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- SOP 20-C-625, "Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment"
- SSOP-0008, "Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area"
- Revised FMPC Waste Determination Plan, September 20, 1990

ATTACHMENT A

-6943

SAMPLE CHECKLIST

FEMP

Reference MEF # 905

LOW-LEVEL RADIOACTIVE WASTE

MATERIALS EVALUATION AND CONTAINER INFORMATION - WOOD

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	MS65
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)

000571

-6943

CONTROL NO. FER-0018
SITE PROCEDURE EW-0005 (SSOP-0039)
REVISION NO. 0

HANDLING CONTAINERS OF UNIDENTIFIED MATERIAL

Effective Date: 09-30-92

NON-CONTROLLED COPY

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: _____ 2/15/95
Terence D. Hagen, Manager of Environmental Restoration and Waste Management
Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to establish the procedure for evaluating bulk waste streams designated as low level radioactive waste (LLRW) to ensure the material is characterized as nonhazardous (per RCRA) and meets the Nevada Test Site (NTS) Waste Acceptance Criteria (WAC) prior to shipment and disposal.

2.0 APPLICABILITY

This procedure is applicable to waste streams, except wastes from a Hazardous Waste Management Unit (HWMU), being inspected or packaged for disposal as LLRW.

3.0 RESPONSIBILITIES

3.1 **Waste Generator Supervisors** shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Division Manager.

3.1.2 Contacting Industrial Hygiene and Radiological Control to determine the appropriate respiratory protection for the task being performed.

3.1.3 Issuing the required respiratory protection to generators.

3.1.4 Coordinating with Waste Characterization to determine disposition requirements for discrepant items.

3.1.5 Obtaining and posting a "Radiation Work Permit" (RWP) when required.

3.1.6 Reviewing applicable Material Safety Data Sheets (MSDS) with evaluators.

3.2 **Waste Generators** shall be responsible for complying with this procedure.

3.3 **Quality Control (QC)** shall be responsible for the following:

3.3.1 Ensuring that the questions in Section I are checked yes or N/A.

3.3.2 Reviewing Section II of the applicable form to verify that no prohibited materials were packaged.

3.4 **Waste Characterization (WC)** shall be responsible for the following:

3.4.1 Reviewing documentation on items that are rejected during inspection.

3.4.2 Approving rejected items for shipment as LLRW or specifying disposition requirements.

4.0 **DEFINITIONS**

4.1 Entrapped Liquids - Collected fluids that have accumulated due to exposure to the elements.

4.2 Internal Fluids - Liquid within equipment which functioned as a working component of the unit.

4.3 Low Level Radioactive Waste - Scrap material that is contaminated with uranium but is below the limits for high level waste.

4.4 Waste Generator (Point of Generation) - Personnel belonging to the organization where waste material originates.

4.5 Waste Stream - Scrap material (plastic, rubber, paper, fiberglass, rope, wood, metal, and glass) and vehicles (including light/medium duty trucks and forklifts) that have been designated as LLRW.

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"

R 5.1.4 PO-D-026, "Site Services Document Program"

5.1.5 FEMP Conduct of Operations Manual

5.1.6 RM-0012, "Quality Assurance Program Description"

5.2 References

None

6.0 **INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS**

6.1 Safety glasses with side shields shall be worn unless other eye protection is specified by ES&H.

6.2 Respiratory protection issued by the supervisor shall be worn when required by ES&H.

6.3 Leather-palmed gloves shall be worn when handling rough or contaminated material.

6.4 Vacuum cleaners equipped with a HEPA filter or an ES&H approved vacuum shall be used for cleaning.

6.5 Evaluators shall have read and be familiar with MSDSs for hazardous material/chemicals that may be used or encountered.

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6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.6 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. FS-F-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

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 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. 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 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.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the step to which they apply.

8.0 PROCEDURE

NOTE: The applicable YES, NO, or N/A box shall be checked for the criteria listed in the Waste Evaluation Section (Section I) of the form being used.

8.1 Evaluating Waste Material to be Packaged

WASTE GENERATOR

NOTE 1: More than one type of form may be required, depending on the make-up of the waste.

NOTE 2: Items that are rejected during inspection shall not be packaged. The NO box shall not be checked unless all items are rejected.

8.1.1 Visually inspect and evaluate waste items to be packaged for disposal per Section I of the applicable materials evaluation and container information (ME&CI) form as follows:

8.0 **PROCEDURE** (cont.)

(A) "Materials Evaluation and Container Information - Glass," Form FS-F-3715 (See Figure 1)
(B) "Materials Evaluation and Container Information - Metal," Form FS-F-3464 (See Figure 2)
(C) "Materials Evaluation and Container Information - Wood," Form FS-F-3465 (See Figure 3)

NOTE: This form and procedure shall not be used to evaluate heavy equipment.

(D) "Materials Evaluation and Container Information - Scrap Vehicles" Form FS-F-3472 (See Figure 4)
(E) "Materials Evaluation and Container Information - Plastic, Rubber, Paper, Fiberglass, Rope" Form FS-F 3580 (See Figure 5)

8.1.2 If an item or items are rejected, proceed as follows:

8.1.2.1 Set rejected items aside.

NOTE: The NO block in Section I shall be checked on the second form (or the original form) for a shipment where all items are rejected.

8.1.2.2 Fill out a separate form for rejected items, unless all items to be packaged were rejected.

8.1.2.3 Notify the supervisor of rejected (discrepant) items.

8.1.2.4 Give the form to the supervisor.

WASTE GENERATOR SUPERVISOR

8.1.2.5 Transmit the form to the Waste Characterization Section (WCS) and request assistance in determining disposition requirements for discrepant items.

WASTE CHARACTERIZATION

8.1.2.6 Review discrepant items.

8.1.2.7 In Section II of the form, document the basis for approval of item for packaging as LLRW or specify disposition requirements.

8.1.2.8 If approved for packaging, sign and date the provided space.

8.1.2.9 Transmit the form and disposition instructions to the Waste Generator Supervisor.

WASTE GENERATOR SUPERVISOR

8.1.2.10 Give the form and applicable instructions to the Waste Generator.

8.0 PROCEDURE (cont.)

WASTE GENERATOR

8.1.2.11 Complete the inspection for items approved for packaging.

8.1.3 Record, in Section II Block 1, the origin and description of items placed in the container.

8.1.4 Complete Section II as required.

8.1.5 Review the form(s) to ensure that all information recorded is accurate and reflects the status of the packaged material.

8.1.6 Sign Block 3 of Section II

8.1.7 Give the completed forms to the supervisor.

WASTE GENERATOR SUPERVISOR

8.1.8 Sign the form to verify that the evaluation was accurate and complete.

8.1.9 Have Quality Control sign to approve the package for shipment.

8.1.10 Distribute the form(s) per Item 8.3.

8.2 Evaluating Packaged Material

WASTE GENERATOR

8.2.1 Open the container to be evaluated.

8.2.2 Visually inspect the contents of the container per the applicable form (Refer to Step 8.1.1).

8.2.2.1 If items can not be seen, shift the container contents, if possible, until all items can be evaluated.

8.2.2.2 If the items can not be rearranged to permit a visual inspection, remove items from the container as required to permit evaluation.

NOTE: Items shall not be returned to the container until disposition instructions are received for discrepant material.

8.2.2.3 If all items pass inspection, based on the criteria in Section I of the form, return removed items to the container.

8.2.3 If the contents of the container are acceptable, close the container. If not acceptable, proceed as follows:

8.2.3.1 Fill out a separate form for failed items, unless all items to be packaged fail the inspection.

8.2.3.2 Notify the supervisor of failed (discrepant) items.

8.0 PROCEDURE (cont.)

8.2.3.3 Give the form to the supervisor.

WASTE GENERATOR SUPERVISOR

8.2.3.4 Transmit the form to the Waste Characterization Section (WCS) and request assistance in determining disposition requirements for discrepant items.

WASTE CHARACTERIZATION

8.2.3.5 Review discrepant items.

NOTE: If not approved, direct that the items be removed from the container and set aside, unless removing the item would be impracticable.

8.2.3.6 In Section II of the form, document the basis for approval of item(s) for packaging as LLRW or specify disposition requirements.

8.2.3.7 If approved for packaging, sign and date the provided space.

8.2.3.8 Transmit the form and disposition instructions to the Waste Generator Supervisor.

WASTE GENERATOR SUPERVISOR

8.2.3.9 Give the form and applicable instructions to the Waste Generator.

WASTE GENERATOR

8.2.3.10 Complete the inspection for items approved for packaging.

8.2.4 Record, in Section II Block 1, the origin and description of items placed in the container.

8.2.5 Complete Section II as required.

8.2.6 Review the form(s) to ensure that all information recorded is accurate and reflects the status of the packaged material.

8.2.7 Sign Block 3 of Section II of the form.

8.2.8 Give the completed form(s) to the supervisor.

WASTE GENERATOR SUPERVISOR

8.2.9 Perform Steps 8.1.8 thru 8.1.10

8.3 Form Distribution

WASTE GENERATOR SUPERVISOR

8.3.1 Remove and file the green copy of the form.

8.3.2 Forward the form to MC&A.

8.0 PROCEDURE (cont.)

MC&A

8.3.3 Remove and file the yellow copy of the form.

8.3.4 Forward the form to Low-Level Waste Handling and Disposal.

LOW LEVEL WASTE HANDLING AND DISPOSAL (WASTE SHIPPING COORDINATOR)

8.3.5 Remove and file the blue copy of the form.

8.3.6 Forward the original of the form to Waste Characterization.

WASTE CHARACTERIZATION

8.3.7 File Waste Characterization copy (original).

9.0 APPLICABLE FORMS

9.1 Form No. FS-F-3715 "Materials Evaluation and container Information-Glass"

9.2 Form No. FS-F-3464, "Materials Evaluation and container Information - Metal"

9.3 Form No. FS-F-3465, "Materials Evaluation and Container Information - Wood"

9.4 Form No. FS-F-3472, "Evaluation and Container Information - Scrap Vehicle"

9.5 Form No. FS-F-3580, "Materials Evaluation and Container Information - Plastic, Rubber, Paper, Fiberglass, Rope"

Table 1
ACUTE HAZARDOUS WASTE

Hazardous Waste Number	Chemical Abstract Number	Substance
P012	1327-53-3	Arsenic trioxide
P015	7440-41-7	Beryllium
P018	357-57-3	Brucine
P022	75-15-0	Carbon disulfide
P037	60-57-1	Dieldrin
P106	143-33-9	Sodium cyanide Na (CN)
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U019	71-43-2	Benzene (I,T)

(1) CAS number given for parent compound only.

-6943

FEMP
LOW-LEVEL RADIOACTIVE WASTE

Reference MEF # 905

MATERIALS EVALUATION AND CONTAINER INFORMATION - WOOD

SECTION I

WASTE EVALUATION	YES	NO	N/A
1. Treated: Material free from creosote treatment			
2. Residues: Free from process or waste residues			
3. Stains: Stains cover less than 10% of wood surface			
4. Paint: Free from lead-based paint *or* Paint covers less than 10% of material			
5. Plastic/Rubber: Material consists of less than 20% other materials by volume and does not contain any oil, solid residues, or entrapped liquids (e.g. plastic or rubber parts/hardware)			
6. Metal: Metal constitutes less than 20% by volume (If no, then metals checklist (FS-F-3464) must also be used.)			

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN/DESCRIPTION *(Provide a complete description of the waste in the container, including information on source or origin if available)*:

SPECIFIC DISCERNIBLE ITEMS APPROVED AS LLRW (NON-RCRA) BY WASTE CHARACTERIZATION:

WASTE CHARACTERIZATION SIGNATURE/DATE

2. PACKAGING START DATE / PACKAGING FINISH DATE:	3. VERIFIED BY: / DATE:
4. CONTAINER NUMBER:	5. CONTAINER TYPE: ☐ S/L ☐ White Metal Box
6. LOCATION PACKAGED:	
7. *MEF NUMBER:	8. INCHES FREEBOARD/HEADSPACE:
APPROVED BY: SUPERVISOR(S) SIGNATURE/DATE	APPROVED BY: QC SIGNATURE/DATE

* For materials packaged that do not meet the criteria in Section I, but have an approved MEF number, record the MEF number and material packaged.

GENERATOR TO MAKE DISTRIBUTION:		
1	*White*	Waste Characterization
2	*Blue*	Low-Level Waste Handling and Disposal
3	*Yellow*	Materials Control and Accountability
4	*Green*	Waste Generator

FS-F-3465 (REV. 11/9/93)

MATERIALS EVALUATION AND CONTAINER INFORMATION-WOOD
FS-F-3465
Figure 1

FEMP

Reference MEF # 1539

LOW-LEVEL RADIOACTIVE WASTE

MATERIALS EVALUATION AND CONTAINER INFORMATION - PLASTIC, RUBBER, PAPER, FIBERGLASS, ROPE

SECTION I

WASTE EVALUATION	YES	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			
4. HWMU: Material was not generated within the physical limits of a hazardous waste management unit (HWMU)			
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: Material 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 20% by volume, then Metal Checklist (FS-F-3464) and/or Wood Checklist (FS-F-3465) 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 7. 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 Waste Characterization. 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 *(Provide a complete description of the waste in the container, including information on source or origin if available).*

SPECIFIC DISCERNIBLE ITEMS APPROVED AS LLRW (NON-RCRA) BY WASTE CHARACTERIZATION

WASTE CHARACTERIZATION SIGNATURE/DATE

2. PACKAGING START DATE	PACKAGING FINISH DATE	3. VERIFIED BY:	DATE:

4. CONTAINER NUMBER.	5. CONTAINER TYPE ☐ S/L ☐ WMB ☐ Other, *Specify* _____
6. LOCATION PACKAGED.	
7. *MEF NUMBER	8. INCHES FREEBOARD/HEADSPACE
APPROVED BY: SUPERVISOR(S) SIGNATURE/DATE	APPROVED BY: QC SIGNATURE/DATE

* For materials packaged that do not meet the criteria in Section I, but have an approved MEF number, record the MEF number and material packaged.

GENERATOR TO MAKE DISTRIBUTION:		
1	*White*	Waste Characterization
2	*Blue*	Low-Level Waste Handling and Disposal
3	*Yellow*	Materials Control and Accountability
4	*Green*	Waste Generator

FS-F-3580 (REV. 11/9/93)

MATERIALS EVALUATION AND CONTAINER INFORMATION
- PLASTIC, RUBBER, PAPER, FIBERGLASS, ROPE
FS-F-3580
Figure 2

-6943

FEMP
LOW-LEVEL RADIOACTIVE WASTE

Reference MEF # 1230

MATERIALS EVALUATION AND CONTAINER INFORMATION - SCRAP VEHICLE

SECTION I

WASTE EVALUATION	YES	NO	N/A
1. Free from the following fluids: a. Anti-freeze			
b. Brake fluid			
c. Gasoline			
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 and Gas filter removed and filter receptacles on engine sealed			
10. Batteries removed			
11. All Hoses that contain liquids have been cut and Drained			

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN/DESCRIPTION (Provide a complete description of the waste in the container, including information on source or origin if available):

SPECIFIC DISCERNIBLE ITEMS APPROVED AS LLRW (NON-RCRA) BY WASTE CHARACTERIZATION:

WASTE CHARACTERIZATION SIGNATURE/DATE

2. PACKAGING START DATE / PACKAGING FINISH DATE:	3. VERIFIED BY: / DATE:
4. CONTAINER NUMBER:	5. CONTAINER TYPE:
6. LOCATION PACKAGED:	
7. *MEF NUMBER:	8. INCHES FREEBOARD/HEADSPACE:
APPROVED BY: (SUPERVISOR'S SIGNATURE/DATE)	APPROVED BY: (QC SIGNATURE/DATE)

* For materials packaged that do not meet the criteria in Section I, but have an approved MEF number, record the MEF number and material packaged.

GENERATOR TO MAKE DISTRIBUTION:		
1	*White*	Waste Characterization
2	*Blue*	Low-Level Waste Handling and Disposal
3	*Yellow*	Materials Control and Accountability
4	*Green*	Waste Generator

FS-F-3472 (REV. 12/07/93)

MATERIALS EVALUATION AND CONTAINER INFORMATION-SCRAP VEHICLE
FS-F-3472
Figure 3

FEMP
LOW-LEVEL RADIOACTIVE WASTE

Reference MEF # 1284

MATERIALS EVALUATION AND CONTAINER INFORMATION - GLASS

SECTION I

WASTE EVALUATION	YES	NO	N/A
1. Liquids: The glass waste does not contain any free liquids			
2. Residues: The glass waste if free of any process or waste residues. For all containers (e.g., glass sample jars) this means that the container must have been emptied using the practices commonly employed to remove materials from that type of container (e.g., pouring, pumping, or aspirating) and no more than 3 percent remains in the container			
3. Acute Waste: The glass was not used as a container to hold an acute hazardous waste (refer to table 1 in SOP 20-C-625) unless the container has been triple rinsed using a solvent capable of removing the commercial chemical product or manufacturing chemical intermediate. (NOTE: Available container labels may be used to verify this criteria.)			
4. Light Bulbs: The glass waste does not include any fluorescent light bulbs (broken or unbroken). (NOTE: The glass waste may include incandescent light bulbs.)			
5. AA Lamps: The glass waste does not include any atomic absorption (AA) lamps used for Toxicity Characteristic metals analyses			
6. Metal/Rubber: The glass waste contains only metal, rubber, and plastic associated with lids or tops of containers (e.g., sample jar lids)			
7. Labels: The glass waste is labelled, and the information from these labels has been summarized in Section II of this form or in an attachment, or the glass waste is not labelled			

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN/DESCRIPTION *(Provide a complete description of the waste in the container, including information on source or origin if available)*:

SPECIFIC DISCERNIBLE ITEMS APPROVED AS LLRW (NON-RCRA) BY WASTE CHARACTERIZATION:

WASTE CHARACTERIZATION SIGNATURE/DATE

2. PACKAGING START DATE	PACKAGING FINISH DATE.	3. VERIFIED BY:	DATE:

4. CONTAINER NUMBER

5. CONTAINER TYPE:
☐ S/L ☐ WMB ☐ Drum ☐ Other, *Specify* _____

6. LOCATION PACKAGED

7. *MEF NUMBER.

8. INCHES FREEBOARD/HEADSPACE.

APPROVED BY:
SUPERVISOR(S) SIGNATURE/DATE

APPROVED BY:
QC SIGNATURE/DATE

* For materials packaged that do not meet the criteria in Section I, but have an approved MEF number, record the MEF number and material packaged.

GENERATOR TO MAKE DISTRIBUTION:		
1	*White*	Waste Characterization
2	*Blue*	Low-Level Waste Handling and Disposal
3	*Yellow*	Materials Control and Accountability
4	*Green*	Waste Generator

FS-F-3715 (REV. 11/9/93)

MATERIALS EVALUATION AND CONTAINER INFORMATION - GLASS
FS-F-3715
Figure 4

-6943

FEMP
LOW-LEVEL RADIOACTIVE WASTE

Reference MEF # 1088

MATERIALS EVALUATION AND CONTAINER INFORMATION - METAL

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: 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: Constitutes less than 20% by volume (If no, then wood checklist (FS-F-3465) must also be used.)			

SECTION II - CONTAINER INFORMATION

1. MATERIAL ORIGIN/DESCRIPTION *(Provide a complete description of the waste in the container, including information on source or origin if available):*

SPECIFIC DISCERNIBLE ITEMS APPROVED AS LLRW (NON-RCRA) BY WASTE CHARACTERIZATION:

WASTE CHARACTERIZATION SIGNATURE/DATE

2. PACKAGING START DATE	PACKAGING FINISH DATE:	3. VERIFIED BY:	DATE:

4. CONTAINER NUMBER:	5. CONTAINER TYPE: ☐ S/L ☐ White Metal Box
6. LOCATION PACKAGED:	
7. *MEF NUMBER:	8. INCHES FREEBOARD/HEADSPACE:
APPROVED BY: SUPERVISOR(S) SIGNATURE/DATE	APPROVED BY: QC SIGNATURE/DATE

* For materials packaged that do not meet the criteria in Section I, but have an approved MEF number, record the MEF number and material packaged.

GENERATOR TO MAKE DISTRIBUTION:		
1	*White*	Waste Characterization
2	*Blue*	Low-Level Waste Handling and Disposal
3	*Yellow*	Materials Control and Accountability
4	*Green*	Waste Generator

FS-F-3464 (REV. 11/9/93)

MATERIALS EVALUATION AND CONTAINER INFORMATION-METAL
FS-F-3464
Figure 5

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.
08-02-93	1	Revised to incorporate CIO C93-143 per Request P93-254 and update to conform with current Procedure Program requirements.
12-15-93	0	Reissued to update per Request P93-750 initiated by P. Philpot.
02-04-94	1	Revised document dated 12-15-93, Rev. 0, to correct typographical errors. Changed supersedes date to 11/05/92 and procedure no. in Step 5.1.4 per Request No. P94-0030, initiated by N.K. Weichold.

WASTE PROGRAMS MANAGEMENT PROCEDURE	Sampling Waste for Hazard Identification	20-C-806 TECHNICAL PROCEDURE
(Signature On File) Authorization: M. Ramirez Waste Sampling Manager	Supersedes: None	Issue Date: 11/27/94

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1.0 PURPOSE

The purpose of this document is to establish the procedure for sampling waste materials contained in 5 to 10 gallon cans and 30, 55, 85 or 110 gallon drums.

2.0 SCOPE

This procedure is applicable to taking samples of waste material contained within drums/cans to support waste characterization programs.

3.0 APPLICABLE DOCUMENTS

3.1 Source Documents

3.1.1 FEMP Site-Wide CERCLA Quality Assurance Project Plan (SCQ).

3.1.2 DOE Order 5820.2A, "Radioactive Waste Management".

3.1.3 NVO-325, Rev. 1, Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements, June 1992.

3.1.4 Material Acceptance Process Manual, Envirocare Inc. of Utah.

3.1.5 Proposed Amended Consent Decree with OEPA.

3.1.6 D10-00-020, "Remediation Support Operations Division Document System"

3.1.7 RM-0012, "Quality Assurance Program Description"

3.2 Reference Documents

3.2.1 EPA SW-846, Test Methods for Evaluating Solid Waste

3.2.2 RM-0005, "FEMP Lot Marking and Color Coding System"

3.2.3 SMS-93-290, Prototype Sampling and Analysis Plan for Containerized Wastes at the FEMP. (Site document number pending).

3.2.4 20-C-602, "Inspection and Operation of NILFISK Portable Vacuum Units"

3.2.5 20-C-909, "Portable Ventilation Unit Operation"

3.2.6 20-C-912, "Checking Scale Operation"

3.2.7 SSOP-0018, "Processing Site-Wide Analysis Request/Custody Record for Sample Control"

3.2.8 SSOP-0035, "Satellite Accumulation Areas and Interim Containers for Hazardous Wastes"

3.2.9 M-107, "Transportation Requirements for Shipment of Samples to Off-Site Laboratories"

4.0 DEFINITIONS

4.1 Composite Sample - A sample collected for representation of large waste streams and prepared by combining equal portions of materials obtained f the same waste stream.

4.2 Concentrated Waste - Materials of physical form or characteristics which require non-typical sampling techniques, or contain contaminant concentrations at such a level that sample preservation is not required for sample integrity. Examples of solid-matrix concentrated wastes include paper, trash, metallic structures (sheets, pipes, beams), concrete, wood, etc. Examples of liquid-matrix concentrated wastes include oils solvents, and process liquids.

4.3 Contact Waste - Discarded materials generated during drum/can sampling activities (e.g., used PPE, rags, rinse water).

4.4 Container Blank - A sample used to determine quality and integrity of sample containers. Unpreserved sample containers are submitted to the laboratory. An extract from the container is prepared and analyzed for parameters of interest. Appropriate for Analytical Support Levels (ASLs) B, C, D, and E. (SCQ)

4.5 Field Duplicate - Two independent samples collected from the same source, analyzed separately and used to evaluate precision of analytical laboratory performance and sample collection techniques. Each duplicate sample is assigned an unique identification number and sent as blind samples to the same laboratory. Appropriate for ASLs A through E and required for ASLs and D. (SCQ and EPA-SW-846)

4.6 Equipment Rinsate Samples - A sample used to determine the effectiveness of decontamination procedures; prepared at the decontamination site by collecting a portion of the final rinse of the sampling equipment. Appropriate for ASLs A through E and required for ASLs, C and D. (SCQ)

4.7 Field Blank - A sample used to determine whether the sample collection process or conditions at the site have affected sample quality; prepared by pouring organic-free, distilled/deionized water into appropriate containers for each type of analysis to be conducted. Field blanks are specified for ASLs C and D and some ASL B and E analysis. (SCQ)

4.8 Low/Medium Concentration Liquid Samples - Liquids which contain contaminant concentrations at such levels that sample preservation is required for sample integrity. Examples include containerized purged groundwater, sump liquids, etc. and quality control (QC) samples.

4.9 Meniscus - The convex portion of liquid matrix samples extending above the rim of the sample container.

4.10 Preservative Blank - A sample used to determine the quality of sample preservatives. Prepared by the Sample Coordinator or Field Sampling Team in a controlled environment by pouring organic-free, distilled/deionized water into sample containers with specified preservative. Appropriate f ASLs B, C, D, and E. (SCQ)

4.0 **DEFINITIONS** (cont.)

4.11 Random Sample - A representative sample of waste material collected from a container chosen from a group of similar containers that had equal probabilities of being selected.

4.12 Sampling Event - Collection of sample(s) in accordance with a single PSAP for a specific project. (SCQ)

4.13 Sample Line(s) - A limited-access, diked area (size: approximately 10 feet by 20 feet) used during drum/can sampling activities. Each sample line contains equipment, supplies, storage cabinets, work benches, hoods and a temporary drum staging area (maximum capacity of four drums).

4.14 Sampling Round - Collection of samples in accordance with one or more PSAPs for a specific project during a specified time period for a similar purpose. (SCQ)

4.15 Split Sample - A sample used to evaluate comparability of analytical data prepared by evenly distributing sample media between two or more sets of containers. Assigned the same identification number as the original sample. The original and the split sample are each shipped to different laboratory facilities for similar analysis. Appropriate for ASLs A through E and required for ASLs C and D. (SCQ)

4.16 Trip Blank - A sample used to determine whether conditions encountered during sample container shipment and handling have affected sample quality; prepared by the sample coordinator in a controlled environment by pouring organic-free, distilled/deionized water into a 40-mL volatile organic analysis vial and sealing it with a teflon-lined septum lid. Trip blanks are required when samples are collected for volatile organic analysis. (SCQ)

5.0 **RESPONSIBILITIES**

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

5.1.1 Contacting Industrial Hygiene and/or Radiological Control to determine if the Personal Protective Equipment (PPE) identified on the work permit is appropriate for the process being performed.

5.1.2 Issuing the required PPE to operators.

5.1.3 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.

5.1.4 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.

5.1.5 Obtaining and maintaining all permits required for implementation of drum/can sampling activities.

5.1.6 Obtaining and maintaining all documents, policies and procedures applicable to drum/can sampling activities.

5.0 **RESPONSIBILITIES** (cont.)

5.1.7 Obtaining specific drum/can storage location(s) from Materials Control Accountability (MC&A).

5.1.8 Notifying MC&A prior to moving drums/cans.

5.1.9 Notifying the Transportation representative to move the drums/cans to a diked sampling area.

5.1.10 Notifying Radiological Control prior to moving drums/cans in and out of Radiological Zones.

5.2 **Operators** shall be responsible for the following:

5.2.1 Complying with this procedure and applicable documents/permits.

5.2.2 Wearing PPE as provided by the Supervisor.

5.3 **Materials Control and Accountability (MC&A)** shall be responsible for the following:

5.3.1 Assigning a representative to support drum/can movement to, from and within the sampling area.

5.3.2 Providing material identification data.

5.4 **Environmental Safety and Health (ES&H)** shall be responsible for the following:

5.4.1 Monitoring vehicles and drums/cans entering and exiting Radiological Zones.

5.4.2 Issuing, reviewing and posting work permit requirements.

5.5 **Environmental Programs (ENV)** shall be responsible for:

5.5.1 Preparing, reviewing and distributing Project-Specific Sampling and Analysis Plans (PSAPs).

5.5.2 Performing statistical analysis on data received from on-site and off-site laboratories.

5.6 **Waste Characterization** shall be responsible for performing hazardous waste determinations and maintaining material evaluation files.

6.0 **GENERAL**

6.1 Warnings, Cautions, and Notes precede the Item, Step, Sub-Step, Section, or Sub-Section to which they apply.

6.0 GENERAL (cont.)

6.2 Any deviation from the PSAP (See Attachment A) shall be initiated and approved through the use of a Variance Request (VR) form (See Figure 1) completed by Waste Sampling. The original VR form is retained in the Waste Sampling project file. A copy is retained at the drum sampling line(s) throughout the sampling event or sampling round. Approved deviations shall be noted in the "Sampling Log Book."

6.3 To prevent cross-contamination, only one drum/can per sampling line shall be opened at a time.

6.4 Volatile organic compounds (VOC) and combustible materials being sampled or staged shall be segregated from other materials. See Steps 7.10 through 7.12 for identification and sampling of organic-contaminated materials or flammable liquids.

6.5 Collect ASL-specific Quality Control (QC) samples as specified in the PSAP (ASL B) or at the frequencies identified in Table 1 for ASLs C and D.

6.6 Collect samples from drums/cans in the following order:

6.6.1 Volatile Organic Analysis

6.6.2 Semi-Volatile Organic Analysis

6.6.3 Metals/Inorganics

6.6.4 Radionuclides

6.7 Initial and date custody tape section prior to sealing sample container.

NOTE: SMS will indicate on the PSAP the proper disposition of wastewater (rinsates) generated during the sampling event.

6.8 Rinsates generated during sampling of materials that are not F-listed wastes will be retained in a 55-gallon bung type drum. Rinsates generated during sampling of F-listed wastes will be contained in accordance with Step 8.1.2 and dispositioned in accordance with SSOP-0035.

6.9 For each sampling event, indicate the amount of wastewater (in gallons) placed in the 55-gallon drum on the Waste Sampling Decon Log (See Figure 7).

NOTE: Contact supervisor when drum storage capacity is obtained, for movement by RSO Transportation personnel.

6.10 Transport full wastewater drums with Waste Sampling Decon Log to general sump for disposal.

7.0 HEALTH AND SAFETY REQUIREMENTS

7.1 Portable ventilation devices shall be used per procedure 20-C-909 when collecting samples from drums/cans containing dry materials or volatile compounds.

7.0 HEALTH AND SAFETY REQUIREMENTS (cont.)

7.2 Operators shall wear the appropriate respiratory protection devices issued by the supervisor and identified by ES&H.

7.3 Leather-palm gloves shall be worn when handling drums, locking rings, lids, sharp or abrasive material, or when using tools.

7.4 Safety glasses shall be worn unless a full face respirator is used.

7.5 Face shields, neoprene gloves, aprons, and chemical cover goggles shall be worn when taking samples of caustic material, acid slurries, or liquids.

7.6 Gloves shall be visually inspected for holes, rips and tears prior to use and after donning. Gloves exhibiting holes, rips or tears prior to entering the controlled area shall be discarded at the Plant 6 checkpoint area. Gloves that are used or torn during sampling shall be discarded in the appropriate container identified in Step 8.1.6.

7.7 Employees shall have reviewed, and be familiar with, the information contained in the MSDS for the chemical/hazardous materials that may be used or encountered.

7.8 Specified personal protective equipment (PPE), which are specified on work permits and this procedure, shall be worn before entering a sample area.

7.9 Personnel shall have access to communications devices and emergency response equipment.

7.10 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. 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 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.

7.11 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. FS-F-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

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7.0 HEALTH AND SAFETY REQUIREMENTS (cont.)

7.12 Industrial Hygiene shall be contacted to measure volatile organic compounds for all drums/cans classified as containing organic-contaminated materials. Results of monitoring along with personal protective equipment requirements shall be reviewed with sampling personnel and posted at the Plant 6 control point and entrance to sample lines.

7.13 Fire and Safety Inspectors shall check for flammable vapors from all drums classified as containing organic-contaminated materials.

7.14 Flammable liquids identified by Fire and Safety shall only be sampled at the flammable liquid sampling line using explosion proof electrical equipment and non-sparking tools.

7.15 All persons will remain clear of aisle-ways while forklifts and handstackers are in use.

7.16 Personnel sampling miscellaneous material (MTC 137) shall wear an airline respirator.

8.0 PROCEDURE

8.1 Preparation for Sampling

NOTE: The supervisor shall be contacted if there are questions pertaining to the PSAP.

8.1.1 Obtain the PSAP from the supervisor.

8.1.2 Obtain lot number from MC&A for 5-gallon cans designated for storage of wastewater and contact waste generated during sampling of D- or F-listed waste materials.

NOTE: Work permits and other associated permits are located at the control checkpoint.

8.1.3 Ensure that all required permits are posted and current.

A. If permit(s) is/are not posted, or current, or if the permit is suspect, notify the supervisor.

NOTE: Scales shall be checked at the start of each operating shift or before the first use each day.

8.1.4 Check the scales to be used per procedure 20-C-912.

NOTE: VOC, flammable/combustible and corrosive material shall be moved to respectively designated area identified by the supervisor.

8.1.5 Using a handstacker or applicable equipment, move skids with drum/cans into the designated sampling or staging areas.

8.0 **PROCEDURE** (cont.)

NOTE: Two separate five gallon cans shall be used for storage of liquid and solid F-listed contact wastes, respectively.

8.1.6 Prepare contact waste canisters (for cleaning sampling equipment and disposal of trash) as follows:

A. Determine tare weight for empty, clean, color-coded 5-gallon containers.

B. Stencil the containers with the tare weight and lot number (obtained in Step 8.1.2) per RM-0005.

C. Install plastic liners in the five gallon cans.

NOTE 1: The equipment to be used for sampling is identified in the PSAP.

NOTE 2: If clean equipment is not available, obtain dirty equipment and clean per Item 8.5.

8.1.7 Obtain sampling equipment that has a "Clean Equipment Tag" (Form FMPC-OPR-3128) attached (See Figure 6).

NOTE 1: Contact supervisor if clean sample containers are not available. The supervisor contacts the Waste Sampling representative to obtain clean sample containers.

NOTE 2: If the box of jars was not labeled, "Clean," process the jars per Step 8.5.2 and submit container blanks for inorganic and radiological constituent analysis.

8.1.8 Obtain a box of clean, lidded sampling jars.

NOTE 1: The following step is applicable for sample containers used for inorganic and radiological analysis <u>only</u> when pre-cleaned bottles/jars cannot be obtained. Sample containers for organic compound analysis must be purchased pre-cleaned.

NOTE 2: Obtain tare weight for appropriate sample containers from list maintained at the sample line.

8.1.9 Complete the "Sample Label" to be used (See Figure 2), including the tare weight.

8.1.10 Fill out the applicable portions of a "Site-Wide Analysis Request/Custody Record" (Form FS-F-3361)(SWAR/CR) form (See Figure 3) per SSOP-0018.

8.1.11 Place an absorbent pad that is applicable for material to be sampled (water/oil) under the sample containers.

8.1.12 Using the Log Book Stamp, imprint the "Sample Log Book." (See Figure 4).

8.0 **PROCEDURE** (cont.)

8.1.13 Fill out the log book with the information required by the stamp.

8.1.14 Obtain Trip Blanks from QC laboratory or from Waste Sampling representative.

A. Complete labels and affix to sample containers.

B. Seal with custody tape and tamper proof seal. (See Figure 5).

C. Place in a cooler with blue ice or refrigerator in close proximity to sampling line.

D. Proceed to Step 8.1.16.

8.1.15 If unable to obtain Trip Blanks per Step 8.1.14, prepare trip blank, if required by PSAP, as follows:

NOTE: Field verification of pH should be performed over the 5-gallon can used for collection of rinse waters.

A. Obtain clean 8-ounce glass jar. Fill with distilled/deionized water and add 4 drops of hydrochloric acid (HCl). Check pH by gently pouring liquid on a pH indicator strip. If pH is less than 2, proceed to Step 8.1.15.B. If pH is greater than 2, add one drop of HCl and repeat pH measurement. Continue until a pH <2 is reached.

B. Obtain three (3) clean 40-mL volatile organic analysis (VOA) vials.

C. Fill one 40-mL vial to overflowing with a visually apparent meniscus present above the vial rim and seal sample vial.

D. Visually check sample vial for air bubbles by inverting and sharply tapping against hand or thigh.

1. If air bubbles are present, unseal container and repeat Steps 8.1.15.B through 8.1.15.D.

2. If air bubbles are not present, label sample vial, seal with custody tape, and place in cooler or refrigerator.

E. Repeat Steps 8.1.15.B through 8.1.15.D for remaining sample vials.

NOTE: Field blanks must be prepared prior to initiation of sampling event and must remain exposed to atmospheric conditions throughout duration of the sampling event. Contact Waste Sampling if conditions in proximity to sampling lines have changed to determine if additional field blanks are warranted.

8.1.16 Prepare field blanks for constituents identified in Section C of the PSAP as follows:

8.0 **PROCEDURE** (cont.)

A. Place containers in close proximity to sampling line and leave uncapped throughout sampling event.

B. Proceed with sampling event.

C. Cap sample containers and process samples in accordance with Step 8.12 upon completion of sampling event.

8.2 Sampling

WARNING

Only non-sparking tools and explosion-proof equipment shall be used in the vicinity of flammable or combustible material sampling lines to prevent an explosion.

8.2.1 Remove the locking ring and drum lid from the drum to be sampled.

NOTE: If the material is dry, use a HEPA filtered ventilation system and inspect and operate per procedure 20-C-602.

8.2.2 Visually inspect the waste material to be sampled to determine the physical characteristics (liquid, solid, dry, or moist).

NOTE 1: HEPA ventilation devices shall have current DOP Test Labels. DOP Test Labels must be unbroken and legible.

NOTE 2: If the material does not match the material type code specified in the PSAP, notify the Supervisor and complete a visual inspection form and record discrepancies in field logbook.

8.2.3 Check that the drum contents corresponds with the Material Type Code (MTC) on the drum and the PSAP.

NOTE 1: The Supervisor shall inform Waste Sampling of discrepancies between reported and observed material types.

NOTE 2: The following steps only apply when a given drum/can contains solid and liquid phases.

8.2.4 Determine total amount of material in drum/can and amount of solid/liquid phases as follows:

A. Indicate top of liquid surface at a point on the exterior of drum/can with a piece of tape.

B. Determine height, in inches, of tape marker from base of the drum/can using a measuring device (i.e.: ruler, yardstick or tape measure).

C. Determine the amount of liquid (in inches) in the drum using a Composite Liquid Waste Sampler (COLIWASA) and a measuring device.

8.0 **PROCEDURE** (cont.)

D. Calculate amount of solid (in inches) by subtracting the amount of liquids (determined in Step 8.2.4.B) from the total amount of material.

E. Record the amount of liquid and solid phases in the "Sampling Log Book" and notify Supervisor to contact Waste Sampling to determine if each phase must be sampled.

8.3 Collection of Solid Matrix Samples

8.3.1 For drums/cans with dry loose or semi-cohesive materials use a grain or pipe sampler as follows:

A. Insert grain or pipe sampler diagonally at a point near the side of the drum/can, through the center, to a point at the drum/can base directly opposite the entry point.

B. Rotate grain or pipe sampler twice until slot is facing upwards.

C. Withdraw grain or pipe sampler.

NOTE: If samples for VOA and/or SVOA analysis are required, proceed with Step 8.3.1.D. If not, proceed with Step 8.3.1.E.

D. Collect VOA and SVOA samples as follows:

1. Use a stainless steel spatula to transfer sample material from the sampling device to appropriate sample containers as identified in COLUMN A of Section C of the PSAP. (See Attachment A)

2. Fill sample containers in such a manner to minimize potential void spaces.

3. Repeat Steps 8.3.1.A through 8.3.1.D.1 until sample container is completely filled.

4. Handle and store samples in accordance with Step 8.11 of this procedure.

E. Collect samples for inorganic or radiological analysis as follows:

1. Transfer sample materials from sampling device to a clean stainless steel pan.

2. Divide sample materials into four (4) equal portions.

3. Mix opposite quarters into two (2) halves.

4. Mix halves.

5. Repeat Steps 8.3.1.E.2 through 8.3.1.E.4.

8.0 **PROCEDURE** (cont.)

6. Transfer materials to the appropriate sample containers identified in COLUMN A of Section C of the PSAP (See Attachment A).

7. Repeat Steps 8.3.1.A through 8.3.1.C and 8.3.1.E.1 through 8.3.1.E.6 until sample containers are completely full.

8. Handle and store sample in accordance with Step 8.11 of this procedure.

8.3.2 For drums/cans with moist or wet cohesive materials use a stainless steel hand auger or coring device as follows:

A. Insert sampling device diagonally at a point near the side of the drums/cans, through the center, to a point at the container base directly opposite the entry point.

B. Rotate sampling device twice.

C. Withdraw sampling device.

D. Transfer sample material from sampling device to appropriate sample containers identified in COLUMN A of Section C of the PSAP, in accordance with Steps 8.3.1.D and 8.3.1.E of this procedure.

8.3.3 For drums/cans with materials such as paper, trash, personal protectiv equipment, filters, pads, rags, and other miscellaneous debris, collec samples as follows:

A. Sort materials within the drum/can. Collect materials which exhibit evidence of discolorations or stains for analysis.

B. Use scissors, shears, utility knives or similar tools to cut materials. Transfer sample material to appropriate sample containers identified in COLUMN A of Section C of the PSAP, in accordance with Steps 8.3.1.D and/or 8.3.1.E of this procedure.

NOTE: If drum/can contains materials that cannot be feasibly cut into small pieces, notify supervisor to contact Waste Sampling to determine the appropriate sampling approach.

C. Complete visual inspection and document in Sample Logbook.

8.4 Collection of Liquid Matrix Samples

8.4.1 Use a clean, glass COLIWASA for collection of liquid waste samples.

A. Insert inner rod of glass COLIWASA inside sheath.

B. Lower glass COLIWASA vertically, keeping the ground glass end of the inner rod away from the hole in the sheath bottom, at a rate that the liquid levels inside and outside the sample tube remain even.

8.0 **PROCEDURE** (cont.)

C. Push inner rod downwards to close the sampling device when the drum/can base has been encountered.

D. Withdraw sampling device with one hand while decontaminating the outside surface with a clean, disposable cloth.

E. Pull inner rod upwards to transfer material to appropriate sample containers identified in COLUMN B or C of Section C of the PSAP in accordance with Step 8.12 and/or 8.13 of this procedure.

NOTE: Equipment decontamination shall be performed over a 5-gallon container. If the material sampled is an F- listed waste, the container must be marked with the appropriate 15-digit FEMP Lot Marking Code (Refer to Step 8.1.2).

8.5 Equipment Decontamination

8.5.1 Sampling equipment and associated devices used for sample transfer shall be decontaminated as follows:

A. Rinse equipment with potable (tap) or distilled water.

B. Clean equipment using a phosphate-free laboratory detergent and potable water solution and scrub brushes.

C. Rinse with potable (tap) or distilled water.

D. Rinse twice with organic-free, distilled/deionized water.

E. If sampling equipment exhibits signs of visible contamination, deliver to site decontamination facility or perform Step 8.5.2.

F. Inspect decontaminated equipment for signs of visible residual contamination (adhered particles) or stains, discolorations.

8.5.2 Decontaminate equipment that exhibits signs of visible contamination or stains/discolorations as follows:

A. Rinse with potable (tap) water.

B. Clean equipment with a phosphate-free laboratory detergent and potable water solution and scrub brushes.

C. Rinse with potable (tap) water.

D. Rinse with 0.02 normal hydrochloric or sulfuric acid.

E. Rinse with potable (tap) water.

F. Rinse with isopropyl alcohol.

G. Triple rinse with organic-free, distilled/deionized water.

8.0 **PROCEDURE** (cont.)

8.5.3 Allow sampling equipment to air dry when feasible, or use a clean, lint free disposable cloth to dry the sampling equipment; then store as follows:

A. Wrap equipment in aluminum foil with the shiny side facing outward if the equipment will be used for VOA or SVOA sample collection.

B. Wrap equipment in a plastic bag if the equipment will not be used for VOA or SVOA sample collection.

8.5.4 Complete a "Clean Equipment Tag", Form FMPC-OPR-3128 (See Figure 6).

8.5.5 Attach the tag to the decontaminated equipment.

8.5.6 Store sampling device by placing decontaminated sampling equipment in a clean protected area.

8.5.7 Process rinsate wastewater generated during sampling of F-listed wastes in accordance with SSOP-0035.

NOTE: Equipment rinsate samples should be collected at the frequency specified in the PSAP, either prior or subsequent to completion of the sampling event and MUST be collected prior to sampling materials of a differing waste stream (Material Type and Source Code).

8.6 Equipment Rinsate Blanks

8.6.1 Obtain sample containers as specified in COLUMN D of Section C of the PSAP (See Figure 1).

8.6.2 Hold stainless steel pan directly beneath the decontaminated sampling device.

8.6.3 Pour organic-free, distilled/deionized water over the decontaminated sampling equipment.

8.6.4 Pour water from stainless steel pan to appropriate sample container.

8.6.5 Repeat Steps 8.6.2 through 8.6.4 until all sample containers are filled.

8.6.6 Process samples in accordance with Step 8.12.

8.7 Duplicate Samples

8.7.1 Collect two sets of samples, when specified by PSAP, from the designated drum/can in accordance with Steps 8.3 and/or 8.4 of this procedure.

8.7.2 Retain one (1) sample set as the "original sample" and assign a sample number as specified in the PSAP.

8.7.3 Retain the other sample set as the "duplicate sample" and assign an unique sample number as specified in the PSAP.

8.0 **PROCEDURE** (cont.)

8.7.4 Process original and duplicate samples in accordance with Step 8.11, 8.12, or 8.13 depending on the matrix of the duplicate sample.

8.8 Split Samples

8.8.1 Obtain two sets of sample containers when specified by the PSAP, and collect sufficient sample material from the designated drum/can in accordance with Steps 8.3 and/or 8.4 of this procedure.

8.8.2 Distribute equal amounts of sample material to each set of sample containers.

NOTE: Solid material for inorganic and radiological analyses must be homogenized per Step 8.3.1.E.1. prior to filling of sample containers. Solid materials for organic analysis (VOAS and SVOAS) should not be homogenized, but split equally between sample container sets.

8.8.3 Assign the same sample number to the "original sample" and "split samples".

8.8.4 Process original and split samples in accordance with Step 8.11, 8.12, or 8.13 depending on the matrix of the split samples.

8.9 Container Blanks

NOTE 1: Container blanks are required if pre-used sample containers are cleaned and re-used per Step 8.5.2 or if vendor-supplied analytical data are not available.

NOTE 2: Container blanks are not required if vendor-supplied analytical data (i.e., Certificate of Analysis) are provided for each batch of sample containers used during the sampling round.

8.9.1 If vendor-supplied analytical data are supplied perform the following:

A. Submit a copy of analytical data to Waste Sampling for storage in the project file.

B. Document vendor-supplied container numbers (provided on a bar code label attached to sample container) in the Sampling Log Book.

C. Proceed to Step 8.11.

8.9.2 If vendor-supplied analytical data are not available, obtain a set of "clean" (unused) sample containers for metals and radionuclides analysis as specified in the PSAP.

8.9.3 Process empty "clean" sample containers in accordance with Step 8.11.

8.9.4 Indicate "Container Blank" in the remarks section of the SWAR/CR.

8.0 **PROCEDURE** (cont.)

NOTE: Preservative blanks may be required if vendor-supplied assay data are not available.

8.10 Preservative Blank

8.10.1 If vendor-supplied assay data are provided, document the preservative manufacturer and lot number (batch identifier) for the respective preservative used in the Sampling Book.

A. Submit a copy of assay data to Waste Sampling for storage in the project file.

B. Proceed to Step 8.11.

8.10.2 If vendor-supplied assay data are not available, obtain the following sample containers and preservatives when a preservative blank is specified in the PSAP.

A. For VOC analysis, obtain a clean 8-ounce glass jar, fill with deionized/distilled water, and add 4 drops of hydrochloric acid. Transfer acidified liquid to three clean 40-mL VOA vials with Teflon-lined septum lids.

B. For metals and radiological analysis, collect one (1) one-liter polyethylene bottle and add 20 to 24 drops of nitric acid.

8.10.3 Pour organic-free, distilled/deionized water into the prepreserved sample containers identified in Steps 8.10.2.A and 8.10.2.B.

8.10.4 Process samples in accordance with Step 8.12.

8.10.5 Indicate "Preservative Blank" in the remarks section of the SWAR/CR.

8.11 Solid-Matrix Concentrated Waste Sample Handling and Storage

8.11.1 Check cooler/refrigerator inner temperature with a thermometer (graded in units of 1°C) on a daily basis to ensure samples are preserved at 2-6°C.

8.11.2 Record cooler/refrigerator temperature in field logbook.

8.11.3 Handle and store solid-matrix samples and duplicate/split samples as follows:

A. Complete label and affix to sample container.

B. Seal with custody tape.

C. Place VOA, SVOA, and metals samples in a cooler with 'blue ice' or refrigerator in close proximity to the sampling line.

D. Place radiological samples in close proximity to the sampling line.

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8.0 **PROCEDURE** (cont.)

8.12 Low/Medium Concentration Liquid-Matrix Sample Handling and Storage

8.12.1 Check cooler/refrigerator inner temperature with a thermometer (graded in units of 1°C) on a daily basis to ensure samples are preserved at 2-6°C.

8.12.2 Record cooler/refrigerator temperature in sample logbook.

8.12.3 Transfer low/medium concentration liquid-matrix VOA samples, field blanks, equipment rinsate, and duplicate/splits from the temporary storage container (8-ounce glass jar or larger), as required, to three (3) 40-mL VOA vials in accordance with Steps 8.1.15.A through 8.1.15.D of this procedure.

A. Complete labels and affix to sample containers.

B. Seal with custody tape.

C. Place in a cooler with 'blue ice' or refrigerator in close proximity to sampling line.

8.12.4 Process low/medium concentration liquid-matrix SVOA samples, field blanks, equipment rinsates and duplicates/splits as follows:

A. Complete labels and affix to the sample container.

B. Seal with custody tape.

C. Place in a cooler with 'blue ice' or refrigerator in close proximity to the sampling line.

WARNING

Goggles, nitrile gloves, and an apron vest must be worn when working with acids to prevent possible serious burns.

8.12.5 Process low/medium concentration liquid-matrix samples, field blanks, equipment rinsates and duplicates/splits for metals and radiological analysis as follows:

A. Add one (1) milliliter (mL) or 20 to 24 drops of Nitric Acid (HNO_3) per 1,000 mL (1-liter) of sample using an acid ampule or dispensing bottle. Cap container and gently invert and rotate bottle to mix acid with sample material.

NOTE: For field blank and equipment rinsate samples Step 8.12.4.B is not necessary, based on past experience.

B. Check pH by gently pouring the acidified sample onto an indicator strip, over a 5-gallon can used to collect rinsate wastewater, and comparing color codes.

8.0 **PROCEDURE** (cont.)

C. If pH is greater than 2, add one drop of nitric acid (HNO_3) and repeat Steps 8.12.4.A and 8.12.4.B. Repeat Steps 8.12.4.B.1 and Steps 8.12.4.A and 8.12.4.B until a pH of less than 2 is achieved.

D. Complete labels and affix to sample container.

E. Seal with custody tape.

F. Place samples for metals analysis in a cooler with 'blue ice' or refrigerator in close proximity to the sampling line.

G. Place radiological samples in a controlled storage area in close proximity to the sampling line.

8.12.6 Complete SWAR/CR in accordance with SSOP-0018.

8.12.7 Transport samples in coolers to the FEMP Sample Processing Laboratory (SPL) with the SWAR/CR and a copy of the PSAP.

8.13 Liquid-Matrix Concentrated Waste Sample Handling and Storage

8.13.1 Check cooler/refrigerator inner temperature with a thermometer (graded in units of 1°C) on a daily basis to ensure samples are preserved at 2-6°C.

8.13.2 Record cooler/refrigerator temperature in sample logbook.

8.13.3 Process liquid matrix concentrated waste samples and duplicates/splits for VOA, SVOA, and metals analyses as follows:

A. Complete label and affix to sample container.

B. Seal with custody tape.

C. Place samples in a cooler with 'blue ice' or refrigerator in close proximity to the sampling line.

8.13.4 Process liquid matrix concentrated waste samples and duplicates/splits for inorganic and radiological analyses as follows:

A. Complete label and affix to sample container.

B. Seal with custody tape.

C. Place samples in a controlled storage area in close proximity to the sampling line.

8.14 Completion of Site-Wide Analysis Request/Custody Record (SWAR/CR)

8.14.1 Complete SWAR/CR in accordance with SSOP-0018, "Processing Site-Wide Analysis Request/Custody Record for Sample Control."

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8.0 **PROCEDURE** (cont.)

8.14.2 Complete "Remarks" section of SWAR/CR as follows:

A. List the Analytical Support Level (ASL) identifier (i.e., B. C, D, etc.).

B. List the relative amount of preservative (in weight %) used for sample preservation as follows:

1. Refer to Table 2, locate type of preservative and volume of sample container used.

2. If number of drops of preservative used is less than maximum number of drops allowed, indicate less than respective wt. % (e.g., <0.04 wt. % HCl <0.15 wt. % HNO_3, etc.).

3. If number of drops of preservative used is greater than maximum number of drops allowed, indicate greater than respective weight percent (e.g., >0.04 wt. % HCl, >0.015 wt. % HNO_3, etc.).

FIELD QUALITY CONTROL SAMPLES

	ANALYTICAL SUPPORT LEVELS		
	B	C	D
INORGANICS, ORGANICS, and RADIONUCLIDES Field QC Samples			
Field blanks	A/S	1 per 20 or 1 per sampling event, whichever is more frequent	20 or 1 per sampling event, whichever is more frequent
Equipment rinsate blanks	A/S	1 per 20 or 1 per sampling event, whichever is more frequent	1 per 20 or 1 per sampling event, whichever is more frequent
Field duplicates	A/S	1 per 20 or 1 per sampling event, whichever is more frequent	1 per 20 or 1 per sampling event, whichever is more frequent
Preservative blanks	A/S	A/S	A/S
Container blanks	A/S	1 per QC lot of containers	I per QC lot of containers
Laboratory control samples	1 per analytical batch if applicable	1 per analytical batch if applicable	1 per analytical batch if applicable
Method blanks	1 per analytical batch of samples	1 per analytical batch of samples	1 per analytical batch of samples
Trip blanks (VOAs only)	A/S	1 per shipping container	1 per shipping container

FIELD QUALITY CONTROL SAMPLES
Table 1

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PRESERVATIVE PARAMETERS FOR SAMPLES

Preservative = HCl (HYDROCHLORIC ACID)

Sample Container Size (in mL)	Maximum Wt. % of Preservative	Maximum Amount of Preservative (mL)	Maximum # of Drops of Preservative **
40	0.040	0.037	Less Than 1
120	0.040	0.110	2
250	0.040	0.229	5
500	0.040	0.458	11
1000	0.040	0.916	22
4000	0.040	3.665	88

Preservative = HNO3 (NITRIC ACID)

Sample Container Size (in mL)	Maximum Wt. % of Preservative	Maximum Amount of Preservative (mL)	Maximum # of Drops of Preservative **
40	0.150	0.061	1
120	0.150	0.182	4
250	0.150	0.380	9
500	0.150	0.760	18
1000	0.150	1.520	36
4000	0.150	6.079	145

Preservative = H2SO4 (SULFURIC ACID)

Sample Container Size (in mL)	Maximum Wt. % of Preservative	Maximum Amount of Preservative (mL)	Maximum # of Drops of Preservative **
40	0.350	0.076	1
120	0.350	0.228	5
250	0.350	0.476	11
500	0.350	0.951	22
1000	0.350	1.902	45
4000	0.350	7.609	182

Preservative = NaOH (SODIUM HYDROXIDE)

Sample Container Size (in mL)	Maximum Wt. % of Preservative	Maximum Amount of Preservative (mL)	Maximum # of Drops of Preservative **
40	0.080	0.042	1
120	0.080	0.125	3
250	0.080	0.261	6
500	0.080	0.523	13
1000	0.080	1.046	25
4000	0.080	4.183	100

Note: ** – Assumes that 24 drops of preservative = 1 mL of preservative

PRESERVATIVE PARAMETERS FOR SAMPLES
Table 2

VARIANCE REQUEST

VARIANCE REQUEST

VR No. ____

Page . of .

Date _____

VARIANCE (Include Justification)

Variance:

Justification:

REQUESTED BY: _____ Date: _____

APPROVED BY: _____ Date: _____

Project Manager

_____

Quality Assurance

_____

SCQ Implementation

APPLICABLE DOCUMENT(S) AND SECTION NUMBER(S)

VARIANCE REQUEST
Figure 1

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SAMPLE LABELS

SAMPLE ID: XXXXXXXXXX

(barcode goes here)

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
SAMPLE ID : XXXXXXXXXX
(barcode goes here)

DATE SAMPLED TIME SAMPLED

MATERIAL NAME / SAMPLE TYPE
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
PRESERVATIVES
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
CONTAINER TYPE GROSS WEIGHT
XXXXXXXXXXXXXXXX

COLLECTORS INITLS TARE WEIGHT

CNT:

COC #:

SAMPLE ID: XXXXXXXXXX

(barcode goes here)

Label A

TEMP SAMPLE ID X-REF SAMPLE ID

DATE SAMPLED TIME SAMPLED

MATL NAME

SAMPLE TYPE

CONTAINER TYPE GROSS WEIGHT
XXXXXXXXXXXXXXXX

COLLECTORS INITLS TARE WEIGHT

PRESERV:

CNT:

COC #:

Label B

SAMPLE LABELS
Figure 2

8403

SITE-WIDE ANALYSIS REQUEST/CUSTODY RECORD
Form No. FS-F-3361

FEMP
RSO - ANALYTICAL

Form Number

SITE-WIDE ANALYSIS REQUEST/CUSTODY RECORD

Page _____ of _____

PROJECT:

☐ PLAN NO.: OR ☐ PROJECT NO.:

PROJECT MANAGER/ENGINEER:

FOR SAMPLE RELATED PROBLEMS, CONTACT:

ORGANIZATION:

NAME: PHONE:

SAMPLER: PHONE:

CHARGE NUMBER: LOT MARKING CODE:

SAMPLER REMARKS:

SAMPLER SIGNATURE(S):

SEND RESULTS TO:

CHECK FOR: ☐ S R LAB ☐ BIO LAB ☐ WTP LAB

SAMPLE SOURCE, DESCRIPTION/IDENTIFICATION, ANALYSIS REGIMEN

ITEM NO.	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
2	REQUESTER
3	SAMPLER

FS-F-3361 (REV 3/25/93)

SITE-WIDE ANALYSIS REQUEST/CUSTODY RECORD
Form No. FS-F-3361
Figure 3

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SAMPLE LOG BOOK

PROJECT Sample Plan 144

Notebook No. _____ 29

Continued From Page _____

BLDG 71

DATE 3-20-91 LOCATION Isotopic Room SAMPLE NUMBER R144-7

SAMPLE PLAN 144 NUMBER AND VOLUME OF SAMPLES 2 Jars

MATERIAL Contaminated Removable Paint Filter (4th Floor) 1-40ml Vials 1-4oz 1-2oz

MATERIAL DESCRIPTION Dark Liquid NUMBER OF PHASES TWO

MATERIAL TYPE 027 SOURCE CODE 530 ANALYSIS REQUIRED Total VOAS TCLP Metals,

DRUM SAMPLED HA03-530-0027-0287 D1#0 U-235 Alpha-Beta Total PH Flash Point

TIME SAMPLED 1300 TYPE Composite (Liquid)

SAMPLED BY F. Merrill - W. Daniel Darrell W. Kelly 3-20-91

Note: 13 inches total 9 inches in Water = 69% water

Note: Plastic Bottles, Metal Cans, Plastic, Trash, Gloves

BLDG 71

DATE 3-21-91 LOCATION Isotopic Room SAMPLE NUMBER R144-18

SAMPLE PLAN 144 NUMBER AND VOLUME OF SAMPLES 2 Jars

MATERIAL Contaminated Removable Paint Filter (4th Floor) 1-40z 1-4oz 1-8oz

MATERIAL DESCRIPTION Plastic Bottles, Metal Cans, Plastic, Trash, Gloves (Solid) NUMBER OF PHASES TWO

MATERIAL TYPE 027 SOURCE CODE 530 ANALYSIS REQUIRED Total VOAS TCLP Metals,

DRUM SAMPLED HA03-530-0027-0287 D1#0 Total U. U-235 Alpha-Beta

TIME SAMPLED 0830 TYPE Composite (Solid)

SAMPLED BY F. Merrill Darrell W. Kelly 3-21-91

Continued on Page

Read and Understood By

R G [illegible] 3-21-91

Signed Date Signed Date

SAMPLE LOG BOOK
Figure 4

TAMPER PROOF SEAL

If Seal is broken or package damaged check contents before signing receipt.

TAMPER PROOF SEAL
Figure 5

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CLEAN EQUIPMENT TAG
Form No. FMPC-OPR-3128

CLEANED BY: _____

DATE: _____

Cleaned according to sop : _____

FMPC-OPR-3128 10/22/91

CLEAN EQUIPMENT TAG
Form No. FMPC-OPR-3128
Figure 6

WASTE SAMPLING DECON LOG

WASTE SAMPLING DECON LOG

DRUM#

	DATE SAMPLED	SAMPLE PLAN #	MEF #	DESCRIPTION OF SAMPLE MEDIA	GAL	BADGE	NAME
MON							
TUE							
WED							
THUR							
FRI							

DO NOT ADD DECON WATER GENERATED FROM F LISTED WASTE

WASTE SAMPLING DECON LOG
Figure 7

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DRUMMED WASTE MATERIAL PSAP

Drummed Waste Material
Project-Specific Sampling and Analysis Plan

Number: 1-
Date: 12-11-93
Page 1 of 5

A. Identifying Information

1) Project Name: 13-
2) Plan No.: 1-
3) Material Description/Matrix Code(s): 2-
4) Number of Drums in Sub-Waste Stream: 10-
5) Material Type: 3-
6) Source Code: 4-
7) Material Evaluation Form #: 5-
8) Sampling Location for Drums: 6-
9) Process Knowledge: 7-

B. Sampling Information

1) General: Samples taken will be contained in glass or polyethylene jars with teflon lined lids.
2) Preservation Method: See Analytical Requirements in Section C.
3) Holding Times: See Preservative and Holding Time Guidelines in Section G. Holding times and sample volume/container requirements for media-specific analyses not listed in the SCQ are provided by the FEMP laboratory facility.
4) Sample Technique: 8-
5) Number of Drums to be Sampled and Analyzed: x, see page 2.
6) Composite Samples: Yes (No)
7) Visual Inspection Performed?: Yes (No) (See attached Visual Inspection Form).
8) Field Contact: 14-
9) Send Results to:
10) Charge No./Project Manager: 15-
11) Required QA/QC Samples:

Field QC	Yes	No	Notes
Trip Blank			no volatile organic samples
Field Blank			1 per 20 samples or 1 per sampling event
Equipment Rinsate			1 per 20 samples or 1 per sampling event
Duplicate			1 per 20 samples or 1 per sampling event
Container Blank		X	analytical data supplied by supplier
Preserv. Blank		X	assay data supplied by supplier

Laboratory QC

Laboratory QC sample type and frequency requirements are provided in Appendix G of the SCQ.

Authorized Signature/Date Approved/Date

DRUMMED WASTE MATERIAL PSAP

Drummed Waste Material
Project-Specific Sampling and Analysis Plan

Number: 1-
Date: 12-11-93
Page 2 of 5

Sampling Information

Start with Sample Number 9- for the first drum sample, then number consecutively until sampling is completed. The drum that is to be sampled in duplicate will be indicated with an asterisk (*). The duplicate samples will be given different sample numbers.

Sample Number	Sample Matrix	Inv. Number	Lot Number	Drum Number
9-				
1-				
1-				
1-				
1-				
1-				
1-				
1-				
1-				

Authorized Signature/Date Approved/Date

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DRUMMED WASTE MATERIAL PSAP

Drummed Waste Material
Project-Specific Sampling and Analysis Plan

Number: 1-
Date: 12-11-93

C. Analytical Requirements

In order to satisfy waste characterization requirements the following analyses may be performed:

	COLUMN A		COLUMN B	
Analysis Requested (Analysis Code) ASL = Analytical Support Level VOA = Volatile Organic Analysis SVOA = Semi-Volatile Organic Analysis U,Th = Uranium, Thorium PFLT = Paint Filter Liquids Test	Solid Matrix Concentrated Waste Sample Container and Preservative/Unit Codes oz. = ounce P00, P01 = No preservation. Cool 4 deg. C U00, U04, U06, U07, U19 = ppm, mg/kg, ug/L, ug/g, pCi/g U99 = present/absent TLC = Teflon Lined Closure		Liquid Matrix Concentrated Waste Sample Container and Preservative/Unit Codes mL, L = milliliter, liter P00 = no preservation needed U02, U06, U17, U18 = mg/L, ug/L, pCi/mL, pCi/L U35, U37 = pH units, degrees Fahrenheit TLS = Teflon Lined Septum	
Total VOAs (2411)* TCLP VOAs (2459)** ASL B	(3) x 4-oz. glass, TLC	P01/U04(total) U06(TCLP)	(1) x 250 mL glass jar, TLS	P01/U06
Total SVOAs (2470)* TCLP SVOAs (2471)** ASL B	(1) x 8-oz. amber glass, TLC	P01/U04(total) U06(TCLP)	(1) x 250 mL amber glass, TLC	P01/U06
Total Metals (2402)* TCLP Metals (2401)** ASL B	(1) x 8-oz. glass or polyethylene	P01/U04(total) U06(TCLP)	(1) x 250 mL glass, TLC	P01/U06
Flash Point (2434) pH (2435) ASL B	.....	...	(1) x 250 mL glass, TLC	P00/U37 P00/U35
Total U (2442) ASL B	(1) x 8-oz. glass or polyethylene	P00/U07(soil) U00(any other solids)	(1) x 120 mL glass or polyethylene	P00/U06
Isotopic U (2026-29) ASL B	(1) x 8-oz. glass or polyethylene	P00/U19	(1) x 250 mL glass or polyethylene	P00/U18
PFLT (2053) ASL B	(1) x 4-oz. glass or polyethylene	P00/U99	.....	...
Alpha-Beta (2005)	(1) x 4-oz. polyethylene	P00/U19	(1) x 120 mL polyethylene	P00/U17
Description of material (Color, appearance, consistency, etc.)				

Note: * - Perform analysis for liquid matrix concentrated waste samples.
** - For solid matrix samples only. Prepare sample extract, then conduct Total concentration screening analyses. If Total concentrations exceed 20 times the TCLP regulatory value, then analyze the sample extract.

DRUMMED WASTE MATERIAL PSAP

Drummed Waste Material
Project-Specific Sampling and Analysis Plan

Number: 1-
Date: 12-11-93
Page 4 of 5

C. Analytical Requirements (cont.)

	COLUMN C		COLUMN D	
Analysis Requested (Analysis Code) ASL = Analytical Support Level VOA = Volatile Organics Analysis SVOA = Semi-Volatile Organics Analysis U,Th = Uranium, Thorium PFLT = Paint Filter Liquid Test	Low to Medium Concentration Liquid Samples Container and Preservative/Unit Codes mL, L = milliliter, Liter P01, P09 = Cool 4 deg. C, HCl to pH < 2. P11 = HNO3 to pH < 2 P13 = HNO3 to pH < 2/cool 4 deg. C U06, U17, U18 = mg/L, ug/L, pCi/mL, pCi/L U35, U37 = pH units, degrees Fahrenheit TLS = Teflon Lined Septum TLC = Teflon Lined Closure		Quality Control Sample@ Container and Preservative/Unit Codes mL, L = milliliter, Liter P01, P09 = Cool 4 deg. C, HCl to pH < 2. P11 = HNO3 to pH < 2 P13 = HNO3 to pH < 2/cool 4 deg. C U06, U17, U18 = ug/L, pCi/mL, pCi/L U35, U37 = pH units, degrees Fahrenheit TLS = Teflon Lined Septum TLC = Teflon Lined Closure	
Total VOAs (2411) ASL B	(3) x 40 mL glass vials, TLS	P01 + P09/U06	(3) x 40 mL glass vials, TLS	P01 + P09/U06
Total SVOAs (2470) ASL B	(1) x 1 gallon jar amber glass, TLC	P01/U06	(1) x 1 gallon jar amber glass, TLC	P01/U06
Total Metals (2402) ASL B	(1) x 1 L jar, polyethylene	P13/U06	(1) x 1 L jar, polyethylene	P13/U06
Flash Point (2434) pH (2435) ASL B	(1) x 250 mL glass, TLC	P00/U37 P00/U35	-----	---
Total U (2442) ASL B	(1) x 1 L jar, glass or polyethylene	P11/U06	(1) x 1 L jar glass or polyethylene	P11/U06
Isotopic U (2026-29) ASL B	(1) x 1 L jar, glass or polyethylene	P11/U18	(1) x 1 L jar glass or polyethylene	P11/U18
PFLT (2053) ASL B	-----	---	-----	---
Alpha-Beta (2005)	(1) x 120 mL polyethylene	P11/U17	(1) x 120 mL polyethylene	P11/U17
Description of material (Color, appearance, consistency, etc.)				

Note: @ - Container and preservation/unit code requirements for trip blanks, field blanks, and equipment rinsates only. Container and preservation/unit code reqirements for duplicate or split samples are provided in Columns A, B, or C, depending on the matrix of the waste sample.

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DRUMMED WASTE MATERIAL PSAP

Drummed Waste Material
Project-Specific Sampling and Analysis Plan

Number: 1-
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D. Sub-Waste Stream Description

The sub-waste stream consists of 10- drums in 11- lots. The material type of "3-" and the source code of "4-" indicate that this material is 7-

E. Safety Concerns

See SOP 20-C-805, Sections 6.0 to 6.14 for Health and Safety requirements.

F. Representative Sampling Procedure

12- drums were chosen at random, and are listed on page 2 of this form. If visual inspection indicates that the material has free liquid or is completely dry, then a P.F.L.T is not necessary. Record pertinent information in the Field Log Book for each drum sampled as specified in SOP 20-C-805, Section 7.2.13.

G. Preservative and Holding Time Guidelines

See Tables 6.1 and 6.2 of the "Prototype Sampling and Analysis Plan for Containerized Waste at the FEMP" and/or Table 6-1 "Sample Container and Preservation Requirements," of the Sitewide CERCLA Quality Assurance Project Plan (SCQ). Sample container, preservative, and holding time requirements for analytical parameters not provided in these tables have been obtained from federal or state of generation poilcies/directives, or from the FEMP or FEMP-contracted laboratory facility; and incorporated into this PSAP as permitted in Section 3.3.2 of the SCQ.

This form must be dated and signed by an authorized individual.

If this Sub-Waste Stream is sampled and analyzed according to the information on this form, the results generated will be in agreement with the sampling and analysis requirements of NVO-325 (Rev. 1), Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements; and the Fernald Environmental Management Project (FEMP) Sitewide CERCLA Quality Assurance Project Plan (SCQ).

Authorized Signature/Date Approved/Date

DRUMMED WASTE MATERIAL PSAP
Attachment A (Sheet 5 of 5)

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
11-27-94	0	Document requirement to establish procedure for Sampling Waste Materials contained in 5 to 10 gallon cans, and 30 to 110 gallon drums per Request No. P94-0588, initiated by J. Gnoose.

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1.0 PURPOSE

1.1 The purpose of this document is to provide the procedure for safely mov and handling unvented containers holding material that could potentially contain or generate hydrogen or biologically-generated gas.

2.0 SCOPE

2.1 This procedure is applicable to personnel involved in handling and moving unvented containers which contain materials identified by material description codes listed in Tables 1, 2 and 3 of this procedure.

3.0 APPLICABLE DOCUMENTS

3.1 Source Documents

3.1.1 DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities"

3.1.2 D10-00-020, "Remediation Support Operations Division Document System"

3.2 Reference Documents

3.2.1 20-C-606, "Hazardous Material Spill Clean-up"

3.2.2 20-C-910, "Venting Potentially Explosive Drums"

3.2.3 20-C-017, "Movement of Hazardous/Mixed Waste"

3.2.4 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)"

3.2.5 20-C-623, "Receipt and Storage of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)"

3.2.6 SPR 2-15, "Barricades"

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 RESPONSIBILITIES

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

5.1.1 Ensuring that personnel are qualified per the established qualification requirements identified by the Division Manager.

5.1.2 Contacting Industrial Hygiene (IH) or Radiological Control to determine the appropriate respiratory protection and personal protective equipment (PPE) for the work being performed.

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5.0 RESPONSIBILITIES (cont.)

5.1.3 Issuing personnel the required respiratory protection and personal protective equipment (PPE) as specified on applicable permits issued by IH and/or Radiological Control.

5.1.4 Ensuring that an Isolation Zone is established around container handling/movement activities and contacting Safety and Health (S&H) when assistance is required.

5.1.5 Obtaining and posting a Radiation Work Permit (RWP), a Chemical Hazardous Work Permit (CHWP), and other permits as required by S&H prior to handling/movement activities.

5.1.6 Ensuring that spill cleanup supplies are available at the Isolation Zone per Procedure 20-C-606, "Hazardous Material Spill Clean-Up".

5.1.7 Contacting Waste Characterization (WC) to determine if the containers to be handled/moved contain RCRA, non-RCRA or uncharacterized materials.

5.2 **Operators** shall be responsible for the following:

5.2.1 Complying with this Procedure.

5.2.2 Complying with all posted signs, RWPs and permits as required by this procedure and/or other safety procedures.

5.3 **Waste Characterization** shall determine the type of waste: RCRA, non-RCRA or uncharacterized.

6.0 GENERAL

6.1 Warnings, Cautions, and Notes shall precede the Item, Step, Sub-Step, Section, or Sub-Section to which they apply.

6.2 Container(s) containing materials identified by the Material Description Codes (MDC) listed in Table 2 require venting. This procedure shall be followed while handling/moving these containers to the designated area for venting. Venting of these containers shall be conducted in accordance with procedure 20-C-910, "Venting Potentially Explosive Drums".

6.3 Materials listed in Table 3 have the potential to generate biological gas if they are stored in tightly sealed containers. Containers that contain materials listed in Table 3 that display evidence of internal pressure, bulges, or deformities must be netted and the pressure relieved by loosening the container lid before they can be moved or processed. Containers containing materials listed in Table 3 may be moved without netting or venting if no bulges or deformities are observed.

6.4 Movement of containers containing materials listed in Tables 1, 2, and 3 is directed by the issuance of Task Orders. Task order information includes the Material Description Codes (MDCs) of the contained materials and the locations of the containers to be moved. Prior to the movement of any container with a MDC listed in Tables 1, 2, and 3, ensure that it is vented or prepared for movement per this procedure.

6.0 GENERAL (cont.)

6.5 If Waste Characterization (WC) determination confirms the presence of Ru and/or un-characterized materials, the Supervisor shall ensure that the material is moved in accordance with this procedure and procedure 20-C-017, "Movement of Hazardous/Mixed Waste".

6.6 The Supervisor shall assign employees to the respective tasks.

7.0 HEALTH AND SAFETY REQUIREMENTS

7.1 An Isolation Zone shall be established per this procedure while handling or moving unvented, unnetted containers identified and listed in Tables 1 and 2 and as applicable in Table 3.

7.2 Safety glasses with side shields shall be worn under a full face shield in the Isolation Zone when handling/monitoring containerized material covered by this procedure. Full face respirators shall be permitted in place of safety glasses and face shield.

7.3 Personal Protective Equipment (PPE) as specified by the work permits shall be worn.

7.4 Hard hats and hearing protection shall be worn in the Isolation Zone.

7.5 Only personnel involved in the handling or moving of containers shall be permitted within the Isolation Zone as stated on the permit for the tas being performed, along with the PPE requirements.

7.6 Leather palm gloves shall be worn while handling/moving containers and while handling sharp or abrasive edges.

7.7 A minimum of two METL-X fire extinguishers shall be present within the Isolation Zone(s) while Tables 1 and 2 containers are being handled or moved.

7.8 All personnel involved with, and the Supervisor in charge of container movement activities shall have communications equipment available.

7.9 Containers must be fitted with nylon nets which conform to ANSI-A10.11 and OSHA 1926.105 before being moved out of the Isolation Zone within the controlled areas.

7.0 HEALTH AND SAFETY REQUIREMENTS (cont.)

7.10 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 S&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. FS-F-1458), and submit and 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.

7.11 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 circumstance 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. FS-F-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by S&H.

7.12 All personnel performing duties covered by this procedure shall adhere to all sign postings and requirements including but not limited to Radiological Work Permits (RWPs) and Chemical Hazard Work Permits (CHWPs).

8.0 PROCEDURE

8.1 Establishing an Isolation Zone for Handling/Movement of Unvented Container(s)

8.1.1 Erect barricades as follows:

NOTE: Barricades shall be positioned a minimum of 50 feet away from container handling/movement activities. See SPR 2-15, "Barricades" for the erection, maintenance and entry requirements for barricades.

A. Place caution tape and/or signs across all roads, walkways and open areas leading into the Isolation Zone.

B. Place caution tape and/or signs across all entrances/exits from buildings within 50 feet of the container handling/movement activities.

8.0 PROCEDURE

8.1 Establishing an Isolation Zone for Handling/Movement of Unvented Container(s) (cont.)

NOTE: IF the same configuration of the Isolation Zone and work area had previously been diagramed and approved, THEN a new "Isolation Zone Approval Record" is not required, AND check with the Supervisor to determine if a new "Isolation Zone Approval Record" form is required.

8.1.2 Diagram the barricade locations on an "Isolation Zone Approval Record", Form FEMP-OPR-3311 (See Figure 1).

NOTE: The Supervisor shall contact S&H for inspection and approval of the Isolation Zone.

8.1.3 Notify the Supervisor that the barricades are erected and give the Supervisor the "Isolation Zone Approval Record" (if the form was required).

8.2 Handling/Movement and Installing The Safety Net for Container(s) of Listed Materials in Tables 1 and 2

8.2.1 Obtain the list of container(s) from the Supervisor requiring handling/movement.

8.2.2 Locate and mark the container(s) as directed by the Supervisor.

WARNING

Ensure the Isolation Zone is clear of all personnel prior to handling/movement of container(s). Only the forklift driver is permitted inside the Isolation Zone while unvented/unnetted container(s) are being moved into position for netting.

8.2.3 Establish an Isolation Zone, in accordance with Section 8.1 of this procedure.

WARNING

Use extreme caution during this movement as concentrations of hydrogen gas in unvented container(s) may cause a fire or an explosion. Only an enclosed cab forklift shall be used during this movement activity and shall be inspected in accordance with procedure 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)."

8.2.4 Move the container(s) to the designated area within the Isolation Zone for netting.

8.2.5 Notify the Supervisor that the container(s) is in the designated location and ready for netting.

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8.0 PROCEDURE (cont.)

8.2 Handling/Movement and Installing The Safety Net for Container(s) of Listed Materials in Tables 1 and 2 (cont.)

WARNING

Keep hands and face away from top of container(s) while netting to prevent risk of injury if the lid should pop off.

CAUTION

Ensure that the safety net does not touch adjacent containers to prevent tangling.

NOTE: Nylon safety netting shall be a minimum of 8 feet by 8 feet in size when covering a single drum or a single pallet of drums.

8.2.6 Install safety net on drums as shown in Figure 2 and/or on a metal box as shown in Figure 3 per Supervisor's instructions and the following guidelines.

A. Secure the netting to the container using straps.

B. Attach the nylon safety net loose at the top to allow the lid on the container(s) to potentially rise 4 to 10 inches above the container(s).

8.2.7 Remove the Isolation Zone from the area once the safety net(s) has been installed.

8.2.8 Move the container(s) to the designated area(s) as specified by the Supervisor in accordance with procedure 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)". Movement documentation shall be in accordance with the following:

A. For Low Level Radioactive Waste and Nuclear Material follow procedure 20-C-623, "Receipt and Storage of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)".

8.2.9 Proceed in accordance with procedure 20-C-910, "Venting Potentially Explosive Drums" once the container(s) is in its new location(s).

8.3 Handling/Movement and Installing the Safety Net for Container(s) of Listed Materials in Table 3

8.3.1 Complete Steps 8.2.1 and 8.2.2 of this procedure.

8.3.2 Inspect the container(s).

8.0 **PROCEDURE** (cont.)

8.3 Handling/Movement and Installing the Safety Net for Container(s) of Li Materials in Table 3 (cont.)

NOTE: Containers containing materials listed in Table 3 may be moved without netting or venting if no bulges or deformities are observed.

8.3.3 Proceed as follows for a container(s) that is bulged or deformed indicating the presence of internal pressure, or if the drum lid is to be removed for any reason.

A. Establish an Isolation Zone per Section 8.1 of this procedure.

B. Complete Steps 8.2.4 - 8.2.7 of this procedure.

NOTE: A popping noise may be heard when the drum clamp ring or box lid is loosened. This is the sound of biological gas pressure being released. A foul odor may also be noticed.

C. Loosen the drum clamp ring or the bolts on a box lid while the safety net is in place on the container.

D. Notify the Supervisor if a popping sound or foul odor is detected.

E. Allow the container(s) to vent for a minimum of 15 minutes.

F. IF in the Supervisor's judgement a drum contains biological gas activity,
THEN replace the drum lid with a drum lid containing a NUCFIL 013 vent plug.

G. Tighten the clamp ring on the drum(s) or bolts on the box(s).

H. Remove the safety net.

8.3.4 Move the container(s) to the designated area(s) as specified by the Supervisor in accordance with procedure 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)". Movement documentation shall be in accordance with the following:

A. Follow procedure 20-C-623, "Receipt and Storage of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)" for Low Level Radioactive Waste and Nuclear Material.

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MATERIALS POTENTIALLY CONTAINING FREE REACTIVE METAL AND STORED IN UNVENTED DRUMS WHICH REQUIRE THE USE OF A NYLON SAFETY NET

MDC	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 Mg F_2 From Liner Cave-ins
134	U_3O_8 For Reoxidation
135	Dust Collector Residue, High Fluoride, Greater Than 20% Assay

MATERIALS POTENTIALLY CONTAINING FREE REACTIVE METAL AND STORED IN UNVENTED DRUMS WHICH REQUIRE THE USE OF A NYLON SAFETY NET
Table 1

MATERIALS REQUIRING VENTING

MDC										
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] MDC 039 with source codes 55-659 do not require vented drums and can be moved without restrictions.

MATERIALS REQUIRING VENTING
Table 2

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MATERIAL TYPES WITH A POTENTIAL FOR
BIOLOGICAL GAS PRODUCTION

MDC	DESCRIPTION
001	Waste Slurries
007	Waste Slurries
008	Grit Blast Residue
009	Waste Machining Coolant
010	Contaminated Water, Chlorine
012	Contaminated Water, Non-Chlorine
011 except source codes 501-599 & 732	Contaminated Soil, Rocks, Sand, Bricks, and Ceramics

MATERIAL TYPES WITH A POTENTIAL FOR
BIOLOGICAL GAS PRODUCTION
Table 3

FEMP

ISOLATION ZONE APPROVAL RECORD

Date: _____

Subject: _____

INSTRUCTIONS: Draw a diagram showing the location of the isolation zone.
(Show location of drum storage and venting activities, barriers, buildings, etc.)

ADDITIONAL REQUIREMENTS: *(To be completed by S&H as needed.)*

_____
_____
_____
_____
_____
_____

PLAN APPROVED	S&H	DATE:	EXPIRATION DATE:
	SUPERVISOR:	DATE:	

FS-F-3311 (REV. 02/14/96)

ISOLATION ZONE APPROVAL RECORD
FORM FS-F-3311
Figure 1

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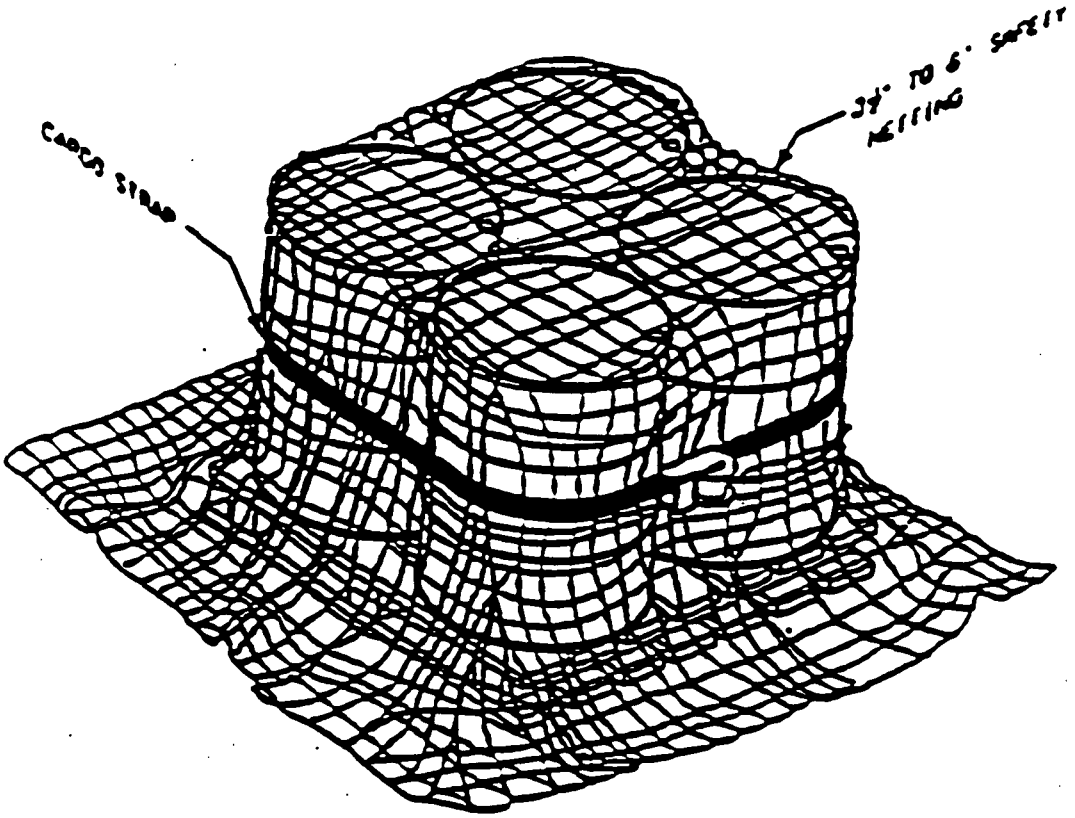
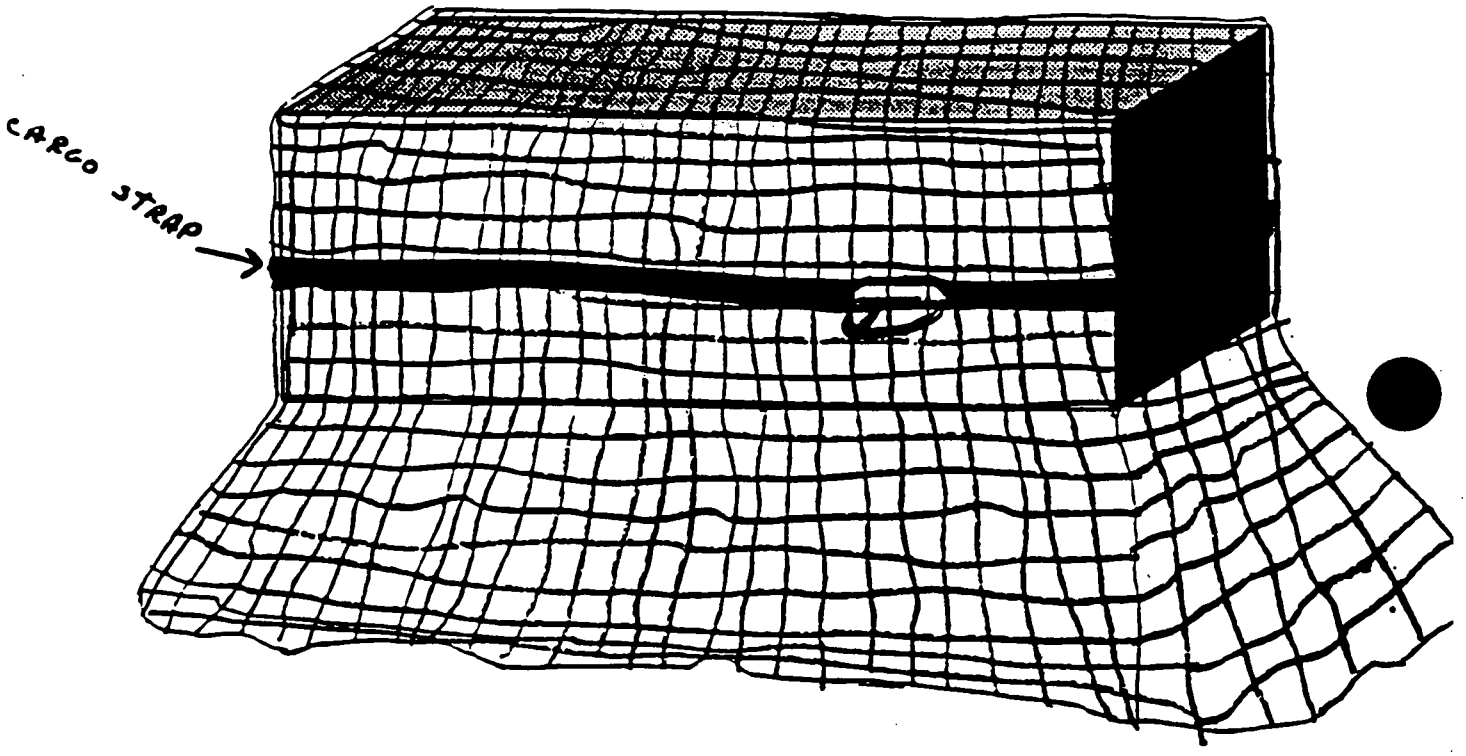


SAFETY NET APPLICATION FOR DRUMS (Typical)
Figure 2



SAFETY NET APPLICATION FOR A BOX (Typical)
Figure 3

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
12-15-92	0	Procedure per Request No. P92-295, initiated by Lyle Hampshire.
02-01-94	0	Procedure reissued per Request No. P93-112, Initiated by L. Hampshire.
04-21-94	0	Procedure reissued per Request No. P94-0312, initiated by J. L. Baarlaer.
04-03-95	0	Reissue procedure to comply with current program requirements, to conform to the established document format, and to incorporate CIO No. C94-028 and CIO No. C94-029, per Request No. P94-0592, initiated by K. Belgrave.

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LIST OF ATTACHMENTS

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1.0 **PURPOSE**

1.1 The purpose of this procedure is to direct the receipt and storage of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM).

2.0 **SCOPE**

2.1 This procedure is applicable to all designated LLRW and NM storage areas. This procedure is not applicable to the receipt and storage of Enriched Restricted Nuclear Material.

3.0 **APPLICABLE DOCUMENTS**

3.1 Source Documents

3.1.1 DOE Order 5480.19

3.1.2 D10-00-020, "Remediation Support Operations Division Document System"

3.2 Reference Documents

3.2.1 20-C-111, "Transport of Low Level Radioactive Waste and Nuclear Material"

3.2.2 SSOP-0067, "Spill Incident Reporting and Cleanup"

3.2.3 20-C-600, "Overpacking Defective Containers"

3.2.4 20-C-606, "Hazardous Material Spill Cleanup"

3.2.5 20-C-910, "Venting and Hydrogen Monitoring of Potentially Explosive Drums"

3.2.6 20-C-918, "Preparation For and Movement Of Unvented Drums"

3.2.7 RM-0005, "FEMP Lot Marking and Color Coding System"

3.2.8 20-C-001, "Changes to Form Entries"

4.0 **DEFINITIONS**

4.1 Bulge - A swollen area, a convex distortion, an outward bend which jeopardizes the integrity of the container.

4.2 Corrosion - A container exhibiting exterior rust which is flaking or discoloration and bulging from interior rust.

4.3 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.

4.4 HAZWAT - Hazardous Waste Technician.

4.0 **DEFINITIONS** (cont.)

4.5 Hole - An opening in the container including a breach, gouge, puncture or leak.

4.6 Low Level Radioactive Waste (LLRW) - Waste that contains radioactivity and is not classified as high level waste, transuranic waste, spent nuclear fuel or 11 e(2) byproduct as defined by DOE Order 5820.2A.

4.7 Motor Vehicle Operator (MVO) - A classification of personnel trained and qualified to operate certain motor vehicles at the FEMP. Such vehicles include forklifts, handstackers, pickup trucks, etc.

4.8 Nuclear Material (NM) - Depleted or normal uranium; or enriched uranium.

4.9 Type 1 Container - A container with a hole from which material has flowed, or is flowing and is accumulating on the pallet or the pad.

4.10 Type 2 Container - A container with a hole from which material has flowed, or is flowing and is accumulating on the drum exterior only; no material on the pallet or pad.

4.11 Type 3 Container - A container exhibiting evidence of exterior contamination and/or corrosion without evidence of active material release. Severe corrosion, holes, dents and/or bulges which affect the container to the degree of potential release.

5.0 **RESPONSIBILITIES**

5.1 Supervisors shall be responsible for the following:

5.1.1 Notifying support organizations and coordinating support organization activities if assistance is required.

5.1.2 Ensuring that personnel are qualified to perform the assigned task.

5.1.3 Signing and/or distributing documentation as required by this procedure.

5.1.4 Ensuring that the receipt inspections required by this procedure are performed.

5.1.5 Upon notification of a spill, immediately reporting the incident by telephone or radio to the Assistant Emergency Duty Officer (AEDO) and the Radiological Control Department (See SSOP-0067, "Spill Incident Reporting and Cleanup and 20-C-606, "Hazardous Material Spill Clean Up")

5.1.6 Ensuring that authorized storage configurations are maintained as required by this procedure.

5.1.7 Ensuring that PPE specified by the work permit is worn.

5.1.8 Ensuring that any required contamination surveys have been performed prior to placing containers of LLRW and NM in storage.

5.0 **RESPONSIBILITIES** (cont.)

5.1.9 Reviewing applicable Material Safety Data Sheets (MSDS) with Operators.

5.1.10 Obtaining any required work permits.

5.2 **Operators** shall be responsible for complying with this procedure.

5.3 **Materials Control and Accountability** shall be responsible for the following:

5.3.1 Maintaining a current LLRW and NM inventory.

5.3.2 Preparing, maintaining, and signing transfer, inventory and identification records required in this procedure.

5.4 **Waste Characterization** shall be responsible for assuring the proper characterization and classification of FEMP material streams.

5.5 **Waste Operations Support** shall be responsible for designating storage locations.

6.0 **GENERAL**

6.1 Warnings, Cautions, and Notes shall precede the Section, Sub-Section, Item, Step, or Sub-Step to which they apply.

6.2 Containers of LLRW and NM shall be stored in the designated container storage locations. If such storage is not available, containers shall be stored on the best available hard surface as designated by Waste Operations Support. Metal boxes may be stored on gravel, if necessary, but four inch by four inch wooden supports are preferred.

6.3 Pallets can be lifted with a forklift from either end. When placing drums on a pallet, ensure that the resulting load is stable.

6.4 Except in the cases of the following three exemptions, straps shall be used during the movement of pallets to secure the drums and reduce the chance of an accidental spill. Exemptions:

6.4.1 When using hand-stackers to move drums on pallets,

6.4.2 When moving one pallet of drums within the buildings or tension support structures, **AND**

6.4.3 When moving one pallet of drums within a defined work area either inside or outside. For example, if an outside area is set up for repalletizing drums, the movement of pallets within this limited area would not require straps.

6.5 Movement of multiple pallets and the movement of pallets to or from elevations above two stacks high shall require the use of straps for securing the drums. The requirement to strap drums for movement only applies to drum(s) on pallets.

6.0 GENERAL (cont.)

6.6 In Plant 1, ensure that the containers are stored in the locations as marked on the Plant 1 pad unless directed to an unmarked location by the Supervisor. The Plant 1 pad pallet/drum storage locations are marked to ensure a 24-inch inspection aisle between each row of pallets and a minimum 50-inch forklift access on at least one side of the storage locations. Pallets/drums stored in an unmarked storage location shall be arranged to provide the above stated access.

6.7 Containers may be stored and stacked in accordance with Table 1, "Pallet Drum Capacity and Container Stacking Limits".

6.8 To be stacked per Table 1, pallets of drums must comply with the following conditions.

6.8.1 The pallets on which the drums are stored are in "good" condition. The pallets involved should be metal pallets or the treated wooden pallets.

6.8.2 The drums, especially 85-gallon drums, are centered on the pallets. All drums, regardless of capacity, when assembled on a pallet should be centered on the pallet and pushed close together. This ensures the load is centered on the pallet and improves stability. Proper centering of drums is especially critical for 85-gallon drums. 85-gallon drums should be placed three to a pallet in a triangle centered on the pallet. When properly centered, 85-gallon drums stick out three to four inches beyond the edge of the pallet. Without close attention, more of a drum may stick out over the edge causing the pallet to become less stable when stacked.

6.8.3 Drivers are able to align the pallets vertically. Operators and Drivers must work as a team during stacking activities. The Driver is responsible for ensuring the load is stable prior to movement and for properly stacking the pallet. The Operator must assist the Operator in positioning the pallet to ensure the pallets are not pushed together such that the drums become interlocked with the drums on an adjacent pallet. It is important to align the drums vertically to have a stable stack. Because 85-gallon drums will overhang the edge of the pallet, caution must be observed to prevent interlocking and to ensure the stack is aligned vertically.

6.8.4 Only enclosed cab forklifts with an extended backrest may be used to stack pallets four-high.

6.9 For the storage of drums, ensure that the drums are positioned on a pallet so that the container labels will face a storage area inspection aisle.

7.0 HEALTH AND SAFETY REQUIREMENTS

7.1 Safety glasses shall be worn in the Process Area unless other eye/face protection is required by the work permit, S&H, or posted signs.

7.2 Personal protective equipment specified by the work permits shall be worn when required.

7.0 **HEALTH AND SAFETY REQUIREMENTS** (cont.)

7.3 Leather-palm gloves shall be worn when handling drums, operating equipment, and when handling rough or sharp-edged material.

7.4 Any spill of LLRW or NM outside of its container shall be reported to the Supervisor immediately.

7.5 A HEPA-type filter vacuum cleaner or a vacuum system with a current DOP test label properly affixed to the vacuum shall be used.

7.6 Communication devices and emergency response equipment shall be available to personnel performing tasks per this procedure.

7.7 Personnel shall have reviewed and be familiar with MSDS's for hazardous chemical/materials that may be used or encountered.

7.8 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 S&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. 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 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.

7.9 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. FS-F-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by S&H.

7.10 All personnel performing duties covered by this procedure shall adhere to all sign postings and requirements including but not limited to RWP's.

8.0 **PROCEDURE**

8.1 Receipt of LLRW and NM at Designated Storage Areas

8.1.1 Inspect the received container(s) per the "Radioactive Material Container Pre-storage Checklist", Form FMPC-REST-3183, (Attachment A).

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8.0 PROCEDURE (cont.)

8.1 Receipt of LLRW and NM at Designated Storage Areas (cont.)

8.1.2 Perform the following:

A. Inspect the containers.

B. Complete the checklist items.

C. Ensure the completion of any necessary corrective actions.

D. Sign the "Radioactive Material Container Pre-Storage Checklist".

8.1.3 Fill out a "Permanent Inventory Record", Form FS-F-367 (Figure 1) for designated containers if requested to do so by the MC&A representative.

8.1.4 Return the completed "Permanent Inventory Record" form to the MC&A representative.

NOTE 1: The Supervisor shall sign the "NM Transfer Record/NM Receipt Record/Material Identification Record", Forms FS-F-1990, -2220, -2221, (68/69 card), (Figure 2) when the Supervisor is satisfied that the receipt inspection and any required corrective actions are complete.

NOTE 2: The Supervisor may discard the "Radioactive Material Container Pre-storage Checklist".

8.1.5 Give the completed "Radioactive Material Container Pre-Storage Checklist", to the Supervisor.

8.2 Storage of LLRW and NM

8.2.1 Move containers of LLRW or NM to storage locations as directed by the following instructions.

A. Move the pallets/drums to storage locations designated by Waste Operations Support and as directed by the Supervisor.

NOTE 1: Drivers shall move containers of LLRW or NM as directed by procedure 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)".

NOTE 2: The Supervisor shall verify storage locations by reviewing the applicable Task Order or contacting Waste Operations Support.

B. Ensure that the movement/storage requirements stated in Section 6 of this procedure are complied with during this activity.

C. When storage of the received material is completed, get the "Waste Material Movement" Form, FS-F-1090-2 (Figure 3), from the MC&A representative and fill in the New Location section for the containers.

8.0 **PROCEDURE** (cont.)

8.2 Storage of LLRW and NM (cont.)

D. Fill in the new location for the containers placed into storage if the containers are being relocated from another location in the same storage area and are listed on a "Waste Material Movement" Form, FS-F-1090-2, (Figure 3).

E. Add the list of containers to a form and include the locations for the containers placed into storage if the containers are not coming from within the same storage area and are not listed on a "Waste Material Movement" Form.

F. Give the completed "Waste Material Movement" Form to the MC&A representative.

8.2.2 Rearrange storage locations of containers within a storage area per the following instructions if required.

A. Locate the containers and assist the driver in moving them to their designated new locations.

NOTE: Any questions concerning the choice of a storage location shall be directed to the Supervisor. Drivers shall move containers of LLRW or NM as directed by procedure 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)".

B. Ensure that the movement/storage requirements stated in Section 6 of this procedure are complied with during this activity.

C. Fill out a "Waste Material Movement" Form, FS-F-1090-2, (Figure 3) indicating the old and new storage locations for the stored items.

D. Give the completed "Waste Material Movement" Form to the MC&A representative.

8.2.3 Retrieve containers from storage as directed by the following instructions.

A. Obtain a list of containers to be retrieved with their current locations from the Supervisor.

B. Locate the listed containers and assist the driver in moving them to the area designated by the Supervisor.

NOTE: Drivers shall move containers of LLRW as directed by procedure 20-C-111, "Transport of Low Level Radioactive Waste (LLRW) and Nuclear Material (NM)".

C. Ensure that the movement/storage requirements stated in Section 6 of this procedure are complied with during this activity.

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8.0 **PROCEDURE** (cont.)

8.2 Storage of LLRW and NM (cont.)

D. Fill out a "Waste Material Movement" Form, FS-F-1090-2 (Figure 3) indicating the old location for the containers being retrieved.

E. If the retrieved containers are to be returned to storage within the same storage area, retain the "Waste Material Movement" Form for completion.

F. If the retrieved containers have a disposition other than storage within the same storage area, give the "Waste Material Movement" Form to the MC&A representative after indicating the old location.

G. If required, return any containers to storage per Section 8.2.1 of this procedure.

PALLET DRUM CAPACITY AND CONTAINER STACKING LIMITS

CONTAINER	DRUM/PALLET	MAXIMUM INDOOR STACKING HEIGHT	MAXIMUM OUTDOOR STACKING HEIGHT
85-Gallon Overpack	3	3 Pallets	3 Pallets
55-Gallon Drum	4	4 Pallets	3 Pallets
30-Gallon Drum	4	4 Pallets	3 Pallets
10-Gallon Pail	9	7 Pallets	3 Pallets
5-Gallon Pail	16	7 Pallets	3 Pallets
110-Gallon Overpack	2	1 Pallet on Top Pallet of Stack	3 Pallets
Whit Metal Boxes	N/A	3 High	3 High

NOTE: Stacking four-high may also consist of any of the following configurations:

- Three pallets of 55-gallon drums with either one pallet of 85-gallon drums or one pallet of 11-gallon drums on top.
- Two pallets of 55-gallon drums with two pallets of 85-gallon drums on top.

PALLET DRUM CAPACITY AND CONTAINER STACKING LIMITS
Table 1

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CONTAINER INSPECTION CATEGORIES

TYPE	CHARACTERISTIC	CORRECTIVE ACTION
I	Material flowing from the container with an accumulation on the pallet or pad.	1. Notify the Supervisor. The Supervisor shall notify the AEDO. The Supervisor shall initiate an Occurrence Report (See SSOP-0067, "Spill Incident Reporting and Cleanup"). 2. Immediately stop or contain the leak. 3. Record on the inspection form that the container requires mitigation within 24 hours. 4. Complete additional cleanup as necessary.
II	Material on the container only; no material on the pallet or pad.	1. Record the leak on the inspection form. 2. Notify the Supervisor. The Supervisor shall initiate an Occurrence Report and notify the AEDO and the Utilities Engineer, (See SSOP-0067, "Spill Incident Reporting and Cleanup"). The Supervisor shall review the completed inspection forms to prioritize containers for transfer to the overpacking area and subsequent mitigation.
III	The container exterior is discolored with visible contamination; no material release Severe corrosion with deep pitting and/or metal flaking Holes, dents and/or bulges which affect container to the degree of potential release.	1. Record the condition on the inspection form. 2. Notify Supervisor. 3. The drum requires disposition as directed by the Supervisor.

CONTAINER INSPECTION CATEGORIES
Table 2

PERMANENT INVENTORY RECORD
FS-F-367 (Typical Example)

FEMP
PERMANENT INVENTORY RECORD

DATE: | INVENTORY SHEET NUMBER:
PLANT: | AREA: | NUCLEAR MATERIAL:

LINE NO.	BADGE NUMBER (1-4)	INVENTORY NUMBER	LOT NUMBER: P. O. NUMBER (5-8)	SOURCE (9-11)	CLASS (12)	MATERIAL (13-15)	SEQUENCE (16-19)	DRUM NO.	GROSS WEIGHT POUNDS	TARE WEIGHT POUNDS (71-77)	NET WEIGHT POUNDS (71-77)	MBA (40-47)	LOCATION: BDYR.	STACK	LEVEL	DRUM SIZE (48-51)	(1/1113) OF	PODS
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

PERMANENT INVENTORY RECORD
FS-F-367 (Typical Example)
Figure 1

NM TRANSFER RECORD/NM RECEIPT RECORD/MATERIAL IDENTIFICATION RECORD
(68/69 CARD) (Typical Example)
FS-F-1990, -2220, -2221

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. 3/8/92) (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. 3/8/92) (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. 3/8/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

NM TRANSFER RECORD/NM RECEIPT RECORD/MATERIAL IDENTIFICATION RECORD
(68/69 CARD) (Typical Example)
FS-F-1990, -2220, -2221
Figure 2

WASTE MATERIAL MOVEMENT
FS-F-1090-2 (Typical Example)

Fernald Site
Contracts & Acquisitions

WASTE MATERIAL MOVEMENT RECORD

DATE	INVENTORY NUMBER	OLD LOCATION					NEW LOCATION					GROSS WEIGHT	TARE WEIGHT	NET WEIGHT	MBA		REMARKS	OP M	RP M
		L	A	R	S	L	L	A	R	S	L				OLD	NEW			

FS-F-1090-2 REV 08/19/94

FS-F-1090-2 (Typical Example)
Figure 3

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RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST
FMPC-REST-3183 (Typical Example)

Number of Container_____ Date Received_____

ITEM No.	INSPECTION	ACCEPTABLE YES/NO	CORRECTIVE ACTION	DATE CORRECTED
1	Container(s) free of spilled/leaked material.		1. Notify Supervisor. 2. Contain the spill/leak per 20-C-606. The Supervisor shall take action per Table 2 of this procedure. Problem Container(s) Inventory No._____	
2	Container(s) free of dents and/or bulges.		1. Notify Supervisor. The Supervisor shall direct the appropriate actions as specified in Table 2 of this procedure. Problem Container(s) Inventory No._____	
3	Container(s) free of corrosion.		1. Notify Supervisor. The Supervisor shall direct the appropriate actions as specified in Table 2 of this procedure. Problem Container(s) Inventory No._____	
4	Container bolt ring secure with bolt lugs pointing downward and no more than 6 inches from the seam of the drum.		Secure per the instruction in procedure 20-C-600, "Overpacking Defective Containers". Problem Container(s) Inventory No._____	

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST
FMPC-REST-3183 (Typical Example)
Attachment A (Sheet 1 of 2)

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST
FMPC-REST-3183 (Typical Example)

ITEM No.	INSPECTION	ACCEPTABLE YES/NO	CORRECTIVE ACTION	DATE CORRECTED
5	Hazardous Material Warning label affixed and coated with polyurethane.		1. Notify Supervisor. 2. Affix label and/or coat with polyurethane as instructed by the Supervisor. Problem Container(s) Inventory No._____	
6	Vented containers stenciled with word "VENT".		1. Notify Supervisor. 2. Stencil per procedure 01-C-910, "Venting Potentially Explosive Drums". Problem Container(s) Inventory No._____	
7	Other labels affixed to container(s) as applicable.		1. Notify Supervisor. 2. Affix labels as applicable. Problem Container(s) Inventory No._____	
8	Container(s) properly color coded/marked.		1. Notify Supervisor. 2. Color code.mark per RM-0005, "FEMP Lot Marking and Color Coding System". Problem Container(s) Inventory No._____	

Comments:_____

_____ HAZWAT Signature

_____ Badge No.

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST
FMPC-REST-3183 (Typical Example)
Attachment A (Sheet 2 of 2)

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RECORD OF REVISION

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
02-06-95	0	Procedure for handling LLRW and NM required per Request P94-0486, initiated by K. Belgrave. This procedure Supersedes 01-C-608.

NON-CONTROLLED CO

1.0 PURPOSE

The purpose of this document is to provide the procedure for the on-site movement and storage of uranium with an enrichment of less than 20 percent U235 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 Manager.

3.1.2 Obtaining Nuclear Criticality Safety approval per SSOP-0095 before beginning an activity involving enriched restricted material.

3.1.3 Ensuring that personnel adhere to nuclear criticality safety limits and restriction specified by the Criticality Safety Approval document.

3.1.4 Ensuring that nuclear criticality safety limits and restrictions are posted in their area of responsibility.

3.1.5 Obtaining and posting a "Radiological Work Permit" (RWP) when necessary.

3.1.6 Contacting Environmental Safety and Health (ES&H) to determine the required protective equipment, including respirators, for the area where the material is being moved and/or delivered.

3.1.7 Issuing the required protective equipment to operators.

3.1.8 Reviewing applicable Material Safety Data Sheets (MSDSs) with operators.

3.1.9 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

4.1 Criticality Safety Analysis - A review (performed before starting a ne activity involving fissile materials or before an existing activity or piece of equipment involving fissile materials is changed) to determine whether the remediation process will be subcritical under normal and credible abnormal conditions.

4.2 Fissile Material - Any material containing uranium-U235 or other fissile radionuclides (such as plutonium-239, plutonium-241, and uranium-233).

4.3 Nuclear Safety Operational Authorization (NSOA) - A form used by Nuclear Safety to authorize nuclear criticality safety for a new activity or change in activity scheduled for completion within 90 days.

4.4 Nuclear Criticality - A self-sustaining chain reaction of fissions (the state in which the effective neutron multiplication content of a system of fissile materials equals or exceeds unity).

4.5 Nuclear Criticality Safety (NCS) - The prevention of inadvertent nuclear criticality and protection against injury or damage due to accidental criticality.

4.6 Request for Criticality Safety Approval - A two-part form used to request and approve nuclear criticality safety for a new activity/design or change in activity/design that will not be completed within 90 days.

4.7 Safe Grouping - A can or drum, or a group of cans or drums, containing materials at the same enrichment and having a total mass which is les the safe limit of that enrichment.

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 RM-0012, "Quality Assurance Program Description"

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"

5.2.5 SSOP-0095, "Criticality Safety Analysis and Approval Process"

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.

6.14 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 hazardous chemicals/materials that may be used or encountered.

6.18 Skids of ingots may be stacked three high provided the ingots are uniformly distributed and within nuclear safety limits.

6.19 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.

6.20 A fire lane shall be provided between a maximum of five rows of pyrophoric material.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.21 Skids of pyrophoric material shall be place in rows in a herringbone pattern.

6.22 Briquettable chips and machining sludges shall be contained in cans or drums not larger than 30-gallon in size.

6.23 Containers of briquettable chips and machining sludges shall not contain more than 2/3 the capacity or a safe mass, whichever is smaller.

6.24 Water/coolant shall not be added to containers of briquettable chips.

6.25 Machining sludges, sawdust, and grinder sludges shall be covered with two inches of water or coolant.

6.26 Uranium bearing sludges covered with water shall be contained in vented drums.

6.27 Drums of sawdust or grinder sludge shall contain a maximum of 75 lbs or a safe mass, whichever is smaller.

6.28 Briquettes shall be packaged in dry, covered, and vented ten-gallon cans and stored inside or under a protective canopy.

6.29 Load limit or nuclear safety limit, whichever is most restrictive, of vehicles shall not be exceeded.

6.30 Containers of pyrophoric material that overheats shall be placed under overhead water spray, if possible, and cooled and ventilated.

6.31 Drums of uranium metal shall be handled per SOP 20-C-917.

6.32 Fissile materials shall be stored in Nuclear Criticality Safety approved storage areas. NCS approval shall be documented on a Nuclear Safety Operation Authorization (NSOA) Form or in a Criticality Safety Analysis (CSA).

6.33 Repackaging activities involving enriched restricted materials shall be approved by Nuclear Safety.

6.34 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. FS-F-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

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6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.35 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. 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 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.

7.0 GENERAL

7.1 Warnings, Cautions, and Notes precede the Subsection or Step to which they apply.

8.0 PROCEDURE

8.1 Repackaging Materials

8.1.1 Identify and color code receiving containers per RM-0005.

8.1.2 Check that an "RWP" is posted.

8.1.2.1 If not, notify the supervisor.

NOTE: The supervisor shall prepare and submit, to Nuclear Criticality Safety, a "Nuclear Safety Operational Authorization Request" Form or a "Criticality Safety Analysis Request" Form, as applicable.

8.1.3 If the material is enriched restricted, notify the supervisor and proceed as instructed.

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.

8.1.4 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 (specified by the NSOA or CSA).

8.0 **PROCEDURE** (cont.)

8.2 Transferring Enriched Materials On-Site

NOTE: The supervisor shall contact the supervisor receiving the material, obtain approval, and verify that receiver has adequate procedural coverage to accept material.

8.2.1 Inform the supervisor that material is ready for on-site movement.

8.2.2 If material is mass or geometry restricted, proceed as follows:

8.2.2.1 Fill out a "Nuclear Safety Operational Authorization," (NSOA) request, Form FS-F-1354 (See Figure 2) per SSOP-0095.

NOTE: The supervisor shall contact Nuclear Criticality Safety for approval of the NSOA.

8.2.2.2 Give the NSOA to the supervisor.

NOTE: The packet shall be completed for all transfers of uranium regardless of enrichment, except for Transportation and Receiver signatures.

8.2.3 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.

8.2.3.1 If not, notify the supervisor.

8.2.4 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.

8.2.5 Contact the supervisor to obtain the material type code, enrichment, nuclear safety limits, and load limits (Refer to RM-0005, SOP 20-C-904, and Tables 1 thru 10).

8.2.6 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.

8.2.6.1 If the container count is wrong or weight/spacing limits are exceeded, notify the supervisor.

8.0 **PROCEDURE** (cont.)

8.2.7 Check the card packet to ensure that the description of the material includes a lot number and is accurate.

8.2.7.1 If the description is in error or there is no lot number, notify the supervisor.

8.2.8 Check that the correct destination has been entered in the packet.

8.2.8.1 If there is no destination or the destination is in error, notify the supervisor.

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.

8.2.9 Give the cards and other forms to the supervisor.

NOTE 1: After being contacted by the shipper and/or receipt of the approved NSOA form, if required (depending on the percent enrichment), the Transportation Supervisor shall schedule the time for shipment and notify the shipper and receiver.

NOTE 2: If a shipment of uranium material is to be delayed or cancelled, the Transportation Supervisor shall inform the shipper, receiver, MC&A, Nuclear Criticality Safety and of the delay and, if appropriate, of the re-scheduled time.

8.3 Moving Enriched Uranium Materials On-Site

8.3.1 Upon receiving documentation from the Transportation Supervisor, proceed to the location of the material.

8.3.2 Check the container count, material identification, and trailer number (if material is loaded on a trailer) to ensure that the transfer matches the information on the documentation (NSOA 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.

8.3.2.1 Return, to the supervisor transferring the material, documentation that does not match the shipment.

8.3.2.2 Notify the Transportation Supervisor of the situation and proceed as directed.

8.0 **PROCEDURE** (cont.)

8.3.3 If the shipment and transfer records match, sign the 68/69 card packet in the space designated "Transportation."

NOTE: The supervisor shall enter the transferring plant's number on the Transfer Record and give the card to the MC&A representative.

8.3.4 Give the "Nuclear Material Transfer Record" (top card of the 68/69 card packet) to the supervisor.

NOTE: Material shall be moved to the receiving location with care to ensure the load configuration of enriched materials is maintained for nuclear safety.

8.3.5 Move the material to the specified receiving location.

NOTE: Transportation shall deliver the NSOA form and the -69 and -XX cards to the receiver.

8.3.6 Give the transfer documentation to the supervisor of the receiving area.

8.4 Receiving Enriched Uranium Materials From On-Site Locations

8.4.1 Using the NSOA form (if used) and/or the -69 and -XX cards, check that the material is acceptable and is in accordance with the information on the documents.

8.4.2 If the material is not acceptable or not as described by documentation, proceed as follows:

8.4.2.1 Make a notation on the Receipt Record card to indicate why the shipment is unacceptable.

8.4.2.2 Request Transportation to return the shipment.

8.4.2.3 Send the -69 card bearing the notation and the -XX cards to the shipper

8.4.2.4 Notify the supervisor of the situation.

NOTE: The supervisor shall sign the card and then give the card to the MC&A representative.

8.4.3 If the material is acceptable, give the -69 card and -XX card to the supervisor.

8.4.5 Unload the material.

8.0 **PROCEDURE** (cont.)

8.5 Storage Enriched Material

8.5.1 Using the appropriate lifting/moving equipment, move the material to the storage area that is authorized for the type and enrichment.

8.5.2 Place the material in storage per Section 9.0.

9.0 **STORAGE REQUIREMENTS**

9.1 Uranium material shall be stored per the limits of Tables 1 thru 10 and/or SOP 20-C-904 (unless otherwise noted on the NSOA or CSA form).

9.2 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.

9.2.1 Pieces not meeting the limits of Table 2 or 3 shall be stored under the limits in Table 1.

9.3 The smallest dimension for hollow, cylindrical pieces $\leq$0.95% U235 is the combined wall thickness (OD+ID).

9.3.1 For higher enrichments the smallest dimension is the outside diameter less the inside diameter (OD-ID).

9.4 Uranium compounds shall be stored according to the maximum limits listed in Table 4.

9.4.1 Materials of higher U densities and/or with higher free metal content shall be stored according to limits in Table 1.

9.5 Rockwell spills (MDC 070) of 2.1% U235 enriched material shall be stored in an area free of water.

9.6 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.

9.7 Chips, turnings, and briquettes (MDCs 107, 111, 112, 252, and 302) shall be stored per Table 7 and the following requirements.

9.7.1 Drums/cans may be stored side-by-side.

9.7.2 Skids of containers may be stored edge-to-edge in a maximum of five parallel rows.

9.7.3 Skids/drums/cans shall not be stacked.

9.7.4 Each group of five rows of skids shall be separated by a fire lane.

9.0 STORAGE REQUIREMENTS (cont.)

9.8 Piped and porous ingots (MDCs 120, 240, 241, 242, 244 400, 404, and 410, 0.86 and 0.95 percent U235 enrichment shall be stored under the most restrictive limits of Table 2 or 3.

9.8.1 Ingots of 1.25 and 2.1 percent U235 enrichment shall be stored as 1/group.

9.9 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.

9.10 Duds (MDC 308) of 0.86 and 0.95 percent U235 enrichment with voids or projections shall stored under the most restrictive limits of Table 2 or 3.

9.10.1 Duds of 1.25 and 2.1 percent enrichment shall be stored as 1/group.

9.11 Boxed and banded extrusions (MDC 453) may be stored 3 boxes high.

9.12 Wet sump/filter cake (MDC 067) may be stored as unlimited at ≤1.25 percent U.

9.12.1 The limits of Table 5 apply to other enrichments.

9.13 UNH solutions (MDCs 150 and 204) <2.00 percent U235 enrichment may be stored as unlimited.

9.13.1 UNH at 2.1 percent U235 enrichment shall be limited to 238 U g/l.

9.14 UNH solids (MDC 207) <2.00 percent U235 enrichment may be stored as unlimited.

9.14.1 The limit shall be 215 lbs for 2.1 percent U235 enrichments.

9.15 UO3 products (MDCs 072 and 200) that are ≤1.25 percent U235 enrichment shall be stored in drums containing 2000 lbs maximum.

9.16 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).

9.16.1 The cans may be stored edge-to-edge in a single plane in unlimited array (mass/unit area control).

9.17 UO3 and UF4 products that are 2.00 percent U235 enrichment may be stored in 30-gallon drums on skids with a maximum of two drums per skid.

9.17.1 There shall be at least 20 inches separating the drums on the skid and 24 inches separation from drums on adjacent skids.

9.18 Pots of UF4 (MDC 216) that are 2.0 or 2.1 percent U235 enrichment shall be stored one pot/group.

10.0 **APPLICABLE FORMS**

10.1 FMPC-ADM-613, "Nuclear Materials Receiving Report"

10.2 FS-F-1354, "Nuclear Safety Operational Authorization"

10.3 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]

235U (%)	Size (U Lbs)	SMALLEST DIMENSION OF PIECE (INCHES)														
		≥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	650	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]
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

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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/ft^3)	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/ft^3), including discard residues, may be handled in unlimited quantities.

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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

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

-6943

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

REQUEST FOR AUTHORIZATION TO SHIP NUCLEAR MATERIAL

ATE	AUTHORIZATION NUMBER	SHIPMENT CLASSIFICATION	MATERIAL CLASSIFICATION
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 (5/4/87)

NUCLEAR SAFETY OPERATIONAL AUTHORIZATION
FS-F-1354
Figure 2

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/RECEIPT/IDENTIFICATION RECORD
FS-F-1990-2220-2221
Figure 3

-6943

RECORD OF REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
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.
10-04-94	0	Reissued to update technical content per Request P94-0340 initiated by S. Moore.

-6943

CONTROL NO. FER-0018
SITE PROCEDURE PT-0004 (SSOP-0060)
REVISION NO. 4

PACKAGING AND LOADING RADIOACTIVE MATERIAL FOR OFFSITE SHIPMENT

Effective Date: 06-18-93

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: MLWest. _____ 2/15/95
Michael L. West, Manager of Packaging and Transportation Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

CONTROL NO. -6943 FER-0018
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0060
REVISION NO. 4

PACKAGING AND LOADING RADIOACTIVE MATERIAL FOR OFFSITE SHIPMENT

SSOP-0060

Effective Date: 06-18-93

AUTHORIZED BY: _____ 6/11/93
N. C. Kaufman, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 398704
Cincinnati, Ohio 45239-8704

Fernald Environmental FERMCO Restoration Management Corporation	Title: PACKAGING AND LOADING RADIOACTIVE MATERIAL FOR OFFSITE SHIPMENT
	DOCUMENT NO: SSOP-0060 REVISION NO: 4
	Effective Date: 06-18-93 — Page 1 of 40

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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.
06-18-93	4	Minor revision completed to incorporate Site Document Changes S93-008,-009, and -010 per Request S93-068.

1.0 PURPOSE

This document provides the procedure for preparing radioactive product materials for offsite shipment from the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure is applicable to FERMCO personnel who perform the packaging and loading methods for shipping uranium product materials offsite. 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, initiating 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**

The **generator/packager** shall comply with this procedure.

The **supervisor** of the area or packager shall:

- Specify applicable scale check procedures and standard tare weight of packages.
- Ensure that 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 that the lid on an unfilled waste container is secured when no packaging is being done to prevent additions of unknown materials.
- Ensure that packages are weather-protected before, during, and after use to prevent moisture buildup.

4.0 RESPONSIBILITIES (cont.)

- Contact Radiological Safety for a radiological work permit or some other safety permits and ensure permits are obtained and signed prior to performing work.

Logistics Administration shall specify the required container and provide a placard for the gondola.

The **Motor Vehicle Operator (MVO)** shall transport packaged material to the applicable staging area and move metal boxes for weighing.

Materials Control and Accountability (MC&A) shall prepare documentation for offsite shipment of the material.

The **Radiological Safety Technician** shall issue a radiological work permit and perform contamination and radiation surveys.

Quality Control shall certify metal boxes for offsite shipment.

Transportation shall provide equipment and resources necessary for the packaging and movement of materials.

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 Onsite 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 ES&H 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 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.

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".

   b. Refer to Tables 1, 2, and 3 for corrective 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 (Figure 1).

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 5.

5. For small pieces, obtain an empty drum and ensure interior is free of water. 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: DELETED

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.

   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.

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.

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).

7.6 PREPARING AND FILLING METAL BOXES (cont.)

GENERATOR/PACKAGER

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 QC the box is ready for certification.

QUALITY CONTROL

32. Inspect the box per the applicable department procedure for certification.

    a. If the box is not certified, complete a DCAR per SSOP-0023.

    b. 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: DELETED

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 a 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.

7.7 SECURING METAL BOX CONTAINER LID (cont.)

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.

7.8 LOADING CONTAINERS/PALLETS ON A TRUCK

NOTE: DELETED

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 onto truck per Transportation's instructions.

7.9 LOADING PALLETS IN A GONDOLA (See Figure 11)

NOTE: DELETED

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 6, 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 6 or band entire load to prevent shifting during transport. The end row material may 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 two 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 (two 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"

TABLE 1
CORROSION INSPECTION TYPES

CATEGORY	CHARACTERISTIC	COULD CAUSE LOSS OF DRUM INTEGRITY		CORRECTIVE ACTION
		YES	NO	
1	Severe corrosion with deep pitting and/or metal flaking	X		As directed by supervision NOTE: Disposition shall be within 24 hours.
2	Corrosion with shallow pitting and/or mild metal flaking		X	As directed by supervision
3	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 TYPES

TYPE	*CHARACTERISTIC*	*CORRECTIVE ACTION*
1	Material flowing from container and accumulation on pallet or pad.	1. Notify supervisor. **NOTE**: Supervisor notifies AEDO. 2. Stop or contain leak as directed by supervisor. 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.
2	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.
3	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 TYPES

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.

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
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

TABLE 6
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.

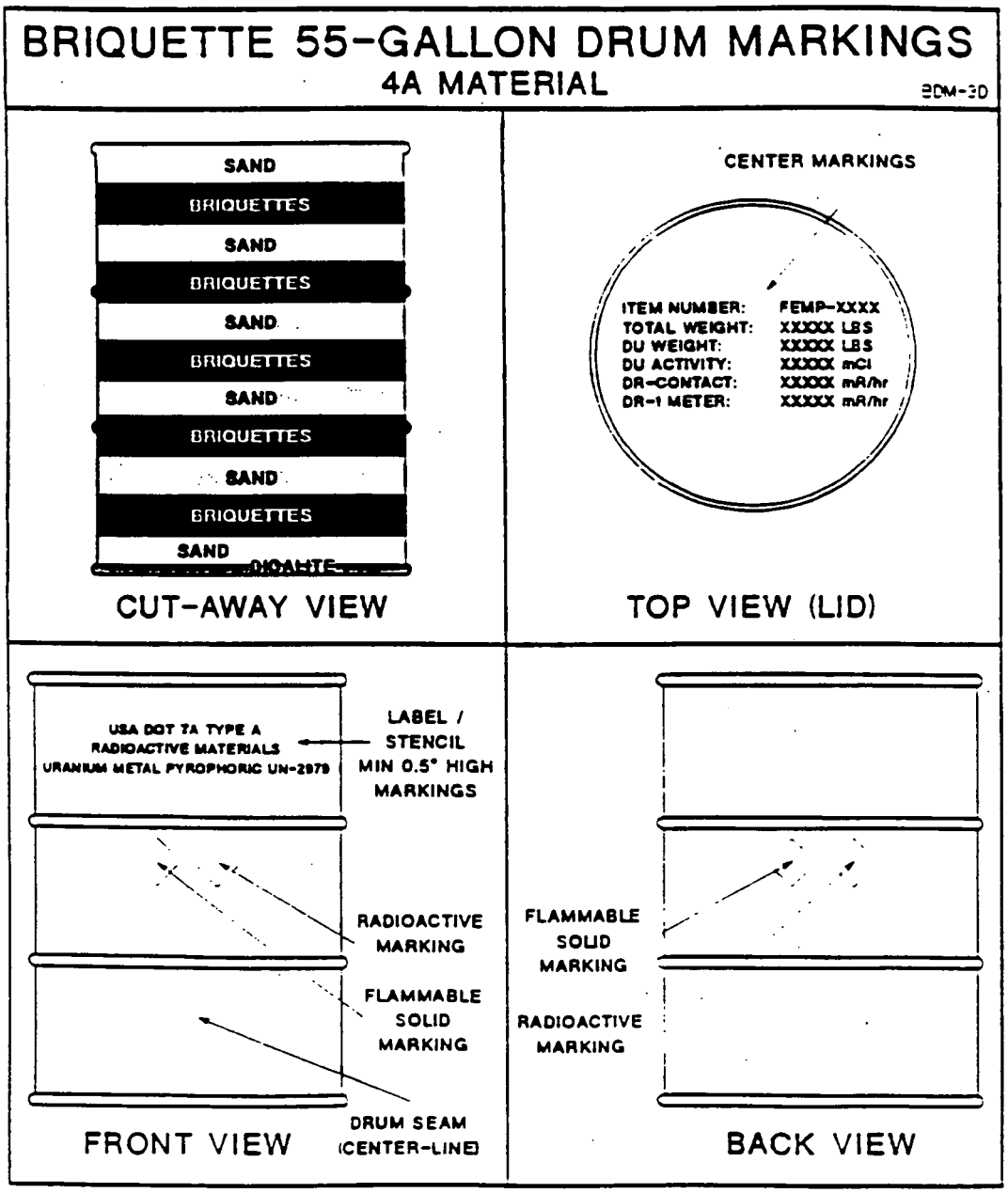

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Figure 1 - Example of Briquette Drum Markings and Cut Away View

TYPICAL LABELING/STENCILING OF AN OPEN HEAD OR BUNG CONTAINER

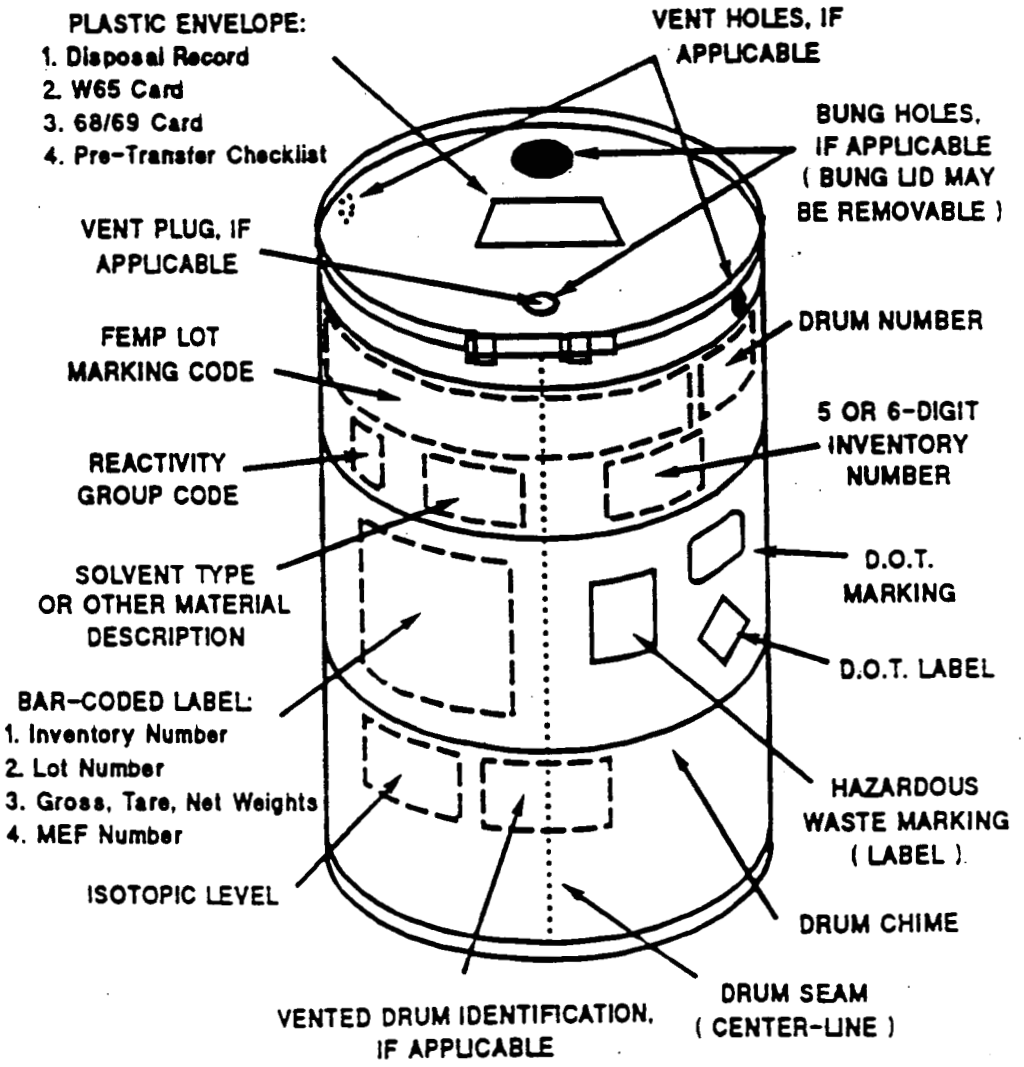
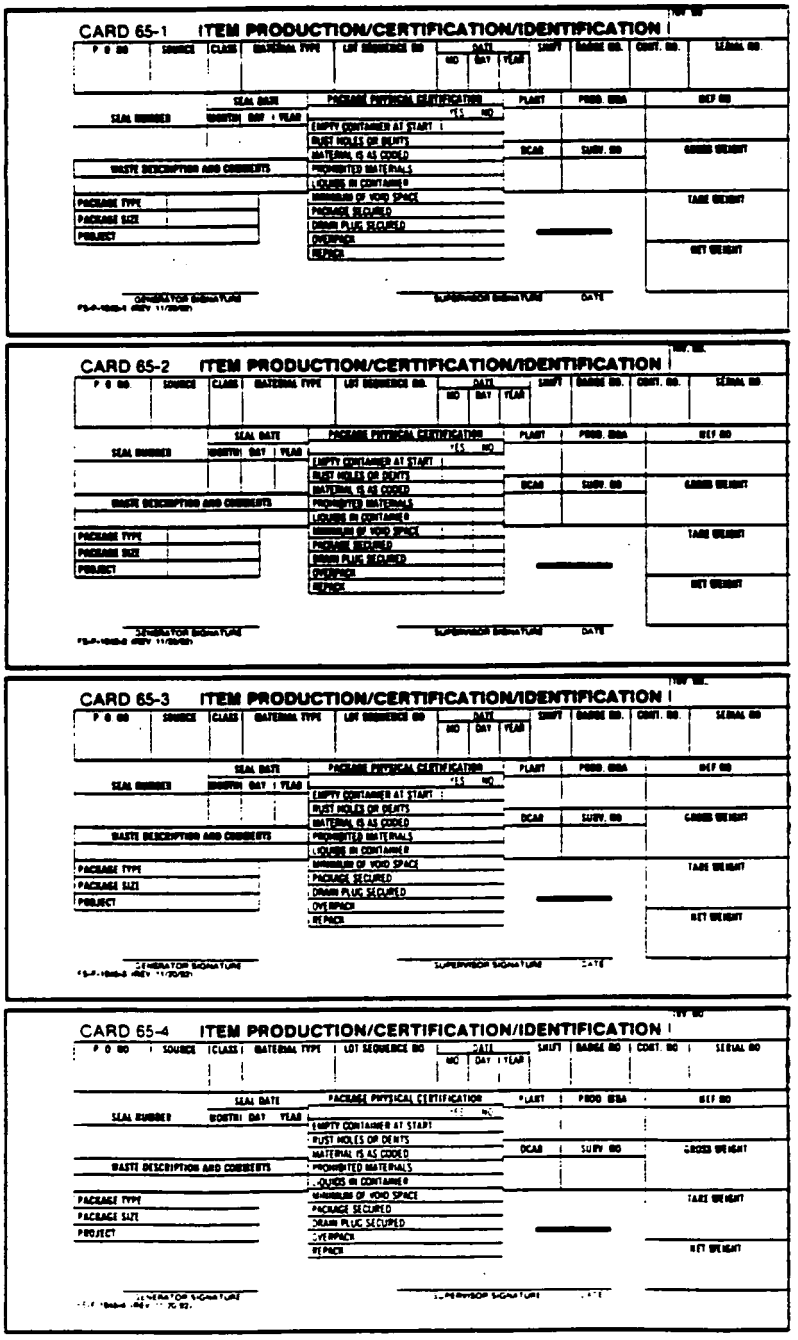


Figure 2 - Example of Packaging Container Markings/Labels


CARD 65-1 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO | SOURCE | CLASS | MATERIAL TYPE | LOT SEQUENCE NO | DATE (MO DAY YEAR) | SHIFT | BADGE NO. | CONT. NO. | SERIAL NO.

SEAL NUMBER | SEAL DATE (MONTH DAY YEAR) | PACKAGE PHYSICAL CERTIFICATION (YES NO) | PLANT | PROD. ORG | REF NO

EMPTY CONTAINER AT START
RUST HOLES OR DENTS
MATERIAL IS AS CODED
PROHIBITED MATERIALS
LIQUIDS IN CONTAINER
MINIMUM OF VOID SPACE
PACKAGE SECURED
DRUM PLUG SECURED
OVERPACK
REPACK

WASTE DESCRIPTION AND COMMENTS | DCAM | SUPV. NO | GROSS WEIGHT

PACKAGE TYPE
PACKAGE SIZE
PROJECT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE | SUPERVISOR SIGNATURE | DATE

CARD 65-2 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO | SOURCE | CLASS | MATERIAL TYPE | LOT SEQUENCE NO | DATE (MO DAY YEAR) | SHIFT | BADGE NO. | CONT. NO. | SERIAL NO.

SEAL NUMBER | SEAL DATE (MONTH DAY YEAR) | PACKAGE PHYSICAL CERTIFICATION (YES NO) | PLANT | PROD. ORG | REF NO

EMPTY CONTAINER AT START
RUST HOLES OR DENTS
MATERIAL IS AS CODED
PROHIBITED MATERIALS
LIQUIDS IN CONTAINER
MINIMUM OF VOID SPACE
PACKAGE SECURED
DRUM PLUG SECURED
OVERPACK
REPACK

WASTE DESCRIPTION AND COMMENTS | DCAM | SUPV. NO | GROSS WEIGHT

PACKAGE TYPE
PACKAGE SIZE
PROJECT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE | SUPERVISOR SIGNATURE | DATE

CARD 65-3 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO | SOURCE | CLASS | MATERIAL TYPE | LOT SEQUENCE NO | DATE (MO DAY YEAR) | SHIFT | BADGE NO. | CONT. NO. | SERIAL NO.

SEAL NUMBER | SEAL DATE (MONTH DAY YEAR) | PACKAGE PHYSICAL CERTIFICATION (YES NO) | PLANT | PROD. ORG | REF NO

EMPTY CONTAINER AT START
RUST HOLES OR DENTS
MATERIAL IS AS CODED
PROHIBITED MATERIALS
LIQUIDS IN CONTAINER
MINIMUM OF VOID SPACE
PACKAGE SECURED
DRUM PLUG SECURED
OVERPACK
REPACK

WASTE DESCRIPTION AND COMMENTS | DCAM | SUPV. NO | GROSS WEIGHT

PACKAGE TYPE
PACKAGE SIZE
PROJECT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE | SUPERVISOR SIGNATURE | DATE

CARD 65-4 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

P O NO | SOURCE | CLASS | MATERIAL TYPE | LOT SEQUENCE NO | DATE (MO DAY YEAR) | SHIFT | BADGE NO | CONT. NO | SERIAL NO

SEAL NUMBER | SEAL DATE (MONTH DAY YEAR) | PACKAGE PHYSICAL CERTIFICATION (YES NO) | PLANT | PROD. ORG | REF NO

EMPTY CONTAINER AT START
RUST HOLES OR DENTS
MATERIAL IS AS CODED
PROHIBITED MATERIALS
LIQUIDS IN CONTAINER
MINIMUM OF VOID SPACE
PACKAGE SECURED
DRUM PLUG SECURED
OVERPACK
REPACK

WASTE DESCRIPTION AND COMMENTS | DCAM | SUPV. NO | GROSS WEIGHT

PACKAGE TYPE
PACKAGE SIZE
PROJECT

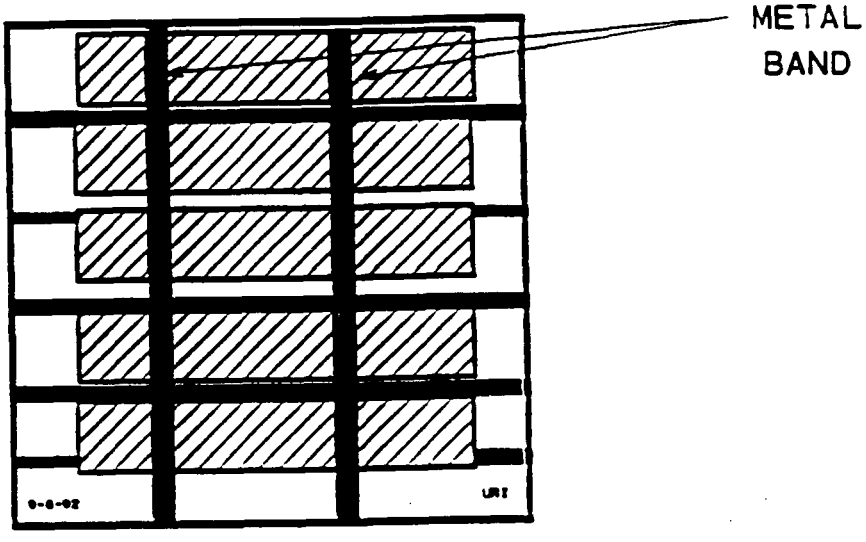
TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE | SUPERVISOR SIGNATURE | DATE

Figure 3 - Item Production/Certification/Identification

URANIUM METAL ROUND INGOTS



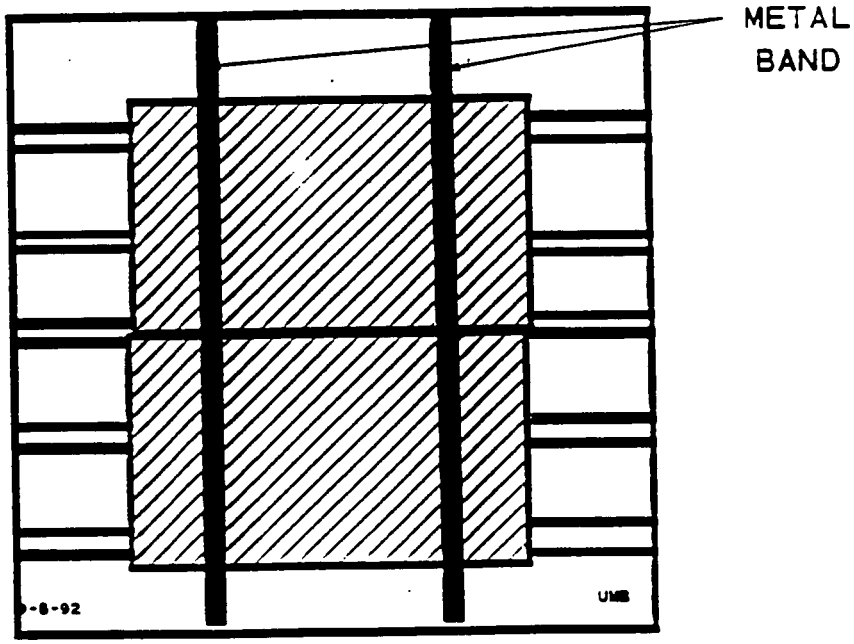
METAL SHALL BE WRAPPED IN RUBBER AND HERCULITE

METAL SHALL BE BANDED TOGETHER AND THEN TO THE PALLET

MAXIMUM GROSS WEIGHT 8000 POUNDS

Figure 4 - Diagram of Uranium Metal Ingot Arrangement on Pallet

URANIUM METAL FLAT BILLETS



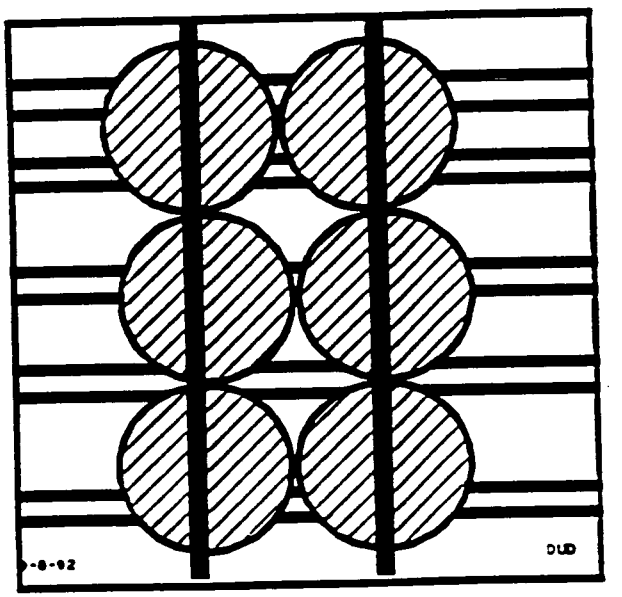
METAL SHALL BE WRAPPED IN RUBBER AND HERCULITE

METAL SHALL BE BANDED TOGETHER AND THEN TO THE PALLET

MAXIMUM GROSS WEIGHT 8000 POUNDS

Figure 5 - Diagram of Uranium Metal Billet Arrangement on Pallet

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

Figure 6 - Diagram of Uranium Duds and Spill Arrangement on Pallet

FEMP
BOX TARE WEIGHT CHECK

BOX NUMBER	DATE	TARE WEIGHT (LBS.)	BADGE NUMBER

FS-F-2867 (REV. 4/30/93)

000714

Figure 7 - Box Tare Weight Check Form, FMPC-PRO-2867

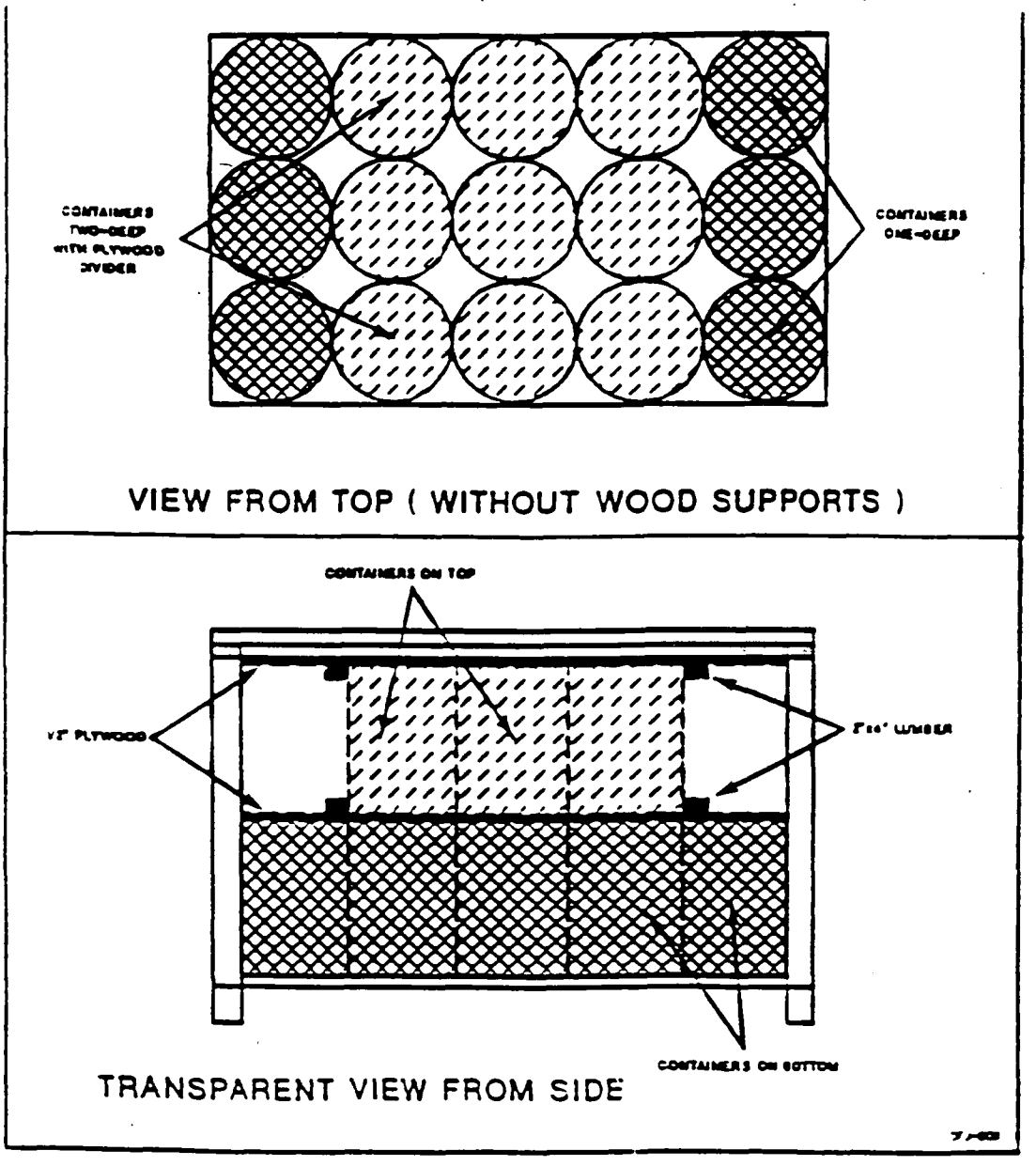
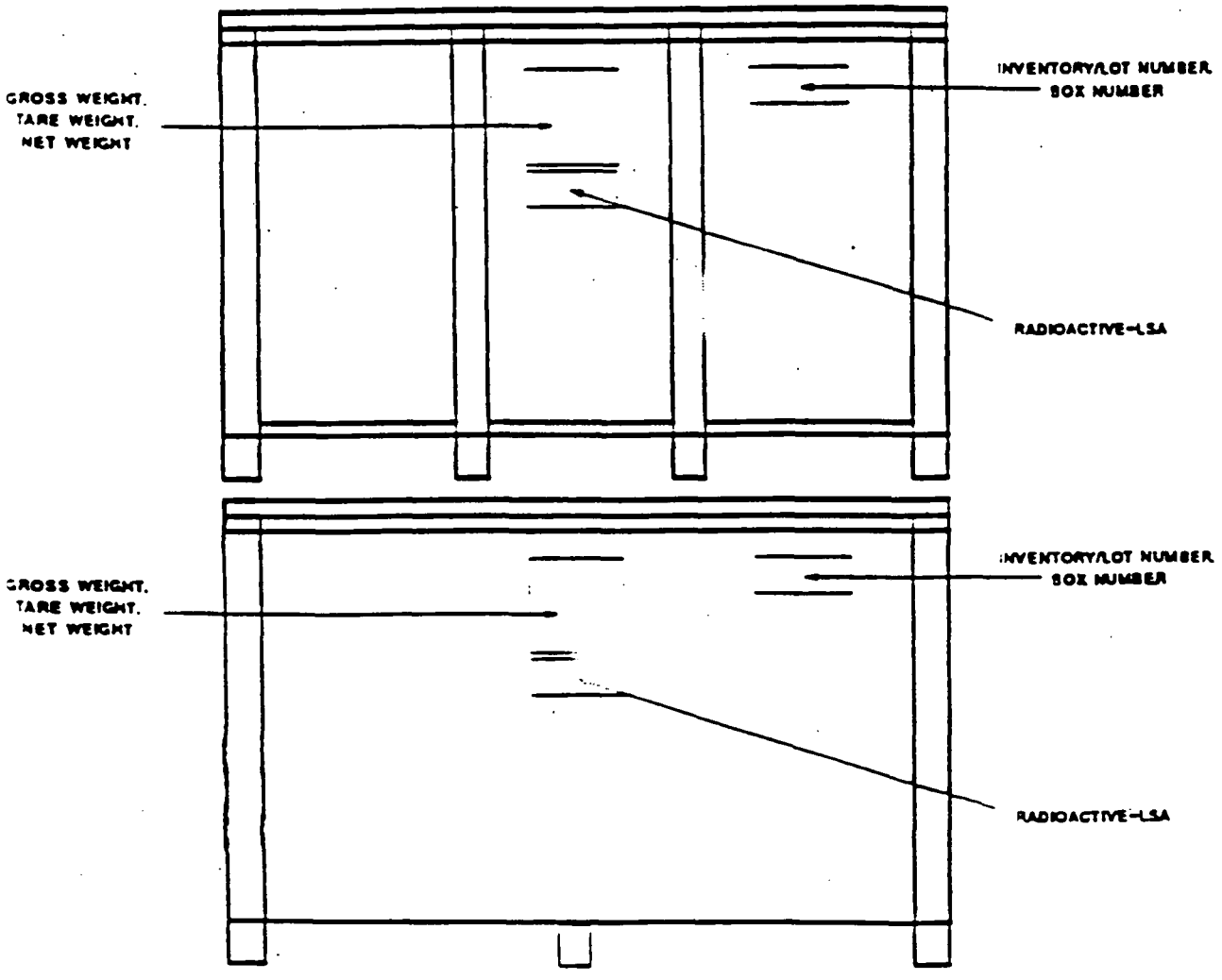


Figure 8 - Diagram of Container Arrangement in Metal Box

TYPICAL METAL BOX MARKINGS FOR OFFSITE SHIPMENT



VIEW FROM SIDE

ALL MARKINGS SHALL BE A MINIMUM OF 1.5" TALL UNLESS OTHERWISE SPECIFIED.

Figure 9 - Diagram of Metal Box Identification

TYPICAL METAL BOX LID INSTALLATION

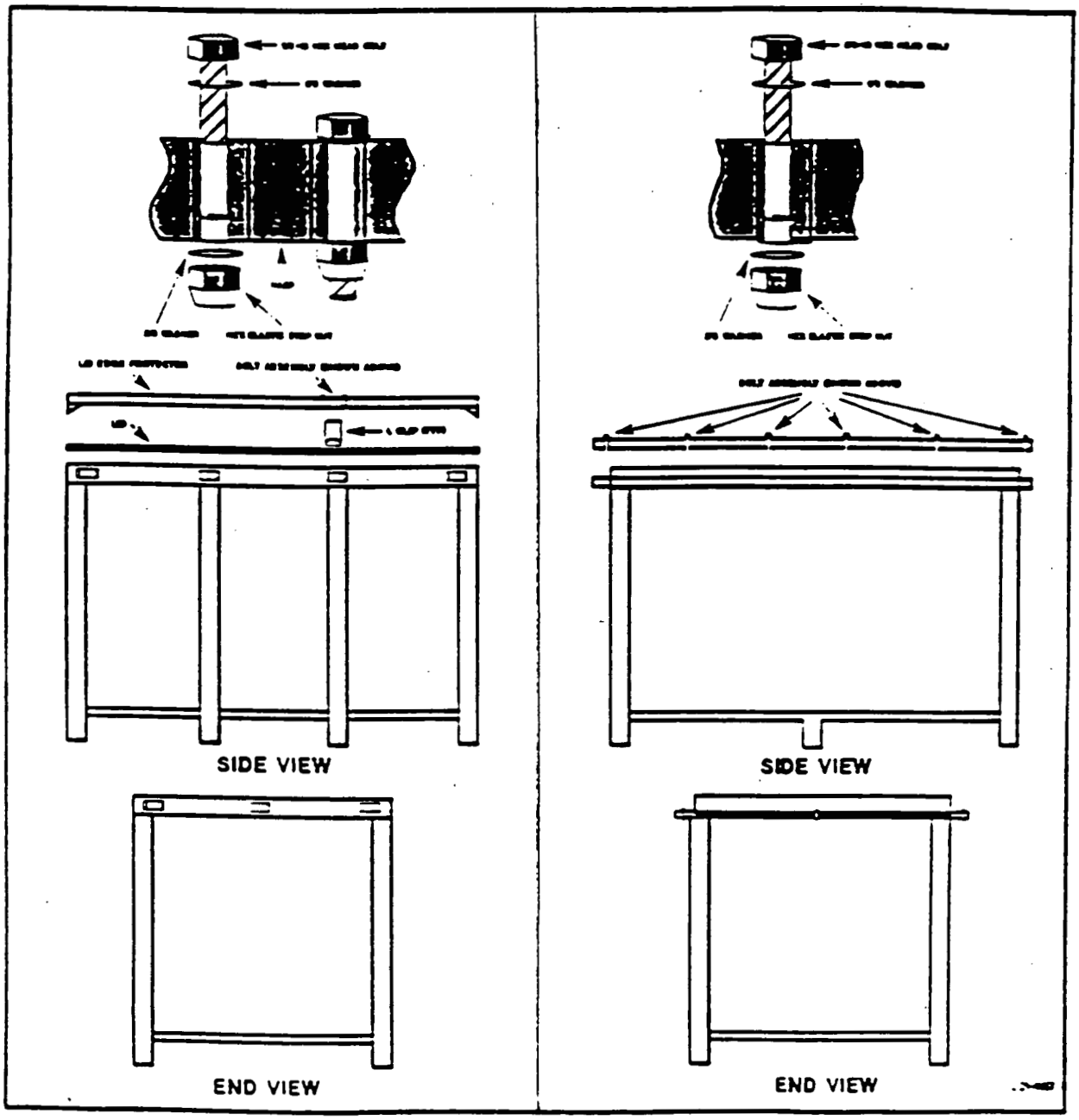


Figure 10 - Lid Installation

LOADING GONDOLA CARS

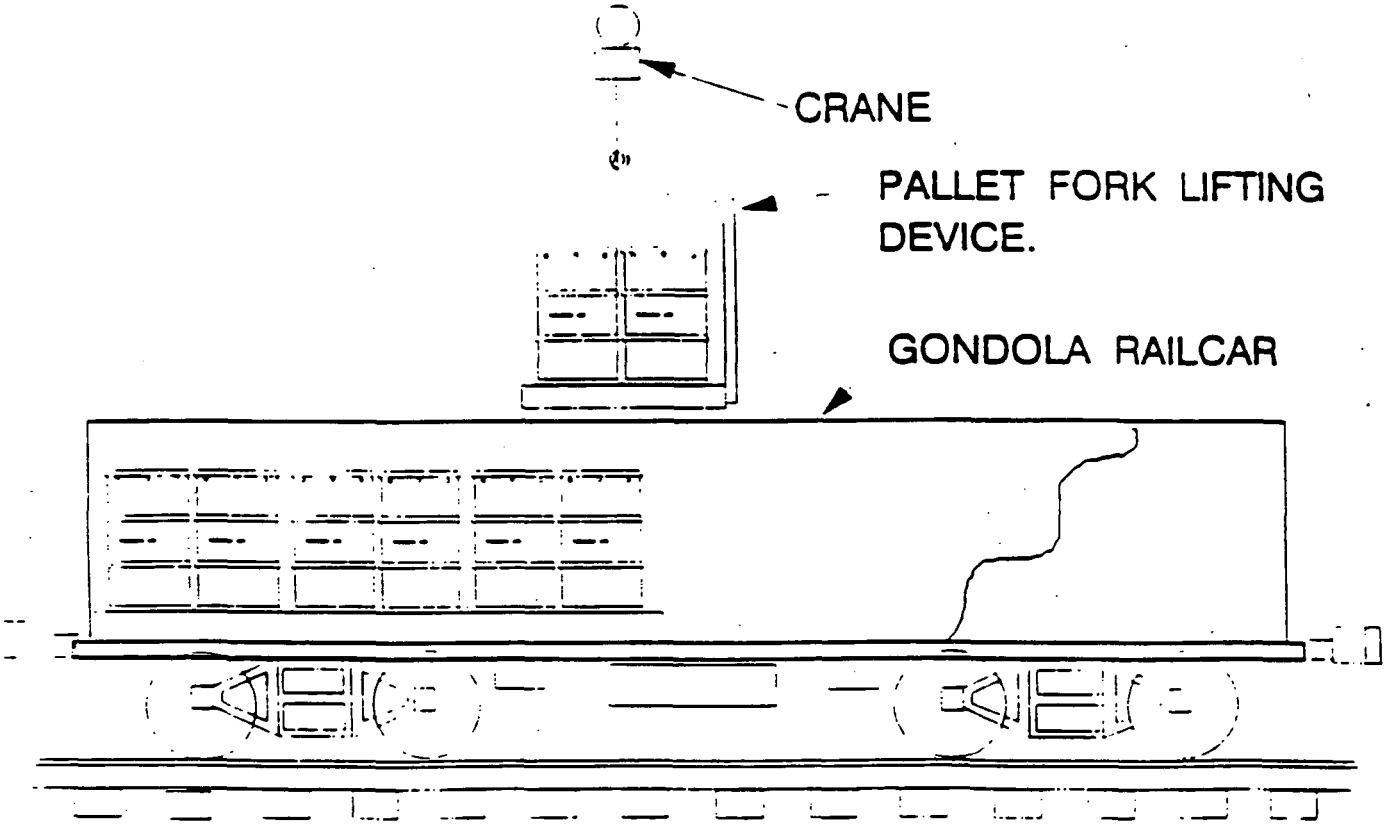
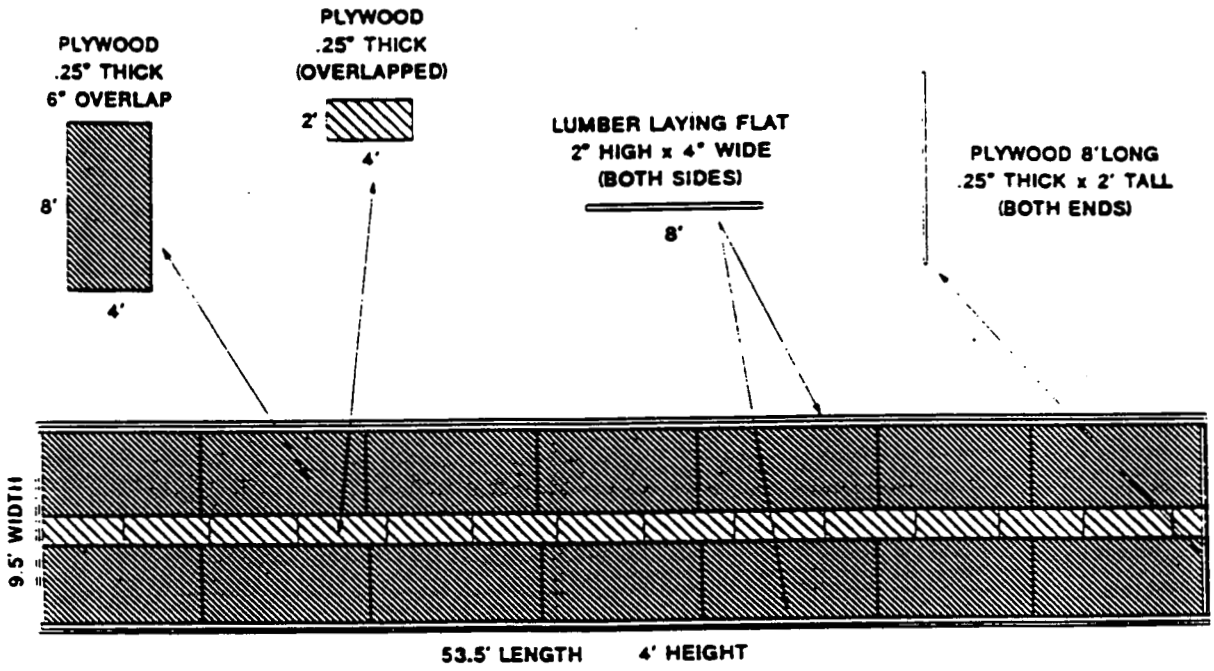


Figure 11 - Diagram of Loading Pallets in Gondola

Fernald Environmental FERMCO Restoration Management Corporation	Title: PACKAGING AND LOADING RADIOACTIVE MATERIAL FOR OFFSITE SHIPMENT
	DOCUMENT NO: SSOP-0060 REVISION NO: 4
Effective Date: 06-18-93	Page 40 of 40



GONDOLA CARS - TOP VIEW

Figure 12 - Plywood Positioning

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ATTACHMENTS

1 Nuclear Material Transfer/Receipt/Identification Record FS-F-1990 (Card 68/69/XX) Attachment I . . . . . .

2 Example of Labels/Markings Open Head Drum Attachment 2 13

3 Example of Labels/Markings Bung Drum Attachment 3 14

4 FM Approved Stainless Steel Safety Can RCRA Waste Labeling/Marking Attachment 4 15

1.0 PURPOSE

The purpose of this document is to establish the procedure for the onsite transportation (not within buildings) of hazardous/mixed/TSCA wastes.

2.0 SCOPE

This procedure is applicable to personnel involved in the transport of hazardous/mixed/TSCA wastes.

3.0 RESPONSIBILITIES

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

- Providing oversite and guidance to the personnel assigned to transport hazardous/mixed waste.
- Ensuring that MVOs are qualified per the established qualification requirements identified by the Division Manager.
- Reviewing applicable Material Safety Data Sheets (MSDS) and Material Evaluation Forms (MEFs) with operators.
- Contacting Industrial Hygiene (IH) or Radiological Control to determine the required respiratory protection and PPE for the area where the material is being moved and/or stored.
- Issuing specified respiratory protection and PPE to personnel as specified on applicable permits.
- Obtaining and posting a "Radiation Work Permit" and/or "Chemical Hazardous Work Permit" when required.

3.2 **Transportation Dispatcher** shall be responsible for coordinating the activities of personnel involved in accepting, transporting, and releasing the hazardous/mixed waste transferred via trailer, forktruck, or other vehicles.

3.3 **Driver** shall be responsible for the following:

- Ensuring that available consignment documentation is complete.
- Transporting consignments in a safe and efficient manner.

3.4 **Materials Control and Accountability (MC&A)** shall be responsible for preparing the forms required for transporting material and updating by making changes to the inventory when containers are moved.

4.0 SAFETY REQUIREMENTS

4.1 An industrial truck used to move hazardous/mixed waste shall have an up-to-date inspection in accordance with SOP 20-C-902 at beginning of each shift.

4.2 Leather-palm gloves shall be worn while operating equipment (not while operating fork trucks) and when handling sharp-edged or abrasive material.

4.3 Safety glasses shall be worn outside of enclosed cab vehicles unless IH of Radiological Control specify other eye protection.

4.4. The driver shall remain with the vehicle while a load is being transported.

4.5 Respiratory protection issued by the Supervisor shall be worn when required by IH or Radiological Control on applicable permits.

4.6 Personnel shall have reviewed and be familiar with MSDSs and MEFs for hazardous chemicals/material that may be used or encountered.

4.7 Radiological Control shall be contacted prior to moving a container out of a contamination area.

4.8 Drums shall be strapped down prior to transport.

4.9 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 ES&H Radiolog Control Department for evaluation. When the suspect isotope is uranium, the involved personn shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. 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 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.

4.10 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 Assistant Emergency Duty Officer (AEDO) as to when and where to report for medical evaluation, completion of an Incident Investigation Report (IIR)(Form No. FS-F-1458), and submitting bioassay samples (e.g., blood, urine, etc.). Employees are responsible for complying with any additional requirements as specified by ES&H.

5.0 PROCEDURE

5.1 Transporting Non-Satellite Accumulation Area Waste to Storage

NOTE: Any time during the movement/transfer of drums, from any location, if a spill occurs refer to SOP 20-C-606.

GENERATOR

5.1.1 Obtain the best available storage location from Waste Operations Support.

5.1.2 Notify the Supervisor of the Storage Area that containers are ready for transport to storage.

5.1.3 Inform the Transportation Dispatcher of material type, packaging, amount of material, location of material, and destination.

TRANSPORTATION DISPATCHER

5.1.4 Notify the Supervisor of the Storage Area of the volume of material that is being transported.

TRANSPORTATION DISPATCHER/SUPERVISOR

5.1.5 Direct the transporter to the waste location.

NOTE 1: Drivers assigned to the generator or Waste Operations may move materials as directed by the generator or Waste Operations w/o notifying the Transportation Dispatcher.

NOTE 2: The Transportation Dispatcher and/or Supervisor shall ensure the driver has the required equipment and training.

DRIVER

5.1.6 Sign the "Nuclear Materials Transfer/Receipt/Identification Record" (68/69/XX Cards), Forms FS-F-1990 (See Attachment 1) after it has been signed by the supervisor.

5.1.7 Transport the consignment to the specified storage area.

5.1.8 Give documentation to the storage area Supervisor.

NOTE: At the delivery point, MC&A and the Supervisor shall accept and sign the "Nuclear Materials Transfer/Receipt/Information Record" cards.

5.1.9 If the material is rejected at the delivery point, proceed per Step 5.5.

NOTE: When transporting drums by forklift (between buildings or pads), one pallet at a time shall be moved.

5.0 PROCEDURE (cont.)

5.2 Transporting Waste from an SAA to Storage using a Forktruck or Trailer

GENERATOR

5.2.1 Obtain the best available storage location from Waste Operation Support.

5.2.2 Notify the Supervisor of the Storage Area that containers are ready for transport to storage.

5.2.3 Inform the Transportation Dispatcher of material type, packaging, amount of material, location of material, and destination.

TRANSPORTATION DISPATCHER

5.2.4 Notify the Supervisor of the Storage Area that material is being transported.

TRANSPORTATION DISPATCHER/SUPERVISOR

5.2.5 Direct a driver to the location of the waste.

NOTE 1: Drivers assigned to the generator or Waste Operations may move materials as directed by the generator or Waste Operations w/o notifying the Transportation Dispatcher.

NOTE 2: The Transportation Dispatcher and/or Supervisor shall ensure that the driver h the required equipment and training.

NOTE 3: Refer to SOP 20-C-606 if a spill occurs during transport.

DRIVER

5.2.6 Check with Quality Assurance to verify that documentation is complete.

NOTE: Documentation attached shall include the Lot Code Number, Reactivity Group Code, Hazardous Waste Marking (label), 65 Card, 68/69/XX Card, MEF, Pre-Transfer Checklist, Weighed and Radiological Survey for surface contamination per Topical Manual FMPC-20898 (Only for drums coming from a contamination area).

- Notify the Generator if documentation is not complete.

5.2.7 Check the condition of the container.

NOTE 1: DOT approved drums and FM approved five-gallon stainless steel and poly safety cans with self-closing spigots are acceptable containers (See Attachments 3 and 4).

NOTE 2: Self-closing spigots shall not bind.

- Notify the Supervisor if the containers have rust, holes, dents, or other damage.

5.0 PROCEDURE (cont.)

5.2.8 Check the security of the lid or closure.

NOTE: Lids shall be taped to drums of liquid waste to avoid spills.

- Tighten loose covers.

5.2.9 Check for leakage or the presence of material on external surface of the container.

- If found, notify the Supervisor.

NOTE: Refer to SOP 20-C-600 for overpacking if necessary.

5.2.10 Check the compatibility of material.

NOTE: Only containers identified by one RGC shall be moved in each load except for containers identified by the compatibility chart in SOP 20-C-630 as compatible material that may be transported with other RGC codes.

- If the inspection indicates a condition that is not acceptable, proceed per Item 5.5.

5.2.11 Check that the load is secure.

CAUTION

The SAC is made of plastic and may be damaged in handling or may slide on smooth surfaces.

NOTE: Containers and/or SACs shall be strapped down.

- Tighten the load if loose.

5.2.12 If the load is acceptable, driver signs the "Nuclear Materials Transfer/Receipt/Identification Record" (68/69/XX Cards).

5.2.13 Transport the consignment to the specified storage area.

5.2.14 Give the documentation to the Supervisor.

NOTE: At the delivery point, MC&A and the Supervisor shall accept the material and sign the "Nuclear Materials Transfer/Receipt/Identification Record" cards.

5.2.15 If the material is rejected at the delivery point, proceed per Item 5.5.

5.0 PROCEDURE (cont.)

5.3 Other Vehicle Transport Process

GENERATOR

5.3.1 Perform Steps 5.2.1 through 5.2.3.

5.3.2 Notify the Transportation Dispatcher of special vehicle requirements (such as pickup truck or flatbed).

5.3.3 Notify the Supervisor of the Storage Area that material is being transported.

TRANSPORTATION DISPATCHER/SUPERVISOR

5.3.4 Send a driver and the required vehicle type to the waste location.

DRIVER

NOTE: Drivers assigned to the generator or Waste Operations may move materials as directed by the generator or Waste Operations w/o notifying the Transportation Dispatcher.

5.3.5 Perform Steps 5.2.6 through 5.2.15.

NOTE: The Generator may have a requirement to move containers of hazardous waste other than to a storage building. The waste may be moved with in an SAA; with a building to store material for shipment; for physical inventory; between or within buildings to obtain scale weight; remove material from non-accumulation areas such as fields; or for any other purpose requiring an Driver and vehicle to move hazardous/mixed waste.

5.4 Miscellaneous Movements

GENERATOR

5.4.1 If required, notify the Transportation Dispatcher of location of waste containers, material type, packaging, amount to be moved, and destination.

NOTE: Drivers assigned to the Generator or Waste Operations may move material as directed by the Generator or Waste Operations without notifying the Transportation Dispatcher.

TRANSPORTATION DISPATCHER/SUPERVISOR

5.4.2 If an Driver is not assigned to the Generator, send an Driver to the location of the waste to be moved.

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5.0 PROCEDURE (cont.)

DRIVER

5.4.3 Inspect the containers of waste as follows:

NOTE: Self-closing spigots shall not bind and the bungs shall be sealed with pipe tape.

5.4.4 Check the container for rust, dents, holes, leaks, and other damage.

- Notify the Supervisor if damage is found and if necessary overpack per SOP 20-C-600.

5.4.5 Check that containers are approved for the type waste.

NOTE: DOT approved drums and FM approved five-gallon stainless steel cans are acceptable containers (See Attachments 2, 3, and 4).

5.4.6 Check that lids or closures are secure.

NOTE: Lids shall be taped to drums to avoid spills for drums containing liquid only.

- Tighten loose covers.

5.4.7 Check the external surface of the container for hazardous material.

- Notify the Supervisor if a container surface is contaminated.

5.4.8 Check that the load is secure on the trailer or vehicle.

NOTE: All containers shall be strapped down.

5.4.9 Check the compatibility of the material.

NOTE: Only containers identified by one RGC shall be allowed per vehicle except for containers identified by the compatibility chart listed in SOP 20-C-630 as compatible material may be transported with other RGC codes.

5.4.10 If inspection reveals an unacceptable condition, the Driver shall proceed per Item 5.5.

5.4.11 Move the material to the location designated by generator.

5.5 Rejection of Consignment Process

DRIVER

5.5.1 Notify the Transportation Dispatcher or Transportation Supervisor of any questionable condition of the consignment.

5.0 PROCEDURE (cont.)

DRIVER/TRANSPORTATION

5.5.2 Request the assistance of the Transportation Supervisor on any questionable condition of the consignment.

NOTE: The Transportation Supervisor shall evaluate the consignment and communicate concerns to the Generator and direct the Driver to perform additional tasks as required.

GENERATOR

5.5.3 Evaluate the concerns and take action as necessary.

NOTE 1: Concerns which are confirmed to be non-compliances along with any corrective actions shall be documented.

NOTE 2: When all confirmed deficiencies have been corrected, transport action shall be initiated.

6.0 DEFINITIONS

6.1 Generator - person generating the waste.

6.2 Hazardous Waste - A waste material exhibiting characteristics of ignitability, corrosivity, reactivity, or toxicity, is listed in 40 CFR 261 (RCRA), or is identified as hazardous in applicab. state regulations.

6.3 Mixed Waste - Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act (RCRA).

6.4 Resource Conservation and Recovery Act (RCRA) - The congressional act requiring "cradle to grave" control and proper management of all hazardous wastes.

6.5 Satellite Accumulation Area (SAA) - A waste accumulation area, controlled by the Supervisor of the process that generated the waste, that is located near the generation point.

6.6 Satellite Accumulation Container (SAC) - Portable polyethylene container, orange in color, designed to hold 55-gallon drums and approved containers.

6.7 Transport - Moving materials by forktruck, trailer, or other vehicle from one location to another.

7.0 APPLICABLE DOCUMENTS

7.1 Drivers

7.1.1 RM-0012, "Quality Assurance Program Description"

7.1.2 DOE 5400 Series, "Environmental Safety and Health (Directives)"

7.0 APPLICABLE DOCUMENTS (cont.)

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7.2 References

7.2.1 SOP 20-C-630, "Receipt Inspection and Placement of Hazardous, Mixed, PCB, and Asbestos Wastes into Storage"

7.2.2 SOP 20-C-606, "Hazardous Material Spill Cleanup"

7.2.3 SOP 20-C-902, "Inspecting and Operating Liquid Propane Gas (LPG) Powered Handstackers and Tuggers"

7.2.4 SOP 20-C-500, "Inspecting RCRA Waste Load/Unload and Staging Area

7.2.5 SSOP-0035, "Satellite Accumulation Areas and Interim Containers for Hazardous Waste"

7.2.6 SSOP-0067, "Spill Incident Report and Cleanup"

7.2.7 SOP 20-C-600, "Overpacking Defective Containers"

NUCLEAR MATERIAL TRANSFER/RECEIPT/IDENTIFICATION
FS-F-1990 (Card 68/69/XX)
Attachment 1

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: [redacted]
MATERIAL CLASS:	MATERIAL TYPE:	MBA: (TO)	PLANT: [redacted]
LOT SEQUENCE NO.:		STORAGE LOCATION:	
[redacted]			
SHAPE CODE:			

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION [redacted]
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.	MBA: (FROM)	PLANT:
MATERIAL CLASS.	MATERIAL TYPE:	MBA: (TO)	PLANT:
LOT SEQUENCE NO..		STORAGE LOCATION	
MATERIAL DESCRIPTION			
SHAPE CODE.			

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.	MBA: (FROM)	PLANT:
MATERIAL CLASS.	MATERIAL TYPE:	MBA: (TO)	PLANT:
LOT SEQUENCE NO..		STORAGE LOCATION:	
MATERIAL DESCRIPTION			
SHAPE CODE:			

NO. OF CONTAINERS OR ITEMS
NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES:

FS-F-2221 (REV. 3/9/92) (SHIPPER) (TRANSPORTATION) (RECEIVER)

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EXAMPLE OF LABELS/MARKINGS OPEN HEAD DRUM
Attachment 2

EXAMPLE OF LABELS/MARKINGS OPEN HEAD DRUM

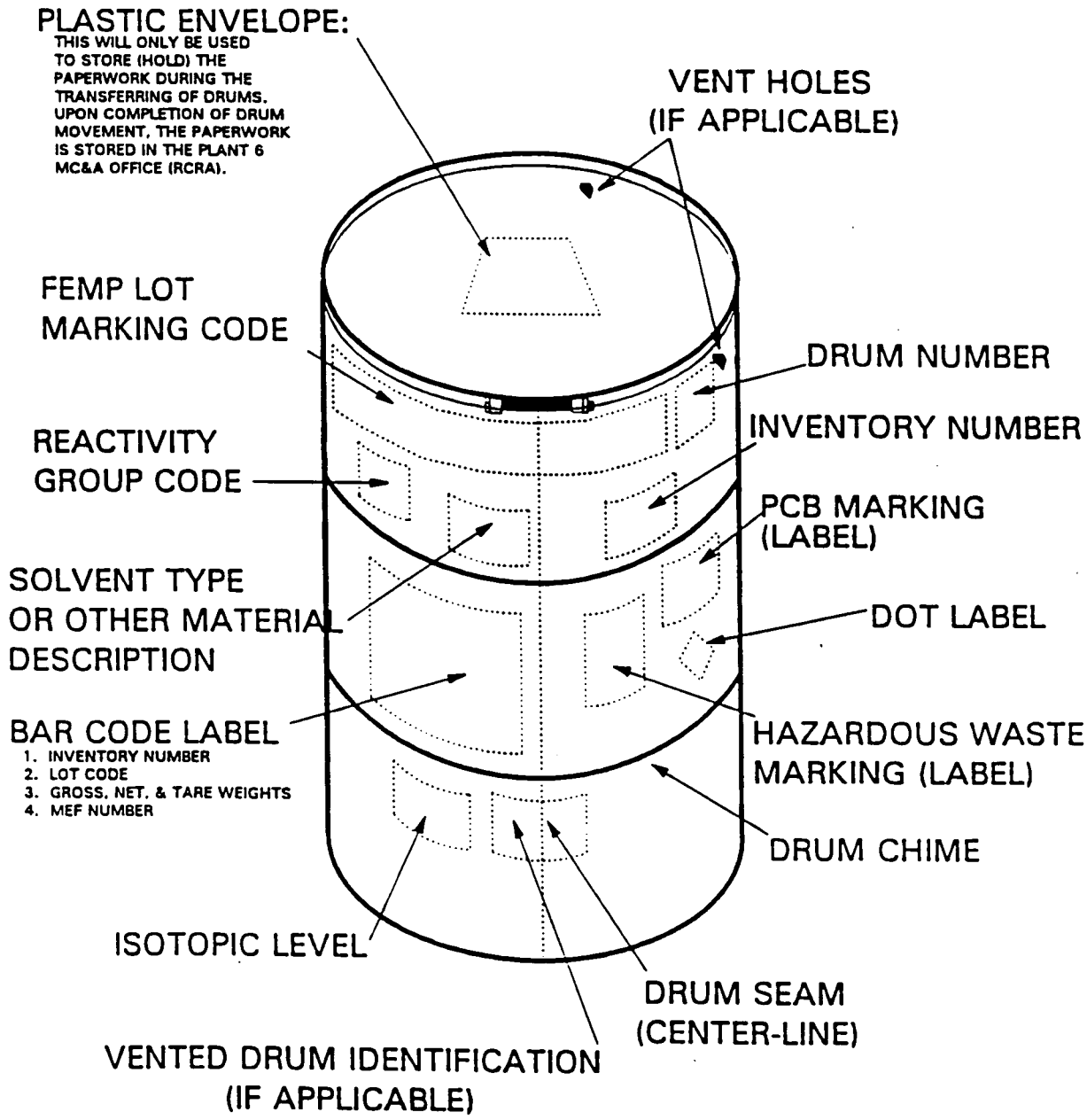

DIAGRAM OF HAZARDOUS WASTE DRUM LABELS/MARKINGS FOR STORAGE IN RCRA WAREHOUSES

EXAMPLE OF LABELS/MARKINGS CLOSE HEAD DRUM
Attachment 3

EXAMPLE OF LABELS/MARKINGS
BUNG DRUM

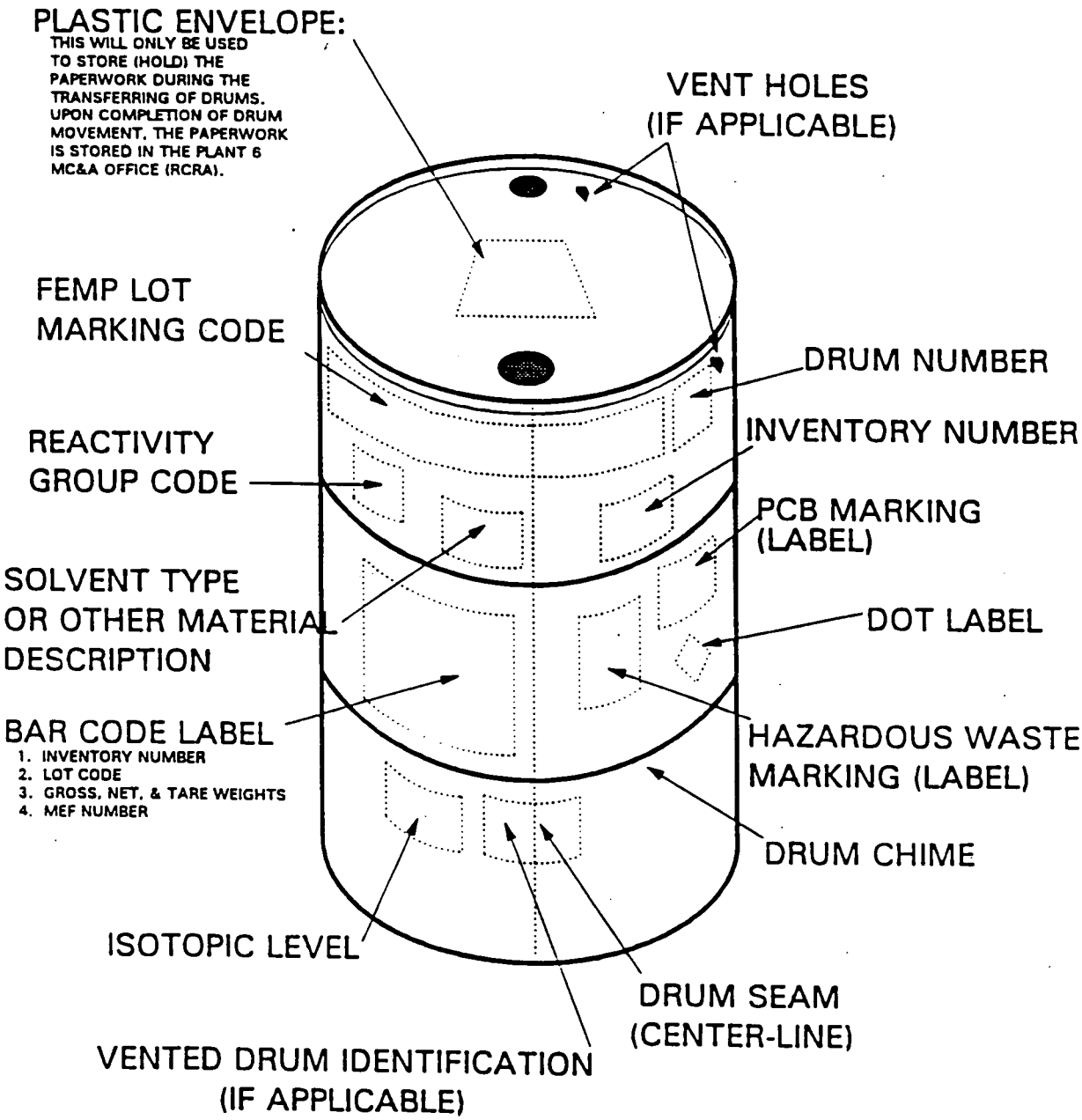

DIAGRAM OF HAZARDOUS WASTE DRUM LABELS/MARKINGS FOR STORAGE IN RCRA WAREHOUSES

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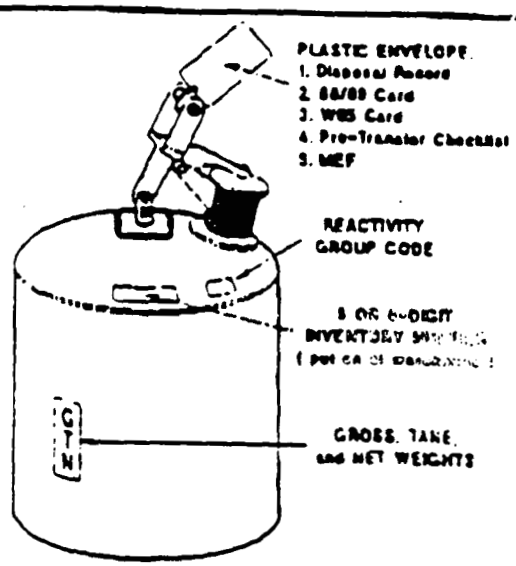
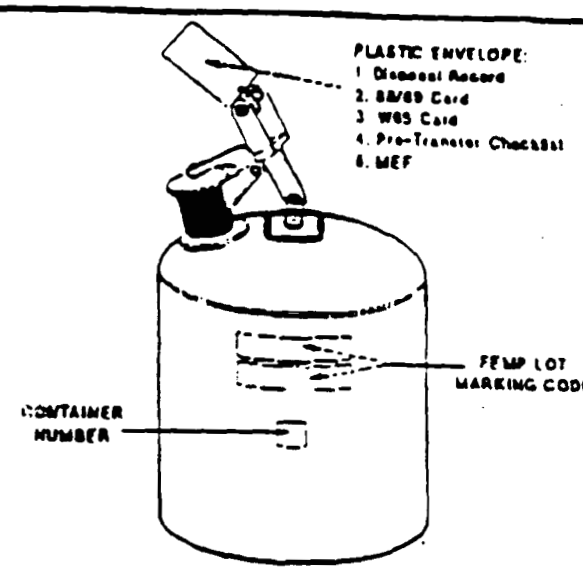
FM APPROVED STAINLESS STEEL SAFETY CAN RCRA
WASTE LABELING/MARKING
Attachment 4

TYPICAL EXAMPLE OF

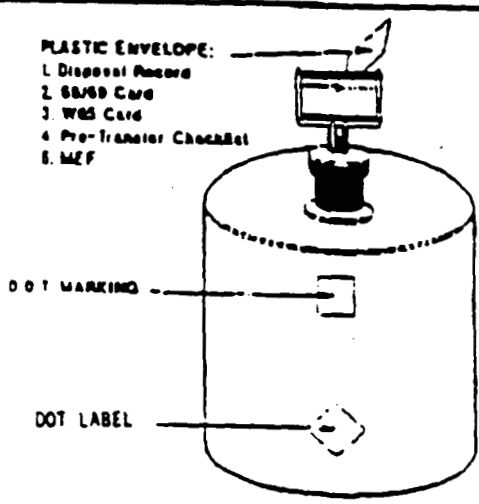
RCRA WASTE CONTAINER LABELING/MARKING



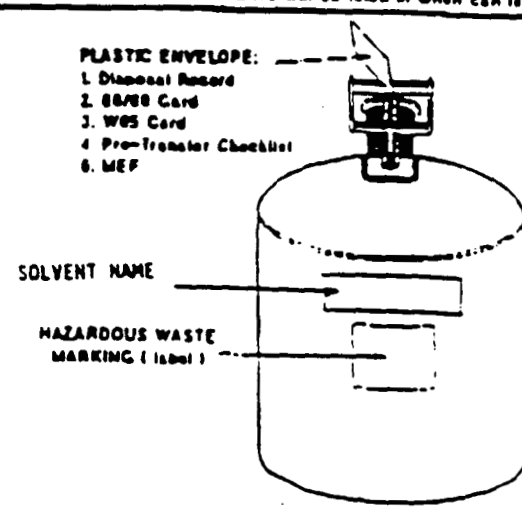
RIGHT VIEW OF SAFETY CAN
SHOWING GROSS, TARE, AND NET WEIGHTS
(actual weights will be filled in when can is full)



LEFT VIEW OF SAFETY CAN
SHOWING LOT MARKING CODE AND CONTAINER NUMBER
(actual location of these numbers will be filled in when can is stamped)



FRONT VIEW OF SAFETY CAN
SHOWING D.O.T. MARKING AND LABEL



BACK VIEW OF SAFETY CAN
SHOWING HAZARDOUS WASTE MARKING (LABEL)

NOTE: The labeling/stenciling/marking orientation shown on this diagram is for guidance only. Not all information shown is required on every container

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
11-06-92	0	Requirement for Establishing Engineering Control Area (ECA) for Sample Disposition per Request No. P92-255, initiated by A. Baisley.
08-09-93	1	Revised to incorporate CIO C93-121 per Request P93-770 and update to conform with Procedure Program requirements.
09-20-94	0	Reissue of document to update to current requirements per Request No. P94-0397, initiated by J. Baarlaer. The document format does not conform to current RSO SOP format per PO-D-026, format changed at the request of 20-C-017 document owner.

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CONTROL NO. FER-0018
SITE PROCEDURE EW-0006 (SSOP-0044)
REVISION NO. 1

MANAGEMENT OF EXCESS SOIL, DEBRIS, AND WASTE FROM A PROJECT

Effective Date: 01-31-94

NON-CONTROLLED COPY

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: _____ 2/15/95
Terence D. Hagen, Manager of Environmental Restoration and Waste Management
Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM		Page 1 of 9 Revision No. 1 Revision Date: 05-04-94
REMEDIATION SUPPORT OPERATIONS PROCEDURE	**CONTROL AND UTILIZATION OF CONTAMINATED TRASH DUMPSTERS**	**SOP 20-C-604** Area: As Applicable
(Signature on File) Authorization: M.L. West, Manager, Environmental Waste Management	Supersedes: 20-C-604 Dated: 05-24-88	Issue Date: 10-18-93

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to provide the procedure for moving, filling, securing, and inspecting the dumpsters for contaminated trash containment on the controlled side.

2.0 APPLICABILITY

This procedure is applicable to contaminated trash dumpsters 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 Department/Section Manager.

3.1.2 Maintaining training records of personnel who are using the dumpsters.

3.1.3 Providing training records to Environmental Waste Management.

3.1.4 Contacting Environmental Safety and Health (ES&H) to determine the appropriate respiratory protection for handling contaminated trash.

3.1.5 Providing Contaminated Trash Handlers with the required respiratory protection.

3.1.6 Reviewing applicable Material Safety Data Sheets with Contaminated Trash Handlers.

3.2 **Contaminated Trash Generators** shall be responsible for ensuring that prohibited items are not placed into trash receptacles.

3.3 **Dumpster Owners** shall be responsible for the following:

3.3.1 Ensuring that designated contaminated trash dumpster access doors remain locked when not in use.

R 3.3.2 Ensuring that contaminated trash does not accumulate around the dumpsters unless the dumpster is full.

3.3.3 Maintaining ownership (or delegating ownership) of the key to open the "master" lock on the contaminated trash dumpster.

3.0 RESPONSIBILITIES (cont.)

R 3.3.4 Notifying Waste Generation Control (WGC) when key control has been
R delegated to someone other than the designated key-holder.

3.3.5 Notifying WGC of problems associated with contaminated trash dumpsters.

R 3.3.6 Ensuring that unidentified (un-labelled) bags that have been "dropped"
R at the dumpster are marked with a large red "X" and placed in the
R dumpster for segregation and internal inspection at the contaminated
R trash baler.

R 3.3.7 Arranging for a Motor Vehicle Operator (MVO) to empty/transport full
R dumpsters.

R 3.3.8 Coordinating with Contaminated Trash Handlers to ensure that bags are
R inspected visually (externally) and prohibited items are detected at the
R point of generation.

R 3.3.9 Ensuring that labeled, acceptable contaminated trash is deposited in
R dumpsters or ensuring that only authorized contaminated trash handlers
R deposit trash into dumpsters.

R 3.4 **Contaminated Trash Handlers/MVOs** shall be responsible for complying with this SOP.

3.5 **RSO Operations and Waste Generation Control (WGC)** shall be responsible for the following:

3.5.1 Periodically updating the prohibited items list that is posted on the contaminated trash dumpsters.

3.5.2 Initiating the appropriate action to take if prohibited items are found.

3.5.3 Maintaining a list of dumpster owners.

3.5.4 Retaining duplicate keys to the dumpster locks.

3.5.5 Routinely issuing "employee updates" to inform personnel of the requirements for disposing of contaminated trash.

3.5.6 Determining placement of contaminated trash dumpsters to better serve the site needs.

R 3.5.7 Coordinating with Dumpster Owners to ensure that authorized Contaminated
R Trash Handlers deposit waste material in dumpsters.

3.6 **Quality Control (QC)** shall be responsible for the following:

3.6.1 Performing weekly inspections of the dumpsters.

3.6.2 Notifying dumpster Owners of deviations and forwarding copies of DCARs to QA & WGC.

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3.0 RESPONSIBILITIES (cont.)

3.7 Quality Assurance shall be responsible for the following:

3.7.1 Evaluating the Contaminated Trash Dumpster per the QC Inspection Checklist form and documentation from the package certifiers (pre-baled trash inspection) and baler operators.

3.7.2 Contacting Dumpster Owners and issuing Deviation Reports whenever appropriate.

4.0 DEFINITIONS

4.1 Contaminated Material - A substance containing radioactive constituents that are above the limit for unrestricted release (1,000 dpm/cm^2).

4.2 Contaminated Trash Dumpsters - Gray, secured containers for contaminated trash that are located throughout the controlled area.

4.3 Contaminated Trash Generator - Any person who works in, or will access, the controlled area to perform duties, and subsequently be disposing of trash.

4.4 Contaminated Trash Handler - Any person (porter, laborer, HAZWAT, chemical operator, sub-contractor, MVO, or radiation technician) that will collect contaminated trash for disposal.

4.5 Contaminated Trash - Any waste that is suspected to have contaminated material which would prevent the disposal at a sanitary landfill.

5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 RM-0012, "Quality Assurance Program Description"

5.2 References

None

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 Safety glasses with side shields shall be worn unless other eye protection is specified by ES&H or posted signs.

6.2 Respiratory protection issued by the supervisor shall be worn when required by ES&H.

6.3 Leather-palm gloves shall be worn when handling rough and/or contaminated material.

6.4 Contaminated trash shall not be allowed to accumulate around the dumpsters.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.5 Contaminated Trash Handlers/MVOs shall have reviewed and be familiar with MSDSs for hazardous materials/chemicals that may be used or handled.

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 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. 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 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.

6.7 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. FS-F-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 Item or Step to which they apply.

8.0 PROCEDURE

8.1 Bag Inspection

CONTAMINATED TRASH HANDLER

8.1.1 Visually examine the trash for prohibited items or categories of waste (Refer to Table 1) as the clear plastic bags are filled.

8.1.1.1. If inspection of the trash is not possible, perform an external visual inspection through the bag.

8.1.2 Remove prohibited items from the trash.

8.1.3 Contact the supervisor and dumpster owner and request disposition instructions.

8.1.3.1 If the supervisor or dumpster owner are unable to determine disposition contact Waste Generation Control (Telephone No. 738-8444).

8.0 **PROCEDURE** (cont.)

8.1.4 Dispose of prohibited items in approved manner (Refer to Table 1) as instructed by the supervisor or Waste Generation Control.

8.1.5 Ensure the building, office area, or project from which the trash originated is clearly marked on the accumulation bags with a permanent marker or paint pen.

8.2 Filling Contaminated Trash Dumpsters

CONTAMINATED TRASH HANDLER

8.2.1 Dispose of small or loose items as follows:

8.2.1.1 Inspect small/loose material for prohibited items (Refer to Table 1).

8.2.1.2 Set prohibited items, if any, aside for disposal.

8.2.1.3 Place the trash in a clear plastic bag.

8.2.1.4 Gather or twist the open end of the bag until the opening is closed.

8.2.1.5 Using tape, secure the bag.

8.2.1.6 Ensure that the building, office area, or project from which the trash originated is clearly marked on the accumulation bags with a permanent marker or paint pen.

8.2.1.7 Contact the supervisor or WGC (738-8444) and request instructions for prohibited items that were removed.

8.2.2 Contact the Dumpster Owner (listed on the information sheet posted on the dumpster) to obtain approval for disposal and to obtain the lock key (See Figure 1).

8.2.3 Unlock the dumpster.

CAUTION

Piping and pieces of wood over two feet in length shall not be placed in the dumpster.

8.2.4 Place bulky items (such as oversize pieces of cardboard) directly into the dumpster.

8.2.5 Inspect the bags for damage.

8.2.5.1 Place damaged bags into undamaged bags.

8.2.5.2 Identify the bag with the same markings as the damaged bag.

8.2.6 Check bags for identification marking and "clean" trash bags.

8.2.6.1 Mark bags without identification with a large red "X."

8.0 **PROCEDURE** (cont.)

NOTE 1: Unsecured and/or unidentified bags or damaged bags shall not be placed in the dumpster.

NOTE 2: Green-tinted "clean office trash bags" shall not be placed in the dumpsters. Clean bags are disposed of differently than contaminated trash. Clean office trash in green-tinted bags are accumulated next to the contaminated trash dumpsters. The bags are picked up by transportation twice per week.

8.2.7 Place identified contaminated trash (excluding items in Table 1) in the dumpster.

8.2.8 Lock the dumpster.

8.2.9 Return the lock key to the Dumpster owner.

8.2.10 Notify Dumpster owner when a full dumpster requires emptying.

8.3 Transporting Contaminated Trash Dumpsters

MOTOR VEHICLE OPERATOR (MVO)

8.3.1 Transport the contaminated trash dumpsters according to the established schedule (Refer to Figure 1).

8.3.2 Pick up prohibited items that have been segregated.

8.3.3 Transport prohibited items to the designated locations for disposal.

8.3.4 Contact Dumpster Owner when transport schedule cannot be met.

8.4 Dumpster Inspection

QUALITY CONTROL

8.4.1 Inspect dumpsters (monthly) and document the inspection.

8.4.2 Notify the Dumpster Owner and Waste Generation Control of inspection results.

9.0 **APPLICABLE FORMS**

9.1 NN, "Contaminated Trash Dumpsters"

TABLE 1

NTS Waste Stream -- ONLO-00000007
"Contaminated Trash"

Allowed Items	Restrictions
Certain Batteries	No Lead-Acid (vehicle) or Ni-Cad (rechargeable)
Empty Cans	No Prohibited Item Residue
Metal	Less than 2 ft. in length. Free from grease. oil. residues. lead-based paint
Paper/Cardboard	
Personal Protective Equipment (Anti-C's. Boots. Gloves. Tyvek)	Unless specifically restricted by Work Plan
Plastic	
Rope. Twine. String	
Styrofoam. Rubber	
Wood	Less than 2 ft. in length. Free from creosote. residue. stains. lead-based paint

Dumpster Usage Instructions:

1. All trash MUST be marked with the building or area of origin.
2. All trash MUST be placed inside the dumpster **(except green-bagged Office Trash)**.

Prohibited Items	Examples	Where to Go	Who to Contact
Asbestos Containing Material	Transite. Pipe Insulation. Floor Tile	---	Leigh Fisher. x8638
Batteries	Auto. Ni-Cad Rechargeable	Plant 6	Susan Hoskins. x6826
Compressed Gases and Aerosol Cans (unpunctured)	Spray Paint. Deodorant Cans. Spray Disinfectant Cleaner. WD-40. Propane	Plant 1	Sam Laupola. x6052
Glass	Bottles. Jars. Light bulbs	Plant 1	Sam Laupola. x6052
Lead-bearing Material	Lead metal. Pipe dope. Lead flashing. Oil filters	Satellite Accum. Areas	John Grace. x8924
Liquids	Water. Coffee. Ice. Pop	Sink	---
Mercury-bearing Material	Switches. Vaccuum Pumps	Satellite Accum. Areas	John Grace. x8924
Particulates (unbagged)	Ashes. Dust. Pad Sweepings	---	Chris Gilbert. x6428
Solvents and Soaked Rags	Kerosene. Toluene. Acetone	Satellite Accum. Areas	John Grace. x8924
UNCONTAMINATED TRASH	Office Trash. Paper. Non-radioactive trash	---	Chuck Menche. x6428
Wood	Pallets. 2x4's.Lumber	Plant 1	Lori Hurst. x8448

Any Questions...Call
Waste Generation Control - x8444

Contaminated Trash Dumpsters – Master

No.	Check-Off	New Lock	Pickup Schedule Mon	Tue	Wed	Thu	Fri	Location	Description	Facility/ Dumpster Owner	Phone	Keyholder(s)	Phone
1		X2584	x					Pit 4 E	E Entrance to Plant 4	Brenda Perkins	6001	Brenda Perkins	6001
2		2703		x				Lab S	South of Lab Bldg.	Ken Bail	6570	Ken Bail	6570
3		2969			x			South of Union Trailer	Gravel near T-84	Jim Hey	6118	Bob Gindling	8409
4		2759				x		Pit 5 NE	NE corner	Ken Peters	6451	Ken Peters	6451
5		2977					x	Pit 6 S	at Bldg 31	Dale Vizedom	6478	Dale Vizedom	6478
6		2870	x					Pit 6 Insp	E side of Plant 6	Ken Peters	6451	Alan Blundell	6611
7		2212		x				Pit 6 N	N side of Plant 6	Ken Peters	6451	Alan Blundell	6611
8		2589	x	x	x	x	x	Lab Pad W	West of Lab Dock	Doug Stamper	8984	Wanda Burk	6556
9		X2227				x		Garage	S side near fence	Steve Schonegg	6822	Tim Feltner	6045
10		X2232					x	Bldg 12 SE	SE end of bldg	Karl Schaefer	6866	Paul Raab	6441
11		X2698	x					Bldg 12 SW	SW end of bldg	Karl Schaefer	6866	Mark Collins	6673
12		X2362		x				Pit 1	Near Plant 1 Pad	Sam Laupola	6052	Sam Laupola	6052
13		2339			x			Decontamination	SE corner	Jerry Knight	6708	Roy Douglas	6776
14		2287				x		Pit 9 W	NW corner	Ken Peters	6451	Bill Gibson	6798
15		2323					x	Bldg 12 N	North side (Electrical Shop)	Bill Libbert	6855	Bill Libbert	6855
16		X2403	x					Pit 1	Near loading dock	Sam Laupola	6052	Sam Laupola	6052
17		2655	x	x	x	x	x	Pilot Plant	Between Lab and Pilot Plant	Brenda Perkins	6001	Brenda Perkins	6001
18		2256			x			Pit 1	Near offices on west side	Sam Laupola	6052	Sam Laupola	6052
19		X2890				x		Lab W	West of Lab Dock	Doug Stamper	8984	Wanda Burk	6556
20		X2386					x	Bldg 3045	NE corner	C.K. Smith	6953	C.K. Smith	6953
21		2728	x					Services Bldg	W side, near Laundry	Joe Legge	6975	Jean West	8476
22		X2445		x				Hot Raffinate Bldg	South side	Brenda Perkins	6001	Brenda Perkins	6001
23		2382			x			Pit 5 W	West side of Pit 5 near annex	Ken Peters	6451	Phil Kraus	6696
24		2709				x		Pit 1	NE of Bldg 71	Sam Laupola	6052	Sam Laupola	6052
25		X2122					x	Plant 2/3 S	South Alley	Brenda Perkins	6001	Brenda Perkins	6001
26		X2464	x					Boiler Plant	Beneath "Electrostatic Precipitator" sign	Bill Naber	6434	Bill Naber	6434
27		2553		x				K-65	East of K-65 silos	Nick Glassey	648-6602	Ray Roseberry	6433
28		2191			x			Lime Bldg	S. of Bulk Lime Handling Building	Ron Young	6437	James Ellis	9396
		Totals	6	7	7	7	7						

CONTAMINATED TRASH DUMPSTERS
Figure 1

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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.
10-18-93	0	Reissued to update to current requirements per Request No. P93-1006, initiated by C. Gilbert. Also CIO C93-717 (P93-1007) was incorporated.
05-04-94	1	Revised to incorporate CIOs C93-757 (per Request P94-0248) and C94-002 (per Request P94-0249).

1.0 PURPOSE

NON-CONTROLLED COPY

The purpose of this document is to provide the procedure for baling contaminated trash for off-site disposal.

2.0 APPLICABILITY

This procedure applies to the SELCON Trash Baler in the Incinerator Bldg. (Bldg. 39A) at the Fernald Environmental Management Project (FEMP).

3.0 RESPONSIBILITIES

3.1 Supervisors are responsible for the following:

3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department Manager.

3.1.2 Maintaining training records of personnel operating the trash baler.

3.1.3 Contacting Environmental Safety and Health (ES&H) to determine the appropriate personal protective equipment (PPE) for handling contaminated trash.

3.1.4 Providing operators with the required PPE.

3.1.5 Shutting off and locking out power to the baler per SSOP-0719 prior to repairs, making adjustments, or cleaning the baler.

3.1.6 Establishing and revising (when required) a regular schedule for the delivery of contaminated trash to the trash baler.

3.1.7 Providing Waste Programs Management (WPM) with the information on prohibited items identified in Nevada Test Site Waste Stream ONLO-000000007 (contaminated trash).

3.1.8 Contacting Quality Assurance when ready to load bales into International Shipping Organization (ISO) container for shipment.

3.1.9 Ensuring the baler is operated in a manner that provides efficient operation dependent on delivery rate of trash.

3.1.10 Ensuring a two-way radio is present and operational when Baler operators are inside the Incinerator Building.

3.0 RESPONSIBILITIES (cont.)

3.2 **Baler Operators** are responsible for the following:

3.2.1 Complying with this Standard Operating Procedure (SOP).

3.2.2 Wearing PPE as directed by the supervisor.

3.3 **Waste Programs Management (WPM)** is responsible for the following:

3.3.1 Periodically updating the prohibited items list, posted on the trash baler and contaminated trash dumpsters, with action to take if prohibited items are found.

3.3.2 Notifying generators, facility owners, and trash handlers, on a routine basis, the disposal alternative for prohibited items.

3.4 **Quality Assurance (QA)** is responsible for the following:

3.4.1 Evaluating the Weekly Trash Baler Operation Log and documentation from the Package Certifiers (pre-baled trash).

3.4.2 Notifying the Baler Supervisor of prohibited items.

3.4.3 Issuing Deviation Reports and/or Corrective Action Reports when appropriate.

3.5 **Package Certifiers (QA)** are responsible for the following:

3.5.1 Inspecting a portion of the trash prior to baling.

3.5.2 Documenting prohibited items segregated.

3.5.3 Notifying violators of prohibited items.

3.5.4 Documenting prohibited item notifications.

3.5.5 Completing Part III of the Weekly Trash Baler Operation Log.

3.6 **Real Time Radioscopic (RTR) Operators** are responsible for the following:

3.6.1 Inspecting 100% of the baled trash, unless otherwise directed by WPM.

3.6.2 Documenting, on the examination log, prohibited items that are found.

3.6.3 Forwarding a copy of the Weekly Trash Baler Operation Log each week to WPM.

4.0 DEFINITIONS

4.1 Contaminated Material - A substance containing radioactive constituents that are above the limit for unrestricted release (1,000 dpm/cm^2).

4.2 Platen - Pressure plate of the baler.

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5.0 APPLICABLE DOCUMENTS

5.1 Drivers

5.1.1 PO-D-026, "Site Services Document Program"

5.1.2 RM-0012, "Quality Assurance Program Description"

5.2 References

5.2.1 SOP 20-C-902, "Inspecting and Operating Liquid Propane Gas (LPG) Powered Handstackers and Tuggers"

5.2.2 SSOP-0719, "FERMCO Lockout and Tagout (Hazardous Energy and Material Control) Procedure"

5.3 Other Sources

5.3.1 NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 Safety glasses shall be worn unless other eye protection is specified by the supervisor, ES&H, or posted signs.

6.2 Leather-palm gloves shall be worn when loading or conveying trash.

6.3 When making adjustments or cleaning the baler, electrical power shall be shut off and locked out per SSOP-0719.

6.4 Respiratory protection and PPE issued by the supervisor shall be worn when specified by ES&H, the supervisor, or posted signs.

6.5 Personnel shall move away from the incinerator bin and conveyor while dumpsters are being emptied.

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 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. 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 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.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.7 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. FS-F-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 Item or Step to which they apply.

7.2 If the baler, supporting facility, or associated vehicles become inoperative, the supervisor shall be notified and the Contingency Plan (See Figure 1) initiated.

8.0 PROCEDURE

8.1 Trash Receiving and Inspection

WARNING

The operator manning the CONVEYOR RUN switch must be the same person inspecting trash for prohibited items to prevent injury by conveyor actuation.

BALER OPERATOR

8.1.1 After a dumpster has been emptied into the bin, check inside the dumpster to ensure no trash remains inside the dumpster.

8.1.1.1 If trash remains inside the dumpster, use a rake to pull the material from the dumpster into the bin.

8.1.2 Actuate the conveyor to move trash bags from the bin by pushing and holding the CONVEYOR RUN switch until trash is at the top of the conveyor. Release the switch to stop the conveyor.

8.1.3 Visually inspect the trash for prohibited items or categories of waste (See Figure 2) and complete Part I of the Weekly Trash Baler Operation Log (See Figure 3).

8.1.4 If prohibited items are found, proceed as follows:

8.1.4.1 Gain access to the trash bags by cutting a hole in the bag.

8.1.4.2 Remove the prohibited items from the trash bag.

8.1.4.3 Segregate each item and place in the interim storage receptacles (55 gallon drums) located adjacent to the baler.

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8.0 PROCEDURE (cont.)

8.1.4.4 Document from which area the prohibited item originated in Part II of the Weekly Trash Baler Operation Log (see Figure 3).

8.1.4.5 Notify the supervisor of prohibited items found.

SUPERVISOR

NOTE: WPM shall be notified if more than 10 percent of dumpster contents consists of prohibited items.

8.1.4.6 Notify the Dumpster Owner of prohibited items found.

8.1.4.7 Forward a copy of the Weekly Trash Baler Operation Log to Waste Verification Quality Assurance after Parts I and II are completed.

BALER OPERATOR

NOTE: A red "X" on a bag identifies bags dropped at a dumpster with no identification showing point of origin.

8.1.5 Check for bags identified with a red X and unmarked bags. If found, proceed as follows:

8.1.5.1 Identify unmarked bags with a red X.

8.1.5.2 Set X-marked bags aside for inspection.

8.1.5.3 Notify the supervisor of X-marked bags.

8.1.5.4 When permission is granted by the supervisor, open the bag(s) and inspect the contents.

8.1.5.5 If prohibited items are found, perform Steps 8.1.4.1 thru 8.1.4.5.

SUPERVISOR

8.1.5.6 If prohibited items were contained in the trash, notify the Dumpster Owner.

BALER OPERATOR

8.1.5.7 If prohibited items were found, enter the following on the Weekly Trash Baler Operation Log (Parts I and II):
(A) the point of generation
(B) bags inspected
(C) items removed at the baler

SUPERVISOR

8.1.5.8 Forward the Weekly Trash Baler Operation Log to Waste Verification Quality Assurance for completion of Part III.

8.0 PROCEDURE (cont.)

BALER OPERATOR

8.1.6 Complete an "Item Production/Certification/Identification" card, (See Figure 4). Sign the 1945-XX Card as "Generator".

8.1.7 Ensure the bale removal chain at the rear of the baler is unhooked from the platen (See Figure 5).

NOTE: The Trash Baler should not operate in the automatic mode unless the door is positioned against limit switches and latched.

8.1.8 Ensure the bale removal door is closed and securely latched.

8.1.9 Check the scaffold for loose items.

8.1.9.1 Remove loose items from the scaffold.

8.1.10 Position the scaffold platform against the bale removal door.

8.1.11 Lock the scaffold wheels in place.

8.1.12 Latch scaffolding chain locks onto the baler frame.

8.1.13 Place moveable walkway between the scaffolding and the platform.

8.1.14 Position the south swinging gate between the angle iron and scaffoldin

8.1.15 Chain and lock the north swinging gate to the scaffolding.

8.2 Baler Operation (See Figure 5)

BALER OPERATOR

8.2.1 Raise the safety gate.

8.2.2 Cover the bale chamber floor with a large sheet of trash cardboard.

8.2.3 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.

8.2.4 Pull down the safety gate until the gate is latched.

NOTE: The baler will automatically compact the contents and return to the UP position.

8.2.5 At the Remote Baler Control, press the DOWN pushbutton.

8.2.6 Repeat Steps 8.2.1 and 8.2.3 thru 8.2.5 until the bale is nearly complete or 1/2 complete if approved by the supervisor.

REMEDIATION SUPPORT OPERATIONS
TEMPORARY CHANGE NOTICE (TCN) - 6943 1

ONLY ONE TCN CHANGE PERMITTED PER DOCUMENT PAGE

1. NOTE: TCN not valid without Supervisor signature, Manager initials and Operator signature (when required).

SUPERVISOR: Tony Paletta EXT: 6798 SIGNATURE: (Signature on File)

OPERATOR: Ray Cranert EXT: 6798 SIGNATURE: (Signature on File)

DOCUMENT OWNER: D. Garrett SUPV. ORG.: RSO/FP CHARGE NUMBER: 7BBK2

2. EFFECTIVE DATE OF CHANGE: 12-19-94

3. EXPIRATION DATE OF CHANGE: 06-19-95 *NOTE: Maximum effective period six months.*

4. AFFECTED DOCUMENT NUMBER: SOP 02-C-923

NON-CONTROLLED CO

5. AFFECTED PAGE NUMBER 6

6. DOCUMENT ISSUE DATE: 10-27-94 REVISION NUMBER: 0

7. CHANGE (Use additional sheets of paper if necessary):
Enter each item number and associated change separately.

1) Step 8.1.6 is DELETED.

8.1.6 DELETED

8. PROCEDURE ADMINISTRATION TCN ACTION REQUIRED (Check as Appropriate)

8a. ☐ EFFECTIVE PERIOD > 30 DAYS. DISTRIBUTE TCN AND INCORPORATE INTO AFFECTED DOCUMENT BEFORE TCN EXPIRES.

8b. ☐ EFFECTIVE PERIOD > 30 DAYS. DISTRIBUTE TCN BUT DO NOT INCORPORATE. ALLOW TCN TO EXPIRE.

8c. ☐ EFFECTIVE PERIOD < 30 DAYS. DO NOT DISTRIBUTE. ALLOW TCN TO EXPIRE.

8.0 PROCEDURE (cont.)

8.2.7 Before compaction is complete, add a large cardboard sheet to the top of bale.

NOTE: When a bale is completed, the indicator at the Remote Baler Control will light and the baler automatically shut off in the DOWN position.

8.2.8 Repeat Steps 8.2.1 and 8.2.3 thru 8.2.5 and complete the bale.

8.2.9 Record the bale number on the Weekly Trash Baler Operation Log.

8.3 Bale Removal

BALER OPERATOR

8.3.1 Check the scaffold to ensure that loose items have been removed from the platform.

8.3.1.1 Remove any remaining loose items.

8.3.2 Unlock scaffold platform wheels.

8.3.3 Move the platform away from the bale removal door.

8.3.4 Using the gradual tension release latch, open the Bale Removal Door.

8.3.5 Insert wires (a maximum of six) through the slots in the floor of the baling chamber.

8.3.6 Wrap the wires around bale and then back through the slots in the ram of the baler.

8.3.7 Insert the end of each wire through the end loop.

8.3.8 Wrap each end of the wire at least four times above the end loop.

8.3.9 At the rear of the baler, hook the bale removal chains onto the platen.

8.3.10 Inspect the handstacker or tugger to be used per SOP 20-C-902.

8.3.11 Operate the handstacker or forklift to be used without a load to ensure safe conditions.

8.3.12 Using the handstacker or forklift, position a wood skid at bale removal door.

8.3.13 Ensure that the baler safety gate is in the closed position.

NOTE: Only one bale shall be placed on a skid.

8.3.14 At the Remote Baler Control, press and hold the UP pushbutton until the bale rolls out onto the skid.

8.0 **PROCEDURE** (cont.)

8.3.15 Using the handstacker 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.

8.3.16 Mark the bale with the date and bale number.

8.3.17 Record the bale number on the Trash Baler Operation Log.

8.3.18 On the baler, close and latch the bale removal door.

8.3.19 At Remote Baler Control, press and hold the DOWN pushbutton.

8.3.20 When the baler platen reaches the lowest position, ensure that bale removal chains automatically unhook from rear of platen.

8.3.21 If chains fail to unhook proceed as follows:

8.3.21.1 Release the DOWN pushbutton.

8.3.21.2 Press the EMERGENCY STOP pushbutton at the Remote Baler Control.

8.3.21.3 Manually unhook the chains.

NOTE: The baler cycle shall complete with the baler ram in the UP position.

8.3.21.4 Push the EMERGENCY STOP button head.

NOTE: The baler shall return to the UP position.

8.3.22 Release the DOWN pushbutton.

8.3.23 Complete the "Item Production/Certification Identification" card (See Figure 4).

8.3.24 Give the completed 1945-XX card and the filled-out Weekly Trash Baler Operation Log to the supervisor.

WARNING

Do not store Bales more than two high, to prevent potential stack collapse.

8.3.25 Move completed bale to the designated storage area (north area of building).

8.3.26 When baling is complete, secure the area and switch baler power off.

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8.0 PROCEDURE (cont.)

SUPERVISOR

8.3.27 Notify QA that baled trash is ready for RTR inspection.

8.4 Trouble Shooting

BALER OPERATOR

NOTE: Bale disassembly and inspection is performed on bales of trash failing RTR inspection for prohibited items.

8.4.1 Inspect baler.

NOTE: Baler must be empty and prepared per Steps 8.2.1 and 8.2.2 procedures prior to disassembling bale for inspection.

8.4.1.1 If a bale is in baler, preform Steps 8.3.1 through 8.3.26 procedures.

NOTE: Only trash from the bale being disassembled is allowed to be deposited into the baler. No new trash is allowed.

8.4.2 Perform Steps 8.2.1 and 8.2.2 procedures.

8.4.3 Move RTR rejected bale to front of the baler using the power handstacker.

8.4.4 Cut the wires holding the bale together to gain access to the bale and inspect for prohibited items.

8.4.5 If the RTR operator identified the approximate area of the prohibited item, look in that area by disassembling the bale.

8.4.6 As the bale is disassembled, put the trash into the baler and perform Steps 8.2.1 through 8.2.9 procedures.

8.4.7 If a prohibited item is found, perform Steps 8.1.4.2 through 8.1.4.7.

NOTE: The disassembled and inspected bale must maintain the original bale number and "Item Production/Certification/Identification" card.

8.4.8 When bale disassembly and inspection is completed, reassemble bale (less prohibited items) per Step 8.2 procedures, then remove the bale per Step 8.3 procedures.

8.5 Trouble Shooting

8.5.1 If the baler will not start or stops during operation, proceed per Corrective Action items listed in Table 1.

8.5.2 If the problem cannot be corrected or if other problems are encountered, notify the supervisor.

8.0 PROCEDURE (cont.)

SUPERVISOR

8.5.3 Inform Maintenance that repair is required.

8.6 Transfer and loading of bales into Sea/Land Containers

SUPERVISOR

NOTE: Baler Operator shall be present to assist QA if problems occur.

8.6.1 Notify Quality Assurance that baled trash is ready for loading into Sea/Land containers.

8.6.2 Notify the Radiological Control Technician responsible for the area that baled trash is ready for loading into Sea/Land containers.

8.6.3 Contact motor vehicle operator to move bales when monitoring personnel are present.

MOTOR VEHICLE OPERATOR

8.6.4 At the direction of the Supervisor, move bales of trash.

9.0 APPLICABLE FORMS

9.1 "Trash Baler Operation Log"

9.2 FS-F-1945-XX, "Item Production/Certification/Identification"

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TABLE 1
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.

TRASH BALER CONTINGENCY OPERATING PLAN

ASSUMPTIONS: Baler operates in a manner that provides an efficient operation dependent on delivery rate of trash.

This contingency plan shall be used until the new compactor is on-line and baling operations are transitioned.

Generation rate of compactable unbaled trash on any given two week period can be contained in 3 ISO containers.

STRATEGY STATEMENT: This plan shall be effective in the event the Trash Baler, supporting facility, or vehicles are inoperable for a period of 3 working days. Should this period of inoperability exceed 10 working days, additional contingencies shall be made available.

COLLECTION: Dumpster Owners shall notify Waste Operations of excess trash (trash that can not be put into the dumpster because the dumpster is full). This trash will be collected daily by RSO Waste Operations and taken to the area containing the interim storage ISO containers.

HANDLING: Waste Operations shall load and unload excess compactable trash.

INSPECTION: QC shall inspect excess trash prior to loading into the interim storage ISO containers. If scheduling conflicts arise and QC can not inspect prior to loading, the ISO may be inspected during unloading for compaction at the baler.

STORAGE: Storage of the excess compactable trash shall be in three containers numbered I, II, and III and located north of Storm Sewer Lift Station. These ISO containers shall be used when this plan is activated and shall be unloaded and baled at the earliest possible date.

TRASH BALER CONTINGENCY OPERATING PLAN
Figure 1

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NTS Waste Stream -- ONLO-00000007

"Contaminated Trash"

Allowed Items	Restrictions
Certain Batteries	No Lead-Acid (vehicle) or Ni-Cad (rechargeable)
Empty Cans	No prohibited Item Residue
Metal	Less than 2 ft. in length. Free from grease, oil, residues, lead-based paint
Paper/Cardboard	
Personal Protective Equipment (Anti-C's, Boots, Gloves, Tyvek)	Unless specifically restricted by Work Plan
Plastic	
Rope,Twine,String	
Styrofoam,Rubber	
Wood	Less than 2 ft. in length. Free from creosote, residue, stains, lead-based paint

Dumpster Usage Instructions:

1. All trash MUST be marked with the building or area of origin.
2. All trash MUST be placed inside the dumpster (except green-bagged Office Trash).

Prohibited Items	Examples	Where to Go	Who to Contact
Asbestos Containing Material	Transite, Pipe Insulation Floor Tile	---	Leigh Fisher, x8638
Batteries	Auto, Ni-Cad Rechargeable	Plant 6	Rick Enneking, x6736
Compressed Gases and Aerosol Cans (unpunctured)	Spray Paint, Deodorant Cans, Spray Disinfectant Cleaner, WD-40, Propane	Plant 1	Sam Laupola, x6052
Glass	Bottles, Jars, Light bulbs	Plant 1	Sam Laupola, x6052
Lead-bearing Material	Lead metal, Pipe dope, Lead flashing, Oil filters	Satellite Accum. Areas	Rick Enneking, x6736
Liquids	Water, Coffee, Ice, Pop	Sink	---
Mercury-bearing Material	Switches, Vacuum Pumps	Satellite Accum. Areas	Rick Enneking, x6736
Particulates (unbagged)	Ashes, Dust, Pad Sweepings	---	Chuck Menche, x6428
Solvents and Soaked Rags	Kerosene, Toluene, Acetone	Satellite Accum. Areas	Rick Enneking, x6736
UNCONTAMINATED TRASH	Office Trash, Paper, Non-radioactive trash	---	Chuck Menche, x6428
Wood	Pallets, 2X4's, Lumber	Plant 1	Lori Hurst, x8448

Any Questions...Call
Waste Generation Control - X8444

PROHIBITED WASTE
Figure 2

FEMP
WEEKLY TRASH BALER OPERATION LOG

PART I							PART II	PART III	
DATE	SHIFT	OPERATOR INITIALS	DUMPSTER NO./REWORK	NUMBER OF BAGS/LABELLED	BALE NO.	PROHIBITED ITEMS FOUND AND DESCRIPTION	WHERE WAS PROHIBITED ITEM DISPOSED?	NAME OF DUMPSTER OWNER OR GENERATOR CONTACTED	QUALITY CONTROL SIGNATURE/DATE

At the end of each week:

1. Operators complete PARTS I and/or II, forward to supervisor. Supervisor forward a copy to QA.
2. QA complete PARTS II and/or III and forward a copy to Operators at MS 62 and Waste Programs Management.
3. QA keep a copy as part of Deviation Reporting System backup file.
4. Supervisor keep original and copy from QA on file at work station.

Any bag that has no markings (Building #, Plant, Area, Project, or a red "X") shall be marked with a red "X" and set aside for internal inspection.

WEEKLY TRASH BALER OPERATION LOG
Figure 3

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CARD 65- **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

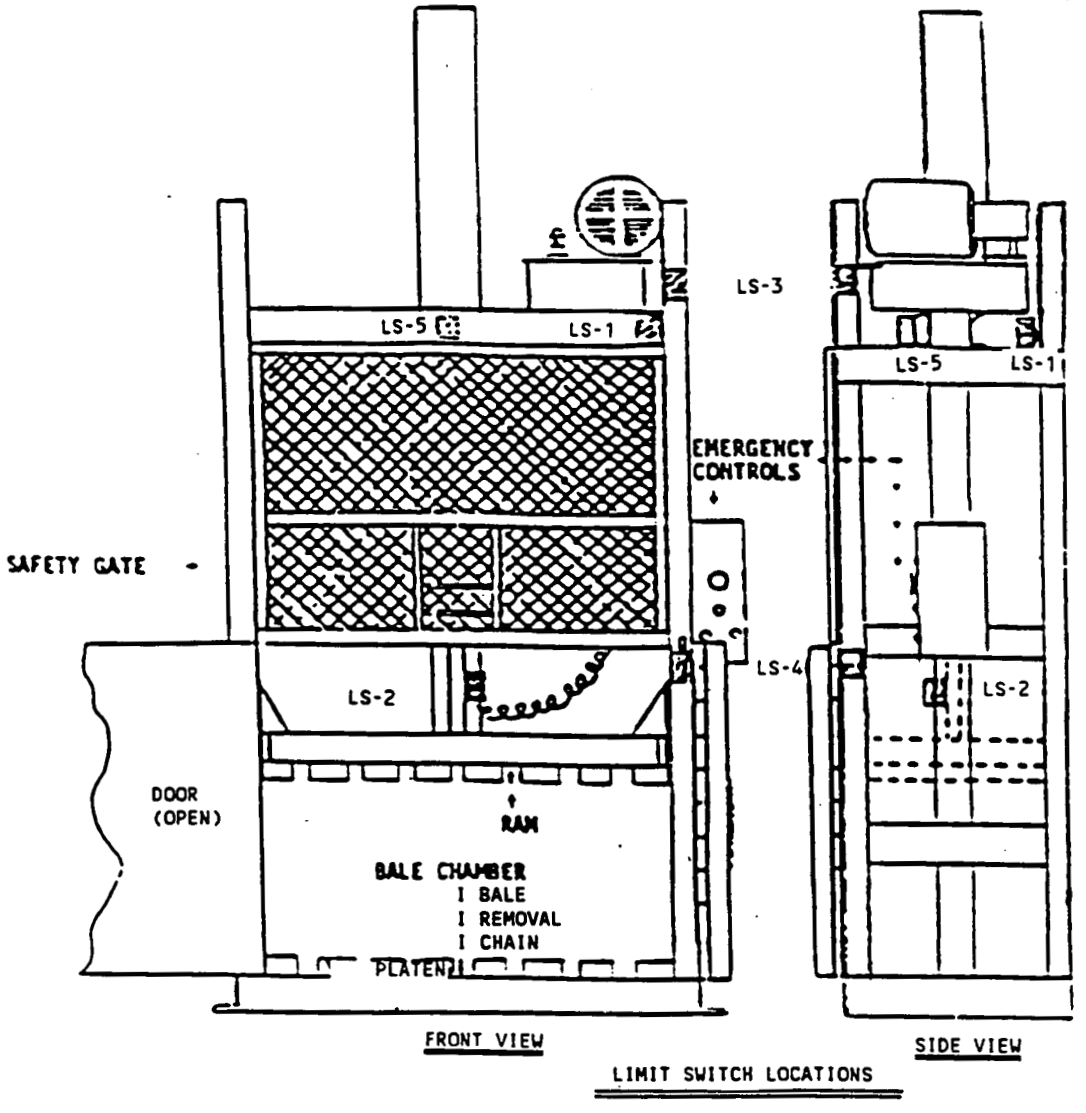
GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FS-F-1945- (REV. 11/20/92)

MENT PRINTING OFFICE: 1993

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
Figure 4



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 5

-6943

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.
10-18-93	0	Reissued to update procedure to current requirements, per Request No. P93-1004, initiated by R.W. Bischoff. Also CIO C93-716 (P93-1005) incorporated.
05-10-94	1	Revised to incorporate CIOs C93-754 (P94-0252), C93-755 (P94-0253), and C94-001 (P94-0254).
10-27-94	0	Reissue required to incorporate changes resulting from Safety Review Committee Audit per request P94-0417, initiated by M. Frost.

PRESIDENTIAL POLICY NON-CONTROLLED COPY

FERMCO Fernald Environmental Restoration Management Corporation	**TITLE:**	**MATERIALS CONTROL AND ACCOUNTABILITY**
	NUMBER:	**PO - SE - 02** **Rev 0**
	EFFECTIVE DATE:	**04 - 1 - 95**

FERMCO will manage a program to control and account for nuclear materials; i.e., depleted, normal and enriched uranium (exclusive of those materials declared to be low level waste.) These materials are property of the Department of Energy, and as such, FERMCO is responsible for the characterization, measurement and tracking of all nuclear material held at the Fernald site.

FERMCO will document the material form, uranium content, isotopic content, and location of all nuclear material. Our nuclear materials control and accountability documentation will reflect a responsible accountability for this government property. Our inventories will be accurate, and our reports of changes in inventories to the Department of Energy will be timely.

FERMCO will develop and implement a plan to control and account for nuclear materials. The plan will identify responsibilities and requirements for program management, threat considerations, performance criteria, the accounting system, physical inventories, measurements and measurement control, control limits, loss detection elements, nuclear material alarms, access control, containment methods and surveillance plans. FERMCO will use graded safeguards to determine the amount of control required for nuclear materials. Management will ensure that implementation of elements of the plan is coordinated among those FERMCO organizations who will follow it. FERMCO will ensure that training is provided to all personnel involved in performing materials control and accountability functions.

3/22/95
Date

R. E. Hatt, for
Don Ofte

PRESIDENTIAL POLICY

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	NUMBER: PO - SE - 02	Rev 0
	EFFECTIVE DATE: 04 - 1 - 95	

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3/22/95
Date

R. E. Hatt, for
Don Ofte

-6943

CONTROL NO. FER-5018
SITE PROCEDURE MT-0003 (SSOP-0061)
REVISION NO. 0

FEMP WORK REQUEST/ORDER PROCEDURE

NON-CONTROLLED COPY

Effective Date: 09-17-92

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: Donald Paine 3/22/95
Don Paine, FAM Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

-6943

CONTROL NO. FEA-0018
SITE PROCEDURE OP-0004 (SSOP-0719)
REVISION NO. 2

FERMCO LOCKOUT/TAGOUT
(HAZARDOUS ENERGY AND MATERIAL CONTROL)
PROCEDURE

NON-CONTROLLED COPY

Effective Date: 03-20-95

Originator (Subject Expert): _____
Date

Checker Concurrence: _____
Date

APPROVED BY: Donald Paine 3/22/95
Don Paine, FAM Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

000767

CONTROL NO. FER-6943
SITE STANDARD OPERATING PROCEDURE
DOCUMENT NO. SSOP-0719
REVISION NO. 2

FERMCO LOCKOUT/TAGOUT

(HAZARDOUS ENERGY AND MATERIAL CONTROL)

PROCEDURE

SSOP-0719

Effective Date: 03-20-95

AUTHORIZED BY: _____ 1/13/95
D. Ofte, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

Fernald Environmental FERMCO Restoration Management Corporation	TITLE: FERMCO LOCKOUT/TAGOUT (HAZARDOUS ENERGY AND MATERIAL CONTROL) PROCEDURE
	DOCUMENT NO: SSOP-0719 REVISION NO: 2
	Effective Date: 03-20-95 — Page 1 of 30

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
04-30-93	0	Procedure required for energy control (Lockout and Tagout) per Request No. S92-225, initiated by A. Miller. This procedure replaces PP-FMPC-0719, dated 2/15/91, Revision 0.
02-14-94	1	Major revision to procedure to reflect new Lockout and Tagout process per Request No. S93-293, initiated by A. Miller. This procedure supersedes SSOP-0719, dated 4/30/93, Rev. 0.
03-20-95	2	Significant revision of Sections 5.3, 7.1, 7.2, 7.3, 7.48, 7.12, and 7.13 per Request No. S94-150, initiated by R. E. Maurer. This procedure supersedes SSOP-0719, dated 2/14/94, Rev. 1 and SSOP-1067, dated 2/24/94, Rev. 0.

The latest changes to this document are indicated by a "change bar" (▌) in the right margin. Changes are also shaded in the text when needed to help identify changes. Note: Change bars and shading from the previous revision are removed, only changes for the latest revision are shown.

1.0 PURPOSE

This procedure provides instructions for the lockout and/or tagout of all processes, machines, or equipment to ensure isolation from all potentially hazardous energy and materials before any servicing and/or maintenance (preventive and corrective) activities are performed at the Fernald Environmental Management Project (FEMP).

2.0 SCOPE

This procedure applies to all FERMCO personnel, subcontractors, and teaming partners in FERMCO managed facilities.

This procedure provides a dual approach to the lockout/tagout process by combining both centrally and individually controlled approaches. It provides the means by which each Facility Owner shall maintain control over all lockout/tagout activities within his/her Facility. It also provides the means by which each Authorized Employee shall maintain a measure of control over the safety of his/her work environment while performing the work. This procedure is initiated by work order/requests for maintenance or construction, by operating procedures, or by approved documents. No other procedure shall take precedence over this procedure.

Work on the following is NOT covered by this procedure:

- Motorized vehicles
- Routine adjustments, cleaning, and tightening operations per Energy Isolation Plan (EIP) requirements.
- Cord and plug electrical equipment work if the cord and plug are NOT connected to a receptacle and the cord and plug remain in the exclusive control of the Authorized Employee while the work is being performed
- Electrical voltage of less than 30 volts
- Portions of a system controlled and worked on solely by CG&E when the work does not present a hazard to the FEMP site workers or equipment
- Hot taps SHALL NOT be performed at the FEMP except in special cases as stated in SPR 2-29, "Hot Tapping"

3.0 DEFINITIONS - See Attachment A.

4.0 RESPONSIBILITIES

The following persons/organizations are assigned responsibilities by this procedure. Attachment B describes each specific responsibility.

AFFECTED EMPLOYEES

APPOINTED EMPLOYEES

AUTHORIZED EMPLOYEES

4.0 **RESPONSIBILITIES** (cont.)

CONSTRUCTION MANAGER/CONSTRUCTION ENGINEER/CONSTRUCTION CONTRACTS MANAGER

FACILITY OWNERS or FACILITY OWNER DESIGNEES

OCCUPATIONAL SAFETY & HEALTH (OS&H) COMPLIANCE

QUALIFIED EMPLOYEES

QUALITY ASSURANCE

RESPONSIBLE SUPERVISORS

SUBCONTRACTORS

TRAINING DEPARTMENT

UTILITY ENGINEER

5.0 **GENERAL**

Operating procedures and/or energy isolation plans (EIP,) shall be used to ensure an orderly shutdown of the equipment or system.

5.1 Multiple work assignments may occur under a single Facility Owner lockout/tagout control as long as each Authorized Employee follows the requirements of this procedure.

5.2 Whenever major replacement, repair, renovation, or modification of equipment or machines is performed and new machines or equipment are installed, Facility Owners and/or Engineering shall ensure that energy or materials isolating devices are included in the design, and will accept a Facility Owner lock.

5.3 Personal locks (keys) MAY be transferred from Authorized Employees of one shift to the next as long as new DANGER - PERSONNEL WORKING tags are hung by the on-coming (replacement) Authorized Employees and there is a transfer of the keys. The replacement Authorized Employees of the same craft should follow this procedure concerning placement of DANGER - PERSONNEL WORKING (see SPR 2-62, "Safety Tags") tags and verify (independently) the isolation of hazardous energy or hazardous material.

NOTE: The transferring of keys transfers control of the locks.

5.4 Facility Owners shall maintain Authorized Employee and Qualified Employee lists.

5.0 **GENERAL** (cont.)

5.5 Both types of danger tags, "DANGER - DO NOT OPERATE" and "DANGER - PERSONNEL WORKING", are multi-part 4" x 7-1/2" forms. The portion of the tag that is hung is constructed of Tyvek with a pressure sensitive overlaminate on the side containing the written information. The tag that must be recorded according to this procedure, the "DANGER - DO NOT OPERATE" tag (see SPR 2-62, "Safety Tags"), is uniquely prenumbered (similarly to the work request/order forms). The "DANGER - PERSONNEL WORKING" tags (see SPR 2-62) are not recorded and are not prenumbered.

5.6 The Facility Owner is responsible for conducting quarterly inspections of all facility owner locks and tags hung in the areas under their control (refer to Attachment B for Facility Owner responsibilities).

6.0 **PREREQUISITES**

"DELETED"

Personnel Requirements - Training for locking and tagging equipment.

"DELETED"

7.0 **PROCEDURE**

NOTE: Cautions and Warnings precede the steps to which they apply.

NOTE: All alphanumeric steps in this procedure must be performed in the listed order. Where steps are shown without alphanumeric order (with bullets), they may be performed in any order provided they are completed prior to the next alphanumeric step.

NOTE: If the requested work activity is to be performed in a physically isolated area, go to Section 7.16.

7.1 DETERMINING THE NEED FOR AN ENERGY ISOLATION PLAN

FACILITY OWNER or AUTHORIZED EMPLOYEE

1. Determine the need for an Energy Isolation Plan (EIP). Unless the machine or system and components meets **ALL** of the following seven conditions, an Energy Isolation Plan (EIP) must be developed.

   - The machine or system and components has no potential for stored or residual energy or reaccumulation of stored energy after shutdown that could endanger personnel.

7.1 DETERMINING THE NEED FOR AN ENERGY ISOLATION PLAN (cont.)

FACILITY OWNER or AUTHORIZED EMPLOYEE

- The machine or system and components has a single energy source that can be readily identified, isolated, and locked out.
- The isolation and locking out of the energy source de-energizes and deactivates the machine or system and components.
- The machine or system and components is isolated from the energy source and locked out during servicing or maintenance.
- The lockout device is under the "exclusive control" of the Authorized Employee(s) performing service or maintenance.
- The servicing or maintenance does NOT create hazards to other personnel.
- The employee, in utilizing the exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

2. If <u>one</u> of the above conditions does not exist, prepare and have approved an Energy Isolation Plan prior to any work being performed.

3. If an EIP is not required, go to 7.3, Preparing for Lockout and Tagout.

7.2 DEVELOPING AN ENERGY ISOLATION PLAN

FACILITY OWNER or FACILITY OWNER DESIGNEE

<u>NOTE</u>: A Specific Equipment Plan is an Energy Isolation Plan (see definition) for a specific item of equipment, machinery, or system.

1. Complete a Specific Equipment Plan Worksheet (Attachment C) or Energy Isolation Plan Form (Attachment D). As a minimum, a Specific Energy Plan Worksheet should include the following:

   - The person initiating the plan and the date initiated.
   - The location of the equipment.

7.2 DEVELOPING AN ENERGY ISOLATION PLAN (cont.)

FACILITY OWNER or FACILITY OWNER DESIGNEE

- The equipment and manufacturer's identification.
- The Equipment Inventory Control number or serial number.
- The type of hazardous energy or material sources associated with the equipment.
- Where and how the energy or hazardous material source(s) are to be isolated.
- Sequence of isolation, where required.
- The alternate methods of isolating the energy and hazardous material source(s) if the energy source is not capable of being locked out.
- Information regarding other possible areas containing energy or hazardous material that should be evaluated prior to performing the task.
- Test for verification of isolation.
- Steps for restoring energy to the equipment.

2. Sign the SEP/EIP.

3. Obtain the issuer's signature (person who gathered the information on the SEP/EIP).

4. Forward the SEP/EIP to OS&H Compliance for concurrence.

   NOTE: The Facility Owner may choose to have, or OS&H Compliance may require, the additional review/approval of the SEP/EIP by Maintenance, Engineering, and/or others.

5. An EIP will be developed by Qualified Employee(s), listing the potential energy hazard(s) and the sequential order in which the job/task will be performed (See Attachment D).

OS&H COMPLIANCE

6. Review, verify, and approve the SEP/EIP and return two copies of the SEP/EIP to the Facility Owner.

   NOTE: If not approved, return the SEP/EIP worksheet to the Facility Owner with comments on why it was rejected.

7. After resolving any comments, return to step 1 above.

7.2 DEVELOPING AN ENERGY ISOLATION PLAN (cont.)

FACILITY OWNER

8. Maintain a copy of the approved SEP/EIP in a file or binder where it is accessible to the Authorized Employees.

9. Place an additional copy (in a plastic sleeve) near the process, machinery, and/or equipment so that it will be accessible to Authorized Employees.

7.3 PREPARING FOR LOCKOUT AND TAGOUT

WARNING

OPERATION OF A DANGER - DO NOT OPERATE TAGGED EQUIPMENT OR SYSTEM IS NEVER PERMITTED.

- Where Facility Owner locks are not applicable or do not provide the level of protection required, other means of isolation may be used. As a minimum, a DANGER - DO NOT OPERATE tag must be put in place. Those other means include air gaps, blind slips, blank flanges, jack stands, blocks, double valve isolation, and others as outlined in DOE-STD-1030-92, DOE Standard Guide to Good Practices For Lockout and Tagouts.

- In case of an emergency (where taking no action would create a greater hazard or allow a hazard to continue), when it is necessary to close valves or open circuit breakers, this procedure shall be suspended for the purpose of eliminating the emergency condition. No work is to be performed to repair the condition until all isolated energy or material sources have been locked out and tagged out per this procedure.

- CAUTION tags should be used for situations that require special operator or maintenance precautions or to amplify information that should be brought to the attention of the shift supervisor and/or operating personnel. CAUTION tags are not acceptable as part of the lockout/tagout procedure for personal protection.

- Fire Protection systems are normally locked and/or tagged just like any other system at the FEMP; however, where the lock would create a greater hazard and after the approval of the Manager of OS&H, permission MAY be granted for a "tag only" isolation. When this is done, other measures that provide protection equal to lockout/tagout must be established.

7.3 PREPARING FOR LOCKOUT AND TAGOUT (cont.)

- A tripped electrical circuit breaker does not constitute an open circuit for the purposes of this procedure. If a circuit breaker is tripped, before an employee can work on the system, the reason(s) for the condition must be determined and controlled by a qualified employee.

- Test equipment used on electrical circuits shall be checked for proper operation immediately before and after the test(s). Exposed employee(s) must don the appropriate Personal Protected Equipment (PPE), as listed in SPR 2-61, when testing voltage greater than 600 volts.

WARNING:

A DANGER - DO NOT OPERATE TAG MAY BE PUT IN PLACE TO PROTECT THE EQUIPMENT BUT IS INSUFFICIENT TO PROVIDE A SAFE CONDITION AND ISOLATION BOUNDARY FOR PERSONNEL PROTECTION.

WARNING

OPERATION OF A DANGER - DO NOT OPERATE TAGGED EQUIPMENT OR SYSTEM IS NEVER PERMITTED.

- DANGER - DO NOT OPERATE tags hung by the Facility Owner and verified by a Qualified, Authorized Employee for process control, equipment, and environmental protection, do not require a Facility Owner lock to be installed.

  NOTE: Use of this procedure is initiated by work order/requests for maintenance or construction, operating procedures, or other approved documents.

FACILITY OWNER

1. Authorize isolation and installation of a Facility Owner lock(s) with DANGER - DO NOT OPERATE tag(s) for personnel protection at each point of energy or material isolation.

2. Notify all employees who may be affected by the pending hazardous energy or hazardous material isolation.

7.3 PREPARING FOR LOCKOUT AND TAGOUT (cont.)

FACILITY OWNER or QUALIFIED, AUTHORIZED EMPLOYEE

3. If the Facility Owner is NOT performing the lockout/tagout, discuss with the Qualified, Authorized Employee(s) the method(s) of hazardous energy or hazardous material isolation per the approved energy or material isolation plan.

   NOTE: The Authorized Employee who is performing the hazardous energy or hazardous material isolation must be a "Qualified Employee" for the hazard being isolated. (Example: A qualified pipe fitter may be required to install pipe blank flanges prior to installing a lock and/or tag.)

4. Locate and identify, using the energy or material isolation plan (if applicable), the energy or material isolation devices necessary to isolate or safeguard the affected equipment of all systems.

7.4 INSTALLING THE LOCKOUT AND/OR TAGOUT DEVICE

FACILITY OWNER or QUALIFIED, AUTHORIZED EMPLOYEE

1. Place the energy or material isolation device in the required position (specified in the EIP).

2. Install the Facility Owner lock and DANGER - DO NOT OPERATE tag on the identified energy or material isolation device. Observe the following:

   a. If the installation of a Facility Owner lock and the associated DANGER - DO NOT OPERATE tag will prevent independent verification of the isolation, the verification may be made before the Facility Owner lock and the associated DANGER - DO NOT OPERATE tag are installed. This shall be done only if there is a way to maintain the safe condition after the check is complete and before the Facility Owner lock and DANGER - DO NOT OPERATE tag are installed.

      NOTE: The Facility Owner lock and "**DANGER - DO NOT OPERATE**" tag are the first to be installed and the last to be removed.

      NOTE: Multiple work activities may be performed under one Facility Owner lock and DANGER - DO NOT OPERATE tag.

7.4 INSTALLING THE LOCKOUT AND/OR TAGOUT DEVICE (cont.)

FACILITY OWNER or QUALIFIED, AUTHORIZED EMPLOYEE

b. When more than one activity is to be performed, install the Facility Owner lock with a DANGER - DO NOT OPERATE tag before any other tag is installed.

NOTE: Hazardous energy or hazardous material's isolation must NOT normally impact conditions established for safety, fire protection, or environmental requirements unless approved by the Facility Owner and a FERMCO department manager or above.

3. If a Facility Owner lock cannot be installed, hang a DANGER - DO NOT OPERATE tag and use an alternate means of rendering the energy or material isolation source inoperative.

NOTE: When a Facility Owner lock cannot be used for personnel protection, an energy or material isolation plan must be verified and approved by the Safety Engineer of OS&H Compliance.

NOTE: OS&H Compliance Safety Engineering and others may be consulted to assist in finding an alternate means of rendering the energy or material isolation source inoperative.

4. If a Facility Owner lock is not used per step 3 above, record that the lock was not used on the DANGER - DO NOT OPERATE tag under "Position of Component" and in the Lockout/Tagout Log under "Tag and Lock Number" (Attachment E).

5. Ensure that each DANGER - DO NOT OPERATE tag is numbered and contains the following:

- Date of the hazardous energy or hazardous material isolation
- Equipment or process being isolated
- Activity or service that requires the lockout
- Position of the component
- Signature of the person authorizing the installation of the Facility Owner lock and DANGER - DO NOT OPERATE tag

7.4 INSTALLING THE LOCKOUT AND/OR TAGOUT DEVICE (cont.)

FACILITY OWNER or QUALIFIED, AUTHORIZED EMPLOYEE

- Signature of the person installing the Facility Owner lock and DANGER - DO NOT OPERATE tag

  NOTE: Do not separate or seal the components of the DANGER - DO NOT OPERATE tag; the Independent Verifier must still sign and date the tag before it can be separated (Section 7.9).

6. Repeat Steps 1 through 5 of this section as many times as necessary to install the specified locks/tags.

FACILITY OWNER

7. Maintain control of keys to the installed Facility Owner locks.

FACILITY OWNER or DESIGNEE

8. Enter the following information in the Lockout/Tagout Log (Attachment E):

   - Type of tag - Caution or DDNO (for DANGER - DO NOT OPERATE tag)
   - Tag/Lock # (Facility Owner's tag/lock number)
   - Location of the Tag/Reason for the Tag
   - Position: On/Off - Open/Closed
   - F.O./Designee Name, Badge #, and Date of Authorization
   - Authorized Emp. Name, Badge #, and Date Installed
   - Verifier Name, Badge #, and Date Authorized
   - Date Tag Removed/By Whom and Badge #

9. Control the log and maintain it in the secured Facility Owners lockout/tagout cabinet.

   NOTE: If this section is not applicable to the work being performed, go to Section 7.5.

7.5 WORKING ON LIQUID SYSTEMS, GAS SYSTEMS, OR PIPING

QUALIFIED, AUTHORIZED EMPLOYEE

1. For liquid and/or gas systems whose maximum operating temperature is less than 200°F and maximum operating pressure is less than 500 psig, the following methods shall be used:

   a. Isolate systems and components normally operating at temperatures and pressures above ambient, through the use of at least one valve between the work area and any heated or pressurized fluid. Vent, and if possible, drain.

      NOTE: The venting and draining of hazardous materials shall be performed with the proper care and by an approved procedure.

   b. If possible, maintain the equipment in a depressurized state by tagging open a vent or drain in the isolated portion of the system to be worked on, using a DANGER - DO NOT OPERATE tag (allowing for thermal expansion/ contraction).

   c. If a normal depressurization path cannot be provided within the work boundary, use other methods to ensure adequate depressurizing and draining of system or component (loosening fasteners on flanged connections or valve bonnets, removing instrument tubing, etc.). Strict supervisory control and advance planning are required if these methods are used.

2. When isolating systems or equipment whose operating temperature exceeds 200°F or operating pressure exceeds 500 psig, the following limits shall be observed in addition to those above:

   a. At least two shutoff valves in series ("two-valve protection") shall be used to provide isolation from the fluid. The requirements for two-valve protection shall apply to all paths from which the fluid could cross the work boundary.

7.5 WORKING ON LIQUID SYSTEMS, GAS SYSTEMS, OR PIPING (cont.)

QUALIFIED, AUTHORIZED EMPLOYEE

b. Single-valve isolation may be used if the system operating controls are locked/tagged where pressures greater than 500 psig and/or temperatures greater than 200°F cannot be reached. (For example, if a boiler is cooled down for maintenance and its operating controls are locked and tagged, work on the steam system can be done with single-valve isolation.)

c. If the required two-valve protection cannot be obtained and the system must remain in operation, the Facility Owner or OS&H Compliance may authorize single-valve isolation, provided that the following three conditions are all met:

(1) Alternate isolation devices (such as blank flanges, blocks, or freeze seals) have been considered and determined to be unfeasible or impracticable.

(2) Approval of the single-valve isolation is documented on the energy or materials isolation plan.

(3) The integrity of the single isolation valve is verified by venting or draining the portion of the system to be worked on and observing it for at least 15 minutes to ensure there are no leaks and the valve is closed before starting work.

7.6 WORKING ON EQUIPMENT REQUIRING VALVE ISOLATION

<u>NOTE</u>: If this section is not applicable to the work being performed, go to the next section.

FACILITY OWNER or QUALIFIED, AUTHORIZED EMPLOYEE

1. Ensure that pneumatically or solenoid operated valves that fail-open have the valve operating supplies isolated and a jacking device or gag installed to keep the valve shut. Tagout the valve and its energy or materials isolation device with a DANGER - DO NOT OPERATE Facility Owner tag and lock (if for personnel protection).

7.6 WORKING ON EQUIPMENT REQUIRING VALVE ISOLATION (cont.)

FACILITY OWNER or QUALIFIED, AUTHORIZED EMPLOYEE

2. Ensure that pneumatically or electrically operated valves that fail shut are verified in the isolated position and the valve operating supplies are isolated, locked out for personnel protection, and tagged out.

3. To use a pneumatically or electrically operated valve as a hazardous energy or hazardous materials control boundary, isolate the motive energy source for the valve and lock/tag out the valve after the valve is in the required position.

4. Tag out all local and remote pneumatic and electric valve operators when the valve is used as a system isolation boundary point.

5. Do NOT use pressure operated valves, regulators and check valves as isolation boundary valves unless the valve is mechanically restrained in the required position with a gagging device designed to be used for isolation valve purpose, locked out for personnel protection, and tagged out.

6. Consider and, if necessary, specify additional isolation to ensure protection when working on valve motor actuators with manual overrides, springs, or other operating mechanisms.

7. For personnel protection, for a motor or for a pneumatically operated valve used as an isolation boundary point:

   a. place a Facility Owner lock and a DANGER-DO NOT OPERATE tag on the local control point (e.g., handwheel, manual operator)

   b. tag remote control points (e.g., control switches).

8. After locks/tags are applied to energy or material isolating devices, relieve, disconnect, restrain, and otherwise ensure all potentially hazardous stored or residual hazardous energy sources.

7.7 WORKING ON ELECTRICAL EQUIPMENT REQUIRING ELECTRICAL GROUNDING

NOTE: If this section is not applicable to the work being performed, go to the next section.

> **WARNING**:
>
> **ELECTRICAL CONTROL CIRCUITS SHOULD NOT BE USED AS BOUNDARY ISOLATION POINTS SINCE THEY DO NOT PROVIDE ADEQUATE PROTECTION TO INTERRUPT MAIN POWER.**

1. If electrical grounding devices are required, ensure that the location and sequence for installation of each device is specified in the energy or material isolation plan.

2. Place DANGER - DO NOT OPERATE tags on all electrical grounding devices used in lockout/tagout to ensure the placement of the grounds until the work is complete and the removal of the grounds before re-energizing the system.

7.8 WORKING ON ROTATING/MOVING EQUIPMENT

NOTE: If this section is not applicable to the work being performed, go to the next section.

1. Where isolation from a hazardous energy source does NOT eliminate the potential for hazardous movement/rotation of equipment, block the equipment or otherwise secure the equipment to prevent movement.

2. Install a Facility Owner DANGER - DO NOT OPERATE tag and, if possible, Facility Owner lock in place to block or secure devices.

7.9 VERIFYING ISOLATION AND PROPER INSTALLATION OF LOCKOUT/TAGOUT DEVICES

> **WARNING**:
>
> **THE UNDERLYING PRINCIPLE OF INDEPENDENT VERIFICATION IS THAT ANYONE CAN MAKE A MISTAKE. THIS ALSO MEANS THAT ANY INCONSISTENCY IDENTIFIED BY THE VERIFIER COULD BE THE VERIFIER'S MISTAKE. THE VERIFIER SHOULD NOT CHANGE THE POSITION OR STATUS OF A COMPONENT TO CORRECT AN INCONSISTENCY.**

NOTE: Tags without locks are not acceptable for personnel protection unless indicated on the energy insolation plan.

7.9 VERIFYING ISOLATION AND PROPER INSTALLATION OF LOCKOUT/TAGOUT DEVICES (cont.)

NOTE: Independent Verification shall be the normal method of verification unless special authorization exists in the energy or material isolation plan for concurrent dual verification.

NOTE: Concurrent dual verification (see definition in Attachment A) is permitted in only those unique cases where independent verification would not be effective (e.g., throttled valves); it must be approved in the energy or material isolation plan. Some energy or material isolation devices such as throttled valves (valves in an intermediate position: between fully open and fully closed) cannot be verified independently and may require concurrent dual verification.

NOTE: The individual performing independent verification must be a different Qualified, Authorized Employee than the one who installed the DANGER - DO NOT OPERATE tag and Facility Owner lock.

NOTE: The independent verification must also be separated by a period of time after the hazardous energy or hazardous material isolation, DANGER - DO NOT OPERATE tagging, and Facility Owner lock installation has been completed.

QUALIFIED, AUTHORIZED EMPLOYEE

1. Independently verify the correct installation of the equipment or components covered by the lockout/tagout per the EIP.
   - Identify the correct component
   - Identify the correct position of the energy or material in the isolation plan
   - Correct position determinates, as appropriate
     - Process parameters observed
     - Remote indicators
     - Valve stems/position indicators
   - Perform a safe condition test of isolation per the EIP.

7.9 VERIFYING ISOLATION AND PROPER INSTALLATION OF LOCKOUT/TAGOUT DEVICES (cont.)

QUALIFIED, AUTHORIZED EMPLOYEE

> **WARNING:**
>
> **USE ONLY STEPS LISTED IN THE ENERGY AND MATERIAL ISOLATION PLAN TO VERIFY ISOLATION.**

NOTE: Verify the isolation of the equipment by operating the push button or other normal operating control(s), unless otherwise prohibited by the EIP.

2. If the safe condition check/verification of isolation reveals any inconsistencies, immediately notify the Facility Owner.

3. If an inconsistency is discovered such as a DANGER - DO NOT OPERATE tag without a Facility Owner lock installed, the verifier should immediately stop and notify her/his Responsible Supervisor and the Facility Owner.

4. Verify the **Stop Work** and complete all documentation.

5. If the correct installation is verified, sign and date the DANGER - DO NOT OPERATE tag. The tag should also be separated and sealed (the plastic laminate covering the Tyvek copy).

6. Verify the correct completion of all documentation.

7. Initial and date the Lockout/Tagout Log.

7.10 NOTIFICATION OF INSTALLATION

QUALIFIED, AUTHORIZED EMPLOYEE

1. Notify the Facility Owner of the installation of the lockout and/or tagout.

7.10 NOTIFICATION OF INSTALLATION (cont.)

FACILITY OWNER or DESIGNEE

2. Notify all Affected Employees of the installation of the lockout/tagout.

   NOTE: The energy and material isolation plan will list any Affected Employees and/or others who must be notified.

7.11 PERFORMING REQUESTED ACTIVITY (SAFE CONDITION CHECK) - (See Attachment A for the definition.)

AUTHORIZED EMPLOYEE

1. Before starting work, review the points of the hazardous energy or hazardous material isolation and confirm the isolation of all hazardous energy or hazardous material sources.

   NOTE: A physical walkdown should be performed to verify the isolation per the energy or material isolation plan.

   NOTE: If an approved group lockout (see Attachment A, Definitions) is used, a DANGER - PERSONNEL WORKING tag and associated personal lock for each Authorized Employee is placed on the group lock box per Section 7.12, Installing a Group Lockout.

2. Use test equipment to test the circuit elements and electrical parts of equipment to which Authorized Employees will be exposed.

3. Verify the de-energization of the circuit elements and equipment parts by doing one of the following:

   - checking the position indicators on electrical isolation devices,
   - visually verify the opening of any disconnects,
   - or by performing a voltage check to ensure the cessation of available power.

7.11 PERFORMING REQUESTED ACTIVITY (SAFE CONDITION CHECK) - (See Attachment A for the definition.) (cont.)

> **WARNING:**
>
> **USE ONLY THE STEPS LISTED IN THE APPROVED ENERGY OR MATERIAL ISOLATION PLAN TO VERIFY ISOLATION.**

4. As the review of each point of hazardous energy or hazardous material isolation is made, each Authorized Employee performing the requested activity shall install a DANGER - PERSONNEL WORKING tag and a personal lock.

   NOTE: Hanging a DANGER - PERSONNEL WORKING tag and personal lock signifies the agreement of the Authorized Employee with the hazardous energy or hazardous material isolation plan. No activity or service is to begin until all Authorized Employees have installed their own personal locks and DANGER - PERSONNEL WORKING tags for each operation.

5. If an inconsistency is found, immediately stop any action and report the inconsistency to the Responsible Supervisor.

6. Prior to restarting any action, resolve the inconsistency with the Responsible Supervisor and/or Facility Owner. Restart at step 1 of this section.

7. Perform the requested activity for which the hazardous energy or hazardous material isolation has been performed.

8. During a shift change, unless excluded in an approved energy and material isolation plan, Authorized Employees working on the activity may leave their personal locks and DANGER - PERSONNEL WORKING tags installed for the duration of the time that they are assigned to the activity (over several days and through different shifts). They must perform a Safe Condition Check and ensure that their personal lock and DANGER- PERSONNEL WORKING tag is in place each time they return to the activity.

7.12 INSTALLING A GROUP LOCKOUT

FACILITY OWNER OR QUALIFIED, AUTHORIZED EMPLOYEE

1. Place a Facility Owner lock and DANGER - DO NOT OPERATE tag at each point of isolation of hazardous energy or hazardous material source.

2. Independently verify isolation of each hazardous energy or hazardous material source (see Section on Verification).

3. Log the installation of the Facility Owner Lock and DANGER - DO NOT OPERATE tag in the Lockout/Tagout Log.

4. Place the keys from the installed Facility Owner lock(s) into the group lock box.

5. Place a Facility Owner lock and DANGER - DO NOT OPERATE tag on the group lock box.

6. Log the installation of the Facility Owner Lock and DANGER - DO NOT OPERATE tag in the Lockout/Tagout Log.

7. Maintain control of the Facility Owner lock's key to the group lock box.

EACH AUTHORIZED EMPLOYEE (who will be doing the work)

8. Perform a Safe Condition Check:

   a. If in agreement with isolation, place a personal lock and a DANGER - PERSONNEL WORKING tag on the group lock box.

   b. If not in agreement with isolation, stop work and contact the Supervisor.

7.13 TEMPORARY OR PARTIAL CLEARANCE/SUSPENDED WORK/PRE- AND POST-TROUBLESHOOTING

A. TEMPORARY OR PARTIAL CLEARANCE

<u>NOTE</u>: Temporary or partial removal of a lockout/tagout is not allowed, **EXCEPT** when required as a part of an approved energy and material isolation plan (Example: To stroke a motor operated valve or to check phase rotation on a motor). It is important that a temporary or partial removal of lockout/tagout is NOT regarded as an opportunity to take shortcuts.

7.13 TEMPORARY OR PARTIAL CLEARANCE/SUSPENDED WORK/PRE- AND POST-TROUBLESHOOTING (cont.)

B. SUSPENDED WORK

AUTHORIZED EMPLOYEE

1. If work is to be suspended, and personal locks and DANGER - PERSONNEL WORKING tags are to be removed (refer to Section 7.14):

   a. Leave the Facility Owner's lock(s) and DANGER - DO NOT OPERATE tag(s) in place during the work suspension if required for safety reasons.

   b. If the Facility Owner's lock(s)/tag(s) are to be cleared, all Authorized Employees working on the affected equipment or system must first remove their personal lock(s) and DANGER - DO NOT OPERATE tags from the energy or material isolation device.

C. PRE-TROUBLESHOOTING

FACILITY OWNER

1. If testing or troubleshooting is required, verify the existence of an approved energy and material isolation plan or Standard Operating Procedure requiring the testing or troubleshooting of a component prior to isolation of the system/equipment.

   - Temporary lockout and tagout may be allowed during single-craft (e.g., electrician only) short-term (not to exceed the end of the shift) work if:

     - The EIP contains approval of temporary lockout and tagout.

     - The EIP is displayed on the system/equipment.

     - Only personal locks and DANGER - PERSONNEL WORKING tags are used.

     - If work exceeds the shift, a Facility Owner lock and DANGER - DO NOT OPERATE tag must be applied per this procedure. CAUTION tags may be installed on remote control operating switches.

7.13 TEMPORARY OR PARTIAL CLEARANCE/SUSPENDED WORK/PRE- AND POST-TROUBLESHOOTING (cont.)

FACILITY OWNER

2. If an approved energy and material isolation plan does not exist requiring the testing or troubleshooting of a locked/tagged component and one is required, have one created and approved.

D. POST-TROUBLESHOOTING

1. Ensure that an approved energy and material isolation plan exists for testing and troubleshooting a locked and tagged component.

2. Obtain authorization for "lifting" (i.e., temporary removal) of locks/tags from the Facility Owner or Designee.

3. Ensure the removal of all tools and equipment from the equipment.

4. Verify that no personnel could be harmed by operation of the component(s).

5. Ensure the acceptability to OS&H Compliance and to the Responsible Supervisor (if applicable) of the planned operation.

6. Authorize temporary clearance of the Facility Owner locks and DANGER - DO NOT OPERATE tags.

7. Document the authorization and the reason for lifting the Facility Owner locks and DANGER - DO NOT OPERATE tags on the Lockout/Tagout Log (Attachment E).

FACILITY OWNER and AUTHORIZED EMPLOYEE(S)

8. Meet and agree to release the lockout/tagout on the designated energy/material source(s) per the EIP.

9. Release the affected components, remove the locks and tags from the affected components and, following completion of that action, clear to Facility Owner Lock and DANGER - DO NOT OPERATE tag. The affected component(s) are now cleared.

7.13 TEMPORARY OR PARTIAL CLEARANCE/SUSPENDED WORK/PRE- AND POST-TROUBLESHOOTING (cont.)

FACILITY OWNER

10. Make the required entries in the Lockout/Tagout Log.

AUTHORIZED EMPLOYEE(S)

11. Perform the testing or troubleshooting as outlined in the approved energy and material isolation plan.

12. If the equipment is ready to be returned to service, remove the remainder of the Lockout/Tagout by completing Section 7.14.

13. If the equipment is not ready to be returned to service:

    a. Restore the equipment to the isolation position/condition (per the approved EIP),

    b. Reinstall the DANGER - DO NOT OPERATE tags

    c. Perform a safe condition check as described in Sections 7.10 and 7.11 (include new tags and log entries), and

    NOTE: If other jobs or operations require the retests (as defined by the energy and materials isolation plan) to be delayed after clearing tags, ensure that the Affected and Authorized Employees in the area are aware of this fact.

    NOTE: The status of the retests should be included in every shift turnover until the system is fully restored. CAUTION tags on system controls may be used for extra assurance to prevent inadvertently operating the system until retests are complete.

7.14 REMOVING LOCKOUTS/TAGOUTS

NOTE: When it is necessary to remove energy or material isolation devices and restore hazardous energy for the purpose of testing equipment following the performance of servicing, inspecting, construction, or maintenance activities, no exception to this procedure is permitted, unless these actions are approved as part of a previously approved energy or materials isolation plan.

AUTHORIZED EMPLOYEE

1. Notify the Facility Owner and Affected Employees prior to the restoration of hazardous energy.

2. Ensure the removal of all tools and any items associated with the job from the work site.

3. When work is complete, notify the Responsible Supervisor of the work status.

RESPONSIBLE SUPERVISOR

4. Physically check the work site to confirm the completion of the work, that no unsafe conditions were created by the work, the removal of any work-related materials, and the accountability of all authorized personnel from the work site.

5. Notify the Facility Owner of the completion of work.

FACILITY OWNER

6. Check the work site to confirm the completion of the work, verifying the shutdown condition of the controls, and the removal of tools and excess materials from the work site.

FACILITY OWNER and AUTHORIZED EMPLOYEE(S)

7. If work is complete and satisfactory, release and then remove or authorize the removal of the Personal locks, DANGER - PERSONNEL WORKING tags, Facility Owner lock(s), and/or DANGER - DO NOT OPERATE tag(s) from energy or material isolation devices.

7.14 REMOVING LOCKOUTS/TAGOUTS (cont.)

FACILITY OWNER and AUTHORIZED EMPLOYEE(S)

8. If an Authorized Employee has left a personal lock and/or DANGER - PERSONNEL WORKING tag installed and is NOT available to remove it, the personal lock and/or DANGER - PERSONNEL WORKING tag may be removed under the direction of the Facility Owner if it can be verified that:

   - The Authorized Employee who installed the personal lock and/or DANGER - PERSONNEL WORKING tag is NOT onsite.
   - A reasonable effort has been made to contact and inform the Authorized Employee that all personal locks and/or DANGER - PERSONNEL WORKING tag are to be removed.
   - The Authorized Employee has knowledge of the removal of his/her personal lock and/or DANGER - PERSONNEL WORKING tag prior to resuming work at the site.

9. If work is not complete and satisfactory, consult with the Responsible Supervisor and complete the requested activity.

FACILITY OWNER

10. Make the required entries in the Lockout/Tagout Log.

11. Notify Affected Employees of the removal of the lockout/tagout.

12. Update all normal configuration and status/equipment status logs, boards, and documentation.

    NOTE: The Facility Owner must coordinate the approvals necessary to establish the plant conditions required when a lockout/tagout is cleared. The Facility Owner must also ensure the understanding of the person clearing tags about which components are to be repositioned when clearing the lockout/tagout.

13. Dispose of tags after use as follows:

    a. Tags which were installed in a radiologically controlled area should be disposed of inside the area in accordance with applicable procedures.

    b. Return other tags to the Facility Owner for disposal.

    c. Enter the appropriate information on the Lockout/Tagout Log (Attachment E).

7.15 MISSING, MUTILATED, or ILLEGIBLE TAGS

FACILITY OWNER

1. Verify (by using the Lockout/Tagout Log) the continuing requirement for the Facility Owner lock or DANGER - DO NOT OPERATE tag or CAUTION tag.

2. Obtain and complete a replacement tag.

3. Note the replacement of the tag and the number of the replacement tag on the Lockout/Tagout Log (Attachment E).

4. Install the tag.

   NOTE: A safe condition check is NOT required unless designated by the Facility Owner.

5. Have the replacement tag independently verified.

6. Remove and dispose of the damaged or mutilated tag.

7.16 PROCEDURE FOR PHYSICALLY ISOLATED AREAS (UNDER CONSTRUCTION OR DEMOLITION)

NOTE: When making connections to site energy and/or material distribution systems (e.g., steam, water, electrical, air) and/or activities performed in a physically isolated facility, all applicable portions of Sections 7.1 through 7.15 of this procedure must be completed.

NOTE: All employees performing lockout and tagout activities under this section of the procedure will be responsible for their own safety by personally locking-out and tagging the equipment on which they are working. Group lockout is permitted as defined in this procedure (see the definition of "Group Lockout" in Attachment A and Lockout/Tagout Log for Isolated Areas in Attachment F).

SUBCONTRACTOR AND SUBCONTRACT EMPLOYEES

1. Building isolation practice requirements for physically isolating facilities for demolition and/or destruction include:

   - All utilities shall be cut at the facility/project boundary.

   - All energized pipe or conduit shall be marked every 10 to 20 feet with a marker stating that the lines are energized

7.16 PROCEDURE FOR PHYSICALLY ISOLATED AREAS (UNDER CONSTRUCTION OR DEMOLITION) (cont.)

SUBCONTRACTOR AND SUBCONTRACT EMPLOYEES

- All lines shall be tested to verify that they are de-energized prior to performing work

  NOTE: The representative shall ensure that each lock is uniquely numbered. The personal locks come from Stores numbered and must have a number etched on the attached tag.

- An adequate quantity of DANGER - PERSONNEL WORKING tags (obtained from FERMCO Stores).

APPOINTED EMPLOYEES

2. All employees performing work on the physically isolated project shall attend no less than General Employee Training (GET), which identifies the requirements of Lockout/Tagout at the FEMP for Affected Employees.

   NOTE: GET training does not qualify Appointed Employees as "Authorized" to perform lockout and tagout under the requirements of Section 7.1 through 7.14 of this procedure.

SUBCONTRACT REPRESENTATIVE

3. Train (or ensure training by checking the subcontract employee's training records) and document the following basic responsibilities for controlling hazardous energy and materials for employees:

   INITIATE

   - Requirements for the protection of "Appointed Employees," and equipment and hazardous material control for performing work directly under the control of the subcontractor's organization.

   PREPARE

   - Selection of "appointed employee(s)" based on training to perform work in a physically isolated area/facility.

   - Notification of all Affected Employees of the impending lockout/tagout activity by the appointed employee.

7.16 PROCEDURE FOR PHYSICALLY ISOLATED AREAS (UNDER CONSTRUCTION OR DEMOLITION) (cont.)

SUBCONTRACT REPRESENTATIVE

- Maintenance of adequate quantities of personal locks and DANGER - PERSONNEL WORKING tags necessary to perform the work and documentation on the Lockout/Tagout Log to whom the personnel locks were issued.

INSTALL

- Location and de-energization of energy sources and installation of personal locks and DANGER - PERSONNEL WORKING tags by appointed employees. In some cases, other means of securing stored energy may be required. <u>The intent of this procedure is that all energy shall be controlled.</u>

SAFE BOUNDARY CHECK

- Assurance of the isolation of all potentially hazardous energy (including all potential energy) and material, as well as the installation of personal locks and DANGER - PERSONNEL WORKING tags by appointed employee(s) who have checked for proper de-energization of equipment by testing or inspecting equipment by:

  a. Reading gauges

  b. Checking with a meter

  c. As directed by her/his management

REMOVING LOCKS AND TAGS (Suspending Work/Temporary or Clearance)

- If work is suspended or partial clearance is required, refer to "REMOVING LOCKS AND TAGS" above. If equipment is again de-energized for repair, refer to "INITIATE", "PREPARE", and "INSTALL" as outlined in this section.

- Removal of all tools and materials upon completion of work.

- Notification of the Responsible Supervisor concerning the completion of the activity.

7.16 PROCEDURE FOR PHYSICALLY ISOLATED AREAS (UNDER CONSTRUCTION OR DEMOLITION) (cont.)

SUBCONTRACT REPRESENTATIVE

- Notification of all Affected Employees of the completion of the work and of the pending return to service of the equipment by the appointed employee(s).
- Discarding tags and returning the locks to the subcontractor's representative per the subcontractor's procedure when work is complete.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities"
- DOE-STD-1030-92, "Guide to Good Practices for Lockout and Tagouts"
- DOE-STD-1036-93, "Guide to Good Practices for Independent Verification"
- DOE 4330.4B, "Maintenance Management Program"
- 29 CFR 1910.147 - "Occupational Safety and Health Standards"
- 29 CFR 1910.331-335 and 339 - "Occupational Safety and Health Standards"

8.2 REFERENCES

- SSOP-0061, "FEMP Work Request/Order Procedure"
- RSM-0013, "Fire Protection Impairment"
- SPR 2-29, "Hot Tapping"
- SPR 2-61, "Electrical Safety-Related Work Practices"
- SPR 2-62, "Safety Tags"

DEFINITIONS

NOTE: All definitions describing "employees" are listed on this page. Following the employee listings, alphabetical order will be used.

Affected Employee - The level of training for an Affected Employee is covered in General Employee Training (GET). An employee whose job requires her/him:

- To operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout.

  or

- To work in an area in which such servicing or maintenance is being performed but does NOT require entry into the path of hazardous energy or material.

Appointed Employee - A subcontractor employee trained to the requirements of the contractor's lockout/tagout program, who performs lockout/tagout activities according to the contractor's lockout/tagout program in physically isolated areas for construction and demolition activities as outlined in Section 7.16. Persons in this category may not perform lockout/tagout under Section 7.1 through Section 7.12, unless they have successfully completed the FERMCO Lock and Tag training course (Lesson #1622).

Assistant Emergency Duty Officer (AEDO) - The emergency management authority on site when the Emergency Operations Center (EOC) is not operational. The AEDO is the incident commander of the FEMP emergency response activities. In non-emergency times, the AEDO is the Utility Engineer.

Authorized Employee - A qualified employee who locks out or tags out machines or equipment in order to perform service or maintenance on that machine or equipment or whose work requires her/him to enter the path of hazardous energy or hazardous material. An Affected Employee becomes an Authorized Employee when that employee's duties include performing service or maintenance covered in this procedure. An Authorized Employee also includes anyone who authorizes lockouts/tagouts or work performed in this procedure. Authorized Employees are not required in activities performed in Section 7.16 of this procedure.

Capable of being locked out - An energy or material isolating device is considered capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy or material isolating devices are considered capable of being locked out if lockout can be achieved without dismantling, rebuilding, or replacing the energy or material isolating device or permanently altering its energy or material control capability.

CAUTION Tag - A tag used to assure that notice of some precaution or some information that is necessary prior to the operation of a process, machinery, and/or equipment is readily apparent. CAUTION tags shall NOT be used for personnel protection (i.e., CAUTION tags shall NOT be used where it is appropriate to use a lock and DANGER - DO NOT OPERATE tag). The use of CAUTION tags should be restricted to those situations in which a component or system is functional, but when some precaution or item(s) of information is necessary prior to operation. CAUTION tags in use are tracked via the Lockout and Tagout Log.

DEFINITIONS (cont.)

Cleared - An energy or material isolation device is "cleared" when all locks and tags have been removed. The Facility Owner lock and associated DANGER - DO NOT OPERATE Tag(s) shall be the last lock and tag(s) removed. An energy or material isolation device cannot be cleared until all Authorized Employees working on the affected equipment or system have released it.

Concurrent Dual Verification - In operations where it is critical that the Authorized Employee who is isolating the hazardous energy or hazardous material follow a specific process or series of sequential steps, it may be impossible for the verifier to determine that the steps were performed correctly through observation of the completed action. These operations should be verified by two Authorized Employees independently observing that the proper steps, sequence, or adjustments are performed according to the energy or material isolation plan. The interaction between the Authorized Employee performing the isolation and the Authorized Employee verifying the action should be minimal so as to maintain independence. This type of verification is only allowed in special cases authorized in the individualized energy or material isolation plan.

Construction Manager/Construction Engineer/Construction Contracts Manager - A person who oversees construction activities within a designated work package assigned to construction.

Controlled Document - A document that is dated, signed, and can be verified to be the most current version prior to its use.

Controlled Drawing - A drawing that is dated, signed, and can be verified to be the most current revision prior to its use.

DANGER - DO NOT OPERATE Tag (See SPR 2-62 for an example) - A tag used to warn against hazardous conditions if machinery or equipment is energized or material is not contained or constrained. The tag shall contain the legend "DANGER - Do Not Operate". The tag is hung by, or under the authority of, the Facility Owner. The use of DANGER - DO NOT OPERATE tags is tracked via the Lockout and Tagout Log.

DANGER - PERSONNEL WORKING Tag (See SPR 2-62 for an example) - A tag used to confirm that each Authorized Employee (except on activities covered by Section 7.16) working on an activity has agreed that the hazardous energy or hazardous material has been correctly isolated at the point identified by the tag. The use of DANGER - PERSONNEL WORKING tags is NOT tracked via the Lockout and Tagout Log (except on activities covered by Section 7.16). This tag shall NOT be hung by itself; it must accompany, or be above, where a DANGER - DO NOT OPERATE tag is already hanging (except on activities covered by Section 7.16).

Energized - Connected to an energy source or containing residual or stored energy.

Energy or Material Isolation Device - A mechanical device that prevents the transmission or release of hazardous energy or hazardous material, including, but not limited to, the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate hazardous energy or hazardous materials. Push buttons, selector switches, and other control circuit type devices are NOT energy or material isolating devices.

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DEFINITIONS (cont.)

Energy (or Hazardous Material) Isolation Plan (EIP) - A written plan that outlines in detail the steps and special pieces of hardware necessary for isolating all hazardous energy and hazardous materials of a specific process, equipment, machine, or system. An energy or material isolation plan outlines steps used for the restoration of hazardous energy and hazardous materials for testing purposes. An energy or material isolation plan is written by, or under the authorization of, the Facility Owner and approved by OS&H Compliance. It is a controlled document. The plan shall include one or more of the following:

- The specific steps for shutting down, isolating, blocking, and securing the specific machine, equipment, or components to control the hazardous energy or hazardous materials.
- The steps for the placement and removal of Facility Owner locks and DANGER - DO NOT OPERATE tags.
- The specific requirements for testing a machine or equipment to determine and verify (including independent verification) the effectiveness of the Facility Owner locks, DANGER - DO NOT OPERATE tags, and other hazardous energy and hazardous material control measures.
- Any special instructions such as checks to be made or people to be notified including notification of Affected Employees.
- Drawings or other means to ensure the use of the correct energy or material isolation devices and maintenance of the proper configuration.

Examples of energy or material isolation plans include Specific Equipment Plans, Maintenance Work Instructions, Operating Procedures, Specific Equipment Plans (Construction), documented "walk-downs" of valve and/or equipment alinements, and other similar, controlled documents.

Energy Source - The origin of the energy directly or indirectly supplied to an affected system, for example, electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or potential (gravity) energy.

Exclusive Control - Energization or de-energization of an isolation point under the complete control of an Authorized Employee who is performing the work activity.

Facility Owner - An individual who is responsible for a facility or area at the FEMP. This responsibility is assigned by FERMCO management.

Facility Owner Designee or Facility Owner Alternate - An "Alternate" is an assigned replacement for a Facility Owner having the same authority and responsibility as the Facility Owner. A "designee" is authorized to act for the Facility Owner with some limited authority and responsibility to the extent authorized by the Facility Owner. This authority and responsibility is granted by the Facility Owner in writing.

DEFINITIONS (cont.)

Facility Owner Locks - A uniquely identified lock used for personnel protection to isolate hazardous energy and hazardous material sources under the authorization of the Facility Owner. The use of Facility Owner locks is tracked via the Lockout and Tagout Log. These locks shall only be used to secure energy or material isolation devices from unauthorized use.

NOTE: This definition does NOT apply to personal locks installed by the Authorized Employees performing the requested activity.

Gagged - A mechanical device used to ensure that equipment or a device can not be operated.

Group Lockout - A special means of isolating equipment that reduces the number of locks required for Authorized Employees performing the work while providing the same level of protection. It can be used by multiple crafts or groups when approved by the Facility Owner. A Group Lockout consists of:

- A Facility Owner lock and DANGER - DO NOT OPERATE tag being placed at each point of isolation of hazardous energy or hazardous material source,
- Independent verification of isolation of hazardous energy or hazardous material source,
- Placing the keys from the installed Facility Owner locks into the group lock box,
- A Facility Owner lock and DANGER - DO NOT OPERATE tag being placed on the lock box,
- and control of the Facility Owner's key to the group lock box being maintained by the Facility Owner or Designee.

Each Authorized Employee who will be doing the work must perform a Safe Condition Check and place a personal lock and a DANGER - PERSONNEL WORKING tag on the group lock box.

Hazardous Material - Any material that by its chemical composition (i.e., recognized toxicity), physical condition (e.g., temperature, pressure), or location in regards to another hazard (e.g., water near electrical service) creates a danger to nearby workers, equipment, or the environment. Examples of hazardous materials include those toxic materials defined and listed in various Federal, state, and local regulations as well as those materials presenting temperature, pressure, or situational hazards.

Hot Tap - A method used in repair, maintenance, and service activities that involves direct connection (e.g., welding on a piece of equipment such as a pipeline, vessel, or tank that is under pressure) to an energy or material source that has NOT been isolated for the purpose of installing connections or appurtenances. Hot taps should only be used when continuity of service is essential. Performing a "hot tap" means that a connection is made to an energized line (usually electricity or a pressurized fluid). (Except in special cases, approved by OS&H Compliance and FERMCO department management, where no other acceptable means exists to perform this activity, hot taps SHALL NOT be performed at the FEMP.)

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DEFINITIONS (cont.)

Independent Verification - The act of checking a condition separately from activities related to establishing the condition or component's position. Independent Verification recognizes the human element of component operation i.e., any individual, no matter how proficient and conscientious, can make a mistake.

Lockout - The placement of a Facility Owner lock (with associated DANGER - DO NOT OPERATE tag) on an energy or material isolating device in accordance with an established procedure, ensuring that the energy or material isolating device and the equipment being controlled cannot be operated until the lock or lockout device is removed.

Lockout Device - The Facility Owner method that holds the energy or materials isolating device in the safe position and prevents the energizing of a machine or equipment for personnel protection. A lockout device may include blank flanges and bolted slip blinds. Where a lock cannot be installed, jacks, air gaps, or other devices approved by OS&H Compliance may be used.

Lockout and Tagout Log (Attachment E) - A log consisting of an index and a record sheet(s) (by activity) used by the Facility Owner for recording the placement and removal of Facility Owner locks, DANGER - DO NOT OPERATE tags, and CAUTION tags on equipment within a facility (except on activities covered by Section 7.16).

Normal Production Operations - The utilization of a machine or equipment to perform its intended production function.

Personal Locks - Unique locks used by Authorized Employees to ensure hazardous energy or material isolation while they are performing an activity that requires the isolation of hazardous energy or hazardous materials. There are no master keys available; only the Authorized Employee has keys to his/her locks. These locks will only be used by Authorized Employees to control energy or materials isolation devices already locked by the Facility Owner (except on activities covered by Section 7.16).

Physically Isolated Facility - A facility or section of a facility that has had all FEMP supplied sources of energy and hazardous material isolated from it. Physically isolated means that a gap exists in the utilities and materials sources or the energy or material isolation devices have been Facility Owner locked and DANGER - DO NOT OPERATE tagged by the Facility Owner, Construction Contracts Manager, or Subcontractor's Lockout/Tagout Program Coordinator.

Process Control - A method used to control a process (material processing/handling/transfer) using energy isolation devices and tagging with "DANGER - DO NOT OPERATE" tags only. The use of process control is to prevent the accidental release of hazardous energy and/or material but does not provide the required personal protection for employees entering the path of hazardous energy to perform servicing or maintenance type activities.

Program Coordinator - The subcontractor's representative who is responsible for the lockout/tagout program of physically isolated areas per Section 7.16 of this procedure.

DEFINITIONS (cont.)

Qualified Employee - A properly trained, Authorized Employee who is capable of using the necessary equipment and/or knowledge to verify the isolation of the potential hazard for which he/she is "qualified" and who is familiar with the construction and operation of the equipment being isolated and the hazards involved.

NOTE: The Qualified Employee's supervisor shall determine if an employee is "properly trained" based on the supervisor's knowledge of the work involved, the employee's experience (including the equipment involved), and the employee's training. As a minimum, an employee qualified in electricity shall meet 29 CFR 1910.331-335 and 339 requirements.

Released - The condition that exists when the Facility Owner and the Authorized Employee conducting the activity have checked the work area to ensure the safety of all affected employees, changed or eliminated the boundary isolation points, and removed the energy or material isolation devices.

Removed - An energy or materials isolation device is removed by an Authorized Employee when the Authorized Employee removes his/her personal lock and DANGER - PERSONNEL WORKING tag from the energy or materials isolation device. An energy or materials isolation device cannot be cleared until all Authorized Employees working on the affected equipment or system have released it and removed their DANGER - PERSONNEL WORKING tag(s) and personal lock(s). The Facility Owner will remove the Facility Owner lock(s) and DANGER - DO NOT OPERATE tag(s) after the Authorized Employee has removed his/her DANGER -PERSONNEL WORKING tag(s) and personal lock(s).

Safe Condition Check - An inspection of conditions established to permit work to be performed within a lockout/tagout boundary. This is attained by isolating a work area from all sources of hazardous energy or hazardous materials and removing or securing all sources of potential hazardous energy or hazardous materials inside the boundary.

Servicing and/or Maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, maintaining, and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, which could cause the employee to be exposed to the unexpected energization or startup of the equipment or release of hazardous energy or hazardous materials.

Setting up - Any work performed to prepare a machine or equipment to perform its normal production operation.

Short T[illegible] When applied to tagging, the period of the employee's shift includi[illegible] ertime.

Specific Equipment - One type of an EIP which outlines in detail the steps and special pieces of hardware necessary for isolating all hazardous energy and hazardous materials of a specific process, equipment, machine, or system.

Subcontractor - Personnel performing work at the FEMP who are not employed by DOE, FERMCO, or a teaming partner and whose work is defined by a contract.

DEFINITIONS (cont.)

Subcontractor Representative - The overseer of the subcontractor lock and tag responsibilities in physically isolated areas. Provides lock(s), training requirement(s), and generates and maintains the appropriate documentation.

Tagout - The placement of a DANGER - DO NOT OPERATE tag or DANGER PERSONNEL WORKING Tag on an energy or materials isolating device, in accordance with an established energy or materials isolation plan, to indicate that the energy or material isolating device and the equipment being controlled may NOT be operated until the DANGER - DO NOT OPERATE tag is removed.

Tagout Device - A DANGER - DO NOT OPERATE tag or DANGER - PERSONNEL WORKING Tag.

Troubleshooting - Locating the cause of trouble in machinery or equipment.

RESPONSIBILITIES

AFFECTED EMPLOYEES

- Ensure their own safety and the safety of other Affected Employees.
- Attend and successfully complete initial training and annual refresher training on this procedure.

AUTHORIZED EMPLOYEES

- Implement the requirements of this procedure (except Section 7.16) and review energy or material isolation plans on machinery or equipment for servicing or maintenance of an identified equipment or process.
- Attend and successfully complete all scheduled training and periodic refresher training on hazardous energy or hazardous material sources; the type and magnitude of the hazardous energy or hazardous materials present at the work site prior to locking out processes, systems, machinery, or equipment, or working under the protection of lockout/tagout devices.
- Obtain proper authorization before hanging or removing a Facility Owner lock and an associated DANGER - DO NOT OPERATE tag or a CAUTION tag.
- Control their personal locks and the DANGER - PERSONNEL WORKING tags.
- Prohibit from shutting down, de-energizing, and restarting or re-energization any equipment or system NOT directly under their control.

CONSTRUCTION MANAGER/CONSTRUCTION ENGINEER/CONSTRUCTION CONTRACTS MANAGER

- Ensures that subcontract personnel working at the FEMP perform activities in accordance with this procedure or, if working in an exempted area, that they are using a lockout/tagout procedure that offers the same level of protection.
- Ensures the proper generation and maintenance of all required lockout/tagout documentation. If the work is in an area without an assigned Facility Owner, the Construction Manager/Construction Engineer/Construction Contract Manager shall be the Facility Owner with all the responsibilities noted in this procedure including keeping the required logs and creating energy or materials isolation plans.
- Coordinates activities with Facility Owners for appropriate hazardous energy and hazardous materials control of equipment, systems, or utilities.
- Ensures the required language of this procedure is contained in contracts with subcontractors.
- Initiates the proper permits to support subcontractor activities.
- Ensures the inclusion of the requirements for lockout/tagout in the project documents.

RESPONSIBILITIES (cont.)

FACILITY OWNER or FACILITY OWNER DESIGNEE

- Oversees all activities of an assigned facility or an area of the FEMP.
- Knows how to isolate all hazardous energy hazardous materials sources within their facility and who to contact.
- Ensures that this procedure is followed within their facilities.
- Keeps the required lockout and tagout logs for tracking Facility Owner locks, DANGER - DO NOT OPERATE tags, CAUTION tags, energy or materials isolation plans, and quarterly inspections.
- Ensures that no work in their facility is performed without their consent.
- Ensures that Facility Owner locks, associated DANGER - DO NOT OPERATE tags, and CAUTION tags are only installed and removed in their facilities only with their authorization (verbal and/or written).
- Ensures that Authorized and Qualified Employees are adequately trained (in the judgement of the Facility Owner) to perform their responsibilities.
- Attends the training offered to learn about hazardous energy or hazardous materials sources and the methods of hazardous energy or hazardous materials isolation in their facilities.
- Ensures that all Affected Employees are made aware of hazardous energy or hazardous material isolation activities prior to the requested activity.
- Maintains files with hazardous energy or material isolation plans and lockout/tagout logs.
- Updates or initiates energy or material isolation plans (Controlled Documents or Drawings), when required.
- Ensures compliance with this procedure by subcontract personnel working in the facilities.
- Uses the Lockout & Tagout log to conduct a quarterly inspection of all Facility Owner locks, DANGER - DO NOT OPERATE tags, and CAUTION tags hanging in their facility.
  - •• Notes any improper use of these tags.
  - •• Resolves any conflicts between the field observations and the Lockout/Tagout log.
  - •• After ensuring that the need still exists for a CAUTION tag older than 90 days, removes the old tag and replaces it with a new one and, documents it as required in Section 7.12.
  - •• Initials and date the bottom of each Lockout/Tagout log as the inspections are complete.
- Corrects findings identified by others in inspections and audits of their facilities lockout/tagout program.
- Ensures that whenever equipment or machines is/are replaced, repaired, renovated, or modified, the equipment or machine becomes capable of being locked out.

RESPONSIBILITIES (cont.)

OCCUPATIONAL SAFETY & HEALTH (OS&H) COMPLIANCE

- Coordinates the training requirements for each Affected and Authorized Employee on the purpose and use of this procedure, the recognition of applicable hazardous energy or hazardous material sources, the type and magnitude of hazardous energy or hazardous materials available in the work place, and the methods and means of isolation.

- Conducts random periodic inspections of the logs, locks, and tags to ensure compliance with this procedure and verify that previously identified findings have been corrected or are being corrected.

- Reports the findings from periodic inspections to Facility Owners and the Manager of OS&H.

- Reviews and approves (by signing) all energy or materials isolation plans.

QUALIFIED EMPLOYEES use the necessary equipment and/or knowledge to verify the isolation of the potential hazard for which they are qualified. This verification is the boundary and safe condition check. Electrically qualified employees will meet 29 CFR 1910.331-335 and 339 requirements.

QUALITY ASSURANCE

- Conducts an annual audit/surveillance of a minimum of ten FEMP procedural requirements within the boundaries of this procedure. This audit/surveillance will be conducted in a manner that meets the requirements of 29 CFR 1910.147 for periodic inspections.

- Submits a letter to the Manager of OS&H reporting on the findings of the audit(s) and/or surveillance(s) certifying that the assessments have taken place.

- Follows up with the Facility Owner and the responsible department manager to ensure the implementation of proper and timely corrective actions where major findings or concerns are found.

RESPONSIBLE SUPERVISOR(S)

- Verifies the generation and maintenance of all documentation required by this procedure.

- Assists the Facility Owner with direct action or by assigning personnel to identify and/or isolate the various hazardous energy and hazardous materials sources.

- Randomly monitors the performance of their employees to ensure compliance with this procedure.

- Ensures that Authorized and Qualified Employees perform the required safe condition checks.

RESPONSIBILITIES (cont.)

SUBCONTRACTORS

- Prohibits the shutting down, de-energizing, restarting or re-energizing of any equipment or system NOT directly under their control.
- Ensures that Affected Employees within their organization are familiar with the FEMP Lockout/Tagout Program and this procedure.
- Trains their Authorized Employees and Responsible Supervisors in the FEMP Lockout/Tagout Program.
- Monitors their employees periodically for effective performance under FEMP's Lockout/Tagout Program. The frequency shall be as necessary, based on the work involved, hazards, level of employee knowledge, and previous observations to ensure effective performance by the subcontractor employee.
- Designates a responsible person(s) to coordinate and fulfill the requirements of Section 7.16 of this procedure for lockout/tagout activities for physically isolated facilities under construction or demolition.

TRAINING DEPARTMENT

- Conducts effective initial and continuing training programs that meet the requirements of this procedure.
- Conducts annual refresher training for Affected and Authorized Employees.

UTILITY ENGINEER for the purpose of this procedure, acts as the Facility Owner, including ensuring the generation and maintenance of the proper documentation in the absence of the assigned Facility Owner or Facility Owner Designee.

ATTACHMENT C

SPECIFIC EQUIPMENT PLAN

INITIATED BY: _____ DATE: _____

LOCATION: _____

MACHINE: _____

EQUIPMENT: _____

MMIC/SERIAL NUMBER: _____

	Lock capable (y)-yes, (n)-no, (N/A)-not applicable	Description/shut off location (if valve or switch must be locked "open", indicate that below)
ELECTRICAL		
PNEUMATIC		
HYDRAULIC		
OTHER (Specify)		
OTHER (Specify)		

NOTE HERE:
Possible areas containing stored energy to be evaluated or if sequence of isolation (e.g., switch 1 must be off before valve A is opened) is important.

_____ SIGNATURE

_____ DATE

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ATTACHMENT D

ENERGY ISOLATION PLAN FORM

[Process/Project Description - Requiring an EIP]

WORK ORDER NUMBER:_____ LOCATION:_____

PURPOSE : [Of the EIP]

STATE DATE : [On or before (date)]

COMPLETION DATE: [On or before (date) **NOTE**: Not to exceed 30 days.]

WORK DESCRIPTION:_____

_____

_____

_____

_____

_____

_____

Sequence of Activities:

1. Notify the Facility Owner of the work to occur. Post a copy of this plan near the work activity.

2. Identify the steps to take to isolate the energy sources(s) and the work to be done. Multiple steps will be documented on the EIP.

3. Inform the Facility Owner when the work is completed.

   NOTE: Operation of a device that has a DANGER tag (other than the tag belonging to the operator of the device) attached to it is cause for disciplinary action and may result in termination.

ENERGY ISOLATION PLAN APPROVAL

Supervisor	Date	OSHC	Date
TBD (as required)	Date	TBD (as required)	Date

Fernald Environmental Management Project

Lockout/Tagout Log

Facility Owner: _____ Facility(s): _____

TAG TYPE (CAUTION OR DANGER - DO NOT OPERATE)	TAG #/LOCK #	LOCATION OF THE TAG/ REASON FOR THE TAG	POSITION: ON/OFF OPEN/CLOSED	AUTHORIZED BY: F.O./DESIGNEE NAME, BADGE, AND DATE	INSTALLED BY: QUAL AUTH'D EMPLOYEE NAME, BADGE, AND DATE	VERIFIED BY: QUAL AUTH'D EMP. NAME, BADGE, AND DATE	AUTHORIZED REMOVAL: NAME, BADGE, AND DATE	REMOVED BY: AUTH'D EMP. NAME, BADGE, AND DATE

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ATTACHMENT E (Sheet 2 of 2)

Lockout/Tagout Sheet Instructions Sheet

Enter the following information:

- Block 1 - Identify the type of tag hung: (CAUTION or DANGER - DO NOT OPERATE).
- Block 2 - Identify the DANGER - DO NOT OPERATE tag and Facility Owner Lock number applied at the component isolated from the energy source.
- Block 3 - Identify the name of the equipment, the specific location of the component being isolated, and the reason for the hazardous energy or material isolation.
- Block 4 - Identify the position (on/off, open/closed, etc.) of the energy isolation device.
- Block 5 - Print the name, badge number, and the date when the Facility Owner/Designee authorized his/her lock and DANGER - DO NOT OPERATE tag be hung on the energy isolation device.
- Block 6 - Print the name, badge number, and the date when the Qualified, Authorized Employee hung the facility owner lock and DANGER - DO NOT OPERATE tag on the energy isolation device.
- Block 7 - Print the name, badge number, and the date when the Qualified, Authorized Employee (Independent Verifier) confirmed the energy isolation sources had been properly isolated.
- Block 8 - Print the name, badge number, and the date when the Facility Owner authorized removal of the energy isolation sources.
- Block 9 - Print the name and badge number of the Authorized Employee who removed the Facility Owner's lock and tag, and record the date the equipment system was put back into service.

The Facility Owner is responsible for conducting an inspection (audit) of the Lockout/Tagout Log Sheet every 90 days (quarterly) and record the date in which the event(s) occurred.

Lockout/Tagout Inspection Date

Jan: (Name of Evaluator):_____ Date:_____

April: (Name of Evaluator):_____ Date:_____

July: (Name of Evaluator):_____ Date:_____

Oct: (Name of Evaluator):_____ Date:_____

When the log sheet has been completed, sign and date the line of completion and place the form in Facility Owner's file.

_____ Verified Log Sheet Completed

_____ Date

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LOCKOUT/TAGOUT LOG FOR ISOLATED AREAS

Subcontractor(s) ______________________________

Lockout/Tagout Program Coordinator: ______________________________

Physically Isolated Area: ______________________________

PERSONAL LOCK NUMBER	APPOINTED EMPLOYEE'S NAME	APPOINTED EMPLOYEE'S BADGE NUMBER	APPOINTED EMPLOYEE'S SUBCONTRACTOR	DATE LOCK ISSUED	DATE LOCK RETURNED

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REMEDIATION SUPPORT OPERATIONS PROCEDURE	**Safe Shutdown Program Energy Isolation Procedure**	D10-05-001 **ADMINISTRATIVE PROCEDURE**

(Signature on File) Authorization: D. Klein, Safe Shutdown Programs Manager	Supersedes: None	Issue Date: 02-08-95

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1.0 PURPOSE

1.1 The purpose of this procedure is to describe the requirements for isolating energy connected to and/or releasing energy contained within systems, equipment and utility connections while placing them in a safe shutdown configuration. It uses and complements the requirements contained in SSOP-0719, "FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure" and replaces all other procedures and work instructions previously used for safe shutdown energy isolation.

2.0 SCOPE

2.1 This document shall apply to all personnel assigned or matrixed to the Safe Shutdown Department of the RSO Division who are responsible for supervising or conducting safe shutdown field activities.

3.0 APPLICABLE DOCUMENTS

3.1 Source Documents

3.1.1 REMOVAL ACTION 12, Safe Shutdown

3.1.2 DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities"

3.1.3 OSHA 29 CFR 1910.331-335, Electrical Safety Related Work

3.1.4 OSHA 29 CFR 1926.950 (b)(2), Power Transmission and Distribution

3.1.5 D10-00-020, "Remediation Support Operations Division Document System"

3.2 Reference Documents

3.2.1 ESH-1-1000, "FERMCO Comprehensive Occupational Safety and Health Program"

3.2.2 SSOP-0719, "FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure"

3.2.3 IM-6001, "Safe Shutdown Program Planning and Implementation Manual"

4.0 DEFINITIONS

4.1 Cleared Lines - Piping lines or equipment that have been drained, vented, flushed and demonstrated to be clear of any hazardous residue, pluggage or pressure.

4.2 Energy - An electrical potential or any pressures, chemicals, gases, temperatures or combination thereof in a circuit, system, equipment, tank or vessel that could injure personnel exposed to them.

4.3 First Line Break - The initial opening of lines or equipment after appropriate preparation.

4.0 **DEFINITIONS** (cont.)

4.4 Hot Tap - A mechanical method of adding a new tie-in or drain point to an existing piping service or equipment without interrupting the existing service.

4.5 Line Break - Opening of drained or undrained lines to equipment by disconnecting flanges, opening valves, breaking pipe joints, removing blanks, opening ports or penetrating a line by mechanical or other means.

4.6 Safe Shutdown Configuration - The proper characterization, emptying and deenergization of all existing previously operated production related equipment. This includes dispositioning all uranium product, in-process residue materials, excess supplies, chemicals and associated equipment.

4.7 Safe Work Space - An area around the location where energy isolation work is being performed that provides the Operator(s) an increased level of protection from the hazards associated with his work.

4.8 Undrained Lines - Any line, equipment or system that has not been drained or flushed clear through existing drains, vents or bleed valves.

5.0 **RESPONSIBILITIES**

5.1 The **Safe Shutdown Program Manager** is responsible for ensuring that all Safe Shutdown Project personnel and Maintenance Department personnel matrixed to the Safe Shutdown Project are trained in the requirements of this procedure.

5.2 The **Safe Shutdown Field Activities Manager** is responsible for ensuring that all Safe Shutdown field activities are conducted in accordance with the requirements of this procedure.

5.3 **Implementation, Operations and Utility Disconnect Supervisors** are responsible for overseeing the day-to-day conduct of field activities and ensuring that the requirements of this procedure are followed.

6.0 **GENERAL**

6.1 Warnings, Cautions, and Notes shall precede the Section, Sub-Section, Item, Step, or Sub-Step to which they apply.

NOTE: Total energy isolation cannot be achieved until it is no longer necessary to energize portions of a system. It is possible to partially shutdown a system, complete other actions and then achieve total energy isolation at a later time.

6.2 Energy isolation to achieve a safe shutdown configuration:

6.2.1 Shall apply when there is no longer any intention of returning a piece of equipment, a system, a process or a facility to service.

6.2.2 Shall mean totally isolating equipment, systems, processes or facilities from all possible sources of energy.

6.0 **GENERAL** (cont.)

6.2.3 Shall be characterized by the fact that the equipment, systems, processes or facilities shutdown cannot possibly be re-energized without extensive deliberate action.

6.3 Work to achieve a safe shutdown configuration should not be confused with work to dismantle equipment, systems, processes or facilities designated for decommissioning. Although they can closely follow each other, the two are separate and distinct actions which will be independently accomplished.

6.4 Some disassembly of equipment may be required to complete required holdup material removal. Otherwise, no equipment, system, process or facility designated for decommissioning shall be dismantled until a safe shutdown configuration has been achieved.

6.5 The Maintenance Department shall matrix personnel to the Safe Shutdown Project to assist in the:

6.5.1 Completion of safe shutdown energy isolation tasks.

6.5.2 Opening of equipment for holdup material removal.

6.5.3 Performance of any test which assures that safe shutdown energy isolation requirements have been satisfied.

6.6 Personnel doing energy isolation work to achieve a safe shutdown configuration shall comply with SSOP-0719, "FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure".

6.7 In order to establish configuration control, an audit trail is required for energy isolation actions taken to achieve a safe shutdown configuration. Technical work documents including safe shutdown work requests, this procedure, required work permits and any task specific health and safety plan shall be used to control and manage safe shutdown work.

6.7.1 A written work request shall be used for any energy isolation work to achieve a safe shutdown configuration.

6.7.2 A written work request shall also be used for any energy isolation work which changes the status of a safe shutdown configuration.

6.7.3 A safe shutdown work request shall include an attached list of all CMMS equipment numbers for all equipment to be safely shut down per the work request.

6.7.4 A safe shutdown work request must specify the scope of the required energy isolation work. If additional work is necessary, it must be requested on a separate work request.

6.8 The CMMS equipment list alone identifies that equipment which has been safely shutdown. The field or mechanical drawing identifies the specific actions which have been taken to achieve safe shutdown. Both documents are necessary to present a complete configuration status.

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6.0 **GENERAL** (cont.)

6.9 The planner shall ensure that any field or mechanical drawings relating to the facility, equipment, process or system to be safely shutdown are attached to the Implementation Plan or Maintenance Work Order. Drawings shall be annotated in red to reflect changes to achieve a safe shutdown configuration.

6.10 Any Job Safety Analysis applicable to the work to be accomplished shall be identified. Personnel assigned to complete the safe shutdown energy isolation work shall be trained on the requirements of the Job Safety Analysis.

6.11 Work shall not proceed without work permits that are required by site policy or other regulatory authorities.

6.12 Information needed to complete any check-list, reports or other records required by site procedures or DOE Orders shall be accumulated as work proceeds.

6.13 Before beginning work, the Utility Disconnect Supervisor shall verify that planned actions satisfy the requirements of the safe shutdown work request and coordinate the action with the Implementation Supervisor.

6.14 For work to proceed, the Facility Owner or his designated representative shall release the work site to the Utility Disconnect Supervisor by signing the work order. No work shall begin until the release is completed.

6.15 Site Waste Management practices require that all waste streams be properly identified and characterized. Any maintenance debris resulting from energy isolation activities shall be disposed of in accordance with site waste management policies.

6.15.1 Material Evaluation Forms (MEF), waste accumulation records and other documentation shall be established and maintained throughout the progress of work in accordance with the current practice in effect by the Implementation Supervisor.

6.15.2 The Utility Disconnect Supervisor shall ensure that appropriate disposal containers are available.

6.16 Materials used under this procedure to cap or plug lines, must be compatible with the materials to which they are mated. As a general practice, materials used shall be of the same composition as the materials to which they are being mated.

6.0 **GENERAL** (cont.)

WARNING

Disconnected equipment can become a personnel safety hazard. Conduit, pipe or duct runs disconnected to achieve a safe shutdown configuration which are left hanging in place shall not be terminated in a way that leaves stub ends which could be tripping or head bumping hazards.

6.17 Conduit, pipe or duct runs disconnected to achieve a safe shutdown configuration and which are left hanging in place shall be labeled at each isolated end, and where accessible, at 10 foot intervals between the isolated ends to identify their status.

6.17.1 Label wording shall follow the following examples; "Isolated HNO_3 Process Line", "Isolated Electrical Conduit Run", "Isolated Dust Collector Duct Run" or equivalent wording approved by the Safe Shutdown Field Activities Manager.

6.17.2 The preferred method of labeling shall be laminated tags attached to the conduit, piping or duct work with plastic tie wrap or wire.

6.17.3 If the safe shutdown work request specifies that a reservoir be drained, flushed and/or purged of fluids, the reservoir and its filler port shall be tagged and labeled. Specific requirements and wording shall be listed in the safe shutdown work request.

6.18 This procedure covers steps applicable to achieving a safe shutdown configuration for a wide variety of equipment, facilities, processes and systems. Those steps in this procedure which do not apply to a particular job may be omitted.

7.0 **HEALTH AND SAFETY REQUIREMENTS**

7.1 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 S&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. 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 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.

7.0 HEALTH AND SAFETY REQUIREMENTS (cont.)

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7.2 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. FS-F-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by S&H.

7.3 Employees assigned to perform safe shutdown electrical disconnect tasks or any task requiring them to work on unguarded electrical lines or equipment shall be trained and qualified to safely perform these tasks using the electrical PPE required by ESH-1-1000, SPR 2-61.

7.4 PPE as required by ESH-1-1000, SPR 2-13 and 2-14 shall be indicated on the line break work permit or the Chemical Hazardous Material Work Permit per SPR 5-16. Appropriate PPE must be worn until the line is broken and the system has been cleared.

7.5 Each Operator/Worker must be shown the location of the nearest safety shower and eye wash station prior to starting work. The Facility Owner is responsible for maintaining this equipment per ANSI Z358.1.

7.6 Unnecessary personnel shall remain outside the safe working area. If additional personnel are required inside the safe working area, they shall wear the same PPE as the person(s) making the first line break. Barricades used to establish safe work areas or spaces shall conform to the requirements of ESH-1-1000, SPR 2-15 and 2-16.

7.7 Existing protection and safety systems, or acceptable alternatives, will remain in place until all energy isolation is completed and all hold-up material and stored enriched material is removed. Work that could disable or interfere with the operation of this equipment shall be approved using the procedures of IM-6001, "Safe Shutdown Program Planning and Implementation Manual".

8.0 **PROCEDURE**

8.1 Electrical Isolation

NOTE: Work on electrical equipment and components must be done in accordance with ESH-1-1000, SPR 2-61, "FERMCO Comprehensive Environmental Occupational Safety and Health Program", which states that; "All terminals or conductors must be treated as energized until they have been isolated and tested for the absence of voltage". This means that when working on energized lines and/or equipment or when first testing electrical lines and/or equipment to verify they are de-energized prior to starting work, the qualified employee performing the testing or work on unguarded energized lines or equipment, must wear electrical PPE required by ESH-1-1000, "FERMCO Comprehensive Environmental Occupational Safety and Health Program".

8.1.1 Obtain any schematics or drawings which describe the electrical power supplies to the targeted equipment.

NOTE: Perform the walkdown prior to starting work to prevent delays and ensure complete identification of "all" electrical energy sources to the targeted equipment and their isolation points. Walking down the system also verifies the capability to lockout isolation points.

8.1.2 Conduct a walkdown using the available drawings.

8.1.3 Prepare an accurate field drawing of electrical power supplies to and loads from the targeted equipment.

8.1.4 Ensure the field drawing is reviewed by the Decommissioning Engineer.

8.1.5 Identify all electrical energy isolation points; circuit breakers, controllers, control centers, disconnect switches and fuses which isolate the safe shutdown targeted equipment from any electrical energy source.

8.1.6 Ensure there are no secondary electrical energy sources to the targeted safe shutdown equipment, such as control/instrumentation power or installed capacitors.

8.1.7 Prepare a lockout/tagout in accordance with SSOP-0719, "FERMCO Lockout/Tagout (Hazardous Energy and Material Control) Procedure".

8.1.8 Electrically isolate the targeted safe shutdown equipment from all sources of electrical energy using the prepared lockout/tagout.

8.1.9 Install the facility owner locks and tags and the "danger-personnel working" locks and tags on all the energy isolation points in accordance with SSOP-0719.

8.0 **PROCEDURE** (cont.)

8.1 Electrical Isolation (cont.)

NOTE: The safe "work space" should encompass an area not less than three feet working distance from the front of the electrical panel. If there is less than three feet safe working space, the component or panel opposite the affected panel must have a properly rated electrically insulated drape or blanket installed. The front of the affected panel should also have an electrically insulated drape/blanket installed around the entry to the exposed unguarded electrical lines/ equipment.

8.1.10 Establish a safe "work space" about the targeted equipment.

A. Place electrically insulated floor matting, rated to the highest voltage in electrical panel/equipment, on the floor in front of the panel/equipment to be worked on.

B. Place an "alerting barricade/barrier" with safety signs around the safe work space. The "qualified employee" performing the safe shutdown task shall work inside the "alerting barricade/barrier." Barricades used to establish safe work areas or spaces shall conform to the requirements of ESH-1-1000, SPR-15 and 2-16.

NOTE 1: Protective equipment shall be maintained in a safe, reliable condition and periodically shall be inspected or tested, as required by 29 CFR 1910.137

NOTE 2: Employees "qualified" in accordance with ESH-1-1000, SPR 2-61 and 29 CFR 1910.331-335 shall be assigned and briefed prior to performing safe shutdown electrical tasks. They shall also have available, be trained in the use of, and wear electrical PPE required by ESH-1-1000, SPR 2-61. They shall wear PPE when safe condition testing the targeted equipment's electrical supply to verify it is de-energized and whenever performing safe shutdown electrical tasks where there are unguarded electrically energized lines and/or components in the work area (for example, while disconnecting breaker load side cables with the breaker line side energized).

8.1.11 The Utility Disconnect Supervisor will ensure the "qualified employee" is wearing the electrical PPE required by ESH-1-1000, SPR 2-61 if handling of stored electrical energy devices is required in order to release stored electrical energy.

8.1.12 Release stored electrical energy which might endanger personnel.

8.1.13 Discharge capacitors isolated along with other electrical components shall be discharged.

8.1.14 Short-circuit high capacitance elements.

8.1.15 Ground high capacitance elements.

8.0 **PROCEDURE** (cont.)

8.1 Electrical Isolation (cont.)

WARNING

Electrical energy may still be present! A conduit run or cable tray may contain wiring that supplies energy to electrical components which is still electrically energized. Isolating energy from some components does not necessarily mean that all wiring in a conduit run or cable tray has been de-energized. It also does not eliminate the possibility of capacitive coupling to wiring that has been isolated.

NOTE 1: If the voltage being tested for is greater than 600 volts, the test instrument shall be inspected immediately prior to and after use. Remember, while performing the testing of electrical circuits to verify they are de-energized, the circuit shall be considered energized until tested and proven de-energized. Therefore, the "qualified worker" performing the testing must wear electrical PPE required by ESH-1-1000, SPR 2-61.

NOTE 2: If while performing this task, there are energized unguarded electrical lines and/or components in the vicinity of the "qualified worker", he/she must wear electrical PPE required by ESH-1-1000, SPR 2-61.

8.1.16 Verify energy isolation by performing the safe condition checks required by SSOP-0719 through the use of voltage test instrumentation to ensure there is no voltage inside the energy isolation boundaries.

8.1.17 Disconnect the electrical leads in accordance with the safe shutdown task at the specified energy isolation device (i.e. circuit breaker).

NOTE: The requirement to consider all circuits energized until tested and proven de-energized shall be invoked here also. Therefore "alerting barricade/barriers" and electrical PPE required by ESH-1-1000, SPR 2-61 shall be used.

8.1.18 Verify that electrical energy at the targeted component (for example, equipment being "safely shutdown"), has been isolated by taking voltage readings.

8.1.19 Remove PPE after verification that it is safe to proceed.

8.1.20 Disconnect the electrical leads at the component/equipment.

NOTE: If this task requires work in the vicinity of exposed/unguarded electrical lines and/or components, use "alerting barricades/barriers" and the electrical PPE required by ESH-1-1000, SPR 2-61. Tape off, as best fits the situation, the holes where the conduit run was disconnected.

8.1.21 Disconnect conduit runs at the energy isolation devices and components/equipments being safely shutdown.

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8.0 **PROCEDURE** (cont.)

8.1 Electrical Isolation (cont.)

NOTE 1: For safe shutdown configuration, electrical energy is not considered fully isolated from the work site until it is no longer possible to easily reconnect the wiring. Therefore, a short length of conduit shall be removed at each end where the conduit was disconnected.

NOTE 2: Isolated wires, which have been placed in a safe shutdown configuration, shall be cut back to the point where conduit remains hanging in place. The isolated wiring shall be terminated by taping off the exposed leads.

8.1.22 Tape over the open ends of any conduit that has been disconnected and remains hanging in place.

8.1.23 Label, in accordance with Step 6.17, any conduit run that will no longer be used.

8.1.24 Tag any conduit run no longer in use at both ends using W. H. Brady tag number 65373 or its equivalent.

WARNING

Bare terminal ends may not remain exposed. Bare terminal ends must be secured using electrical tape, wire nuts, or other appropriate means. Any electrical box designed to accept a cover plate, must have the cover plate installed. Any electrical cabinet or other enclosures with doors shall have the doors properly closed and secured.

8.1.25 Verify that the safe shutdown task has been adequately completed by walking down the work site.

NOTE: After total electrical energy isolation has been verified, locks, lockout devices, and danger tags hung, per SSOP-0719, in accordance with Step 8.1.9 are no longer required because the electrical cabling carrying electrical energy has been disconnected.

8.1.26 Remove employee "danger-personnel working" tags and locks/locking devices and Facility Owner lockout/tagout which are no longer required.

8.0 **PROCEDURE** (cont.)

8.2 Process Piping System Isolation

NOTE 1: Because of the complexity of many piping systems (loops, turns, pockets and traps) there is no guarantee that a piping system or equipment will be completely drained, contain no plugs or is free of pressure even after the first connection is broken.

NOTE 2: When cooling occurs, vacuums which may be holding liquids in pockets often break without warning and liquid is released to run to the lowest point. Plugs (particularly solidified process materials) can move and release materials after the first connection has been broken.

NOTE 3: All systems must be considered to have the potential to discharge contaminated or hazardous liquid from open ends of lines or broken flanges at any time even after the line has been drained and vented.

NOTE 4: The Implementation Supervisor must furnish a lockout plan identifying break points and must physically mark each break point with the Utility Disconnect Supervisor. The Implementation Supervisor and the Utility Disconnect Supervisor must agree on the location of the first line break.

NOTE 5: The Implementation Supervisor and the Utility Disconnect Supervisor must be present when the first line break is made.

NOTE 6: PPE as required by ESH-1-1000, SPR 2-13 and 2-14 shall be indicated on the line break work permit or the Chemical Hazardous Material Work Permit per SPR 5-16. Appropriate PPE must be worn until the line is broken and the system has been cleared. The following additional factors shall be considered when deciding what PPE is required; potential levels of contamination, inadequate drains and or vents, the possibility of line pockets, possible material trapped in valves, traps, strainers or pumps; potential release of toxic material when the pipe line or equipment is open and subsequently heated, and the degree of toxicity of the material in the line.

8.2.1 **Preparation For First Line Break**

A. Establish a safe working area around the location of the first line break.

B. Place an alerting barricade/barrier with safety signs around the first line break location. Barricades used to establish safe work areas or spaces shall conform to the requirements of ESH-1-1000, SPR 2-15 and 2-16.

C. Consider the volume and pressure of the system when establishing the size of the safe working area.

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8.0 **PROCEDURE** (cont.)

8.2 Process Piping System Isolation (cont.)

8.2.1 **Preparation For First Line Break** (cont.)

NOTE: A number of installations have redundant pumps. All applicable pumps must be identified and isolated. If the pumps are to be safely shutdown along with the process piping, totally isolate electrical energy to the pump motors.

D. Identify any pumps which are an integral part of the system. Isolate electrical energy to the pump motors per Step 8.1.

NOTE: Use only positive shutoff valves (i.e. gate, globe, ball, plug or needle type valves) to isolate the system. Do not use control valves, pinch valves, check valves or valves that have been modified for continuous flow.

E. Valve off those portions of the process piping system to be safely shutdown.

F. Hang danger tags and locks on the isolation valves in accordance with current lock and tag procedure, SSOP-0719.

CAUTION 1

Back flow is a potential hazard which can occur in many piping systems. To be considered safely shutdown, process piping must be isolated from any possible back flow.

CAUTION 2

Some process equipment/systems may contain volatile or flammable materials. Work on these systems requires the use of non-sparking tools. Check the provisions of the work permit for applicable safety instructions.

NOTE 1: The work permit shall describe those efforts necessary to ensure that no unknown substances, chemicals, or processes are in the system.

NOTE 2: A method shall be planned for collecting, containing and disposing of spilled materials.

G. Depressurize, drain, flush, vent and purge all process lines and pump cavities of process substances or materials as much as can reasonably be achieved in order to prepare the system for safe opening.

8.0 **PROCEDURE** (cont.)

8.2 Process Piping System Isolation (cont.)

8.2.1 **Preparation For First Line Break** (cont.)

NOTE: Process substances must be handled, accumulated, recorded, stored and processed in accordance with waste management practices (See Step 6.15).

WARNING

Some process piping may be insulated. Insulation may be asbestos containing material. Any asbestos issues must be resolved, per ESH-1-1000, SPR 5-2.

CAUTION

Even though the system has been drained and purged, residual levels of process material may remain entrained in the piping system. When breaking into the system, caution must be taken to minimize the potential for injury to personnel from hazardous substances and minimize the chances of spreading contamination. If a plugged condition is discovered or suspected, immediately stop work and develop a plan to dislodge the plug.

8.2.2 **First Line Break**

NOTE: The Worker shall attempt to position himself on the upwind side or away from the location of the first break on the flange being broken.

A. Break a flange by loosening the bolts on the lower and opposite side from the Worker, keeping the bolts nearest the Operator under control.

B. Allow the line to separate in a manner that causes any spillage to be away from the Worker.

C. Spread the flange apart.

D. Remove a valve bonnet by draining the line.

NOTE: Ball and plug valves may have pressure in the cavity under the stem packing and bonnet, regardless of the position of the valve and the pressure in the adjacent lines. Ball and plug valves that are to be removed from the system must be opened, closed and reopened to relieve pressure after the line is drained.

E. Place the valve in the open position.

F. Loosen the bonnet bolts.

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8.0 **PROCEDURE** (cont.)

8.2 Process Piping System Isolation (cont.)

8.2.3 **Continuing Process Piping System Isolation**

NOTE: Once the first line break is completed and the line is verified by the Implementation Supervisor and Utility Disconnect Supervisor to be cleared (i.e. drained, vented, flushed, and demonstrated clear of any hazardous residue, pluggage or pressure), work may be done on the system or in the area of the first line break with less restrictive PPE if it is specified in the work permit. If the line cannot be verified clear, personnel must continue to use the more restrictive PPE, specified by the work permit, for any work on or in the vicinity of the open line.

A. Disconnect the piping system from all pumps.

B. Cover the suction and discharge ports of the pumps.

C. Disconnect pipe joints in the vicinity of the isolation valves.

D. Remove a spool piece or a short length of pipe.

E. Install caps, plugs, blank flanges or covers to close off all ends of the separated piping.

F. Label the isolated system per Step 6.17.

NOTE: After piping has been separated from all pumps and isolation valves and the ends of the pipe have been closed off, locks, lockout devices and danger tags hung on isolation valves under Step 8.2.1.F are no longer required because process material cannot be fed into the isolated pipe.

G. Remove any danger tags and locks no longer needed on piping that has been safely shutdown.

8.0 **PROCEDURE** (cont.)

8.3 Utilities Piping System Isolation

NOTE 1: Because of the complexity of many piping systems (loops, turns, pockets and traps) there is no guarantee that a piping system or equipment will be completely drained, contain no plugs or is free of pressure even after the first connection is broken.

NOTE 2: When cooling occurs, vacuums which may be holding liquids in pockets often break without warning and liquid is released to run to the lowest point. Plugs (particularly solidified process materials) can move and release materials after the first connection has been broken.

NOTE 3: All systems must be considered to have the potential to discharge contaminated or hazardous liquid from open ends of lines or broken flanges at any time even after the line has been drained and vented.

NOTE 4: The Implementation Supervisor must furnish a lockout plan identifying break points and must physically mark each break point with the Utility Disconnect Supervisor. The Implementation Supervisor and the Utility Disconnect Supervisor must agree on the location of the first line break.

NOTE 5: The Implementation Supervisor and the Utility Disconnect Supervisor must be present when the first line break is made.

NOTE 6: PPE as required by ESH-1-1000, SPR 2-13 and 2-14 shall be indicated on the line break work permit or the Chemical Hazardous Material Work Permit per SPR 5-16. Appropriate PPE must be worn until the line is broken and the system has been cleared. The following additional factors shall be considered when deciding what PPE is required; potential levels of contamination, inadequate drains and or vents, the possibility of line pockets, possible material trapped in valves, traps, strainers or pumps; potential release of toxic material when the pipe line or equipment is open and subsequently heated, and the degree of toxicity of the material in the line.

8.3.1 Establish a safe working area around the location of the first line break.

8.3.2 Place an alerting barricade/barrier with safety signs around the first line break location. Barricades used to establish safe work areas or spaces shall conform to the requirements of ESH-1-1000, SPR 2-15 and 2-16.

NOTE: Piping which distributes among other things water supply, steam supply and plant air supply, for the purposes of this procedure is considered utilities piping. Utilities piping in a facility generally consist of a series of branches.

8.3.3 Identify the branch of the utility system to be safely shutdown.

8.0 **PROCEDURE** (cont.) -6943

8.3 Utilities Piping System Isolation (cont.)

8.3.4 Locate the isolation valves which close off the branch.

NOTE: Use only positive shutoff valves (i.e. gate, globe, ball, plug or needle type valves) to isolate the system. Do not use control valves, pinch valves, check valves or valves that have been modified for continuous flow.

8.3.5 Valve off those portions of the utility piping branch to be safely shutdown.

8.3.6 Hang danger tags and locks on the isolation valves in accordance with the current lock and tag procedure, SSOP-0719.

8.3.7 Relieve any entrapped pressure.

8.3.8 Drain the isolated branch of the utilities piping system.

WARNING

Some utilities piping is insulated. Insulation may be asbestos containing material. Any asbestos issues must be resolved, per ESH-1-1000, SPR 5-2.

CAUTION

Even though steam has been turned off and steam pressure has been relieved, steam pipes may still retain some residual heat. PPE required by ESH-1-1000, SPR 2-13 and 2-14 must be worn to avoid burns.

8.3.9 Disconnect the piping of the branch in the vicinity of the isolation valves.

8.3.10 Remove a spool piece or a short length of pipe.

8.3.11 Install caps, plugs, or blank flanges designed to meet the system pressure, temperature and contents requirements to close off the ends of separated piping that may become repressurized.

8.3.12 Label the utilities piping branch per Step 6.17.

NOTE: Once the utility piping has been separated and the ends have been closed off, lockout devices locks and danger tags under Step 8.3.6 are no longer needed because utilities can no longer be fed into the branch that was shutdown.

8.3.13 Remove any danger tags and locks no longer needed on piping that has been safely shutdown.

8.0 **PROCEDURE** (cont.)

8.4 Hydraulic Pressure Piping Systems

NOTE 1: Because of the complexity of many piping systems (loops, turns, pockets and traps) there is no guarantee that a piping system or equipment will be completely drained, contain no plugs or is free of pressure even after the first connection is broken.

NOTE 2: When cooling occurs, vacuums which may be holding liquids in pockets often break without warning and liquid is released to run to the lowest point. Plugs (particularly solidified process materials) can move and release materials after the first connection has been broken.

NOTE 3: All systems must be considered to have the potential to discharge contaminated or hazardous liquid from open ends of lines or broken flanges at any time even after the line has been drained and vented.

NOTE 4: The Implementation Supervisor must furnish a lockout plan identifying break points and must physically mark each break point with the Utility Disconnect Supervisor. The Implementation Supervisor and the Utility Disconnect Supervisor must agree on the location of the first line break.

NOTE 5: The Implementation Supervisor and the Utility Disconnect Supervisor must be present when the first line break is made.

NOTE 6: PPE as required by ESH-1-1000, SPR 2-13 and 2-14 shall be indicated on the line break work permit or the Chemical Hazardous Material Work Permit per SPR 5-16. Appropriate PPE must be worn until the line is broken and the system has been cleared. The following additional factors shall be considered when deciding what PPE is required; potential levels of contamination, inadequate drains and or vents, the possibility of line pockets, possible material trapped in valves, traps, strainers or pumps; potential release of toxic material when the pipe line or equipment is open and subsequently heated, and the degree of toxicity of the material in the line.

8.4.1 Establish a safe working area around the location of the first line break.

8.4.2 Place an alerting barricade/barrier with safety signs around the first line break location. Barricades used to establish safe work areas or spaces shall conform to the requirements of ESH-1-1000, SPR 2-15 and 2-16.

NOTE: If hydraulic pressure is produced by a pump powered by an electric motor, the proper energy isolation action is isolation of electrical energy to the motor per Step 8.1. If the device which generates the pressure is to be safely shutdown along with the piping, totally isolate energy from the pump motor.

8.4.3 Identify the hydraulic pressure generating device and the component that powers it.

8.0 **PROCEDURE** (cont.)

8.4 Hydraulic Pressure Piping Systems (cont.)

8.4.4 De-energize the source of power for the hydraulic pressure generating device and isolate it per Step 8.1.

NOTE: Use only positive shutoff valves (i.e. globe, ball, plug or needle type valves) to isolate the system. Do not use control valves, pinch valves, check valves or valves that have been modified for continuous flow.

8.4.5 Valve off those portions of the hydraulic piping system to be safely shutdown.

8.4.6 Hang danger tags and locks on the isolation valves in accordance with current lock and tag procedure, SSOP-0719.

8.4.7 Vent, depressurize, gravity drain and/or blow down with air all hydraulic oil lines and pump cavities as much as can reasonably be achieved in order to prepare the system for safe opening.

NOTE 1: A method shall be planned for collecting, containing and disposing of the residual hydraulic oil.

NOTE 2: Hydraulic oil drained from the system must be handled, accumulated, recorded, stored and processed in accordance with waste management practices see Step 6.15.

CAUTION

Even though hydraulic oil has been drained from the system, small amounts of fluid may remain entrained in the piping. When breaking into the system, a containment must be used to collect the residual hydraulic oil.

8.4.8 Disconnect hydraulic lines which lead from the hydraulic pressure generating device or its pressure distribution manifold to all hydraulic devices being safely shutdown.

8.4.9 Cover the opened hydraulic lines and the ports where hydraulic lines were disconnected.

NOTE: Short lengths of hydraulic line may be completely removed. If longer runs are involved, the line may be disconnected, the ends of the line may be closed off and it may continue to hang in place.

8.4.10 Label any hydraulic piping which remains hanging in place in accordance with Step 6.17.

8.0 **PROCEDURE** (cont.)

8.4 Hydraulic Pressure Piping Systems (cont.)

NOTE: Once piping to hydraulic devices is separated or removed and electric wiring is removed, lockout devices, locks and danger tags hung under Step 8.4.6 are not required because hydraulic pressure can neither be generated nor transmitted to hydraulic devices.

8.4.11 Remove any danger tags and locks no longer needed on piping that has been safely shutdown.

8.5 Fuel Gas Piping System Isolation

NOTE 1: Because of the complexity of many piping systems (loops, turns, pockets and traps) there is no guarantee that a piping system or equipment will be completely drained, contain no plugs or is free of pressure even after the first connection is broken.

NOTE 2: When cooling occurs, vacuums which may be holding liquids in pockets often break without warning and liquid is released to run to the lowest point. Plugs (particularly solidified process materials) can move and release materials after the first connection has been broken.

NOTE 3: All systems must be considered to have the potential to discharge contaminated or hazardous liquid from open ends of lines or broken flanges at any time even after the line has been drained and vented.

NOTE 4: The Implementation Supervisor must furnish a lockout plan identifying break points and must physically mark each break point with the Utility Disconnect Supervisor. The Implementation Supervisor and the Utility Disconnect Supervisor must agree on the location of the first line break.

NOTE 5: The Implementation Supervisor and the Utility Disconnect Supervisor must be present when the first line break is made.

NOTE 6: PPE as required by ESH-1-1000, SPR 2-13 and 2-14 shall be indicated on the line break work permit or the Chemical Hazardous Material Work Permit per SPR 5-16. Appropriate PPE must be worn until the line is broken and the system has been cleared. The following additional factors shall be considered when deciding what PPE is required; potential levels of contamination, inadequate drains and or vents, the possibility of line pockets, possible material trapped in valves, traps, strainers or pumps; potential release of toxic material when the pipe line or equipment is open and subsequently heated, and the degree of toxicity of the material in the line.

8.5.1 **Preparation For First Line Break**

A. Establish a safe working area around the location of the first line break.

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8.0 **PROCEDURE** (cont.)

8.5 Fuel Gas Piping System Isolation (cont.)

8.5.1 **Preparation For First Line Break** (cont.)

B. Place an alerting barricade/barrier with safety signs around the first line break location. Barricades used to establish safe work areas and spaces shall conform to the requirements of ESH-1-1000, SPR 2-15 and 2-16.

NOTE: Use only positive shutoff valves (i.e. gate, globe, ball, plug or needle type valves) to isolate the system. Do not use control valves, pinch valves, check valves or valves that have been modified for continuous flow.

C. Valve off the fuel gas supply at the last isolation valve before the gas line enters the component to be safely shutdown.

D. Hang lockout devices, locks and danger tags at tag the isolation valves in accordance with current lock and tag procedure, SSOP-0719.

CAUTION

Work on fuel gas systems requires the use of non-sparking tools. Check the provisions of the work permit for applicable safety instructions.

E. Vent and purge any residual levels of fuel gas that may remain in the pipe between the isolating valve and the component to be safely shutdown.

F. Ensure the work site is checked for potentially explosive fuel gas atmosphere in accordance with the work permit.

CAUTION

Fuel gas supply lines shall not be terminated in a configuration which might place them in jeopardy of being ruptured by activity in the area (e.g. fork truck traffic). If necessary, valve off the fuel gas supply line at a more remote location and remove as much pipe as safety requires.

8.5.2 **First Line Break**

NOTE: The Worker shall attempt to position himself on the upwind side or away from the location of the first break on the connection being broken.

A. Break an appropriate connection.

B. Allow the line to separate in a manner that causes any spillage to be away from the Operator.

C. Spread the piping apart.

8.0 **PROCEDURE** (cont.)

8.5 Fuel Gas Piping System Isolation (cont.)

8.5.2 **First Line Break** (cont.)

NOTE: Ball and plug valves may have pressure in the cavity under the stem packing and bonnet, regardless of the position of the valve and the pressure in the adjacent lines. Ball and plug valves that are to be removed from the system must be opened, closed and reopened to relieve pressure after the line is drained.

D. Remove a valve bonnet by first draining the line.

E. Place the valve in the open position before loosening the bonnet bolts.

F. Disconnect fuel gas pipe joints in the vicinity of the isolation valves and the component to be placed in a safe shutdown configuration.

G. Remove as much piping as necessary to establish a safe configuration.

H. Install caps, plugs or covers to close off all ends of the separated piping.

I. Label the isolated piping per instructions in Step 6.17.

NOTE: After piping has been separated from all isolation valves and components and the ends of the pipe have been closed off, locks, lockout devices and danger tags hung on isolation valves under Step 8.5.1.D are no longer required because fuel gas cannot be fed into the isolated piping.

J. Remove any danger tags and locks no longer needed on piping that has been safely shutdown.

8.6 Internal Combustion Engine Isolation

8.6.1 Disconnect the source of electric power, such as the battery.

8.6.2 Disconnect the fuel lines at the fuel pump and drain and purge the fuel tank and fuel lines.

8.6.3 Disable the source of ignition by grounding the spark, removing the rotor or other appropriate action.

8.6.4 Conspicuously tag the ignition switch and/or other strategic locations on the unit to indicate their status.

8.0 **PROCEDURE** (cont.)

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8.7 Mechanical Energy Isolation

8.7.1 Mechanical energy commonly results from the operation of hydraulic or pneumatic devices, electric motors, and internal combustion engines. The proper removal of mechanical energy results from safe shutdown of those systems or components described in the applicable Steps above.

8.8 Stored Energy Isolation

8.8.1 Brace, block, wedge or otherwise secure items which could slip, shift or fall by force of gravity, to prevent movement.

8.8.2 Conspicuously tag or label any braces, blocks or wedges to be used "Danger: Stored energy isolating device. Do not remove or disturb".

8.8.3 Secure items such as braces, blocks or wedges used to secure other items against movement, with nails, screws or bolts.

8.8.4 Bleed off entrapped pressures in hydraulic, pneumatic or other fluid systems per Steps 8.2, 8.3, 8.4 and 8.5.

8.8.3 Discharge stored electrical energy in capacitors per Step 8.1.

NOTE: Air handling duct work includes any square or round ducting which may carry either a positive or negative pressure air flow. These ducts may have interior contamination. The principle reasons for isolating ducting are to allow access for removal of holdup materials, to minimize the chances of personnel being exposed to possible contamination and to minimize chances of the spread of contamination.

8.9 Air Handling Duct Work Isolation

8.9.1 Identify the device which produces the air flow in the duct to be safely shutdown. Determine if duct work alone is to be shutdown or the device which produces the air flow is to be shutdown along with the duct work.

NOTE: If the device which produces air flow is not to be safely shutdown along with duct, no further energy isolation of the motors is required. If the device which produces air flow is to be safely shutdown along with the duct work, continue with the Steps 8.1 and totally isolate energy from the motors which power the device.

8.9.2 Isolate electrical energy from the motors that power the device which produces the air flow per Step 8.1.

8.9.3 Close any duct dampers in the vicinity of the area where the duct is to be isolated.

8.9.4 Measure the duct at an appropriate duct connection. Lay out and fabricate blanks to close off the planned openings of the duct.

8.0 **PROCEDURE** (cont.)

8.9 Air Handling Duct Work Isolation (cont.)

NOTE: Where weather is not a critical factor, the duct blank may be fabricated from plywood. Where weather may be a factor, sheet metal should be used. The safe shutdown work permit may specify an alternative.

WARNING

Some duct work may be insulated with asbestos containing material. Any asbestos issues must be resolved per ESH-1-1000, SPR 5-2.

8.9.5 Separate the duct at the selected connection. If possible, drop out a short section of the duct. Install the fabricated blanks.

8.9.6 Label any ducting which remains hanging in place per Step 6.17.

NOTE: If the source of the air flow was safely shutdown along with the ducting, locks, lockout devices and danger tags, hung are no longer needed because air flow through the isolated duct has been eliminated. Therefore lockout devices, locks and danger tags hung under Step 8.9.2 are no longer needed.

8.9.7 Remove any locks and danger tags which are no longer needed.

8.10 Administration

UTILITY DISCONNECT SUPERVISOR

8.10.1 Verify that all entries required on check lists reports or other documents are complete and accurate.

8.10.2 Arrange for the removal of maintenance debris from the work site.

8.10.3 Return the work site to the control of the Facility Owner.

UTILITY DISCONNECT SUPERVISOR AND IMPLEMENTATION SUPERVISOR

8.10.4 Verify jointly that the work required has been satisfactorily completed.

8.10.5 Final entries shall be made on the safe shutdown work permit and the work order will be closed out. Provide to the manager of the maintenance information system a complete list of CMMS equipment numbers for all components safely shutdown.

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RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
02-08-95	0	Document requirement to describe Energy Isolation Requirements for Safe Shutdown Activities per Request No. P94-0593, initiated by M. Morris.