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TECHNICAL SAFETY REQUIREMENTS FOR THE UNH NEUTRALIZATION PROJECT - FEBRUARY 1995

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TECHNICAL SAFETY REQUIREMENTS

for the

UNH NEUTRALIZATION PROJECT

FEBRUARY 1995

AUTHORIZED BY: _____ 4-26-95
D. Ofte, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
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Prepared for the
U. S. Department of Energy
Fernald Office
Under Contract DE-AC24-92OH21972

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DOE F 1320.8 (5-93)

United States Government

memorandum

UNCONTROLLED

MAR 16 1995

DATE: DOE-0715-95

REPLY TO ATTN OF: FN:Simak

SUBJECT: URANYL NITRATE HEXAHYDRATE PROJECT SAFETY ANALYSIS REPORT AND TECHNICAL SAFETY REQUIREMENTS APPROVAL

TO: Phil Hamric, DOE-OH

THRU: Nat Brown, DOE-OH

Attached for your approval is the revised Safety Analysis Report (SAR) and Technical Safety Requirements (TSR) for the Uranyl Nitrate Hexahydrate (UNH) Project. Also provided is a "redline/strikeout" version of the SAR indicating only those revisions reflecting the U.S. Department of Energy (U.S. DOE) Safety Evaluation Report (SER).

The Department of Energy, Fernald Area Office (DOE-FN) SAR Review Team reviewed the subject revisions without any additional comment. Therefore, the DOE-FN is recommending full approval of the SAR and TSR which was previously approved by the Department of Energy, Ohio Field Office (DOE-OH) on a conditional basis in conjunction with the SER.

If you have any questions, please contact John Simak at (513) 648-3150.

for Jack R. Craig
Director

Attachment: As Stated

cc w/o att:

J. Zimmerman, DOE-OH
W. Quaider, DOE-FN
C. White, DOE-FN

CONCURRENCE: DATE: 4/13/95

J. Phil Hamric, Manager
Ohio Field Office

APR 14 1995

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Acronyms, Abbreviations, and Symbols

AC	Administrative Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSA	Criticality Safety Analysis
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DOE-FN	DOE Fernald Area Office
EPA	Environmental Protection Agency
FERMCO	Fernald Environmental Restoration Management Corporation
HASP	Health and Safety Plan
LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
NRC	U.S. Nuclear Regulatory Commission
NTS	Nevada Test Site
OSHA	Occupational Safety and Health Administration
RSO	Remediation Support Operations Division
SAR	Safety Analysis Report
SL	Safety Limit
SR	Surveillance Requirement
S/RID	Standards/Requirements Identification Document
TIP	UNH Neutralization Project Technical Implementation Plan
TSR	Technical Safety Requirement
UNH	Uranyl Nitrate Hexahydrate
USQ	Unreviewed Safety Question

1.0 Use and Application

Because the UNH Neutralization Project is a nuclear facility DOE Orders 5480.21 *Unreviewed Safety Questions*, 5480.22 *Technical Safety Requirements* and 5480.23 *Nuclear Safety Analysis Reports* apply. The UNH Neutralization Project Safety Analysis Report (SAR), FEMP-2385, was developed using the guidance of DOE Order 5480.23 *Nuclear Safety Analysis Reports* and a Technical Safety Requirement (TSR) document is required for administrative controls only.

This TSR is an extension of the UNH Neutralization Project SAR since it compiles the important safety commitments and requirements from the SAR which are necessary for the safety of personnel, equipment and the environment. It is the UNH Neutralization Project Management's responsibility to implement the TSR in procedures.

1.1 Definitions

TERM	DEFINITION
ADMINISTRATIVE CONTROL	ADMINISTRATIVE CONTROLS are the provisions relating to organization and management, procedures, record-keeping, reviews, and audits necessary to ensure safe operation of the facility.
CONTROL DOCUMENT	A document whose content is maintained uniform among the copies by an administrative control system.
HAZARD CATEGORY 3	The hazard category for which the hazard analysis shows the potential for only significant localized consequences.
HAZARDOUS MATERIAL	Any solid, liquid, or gaseous material that is toxic, explosive, flammable, corrosive, or otherwise physically or biologically threatening to health. Petroleum products are excluded from this definition.
LIMITING CONDITION FOR OPERATION	A LIMITING CONDITION FOR OPERATION is the lowest functional capability or performance level of safety-related structures, systems, components, and their support systems required for normal safe operation of a facility.

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LIMITING CONTROL SETTINGS	LIMITING CONTROL SETTINGS are settings on systems that control process variables to prevent exceeding SAFETY LIMITS.
SAFETY LIMITS	SAFETY LIMITS are limits on process variables associated with those physical barriers, generally passive, that are necessary for the intended facility function and which are found to be required to guard against the uncontrolled release of radioactivity and other hazardous materials.
SURVEILLANCE REQUIREMENTS	SURVEILLANCE REQUIREMENTS are requirements relating to test, calibration, or inspection to ensure that the necessary operability and quality of safety-related structures, systems, components, and their support systems required for safe operation of the facility are maintained.
TSR VIOLATION	A TSR VIOLATION occurs as the result of non-compliance with the ADMINISTRATIVE CONTROLS specified in Section 5.0.

1.2 Operational Modes

This HAZARD CATEGORY 3 environmental remediation activity requires only administrative controls. The differentiation of operational modes is not necessary, because the administrative controls apply to the UNH Neutralization Project over all operating modes once project authorization has been obtained to commence processing.

1.3 Frequency Notation

No operational limits (that is, LIMITING CONTROL SETTINGS, or LIMITING CONDITIONS FOR OPERATION or SURVEILLANCE REQUIREMENTS) are required so no frequencies will be defined.

1.4 TSR Violations

A TSR violation occurs if there is failure to comply with an ADMINISTRATIVE CONTROL requirement. For these TSRs, such failures could include:

a) failure to establish, implement, and maintain the safety and management programs identified in the TSR Section 5.4 Programmatic ADMINISTRATIVE CONTROLS. A failure to comply with any specific element of these programs is not considered a TSR violation unless the intent of the ADMINISTRATIVE CONTROL requirement is not met and there is a direct threat to the safety of the facility, personnel or the environment.

b) failure to comply with the requirements in the ADMINISTRATIVE CONTROLS TSRs that are not in Section 5.4 Programmatic ADMINISTRATIVE CONTROLS, including Section 5.1 FERMCO Responsibility, Section 5.2 FERMCO Organization, Section 5.3 Procedural Controls, Section 5.5 Minimum Operations Shift Complement, Section 5.6 Operating Support, and Section 5.8 Technical Safety Requirements Basis Control.

2.0 Safety Limits

The bounding worst case unmitigated release of radioactive or hazardous material for HAZARD CATEGORY 3 environmental remediation activities has the potential for only significant localized consequences. No SAFETY LIMITS are required.

3.0 Operational Limits

The bounding worst case unmitigated release of radioactive or hazardous material for HAZARD CATEGORY 3 environmental remediation activities has potential for only significant localized consequences. Preventive or mitigative engineered safety features or safety-related systems and components are not required. Therefore, no operational limits (that is, LIMITING CONTROL SETTINGS, or LIMITING CONDITIONS FOR OPERATION or SURVEILLANCE REQUIREMENTS) are required.

4.0 Surveillance Requirements

The bounding worst case unmitigated release of radioactive or hazardous material for HAZARD CATEGORY 3 environmental remediation activities has potential for only significant localized consequences. Preventive or mitigative engineered safety features or safety-related systems and components are not required. Therefore, there are no SURVEILLANCE REQUIREMENTS.

5.0 Administrative Controls

ADMINISTRATIVE CONTROLS apply at all times once project authorization has been obtained to commence processing, unless otherwise noted.

5.1 FERMCO Responsibility

The project organization shall include, at a minimum, the following personnel with the identified responsibilities:

- Project Manager with overall responsibility for safety and regulatory compliance and interface between the project and technical support organizations and subcontractors
- Operations Manager with responsibility and authority to direct all field operations, day to day supervisory authority, and responsibility for compliance with established control procedures
- Support personnel as described in Section 5.6
- Project personnel with responsibility for performing tasks safely and empowered to stop any activity that endangers workers or the environment

5.2 FERMCO Organization

The FERMCO RSO organization has overall responsibility for assuring that activities are performed safely. The relationship of the RSO organization, project organization and technical support shall be defined in the UNH Project Technical Implementation Plan (TIP). The RSO organization shall develop, implement, and maintain the following documentation:

- Project Specific Health and Safety Plan
- Safety Analysis Report

FERMCO is responsible for the development and enforcement of a Safety & Health Program. The Safety and Health Program shall follow the requirements of DOE Directives and the regulations of other Federal agencies and the State of Ohio. The RSO organization is responsible for ensuring the project is performed in compliance with Safety and Health Program requirements. (See Section 5.4.1 for specific Safety and Health Program requirements.)

5.3 Procedural Controls

Written procedures shall cover the conduct of activities during normal conditions, postulated abnormal and emergency conditions, and surveillance, testing, and maintenance. The procedures shall be changed/revised as necessary based on use in the field until the UNH project is completed. Qualified operators and operations supervisors are permitted to deviate from written procedures to take immediate actions during emergency conditions to place the facility in a safe condition, and to protect equipment, personnel and public safety.

The following Procedural Controls will govern UNH Project operations.

1. Enriched filter cake shall be packaged, handled, staged, and stored in accordance with written nuclear safety procedures or analyses in accordance with DOE Order 5480.24 *Nuclear Criticality Safety*.

2. The written operating procedures shall contain controls that reduce the generation of NO_x.

3. Tank D1-7 will not be processed as part of this project and all other projects and activities in the area of Tank D1-7 shall be in accordance with *Process Requirements for the Maintenance of Tank D1-7 in a Safe Configuration until Processing, 7-21-94*.

4. Process sampling shall be performed to verify that the pH of high nitrate slurry is greater than 7.0 prior to transferring to the rotary drum filters.

5. Sampling and analysis shall be performed that verifies that the uranium concentration and enrichment of the filter cake is within the specifications of Criticality Safety Analysis (CSA) 94-010; and the filter cake meets the Nevada Test Site (NTS) waste acceptance criteria prior to shipping the filter cake to its on-site storage location.

6. Sampling and analysis of the filtrate shall be performed to verify that the filtrate is acceptable for discharge from the UNH Processing System for further treatment prior to discharging the filtrate from the Filtrate Hold Tank.

7. Sampling and assay analysis of crystals left in the UNH tanks shall be performed prior to turning the tanks over to the Safe Shutdown Program.

5.4 Programmatic ADMINISTRATIVE CONTROLS

5.4.1 Safety and Health Program

A Safety and Health Program shall be in place and implemented to identify, evaluate, and control safety and health hazards, and provide for emergency response. A Project Specific Health and Safety Plan shall be written, approved, and maintained addressing the following elements as required by 29 CFR 1910.120:

- Safety and health risk and hazard analysis
- Employee training assignments
- Personal protective equipment
- Medical surveillance

- Frequency and type of air monitoring, personnel monitoring, and environmental sampling
- Site control measures
- Decontamination procedures
- Emergency response procedures

5.4.2 Radiation Protection Program

A Radiation Protection Program in accordance with the requirements of the DOE Radiological Control Manual as specified in S/RID No. 14, Radiological Protection, and the TIP shall be in place, implemented, and maintained.

5.4.3 Industrial Hygiene Program

An Industrial Hygiene Program in accordance with the industrial hygiene requirements of DOE Order 5480.10 *Contractor Industrial Hygiene Program*, and DOE Order 5480.4 *Environmental Protection, Safety and Health Protection Standards*, as specified in S/RID No. 10, Occupational Safety and Health, and the TIP shall be in place, implemented, and maintained.

5.4.4 Industrial Safety Program

An Industrial Safety Program in accordance with the industrial safety and health standards of DOE Order 5480.4 *Environmental Protection, Safety and Health Protection Standards* as specified in S/RID No.10, Occupational Safety and Health, shall be in place, implemented, and maintained.

5.4.5 Emergency Preparedness Program

An Emergency Preparedness Program in accordance with the requirements of Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulations and DOE Directives as described in S/RID No. 3, Emergency Preparedness and Management, and the TIP shall be in place, implemented, and maintained.

5.4.6 Document Control Program

A documentation management program for the UNH Neutralization Project shall be implemented to assure records of the activity are prepared and maintained to furnish objective auditable evidence of safety and quality. The requirements and responsibilities for document and records control shall be established and documented in accordance with FERMCO Engineering Procedure 12-5001, *Engineering Document Control*, 10 CFR 830.120 as specified in S/RID No. 1, Configuration Management, the UNH Neutralization Project Technical Implementation Plan (TIP), and the UNH Neutralization Project Configuration Management Instruction.

5.4.7 Quality Assurance Program

A Quality Assurance Program in accordance with the requirements of 10 CFR 830.120 as specified in S/RID No.13, Quality Assurance, the TIP, and FERMCO RM-0012 shall be in place, implemented, and maintained for the UNH Neutralization Project.

5.4.8 Conduct of Operations Program

A Conduct of Operations Program shall be implemented for the UNH Neutralization Project in accordance with the applicable requirements of DOE Order 5480.19, *Conduct of Operations*, M-100 *RSO Conduct of Operations Implementation Manual*, and the UNH Conduct of Operations Applicability Matrix.

5.4.9 Review and Audits

5.4.9.1 Reviews

Self assessment, independent review, and appraisal of safety performance shall be accomplished through an independent safety review system. The program shall be in accordance with the requirements of DOE Order 5482.1B and 10 CFR 830.120. Self assessments will be conducted as directed by the Secretary of DOE in Secretary of Energy Notice SEN-35-91.

5.4.9.2 Unreviewed Safety Question Review

Procedures shall be in place and implemented to establish an Unreviewed Safety Question (USQ) review process that meets the requirements of DOE Order 5480.21. UNH Project personnel will be available as USQ Technically Responsible individuals. FERMCO Safety Analysis Department personnel will serve as USQ Qualified Safety Evaluators for the UNH Project.

5.4.9.3 Readiness Assessment

Operational readiness shall be conducted in accordance with DOE Order 5480.31 and the TIP.

5.4.10 Response to TSR Violations

If a TSR Administrative Control is violated, the following procedure will be followed:

1. Notify DOE of the violation in accordance with DOE Order 5000.3B.

2. Prepare an Occurrence Report in accordance with DOE Order 5000.3B.

3. Prepare a recovery plan describing steps leading to compliance with the Administrative Control.

4. Perform and document a technical evaluation, if appropriate, of the Administrative Control violation to determine if any damage occurred.

5.4.11 Nuclear and System Safety Program

A Nuclear and System Safety Program in accordance with the appropriate requirements of S/RID No. 9, Nuclear and System Safety, and the TIP shall be in place, implemented and maintained.

5.4.12 Facility Staff Qualifications and Training

The Project Manager, Operations Manager, project personnel, and support personnel shall meet the minimum personnel qualification and training requirements of DOE Order 5480.20 *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities* as specified in S/RID No. 16, Training and Qualification, the TIP, and the UNH Neutralization Project Training and Qualifications Plan.

A training program for project personnel shall be established in accordance with the general training required by DOE Order 5480.20 as specified in S/RID No. 16, the TIP, and the special training required by the DOE Radiological Control Manual and OSHA regulations.

5.4.13 Fire Protection Program

A Fire Protection Program shall be established in accordance with the applicable sections of DOE Order 5480.7A *Fire Protection* as specified in S/RID No. 6, Fire Protection, and the TIP.

5.5 Minimum Operations Shift Complement

The minimum operations shift complement shall be specified, as required, by the SAR.

5.6 Operating Support

The following operational support shall be provided:

- Fire Protection
- Emergency Preparedness
- Radiation Control Technicians
- Industrial Hygiene Technicians
- Quality Assurance Monitor

- Maintenance
- Occupational Safety

5.7 Operability Definition and Implementation Principles

These are not applicable since engineered safety systems and safety systems and components are not required for the UNH Project.

5.8 Technical Safety Requirement Basis Control

The safety basis in the SAR and the TSR shall be under the document control program described under documentation in Section 5.4.6. The safety analysis documentation shall be updated annually while the UNH project is active in accordance with the requirements in DOE Order 5480.23 *Nuclear Safety Analysis Reports*.

Appendix A Bases

Since there are no SAFETY LIMITS and no OPERATIONAL LIMITS/SURVEILLANCE REQUIREMENTS, no bases are required.

Appendix B Design Features

The bounding worst case unmitigated release of radioactive or hazardous material for HAZARD CATEGORY 3 environmental remediation has potential for only significant localized consequences. No safety-related Design Features are required.