

**U.S. NUCLEAR REGULATORY COMMISSION
JUNE 22, 2022, 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 9th onsite observation visit (OOV) to the Idaho Nuclear Technology and Engineering Center (INTEC) Tank Farm Facility (TFF) at the Idaho National Laboratory (INL) on June 22, 2022. This is the first INTEC TFF OOV in Calendar Year (CY) 2022. 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* (10 CFR) Part 61, Subpart C, "[Performance Objectives](#)": (1) §61.41, "[Protection of the general population from releases of radioactivity](#)," (2) §61.42, "[Protection of individuals from inadvertent intrusion](#)," (3) §61.43, "[Protection of individuals during operations](#)," and (4) §61.44, "[Stability of the disposal site after closure](#)." If the NRC concludes with reasonable assurance that the DOE complies with §61.41, §61.42, §61.43, and §61.44, then the NRC will also conclude with reasonable assurance that the DOE complies with §61.40, "[General requirement](#)."

For this OOV, the NRC focused on the key monitoring areas (KMAs) 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 June 21, 2022, and two IDEQ staff accompanied the NRC on the OOV.

As described in the NRC Onsite Observation Guidance Memorandum for this OOV (dated May 31, 2022) ([ML22151A334](#)), and as added to during the OOV, the main activities conducted during the OOV were 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 (RPP); (iii) the environmental sampling program; and (iv) the engineered surface barrier construction program. 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.

2.0 NRC OOV ACTIVITIES:

On May 31, 2022, the NRC issued the Onsite Observation Guidance Memorandum ([ML22151A334](#)) for the June 22, 2022 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 the DOE (staff and contractors), the NRC, and IDEQ. 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 RPP; (iii) the environmental sampling program; and (iv) the engineered surface barrier construction program.

2.1 Tour and General 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 KMAs in the INTEC TFF Monitoring Plan, Rev. 0:

- KMA 1 – Residual Waste Sampling
 - The NRC monitoring of the DOE activities related to residual waste sampling and volume estimation is important because those DOE activities are pertinent to the final waste inventory.
- KMA 2 – Grout Formulation and Performance
 - The NRC monitoring of the DOE activities related to grout formulation and performance is important because those DOE activities help to retain key radionuclides in the engineered system.
- KMA 4 – Monitoring During Operations
 - The NRC monitoring of the DOE activities related to the RPP 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, "[Standards for Protection Against Radiation](#)," (i.e., similar to the DOE regulations and orders) are met.
- KMA 5 – Engineered Surface Barrier/Infiltration Reduction
 - The NRC monitoring of the 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 the DOE performance assessment.

2.1.2 Observation Results:

The key points from the tour and technical discussion were:

- The DOE discussed the current and planned closure activities at the INTEC TFF, which included discussions on status and updates on activities.
- The DOE updated the NRC with current outlook for the cleanup and closure of the four 1,000 cubic meter high-level waste tanks (including one spare tank) and were dependent upon the start-up of the Integrated Waste Treatment Unit (IWTU). DOE continues to make progress testing of the IWTU. DOE stated they plan to bring IWTU operation by end of CY 2023.
- The DOE provided NRC a tour of the INTEC facilities, including a walk-down of tank farm 4 pack slated for closure, observed above-ground transfer lines, structures, other equipment for INTEC TFF closure activities and the mock-up for the calcine facility.
- Although outside the scope of NRC's monitoring responsibilities, DOE provided a tour of the full scale mockup of calcine waste retrieval process and the two ISFSI pads, containing Three Mile Island, Unit 2 spent fuel and Peach Bottom spent fuel. One step in the multiple day process of a fuel transfer of Peach Bottom spent fuel was observed during the tour.

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 – RPP

2.2.1 Observation Scope:

The technical discussion supported the NRC monitoring of the 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

2.2.2 Observation Results:

The key points from the technical discussion were:

- The DOE provided the NRC with information on INTEC TFF activities that had occurred since the previous OOV in July 2019:
 - DOE indicated that since the last OOV no activities took place that incurred significant radiation doses.

- Other minor activities included the following (no specific radiation protection information was provided on any of these activities during the OOV)
 - routine surveys to verify radiation levels were below expected
 - valve maintenance—new radiation work permits and ALARA documentation
 - valve box camera replacement (use cameras for observation instead of humans to meet Resource Conservation and Recovery Act permit obligations)
 - upgraded equipment (high efficiency particulate air filter bank and leak detection sump)

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 the 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 (FY) 2020 Annual Report for Operable Unit 3-14, Tank Farm Soil and INTEC Groundwater, July 2021 (DOE/ID-12041)
- NRC staff also reviewed Five-Year Review of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Response Actions at the INL Site— FYs 2015-2019, DOE/ID-12034, Rev. 0, January 2021. Results of perched and saturated groundwater sampling were consistent with previous CERCLA documentation reviewed by NRC staff during the Performance Assessment review.

- DOE contractor, Fluor, performs environmental surveillance at the site. Environmental surveillance reports are available online.
- 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 the 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 KMAs, OPEN ISSUES, OPEN FOLLOW-UP ACTION ITEMS, AND ISSUANCE OF NRC TECHNICAL REVIEW REPORTS:**

3.1 Overall Conclusions:

There is no change to the NRC staff overall conclusions from the 2006 Technical Evaluation Report regarding compliance of the disposal actions with the 10 CFR Part 61, "[Licensing Requirements for Land Disposal of Radioactive Waste](#)," performance objectives. The main key message from the OOV was that the NRC staff did not identify the need for any new KMAs nor did it identify any Follow-Up Action Items. The NRC staff continues to have reasonable assurance that the Part 61 Performance Objectives can be met.

3.2 Status of KMAs in INTEC TFF Monitoring Plan, Rev.0:

INTEC TFF Observation 2022 is the ninth OOV under INTEC TFF Monitoring Plan, Rev. 0. KMA 3 was closed in June 2014 ([ML14149A337](#)). The NRC staff did not close any KMAs during this OOV. Therefore, KMA 1, KMA 2, KMA 4, and KMA 5 from INTEC TFF Monitoring Plan, Rev. 0 remain open.

4.0 **PARTICIPANTS:**

U.S. NRC	U.S. DOE & DOE Contractor
Cynthia Barr	Valerie Kimbro
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	Seabury Zolman
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Landry Austin	Tom Hall
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5.0 **REFERENCES:**

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