



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 15, 2019

Joel T. Case, Assistant Manager
Facility and Material Disposition
U.S. Department of Energy
Idaho Operations Office
1955 Fremont Ave., MS 1222
Idaho Falls, ID 83415

SUBJECT: THE U.S. NUCLEAR REGULATORY COMMISSION JULY 16, 2019, ONSITE
OBSERVATION VISIT REPORT FOR THE IDAHO NATIONAL LABORATORY
IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER TANK FARM
FACILITY (DOCKET NO. PROJ0735)

Dear Mr. Case:

The enclosed onsite observation visit (OOV) report describes the U.S. Nuclear Regulatory Commission (NRC) OOV on July 16, 2019, at the Idaho National Laboratory (INL) Idaho Nuclear Technology and Engineering Center (INTEC) Tank Farm Facility (TFF). The OOV was conducted in accordance with Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA), which requires the NRC to monitor certain disposal actions taken by the U.S. Department of Energy (DOE) for assessing compliance with the performance objectives set out in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 61, Subpart C. The five 10 CFR Part 61, Subpart C performance objectives are: §61.40 (General Requirements); §61.41 (Protection of the General Population from Releases of Radioactivity); §61.42 (Protection of Individuals from Inadvertent Intrusion); §61.43 (Protection of Individuals during Operations); and §61.44 (Stability of the Disposal Site after Closure). This observation was the seventh INL INTEC TFF OOV since the NRC began monitoring the DOE INTEC TFF disposal actions under NDAA Section 3116(b) in November 2006.

The main activities conducted during the July 2019 INL INTEC TFF OOV were a tour of the INTEC facilities and technical discussions. The tour focused on the INTEC facilities. The technical discussions focused on: (i) the operating status; (ii) the radiation protection program; (iii) the environmental sampling program; and (iv) the engineered surface barrier construction program.

The OOV activities were consistent with the activities described in the NRC Onsite Observation Guidance Memorandum for the July 2019 INTEC OOV (dated June 19, 2019) [Agencywide Documents Access and Management System (ADAMS) Accession No. ML19154A372]. The Guidance Memorandum was developed using the INTEC TFF Monitoring Plan, Rev. 0 (dated April 2007) [ADAMS Accession No. ML070650222] and the key monitoring areas established to evaluate performance of the INTEC TFF.

The July 2019 INL INTEC TFF OOV did not result in any changes to the overall conclusions from the INTEC TFF Monitoring Plan, Rev. 0.

In accordance with the requirements of NDAA Section 3116(b), the NRC will continue to monitor the DOE disposal actions at INTEC TFF. If you have any questions or need additional information regarding this onsite observation visit report, then please contact Mr. Maurice Heath of my staff at Maurice.Heath@nrc.gov or at (301) 415-3137.

Sincerely,

/RA/

Patricia K. Holahan, Director
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No. PROJ0735

Enclosure:
NRC Onsite Observation Visit Report

cc: (w/ Enclosure):
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SUBJECT: THE U.S. NUCLEAR REGULATORY COMMISSION'S JULY 16, 2019, ONSITE OBSERVATION VISIT REPORT FOR THE IDAHO NATIONAL LABORATORY IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER TANK FARM FACILITY (DOCKET NO. PROJ0735) **DATE: October 15, 2019**

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**U.S. NUCLEAR REGULATORY COMMISSION
JULY 16, 2019, ONSITE OBSERVATION VISIT REPORT FOR THE
IDAHO NATIONAL LABORATORY IDAHO NUCLEAR
TECHNOLOGY AND ENGINEERING CENTER TANK FARM
FACILITY**

EXECUTIVE SUMMARY:

The U.S. Nuclear Regulatory Commission (NRC) staff conducted its seventh onsite observation visit (OOV) to the Idaho Nuclear Technology and Engineering Center (INTEC) Tank Farm Facility (TFF) at the Idaho National Laboratory (INL) on July 16, 2019 (INTEC TFF Observation 2019-01). That was the first INTEC TFF OOV in Calendar Year (CY) 2019. On every OOV to INL, the NRC is focused on assessing the U.S. Department of Energy (DOE) compliance with four performance objectives in Title 10 of the *Code of Federal Regulations* (CFR) Part 61, Subpart C: protection of the general population from releases of radioactivity, protection of individuals from inadvertent intrusion, protection of individuals during operations, and stability of the disposal site after closure. If the NRC concludes with reasonable assurance that the DOE complies with the four performance objectives, then the NRC will also conclude with reasonable assurance that the DOE complies with the general requirements of §61.40.

For this OOV, the NRC focused on the key monitoring areas in the INTEC TFF Monitoring Plan, Rev. 0 (dated April 2007) [available via the NRC Agencywide Documents Access and Management System (ADAMS) at Accession No. ML070650222]. The NRC performs monitoring activities in coordination with the state of Idaho. Therefore, the NRC provided the Idaho Department of Environmental (IDEQ) staff the opportunity both to participate in this OOV and to receive the same information from the DOE as the NRC received from the DOE during this OOV. The NRC staff met with the IDEQ staff prior to this OOV on July 15, 2019.

As described in the NRC Onsite Observation Guidance Memorandum for this OOV (dated June 19, 2019) [ADAMS Accession No. ML19154A372] and as added to during the OOV, the main activities conducted during the OOV were a tour of the INTEC facilities and technical discussions. The technical discussions focused on: (i) the operating status; (ii) the radiation protection program; (iii) the environmental sampling program; and (iv) the engineered surface barrier construction program.

1.0 BACKGROUND:

Section 3116(a) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA) authorizes the DOE, in consultation with the NRC, to determine that certain radioactive waste related to the reprocessing of spent nuclear fuel is not high-level waste,

provided certain criteria are met. NDAA Section 3116(b) requires the NRC to monitor the DOE disposal actions to assess compliance with the performance objectives in 10 CFR Part 61, Subpart C.

On September 7, 2005, the DOE submitted to the NRC the *Draft Section 3116 Determination Idaho Nuclear Technology and Engineering Center Tank Farm Facility* (DOE/NE-ID-11226, Rev. 0) [ADAMS Accession No. ML12345A036] to demonstrate compliance with the NDAA-criteria, including demonstration of compliance with the performance objectives in 10 CFR Part 61, Subpart C. In its consultation role, the NRC staff reviewed the draft waste determination. In the NRC Technical Evaluation Report (TER) issued in October 2006 [ADAMS Accession No. ML062490142], the NRC staff documented the results of its review and concluded that there was reasonable assurance that the applicable NDAA-criteria could be met provided certain assumptions made in the DOE analyses were verified via monitoring. Taking into consideration the assumptions, conclusions, and recommendations in the NRC's 2006 TER based on the validity of certain assumptions listed in NRC staff's TER, the DOE issued the Final INTEC TFF Waste Determination in November 2006 (DOE/NE-ID-11226, Rev. 0) [ADAMS Accession No. ML14317A056).

To carry out its monitoring responsibility under NDAA Section 3116(b), the NRC, in coordination with IDEQ, performs three activities: (1) technical reviews, (2) OOVs, and (3) data reviews.

Specifically, technical reviews generally focus on reviewing information generated to provide support for key assumptions that DOE made in the INTEC TFF performance assessment. OOVs generally focus on either: (1) observing the collection of data and reviewing the data to assess consistency with assumptions made in the Final INTEC TFF Waste Determination; or (2) observing key disposal or closure activities related to technical review areas. Data reviews generally focus on supplementing technical reviews by focusing on monitoring data that may indicate future system performance or reviewing records or reports that can be used to directly assess compliance with the performance objectives.

Information in an OOV report is relevant to all aspects of the NRC monitoring activities. The NRC will use the information in an OOV report to evaluate whether DOE disposal actions at the INTEC TFF comply with the performance objectives and whether to open new or close current INTEC TFF key monitoring areas. During an OOV, DOE may present preliminary data and commit to provide final data in a publicly available document or documents to the NRC. The DOE commitment to provide that future document or documents to the NRC would be a Follow-Up Action Item in an OOV report. The future NRC decisions on performance objectives and key monitoring areas will be based on evaluating the final data in that future DOE document or documents and will not be based on the preliminary data discussed at an OOV and summarized in an OOV report. The NRC review of the final DOE data may be documented in technical review reports or technical evaluation reports and both types of those reports would be publicly available. The issues evaluated in technical review reports and technical evaluation reports will be related to NRC monitoring activities that are described in the 2007 INTEC TFF Monitoring Plan.

2.0 NRC ONSITE OBSERVATION VISIT ACTIVITIES:

On June 19, 2019, the NRC issued the Onsite Observation Guidance Memorandum [ADAMS Accession No. ML19154A372) for the July 16, 2019, INTEC TFF Observation. An Onsite Observation Guidance Memorandum is a plan for what the NRC expects to cover during an OOV, which may be changed based on what happens during the OOV.

The OOV began with introductions and welcoming remarks followed by a short briefing on the agenda. This OOV was attended by representatives from DOE (staff and contractors) and the NRC. The rest of the OOV consisted of a tour and technical discussions. The tour focused on the INTEC facilities. The technical discussions focused on: (i) the operating status; (ii) the radiation protection program; (iii) the environmental sampling program; and (iv) the engineered surface barrier construction program.

2.1 TOUR AND TECHNICAL DISCUSSION – OPERATING STATUS

2.1.1 Observation Scope:

The tour and technical discussion supported the NRC monitoring of the DOE disposal actions to assess compliance with 10 CFR 61.41, 10 CFR 61.42, 10 CFR 61.43, and 10 CFR 61.44. The tour and technical discussion was most relevant to the following key monitoring areas (KMAs) in the INTEC TFF Monitoring Plan, Rev. 0:

- KMA 1 – Residual Waste Sampling
 - The NRC monitoring of DOE activities related to residual waste sampling and volume estimation is important because those DOE activities are pertinent to the final waste inventory, which is risk-significant because it is directly related to the projected long-term dose to members of the public and inadvertent intruders.

- KMA 2 – Grout Formulation and Performance
 - The NRC monitoring of DOE activities related to grout formulation and performance is important because those DOE activities help to retain key radionuclides in the engineered system and fill void space to ensure site stability.

- KMA 4 – Monitoring During Operations
 - The NRC monitoring of DOE activities related to the radiation protection program for more risk-significant tank closure activities (e.g., reviewing radiation records and As Low As Is Reasonably Achievable (ALARA) documentation) is important because those DOE activities help ensure that the public and the workers radiation dose limits specified in 10 CFR Part 20 (i.e., similar to the DOE regulations and orders) are met.

- KMA 5 – Engineered Surface Barrier/Infiltration Reduction
 - The NRC monitoring of DOE activities related to design, installation, and maintenance of the engineered cover is important because those DOE activities are pertinent to the infiltration rates, which are important to the radionuclide release rates and those infiltration rates should be consistent

with or lower than those assumed in DOE performance assessment.

2.1.2 Observation Results:

The key points from the tour and technical discussion were:

- DOE discussed the current and planned closure activities at the INTEC TFF, which included discussions on status and updates on activities.
- DOE informed the NRC that the delays in the schedule for the cleanup and closure of the four remaining 1,000 cubic meter high-level waste tanks (including one spare tank) were dependent upon the start-up of the Integrated Waste Treatment Unit (IWTU). DOE continues to work on the IWTU and intends to start-up in the next year.
- The NRC appreciated DOE tour of the INTEC facilities, including a walk-down of the tank farm 4 pack slated for closure, observation of above-ground transfer lines, structures, operations, remote video surveillance of tank 190, and other equipment for INTEC TFF closure activities.
- Although outside the scope of NRC's monitoring responsibilities, DOE provided a tour of the IWTU including the two reaction vessels, denitration mineralization reformer (DNR) and carbon reduction reformer (CRR). The technical discussions centered around decontamination technology and process. Final closure of the tanks is dependent on the schedule for start-up and operation of the IWTU.

2.1.3 Conclusions and Follow-up Action Items:

The NRC staff will continue to monitor the DOE INTEC TFF activities related to the operating status. There were no Follow-Up Action Items that resulted from either the tour or the technical discussion.

2.2 **TECHNICAL DISCUSSION – RADIATION PROTECTION PROGRAM (RPP)**

2.2.1 Observation Scope:

The technical discussion supported the NRC monitoring of DOE disposal actions to assess compliance with 10 CFR 61.43. The technical discussion was most relevant to the following KMA 4 in the INTEC TFF Monitoring Plan, Rev. 0.

2.2.2 Observation Results:

The key points from the technical discussion were:

- DOE provided the NRC with information on INTEC TFF activities that had occurred since the previous OOV in June 2017:
 - DOE indicated that since the last OOV no activities took place that incurred significant radiation doses.
 - Other minor activities included the following (no radiation protection information was provided on any of these activities during the OOV)
 - annual washing of the tanks and sampling was conducted; sump level and tank level readings were made

- asphalt paving was completed in October 2017 after we discussed during the OOV in June 2017
- additional ditch lining with cement and poly liner was conducted since our last OOV

2.2.3 Conclusions and Follow-up Action Items:

The NRC staff will continue to monitor the DOE INTEC TFF activities related to the RPP. There were no Follow-Up Action Items that resulted from the technical discussion

2.3 **TECHNICAL DISCUSSION – ENVIRONMENTAL MONITORING PROGRAM (EMP)**

2.3.1 Observation Scope:

The technical discussion supported the NRC monitoring of DOE disposal actions to assess compliance with 10 CFR 61.43. The technical discussion was most relevant to the following KMA in the INTEC TFF Monitoring Plan, Rev. 0:

- KMA 4 – Monitoring During Operations

2.3.2 Observation Results:

The key points from the technical discussion were:

- The NRC reviewed the Fiscal Year 2017 Annual Report for Operable Unit 3-14, Tank Farm Soil and INTEC Groundwater, July 2018 (DOE/ID-11575)
- The NRC staff did note an increase in perched water in 2017 annual report, which was thought to have been caused by a large spring snow melt event. Perched water levels have since decreased to more normal levels. The 2018 annual report is scheduled to be issued in near future. The NRC staff will review the report when it is completed.
- DOE contractor, Veolia, performs environmental surveillance at the site. Environmental surveillance reports are available online.
- The NRC staff reviewed other documents provided on DOE's Administrative Record and Information Repository public web site under Waste Area Group 3 (document prepared under the Comprehensive Environmental Response Compensation and Liabilities Act program at INL). In general, there were no significant changes in the results compared to previous reports.
- The NRC review of monitoring data associated with the INTEC TFF revealed no new or significant information related to the performance of the disposal facility or evidence of new releases from the INTEC TFF.

- The similarity between the IDEQ data and DOE data provided the NRC with confidence that both provide reasonable representations of the environment surrounding INL.

2.3.3 Conclusions and Follow-up Actions:

The NRC will continue to leverage the IDEQ monitoring of INL operations because the NDAA requires the NRC to monitor DOE disposal activities in coordination with the covered state. The NRC staff will continue to monitor the DOE INTEC TFF activities related to the EMP. There were no Follow-Up Action Items that resulted from the technical discussion.

3.0 OVERALL CONCLUSIONS, STATUS OF KEY MONITORING AREAS, OPEN ISSUES, OPEN FOLLOW-UP ACTION ITEMS, AND ISSUANCE OF NRC TECHNICAL REVIEW REPORTS:

3.1 OVERALL CONCLUSIONS:

There is no change in to the NRC staff overall conclusions from the 2006 TER regarding compliance of the disposal actions with the 10 CFR Part 61 performance objectives. The major conclusion from the OOV was that the NRC staff did not identify the need for any new key monitoring areas, or to modify current key monitoring areas.

3.2 STATUS OF KEY MONITORING AREAS IN INTEC TFF MONITORING PLAN, REV.0:

INTEC TFF Observation 2019 is the seventh OOV under INTEC TFF Monitoring Plan, Rev. 0. KMA 3 was closed in June 2014 [ADAMS Accession No. ML14149A337]. The NRC staff did not close any key monitoring areas during this OOV. Therefore, KMA 1, KMA 2, KMA 4, and KMA 5 from INTEC TFF Monitoring Plan, Rev. 0 remain open.

3.3 STATUS OF OPEN ISSUES FOR INTEC TFF MONITORING:

There were no INTEC TFF Open Issues at the beginning of INTEC TFF Observation 2017. The NRC staff did not open any new Open Issues during this OOV. Therefore, there are currently no INTEC TFF Open Issues.

3.4 STATUS OF OPEN FOLLOW-UP ACTION ITEMS FROM PREVIOUS INTEC TFF OOV REPORTS:

There were seven previous INTEC TFF OOVs. All Follow-Up Action Items from previous OOVs were closed prior to INTEC TFF Observation 2017.

3.5 STATUS OF OPEN FOLLOW-UP ACTION ITEMS FROM CLARIFYING TELECONFERENCE CALLS AND TECHNICAL TELECONFERENCE CALLS:

All Follow-Up Action Items from previous clarification teleconference calls and technical teleconference calls were closed prior to INTEC TFF Observation 2017-01.

3.6 SUMMARY OF FOLLOW-UP ACTION ITEMS OPENED DURING THIS INTEC TFF OOV:

There were no Follow-Up Action Items opened during INTEC TFF Observation 2019-01.

3.7 ISSUANCE OF NRC TECHNICAL REVIEW REPORTS:

Between the previous OOV and INTEC TFF Observation 2019-01, the NRC issued no technical review reports related to the INTEC TFF via memorandum.

4.0 PARTICIPANTS:

U.S. NRC	U.S. DOE & DOE Contractor
Cynthia Barr	Robert (Mark) Shaw
Maurice Heath	Scott Schakelford
Stephen Koenick	Butch Blackner
Olivier Lareynie (foreign assignee)	Chris Vilord
	Mark Stubblefield
	John Law

5.0 REFERENCES:

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_____ "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. ML052630012

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_____ "Technical Review of Hydrological Studies and Data for Idaho National Laboratory, Idaho Nuclear Technology and Engineering Center, Tank Farm Facility," May 2014. ML14113A278

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_____ "U.S. Nuclear Regulatory Commission Onsite Observation Report for the Idaho National Laboratory Idaho Nuclear Technology and Engineering Center Tank Farm Facility," September 2014. ML14265A092

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