

September 24, 2014

Mr. Robert M. Shaw
Project Manager, Tank Farm Closure Project
U.S. Department of Energy, Idaho Operations Office
MS-1222
1955 Freemont Avenue
Idaho Falls, ID 83415

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION ONSITE OBSERVATION
REPORT FOR THE IDAHO NATIONAL LABORATORY IDAHO NUCLEAR
TECHNOLOGY AND ENGINEERING CENTER TANK FARM FACILITY
(PROJ0735)

Dear Mr. Shaw:

The enclosed document describes the U.S. Nuclear Regulatory Commission's (NRC's) onsite observation activities on June 26, 2014, for monitoring disposal actions taken by the U.S. Department of Energy (DOE) at the Idaho National Laboratory (INL), Idaho Nuclear Technology and Engineering Center Tank Farm Facility (INTEC TFF). This onsite observation was conducted in accordance with the Ronald Reagan National Defense Authorization Act for Fiscal Year 2005, which requires NRC to monitor disposal actions taken by the DOE for the purpose of assessing compliance with the performance objectives set out in Subpart C of Part 61 of Title 10 of the Code of Federal Regulations.

NRC's onsite observation at INL supported assessment of compliance with the 10 CFR 61.43 performance objectives. The main focus was to verify DOE's radiation protection and environmental monitoring programs at the INTEC TFF. Because environmental monitoring data also provides information to assess performance assessment models, this onsite observation also partially addresses the 10 CFR 61.41 performance objectives. Additional visits will be conducted in the future to assess compliance with all of the performance objectives in 10 CFR Part 61, Subpart C.

R. Shaw

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If you have any questions or need additional information regarding this report, please call me at 301-415-8087, or call Mr. Maurice Heath, Project Manager of my staff, at 301-415-3137.

Sincerely,

/RA/

Gregory Suber, Acting Deputy Director
Environmental Protection and Performance
Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
NRC Observation Report

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ML14265A092

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**IDAHO NATIONAL LABORATORY IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING
CENTER TANK FARM FACILITY
U.S. NUCLEAR REGULATORY COMMISSION ONSITE OBSERVATION REPORT**

1.0 BACKGROUND:

The National Defense Authorization Act (NDAA) for Fiscal Year 2005 authorizes the U.S. Department of Energy (DOE), in consultation with the U.S. Nuclear Regulatory Commission (NRC), to determine whether certain radioactive waste related to the reprocessing of spent nuclear fuel is not high-level waste, provided certain criteria are met. The NDAA also requires NRC to monitor DOE disposal actions to assess compliance with 10 CFR Part 61, Subpart C, performance objectives for land disposal of low-level radioactive waste.

On September 7, 2005, DOE submitted a draft waste determination for residual waste incidental to reprocessing stored in the Idaho Nuclear Technology and Engineering Center Tank Farm Facility (INTEC TFF) to demonstrate compliance with the NDAA criteria. In its consultation role, the NRC staff reviewed the draft waste determination and concluded that the NDAA criteria could be met for residual waste stored in the INTEC TFF. The NRC documented the results of its review in a Technical Evaluation Report (TER) issued in October 2006 (NRC, 2006). DOE issued a final waste determination in November 2006 taking into consideration the assumptions, conclusions, and recommendations documented in NRC's TER (DOE Idaho, 2006).

To carry out its monitoring responsibilities under the NDAA, NRC developed a monitoring plan for the INTEC TFF facility in April 2007 (NRC, 2007). The NRC conducted two onsite observations in 2007 to observe tank grouting operations (seven of 11 large tanks and four smaller tanks) at the INTEC TFF. All open items identified in the first onsite observation conducted in April 2007 (ML071300222) were closed in the August 2007 onsite observation (ML072570173). In August 2008, the NRC staff participated in a third onsite observation to observe pipe grouting operations, radiation protection controls, and the environmental sampling program (ML082050071). No findings resulted from the three onsite observations. No significant tank farm closure activities occurred in calendar year 2009; therefore, the NRC staff elected to forego an onsite observation. No significant closure activities occurred at the INTEC TFF in calendar year 2010; however, given the length of time that had elapsed since the last onsite observation, the NRC staff decided to conduct an onsite observation visit in August 2010. The NRC staff's visit did not identify any significant issues; however the NRC staff did have two recommendations for DOE to consider when performing its annual checklist to determine if the INTEC TFF Performance Assessment should be updated. The NRC staff documented its results in the October 2010 observation report (ML102770022). In July 2012 the NRC decided to conduct another onsite observation to obtain additional information and observe, as appropriate, disposal actions related to closure of the remaining four large tanks. During the visit, the NRC staff obtained updates on closure activities and schedules, and collected routine information related to several monitoring factors listed in NRC's monitoring plan for the INTEC TFF (ML070650222), such as radiation protection and environmental monitoring programs. The NRC staff documented its results in the observation report (ML12240A037). In June 2014, the NRC staff conducted an onsite observation to obtain additional information on disposal actions related to closure of the remaining four large tanks at INL.

Enclosure

2.0 NRC ONSITE OBSERVATION ACTIVITIES:

On June 26, 2014, the NRC staff visited the INL site and listened to presentations by DOE regarding current and planned closure activities at the INTEC TFF. Mr. Bruce LaRue of the Idaho Department of Environmental Quality, DOE provided information regarding start-up of the Integrated Waste Treatment Unit (IWTU)¹ that will be used to treat the sodium-bearing waste remaining in the remaining four large 1000 m³ high level waste tanks (tanks WM-186 through WM-190), including one spare tank to be cleaned (WM-190). Despite uncertainty in the timing of start-up of the IWTU, DOE expects the IWTU will be operational within the year. In the 2012 onsite observation, DOE discussed tank closure activities including preparations for bulk waste removal and residual heel retrieval. Preparations included design modifications, refurbishment and testing of existing wash equipment; fabrication and installation of steam jets and above-ground transfer lines; activation of wash procedures; and preparation of liquid transfer sheets to support cleaning operations. During the 2014 onsite observation, DOE also indicated that it needed to construct above ground transfer lines to be used for sending wash water to the INTEC evaporators. DOE also indicated that it updated its tank washing and grouting procedures. For example, DOE updated its grouting procedures to address lessons learned from previous tank grouting activities. DOE also discussed sequencing of waste retrieval operations and constraints on waste processing (e.g., evaporator capacity and schedule constraints). DOE also provided a tour of INTEC facilities, including a walk-down of the tank farm, and the operations center where remote video surveillance of tank cleaning is conducted.

2.1 RADIATION PROTECTION:

2.1.1 Observation Scope:

During the onsite observation, the NRC staff participated in discussions with DOE and DOE contractor staff regarding completed and planned tank farm closure activities to obtain a better understanding of the types of activities that may lead to the greatest risks to radiation workers and members of the public. The NRC staff also obtained information regarding radiological controls during washing and grouting operations. DOE provided information on recent worker doses associated with tank farm closure activities. Calendar Year 2014 annual collective dose at the time of the onsite observation were less than 100 mrem (1 mSv/yr). The dose in Calendar Year 2013 was around 300 mrem/yr (3 mSv/yr). Upon NRC's request, DOE agreed to send NRC the Radiation Control Manual and the ALARA procedures. Following the onsite observation, DOE provided electronic copies of the documents to NRC. The documents can be found in NRC's Agencywide Documents Access and Management System (ADAMS)². The NRC staff reviewed the Radiation Control Manual and the procedure for "ALARA Program and Implementation" and did not identify any programmatic issues. The NRC staff will continue to monitor DOE's radiation protection program related to tank farm closure in a future onsite

¹ In the 2012 onsite observation, the NRC staff was informed that IWTU start-up would be delayed due to over-pressurization of the off-gas system during testing. In the 2014 onsite observation, DOE indicated that since the 2012 onsite observation, the off-gas system had been redesigned and the IWTU was currently going through testing with start-up expected in the fall of 2014.

² ADAMS is the official recordkeeping system through which the NRC provides access to its collecting of publicly available documents. ADAMS can be access online at <http://www.nrc.gov/reading-im/adams.html>.

observation or through technical review of documentation such as the Radiation Control Manual, radiation work permits, worker dose records, and ALARA documentation as tank farm closure activities progress.

2.1.2 Observation Results:

The NRC staff identified no issues or follow-up actions related to DOE's radiation protection program.

2.1.3 Conclusions:

The NRC staff continues to have reasonable assurance that the performance objective in 10 CFR 61.43 can be met.

2.2 ENVIRONMENTAL MONITORING:

2.2.1 Observation Scope:

During this onsite observation visit, the NRC staff discussed results of technical reviews related to hydrological uncertainties (Key Monitoring Area [KMA] 3 in NRC staff's INTEC TFF monitoring plan (NRC, 2007), and environmental monitoring (KMA 4 in [NRC, 2007]). The NRC staff discussed the conclusions of the KMA 3 technical review report. In that report, the NRC staff determined that sufficient information had been provided by DOE to close out KMA 3 related to hydrological uncertainties. For example, DOE prepared a supplemental analysis that addressed many of the technical issues identified in the NRC staff's technical evaluation report (NRC, 2006) in this area. In the future, the NRC staff will continue to evaluate routine environmental monitoring data under KMA 4. During the onsite observation visit, DOE provided the latest tank farm monitoring report, "Fiscal Year 2013 Annual Operations and Maintenance Report for Operable Unit 3-14, Tank Farm Soil and INTEC Groundwater", DOE/ID-11500, Rev. 0, dated June 2014. This report provides monitoring results for perched water and groundwater at the INTEC TFF. The NRC staff will review the report and continue to monitor DOE's environmental monitoring program under KMA 4 in future onsite observations.

2.2.2 Observation Results:

The NRC staff identified no issues or follow-up actions related to DOE's environmental monitoring program. The NRC staff continues to coordinate with the Idaho Department of Environmental Quality and to rely on its oversight of INTEC TFF activities through its independent environmental surveillance program.

2.2.3 Conclusions and Follow-up Actions:

The NRC continues to have reasonable assurance that the performance objectives in 10 CFR Part 61, Subpart C can be met.

3.0 PARTICIPANTS:

NRC Observation Team
Barr, Cynthia

Schwartzman, Adam
Heath, Maurice
McKenney, Christopher
Roberts, Mark
Idaho Department of Environmental Quality
LaRue, Bruce

Partial List of DOE Representatives

Shaw, Robert (Mark)
Butterworth, Steve
Davis, Robert
Evans, Susan
Hutchison, David
Lehrer, Steve
Long, Jeff
McCollum, Robyn
Suttora, Linda

4.0 REFERENCES:

DOE Idaho. "Basis for Section 3116 Determination for the Idaho Nuclear Technology and Engineering Center Tank Farm Facility." DOE/NE-ID-11226, Revision 0. November 2006.

DOE Idaho. "Compliance and Monitoring Plan for Performing Grouting at the INTEC Tank Farm Facility Closure Project." PLN-2309, Revision 3. October 6, 2010.

DOE Idaho. DOE/ID-10966, "Performance Assessment for the Tank Farm Facility at the Idaho National Engineering and Environmental Laboratory." Revision 1. (Errata December 2, 2003). Idaho Falls, Idaho: DOE Idaho. 2003.

NRC. "U.S. Nuclear Regulatory Commission Plan for Monitoring Disposal Actions Taken by the U.S. Department of Energy at the Idaho National Laboratory Idaho Nuclear Technology and Engineering Center Tank Farm Facility in Accordance with the National Defense Authorization Act for Fiscal Year 2005." Washington, D.C.: NRC. 2007. Available in ADAMS at Accession No. ML070650222.

NRC. "U.S. Nuclear Regulatory Commission Technical Evaluation Report for the U.S. Department of Energy Idaho National Laboratory Site Draft Section 3116 Waste Determination for Idaho Nuclear Technology and Engineering Center Tank Farm Facility." Washington, DC: NRC, 2006. Available in ADAMS at Accession No. ML052630012.

Fiscal Year 2013 Annual Operations and Maintenance Report for Operable Unit 3-14, Tank Farm Soil and INTEC Groundwater. Need report No. DOE/ID-IISOU, Revision June 2014. Available in ADAMS at Accession No. ML14260A097ⁱ.

ⁱ ADAMS can be access online at <http://www.nrc.gov/reading-rm/adams.html>.