NUCLEAR FUEL SERVICES, INC.

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Bldg. 234 Soil Excavation and Groundwater Treatment Project Review

(IACS 676 & 680)

NOVEMBER 24, 2009

Presented to U.S. NRC

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Topics for Discussion

- Previous project experience
- Operational preparations
- Project team experience
- Safety and Regulatory reviews
- Decommissioning Plan not required

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Previous Project Experience

- **NFS Building 234 & Building 110C experience:**
- ***1st Phase (early 1990s)*** – Removal of gloveboxes, process and equipment from Building 234 and Building 110C; Decontamination & Volume Reduction Facility (DVRF), 1st wet cell soil excavation

- ***2nd Phase (1999-2005)*** – Capping of wet cell excavation, wet cell wall removal, DVRF removal, and facility demolition, repackaging TRU waste for shipment to Oak Ridge.

- ***3rd Phase (2008-present)*** – Installation of soil and groundwater equipment for the removal of contaminated soil to meet WIPP requirements for small quantity sites.

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Operational Preparations

- ***Operational Excellence Tools*** – Utilization of failure modes and effects analysis and project mapping tools to plan project
- ***Human Performance*** – Conducting mock ups to move from "knowledge based" to "skills based" performance and reduce likelihood of errors
- ***OJT*** – On the job training to transition hourly work force from North Site and RBG to work inside Building 234
- ***Internally Authorized Change process*** **(IAC)** – approvals from NFS safety disciplines

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Project Team

Decommissioning Manager (Janice Greene)

- 17 years of experience in the nuclear industry
- 13 years of safety related experience
- 4 years of decommissioning operations management experience

Senior Project Manager (Mark Hopson)

- 25 years of experience in the nuclear industry
- Decommissioning planning, operations, plant superintendant
- Serves as back up Decommissioning Manager

Operations Manager (Kim Cornett)

- 11 years experience in the nuclear industry
- Managed excavation activities on North Site and RBG
- Operations Specialist for excavation activities since 1998 (Southwest Trenches, North Site, RBG)

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Project Team

Senior Project Manager (Daniel Boss)

- 15 years of experience in the nuclear industry
- Engineer on Building 234 Project since 1999.
- Lead engineer for Building 234 wet cell wall removal and packaging
  - Wet cell capping and wall demolition and packaging
  - Plutonium decontamination of Building 110C
  - Building 234 Shear Baler Removal
  - Repackaging of TRU waste for shipment to ORNL

Lead Excavation and Packaging Engineer (Mark Wetherill)

- 7 years of experience in the nuclear industry
- Planning involvement since May 2008 on Building 234 Project
- 5 years experience in mixed waste treatment and packaging from Oak Ridge

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Project Team

Lead Water Treatment Engineer (Amaryl Isenberg)

- 20 years experience in the chemical industry
- Professional Engineer in State of TN

Operations Specialist (Greg Lawson)

- 7 years experience in the nuclear industry
- Experienced D&D excavator operator with hands-on radiological excavation experience
- Experienced in the packaging of Building 234 D&D debris
- Field environmental sampling experience
- Data validation and characterization experience

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Project Team
Radiological Experience

Project Health Physicist (Ron Fine)

- 38 years of Health Physics experience
- Supervisor, Health Physics & Industrial Safety for D&D of Pu MOX facility for 11 years.
- Sr. Health Physics Technician in plutonium production plant for 3 years.

Radiation Monitoring Manager (Ron Rice)

- 28 years experience in the nuclear industry
- 1 year supervisory experience in Building 234
- Certified Health Physicist.

Nuclear Safety Engineer (TJ Harrison)

- 5 years experience in the nuclear industry
- Professional engineer in State of Tennessee
- Masters degree in Nuclear Engineering

Additional Safety Support through the life of Building 234 Project

- Integrated Safety Analysis (ISA)
- Safety and Safeguards Review Council (SSRC)

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Project Team
Radiological Experience

Supervision (Rick Brooks)

- 8 years experience in the nuclear industry
- 3 years of supervisory experience on previous Pu project
- 1 year Facilities D&D experience
- 4 years supervisory experience on radiological excavations and sampling

Supervision (Gerald Lundy)

- 9 years experience in the nuclear industry
- 4 years supervisory experience on radiological excavations
- 5 years supervisory experience in nuclear facility operations

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Project Team
Radiological Experience

Hourly Work Force

- Total of 9 HEU material handlers with experience with radiological excavations
- Hands-on experience with wet cell wall demolition and capping and other Pu decommissioning Projects (1 HEU Matl Handler)
- Hands-on experience with TRU Waste Repackaging inside containment tent (1 HEU Matl Handler)

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Operations Summary

- Extensive planning, training, and mock-ups to be used for project
- Utilization of a team experienced in radiological excavation
- NFS expertise in plutonium operations and TRU waste packaging
- Experienced safety staff with safety oversight throughout the project

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Project Safety and Regulatory Reviews

- License Condition S-26 Review
- License Section 1.6.6 Review
- Internally Authorized Change (IAC) Review
- SSRC Review
- Enhanced Safety Review Board Review

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License Condition S-26

- NRC License Condition S-26 states:

Prior to engaging in the decommissioning activities specified in Section 1.6.6 of the license application dated November 16, 1998, NFS must determine the status of the procedures and activities planned with respect to 10 CFR 70.38(g)(1). If required, NFS must submit a decommissioning plan to the NRC for review and approval prior to initiating such actions.

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License Section 1.6.6

- **1.6.6 Decommissioning-Related Activities**:

  Facilities or grounds may be remediated/decontaminated on a project-by-project basis prior to the end of plant life. These projects will address portions of the facility no longer in use or in need of decontamination to protect the environment. The portions of the NFS plant subject to these operations may be used for future licensed activities, require cleanup to protect the environment, or be conducted as a precursor to decommissioning an area under a NRC approved final status survey and release plan. These operations may include:

  1. Dismantlement of contaminated buildings and equipment;
  2. Pumping and treatment of contaminated groundwater/surface water;
  3. Washing, spraying, stripping, vacuuming, or otherwise cleaning the surfaces of structures or equipment;
  4. Scabbling, scaling, or otherwise decontaminating structural and equipment surfaces;
  5. Characterization efforts; and,
  6. Source reduction measures, including removal of soil and debris.

  Changes to approved processes, procedures, facilities, and equipment necessary to perform decommissioning-related activities will be implemented in accordance with the change process discussed in Chapter 11 (Sections 11.7.7 and 11.7.8).

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Internally Authorized Change (IAC) Process (NFS-GH-44)

- Safety Evaluation Requested
  - IAC Meeting with experienced Safety Staff
  - Procedure reviews
  - SSRC Preliminary Review and Feedback
  - License Amendment Evaluation
  - Determining the Need for an NRC-Approved Decommissioning Plan
- SSRC Approval
- Enhanced Safety Review Board Approval

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IAC Review for the Building 234 Project

10 CFR 70.38(g)(1) A decommissioning plan must be submitted if required by license condition or if the procedures and activities necessary to carry out decommissioning of the site or separate building or outdoor area have not been previously approved by the Commission and these procedures could increase potential health and safety impacts to workers or to the public, such as in any of the following cases:

NFS Assessment: License Condition S-26 allows NFS to evaluate decommissioning-related activities against those cited in Section 1.6.6 of SNM-124 to determine whether or not we need to have a decommissioning plan approved by the NRC prior to commencing with D&D activities. Soil remediation as a source reduction measure is listed as an authorized license activity in Section 1.6.6.

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IAC Review for the Building 234 Project

10 CFR 70.38(g)(1)(i) Procedures would involve techniques not applied routinely during cleanup or maintenance operations;

NFS Assessment: NFS has had multiple projects involving soil excavation (over 5 million cubic feet excavated including Class A, Class C, and Greater than Class C wastes) and associated decommissioning activities (i.e., water treatment and soil processing). Contaminated soil has also been excavated and packaged at the North Site, the Southwest Trenches, and Radiological Burial Ground. NFS will be using similar techniques for wet cell soil excavation, soil processing, and water processing as were employed previously on the former Building 234 wet cell soil excavation and on the North Site excavation.

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IAC Review for the Building 234 Project

10 CFR 70.38(g)(1)(ii) Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation;

NFS Assessment:

- NFS operators made numerous entries to the wet cell soil area during the previous soil excavation in the early 1990s.
- After soil excavation, NFS operators entered the wet cell soil area for wet cell filter changes, wet cell soil sampling, wet cell debris removal, and wet cell fiberglass cap installation.
- Future soil excavation activities are not expected to result in any higher exposures than in previous activities.

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IAC Review for the Building 234 Project

10 CFR 70.38(g)(1)(iii) Procedures could result in significantly greater airborne concentrations of radioactive materials than are present during operation; or **(iv)** Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operation.

NFS Assessment: Airborne concentrations of radioactive materials are not expected to be higher than levels experienced during previous decommissioning-related activities. NFS has in fact improved the quality of both ventilation and containment since the previous Building 234 wet cell soil excavation project. In addition, a continuous air monitoring system will be used to monitor airborne concentrations.

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Project Summary

- NFS has extensive experience with this type of project
- Highly experienced leadership team
- Enhanced training is planned for the project work force
- Thorough reviews of the project are conducted by both the Safety and Management Staff
- Project is authorized by SNM-124 and NRC regulations
- Final release of the area is not an objective at this point in time

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