

AWAY-FROM-REACTOR INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION GUIDANCE

Effective Date: May 27, 2025

PROGRAM APPLICABILITY: IMC 2690

60858-01 INSPECTION OBJECTIVE

Determine by direct observation and independent evaluation whether the licensee is operating and maintaining the away-from-reactor (AFR) independent spent fuel storage installation (ISFSI) in conformance with regulatory requirements.

An AFR ISFSI, as defined in Inspection Manual Chapter (IMC) 2690, "Inspection Program for Storage of Spent Reactor Fuel and Reactor Related Greater than Class C Waste at Independent Spent Fuel Storage Installations and for 10 CFR Part 71 Transportation Packagings," is 1) a specifically licensed ISFSI whose associated support programs are not conducted under a Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 license, or 2) any generally licensed ISFSI where decommissioning and final status survey activities related to reactor operations are completed and the only remaining operation conducted under the 10 CFR Part 50 license is the operation of the generally licensed ISFSI.

60858-02 INSPECTION REQUIREMENTS

The following are the minimum inspection requirements to be performed during each inspection. The requirements were established following the development of a risk-informed performance-based inspection program and the establishment of five safety focus areas. The five safety focus areas include: occupational exposure, public exposure, fuel damage, confinement, and impact to plant operations. Successful implementation of this inspection procedure will include a review of licensee activities in each safety focus area. IMC 2691, "Technical Basis for the Independent Spent Fuel Storage Installation Inspection Program" provides a description of the ISFSI inspection program technical basis.

If performance deficiencies are identified, then the inspector shall perform additional inspection activities to determine the breadth of performance deficiencies and their reasons. The additional inspection activities shall be approved by regional management. The basis for the added inspection activity shall be communicated to the licensee and documented in a publicly available record, such as the inspection report. IMC 2690 provides guidance on when to consider performance-based inspection activity.

02.01 Changes, Test, and Experiments and 72.212 Evaluations

- a. Review selected changes, tests, or experiments associated with the ISFSI since the last ISFSI inspection. Verify that when changes, tests, or experiments were made,

evaluations were performed in accordance with 10 CFR 50.59 and 10 CFR 72.48, if required. Verify that the licensee has appropriately concluded that the change, test or experiment can be implemented without obtaining either a license amendment or a Certificate of Compliance (CoC) amendment.

- b. For the changes, tests, or experiments that the licensee determined an evaluation was not required, verify that the licensee's compliance with 10 CFR 50.59 and 10 CFR 72.48 as applicable, and licensee procedures.
- c. Review selected changes to 10 CFR 72.212 evaluations performed by general licensees since the last ISFSI inspection. Verify that evaluations required by 10 CFR 72.212 are revised when required by changes to the facility, to the dry storage system (DSS), or to licensee procedures.

02.02 Radiation Protection Program

- a. Evaluate the effectiveness of the licensee's plans and preparations for controlling radiologically significant activities, by reviewing documents and interviewing selected individuals.
- b. Verify by independent measurement and review of selected records, that ISFSI radiation dose and contamination levels are within prescribed limits, in accordance with 10 CFR Part 20 and 10 CFR 72.104.
- c. Verify by direct observation that radioactive material present at the ISFSI is properly controlled and stored in accordance with site requirements. Verify that special nuclear material (SNM) stored at the ISFSI is properly accounted for by the licensee in accordance with 10 CFR 72.72. Radioactive material includes sources that the licensee may maintain to perform instrument source checks.

02.03 Emergency Preparedness Program

- a. If the licensee is permitted to make changes to their emergency preparedness program in accordance with 10 CFR 50.54 or specific license conditions, verify that the licensee has not made changes that decrease the overall effectiveness of the emergency preparedness program without prior U.S. Nuclear Regulatory Commission (NRC) approval.
- b. Verify that changes to the emergency preparedness program have been properly coordinated with the appropriate offsite emergency response groups and have been reflected in the emergency plan and emergency plan implementing procedures.
- c. Review emergency plan drills and exercises performed since the last inspection to ensure the drills and exercises were performed in accordance with the frequency and scope of the training requirements specified in the emergency plan. If possible, schedule the NRC's onsite inspection during an emergency plan drill or exercise and observe the exercise.
- d. Examine audit and assessment reports of the emergency preparedness program that have been conducted since the last inspection. Ensure that findings and deficiencies identified during drills and exercises were entered into the licensee's corrective action program and resolved.

02.04 Maintenance and Surveillance Program

- a. Verify by direct observation, review of records, and by conducting interviews that maintenance and surveillance activities are performed in accordance with regulatory requirements to support safe storage of spent fuel and greater-than-Class-C (GTCC) waste and to support reliable operation of the ISFSI facility.
- b. Perform walkdowns to assess the overall material condition of the ISFSI facility as it pertains to the safe operation of the ISFSI.
- c. Verify by direct observation that combustible materials are properly stored or located within the ISFSI facility and that the fire loading does not exceed the fire hazards analysis limits in the Safety Analysis Report.

02.05 Environmental Monitoring Program

Verify that doses to the nearest real individual are within limits prescribed by 10 CFR 72.104.

02.06 Quality Assurance (QA) Program

Evaluate the licensee's effectiveness in identifying, resolving, and preventing problems, by reviewing the overall corrective action program (CAP). This includes a risk-informed review of condition reports, a review of all root cause and apparent cause analyses, a review of safety committee meeting minutes and correspondence, as applicable, and a review of audits and self-assessments of the CAP. If the licensee's contractor(s) have a corrective action program separate from or integral to the licensee's program, the inspector shall evaluate all corrective action programs associated with ISFSI activities.

02.07 Aging Management Activities

If the licensee has a renewed specific ISFSI license or uses a renewed CoC under their general license, then verify and evaluate the adequacy of the aging management program (AMP) and time limited aging analyses (TLAAs) as described in the safety evaluation report (SER) and incorporated in the final safety analysis report (FSAR) supplement as revised or 10 CFR 72.212 evaluations.

60858-03 INSPECTION GUIDANCE

03.01 General Guidance

Programs for ISFSI facilities located at active or decommissioning 10 CFR Part 50 facilities are typically controlled by the associated 10 CFR Part 50 facilities programs. In comparison, an AFR ISFSI may be a specifically licensed ISFSI whose associated support programs are not conducted under a 10 CFR Part 50 license, or a generally licensed ISFSI where decommissioning and final survey activities related to reactor operations are completed and the only remaining operations conducted under the 10 CFR Part 50 license are the operation of the generally licensed ISFSI. AFR ISFSI licensee programs (i.e., QA, safety evaluations, radiation protection, emergency preparedness, and training), even if previously reviewed under IMC 2500 series inspection procedures (IPs), require periodic inspection in accordance with this

inspection procedure (IP). IMC 2691, Section 04.05, provides guidance regarding the five safety focus areas evaluated by the ISFSI inspection program. The inspectors should refer to the risk prioritization table in IMC 2690, Appendix D. A majority of the inspectors' focus should include review of priority level 1 items.

This IP provides specific guidance for the inspection of programs associated with operational AFR ISFSIs that are not, or are no longer, reviewed by IMCs 2515 and 2561 IPs associated with operating or decommissioning reactor facilities, respectively. While guidance within the IP directs the inspector to primarily evaluate changes to the programs or the results of assessments from these programs, it is recognized that a review of certain programs even if a change has not occurred during each inspection may be necessary. Specific guidance for the review of programs can be found in IP 60854, "Preoperational Testing of an Independent Spent Fuel Storage Installation," or IP 60856 as necessary.

If the inspector has questions or concerns that require additional technical or regulatory support, additional guidance can be found in IMC 2690 for obtaining additional support from headquarters.

03.02 Specific Guidance

a. Changes, Test, and Experiments and 72.212 Evaluations

This requirement affects all safety focus areas except plant operations and criticality. The 10 CFR 72.48 screenings and evaluations selected for review should be based upon their safety significance, impact on the five risk-informed safety focus areas, and complexity. The inspectors should refer to IMC 2690, Appendix E, for guidance in prioritizing the review of 10 CFR 72.48 evaluations.

Regulatory Guide 1.187 "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," Revision 1, states that Revision 1 of Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," is acceptable for complying with the NRC regulations in 10 CFR 50.59. To ensure consistent interpretation of 10 CFR 50.59, Regulatory Guide 1.187, contains clarifying statements to address certain language in the NEI guidance.

Regulatory Guide 3.72, "Guidance for Implementation of 10 CFR 72.48, Changes, Tests, and Experiments," Revision 1, endorses NEI document NEI 12-04, "Guidelines for 10 CFR 72.48 Implementation," Revision 2, dated September 2018 with exceptions and clarifications.

Inspectors should refer to IP 60857, "Review of 10 CFR 72.48 Evaluations," as needed for additional guidance for the review of 10 CFR 72.48 evaluations. Inspection hours are charged to IP 60858.

For general licensees, specific attention should be placed on a risk-informed review of evaluations performed to apply changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC. Additionally, specific attention should be placed on a risk-informed review of evaluations used to transition to a new amendment of the same CoC. Inspectors should be aware that performance of a 10 CFR 72.212 evaluation alone does not relieve the licensee from performing a 10 CFR 72.48 evaluation, if required, as discussed in NRC Regulatory Issue Summary

(RIS) 2012-05, "Clarifying the Relationship Between 10 CFR 72.212 and 10 CFR 72.48 Evaluations." A risk-informed selection involves a change that has an actual or potential reduction in margin for one or more of the safety focus areas.

Inspectors should refer to IP 60856, "Review of 10 CFR 72.212 Evaluations," as needed for additional guidance for the review of 10 CFR 72.212 evaluations. Inspection hours are charged to IP 60858.

b. Radiation Protection Program

This requirement affects the occupational and public exposure safety focus areas. Review the site's ALARA and radiological programs to determine if the site is adequately implementing ALARA practices and if worker dose is below regulatory limits and review any large dose variances.

The inspectors should verify that the licensee has access to appropriate radiological monitoring instrumentation to perform surveys appropriate to the facility and that these instruments are appropriately calibrated. Radiological monitoring instrumentation equipment needed for emergency response shall be available in accordance with the emergency plan and shall be appropriately calibrated. The inspectors should perform independent radiological surveys of portions of the ISFSI to determine that radiological conditions meet regulatory requirements and are as indicated by the licensee's radiological surveys.

The inspectors should verify that a physical inventory of all special nuclear material, including reactor related GTCC waste containing special nuclear material, is performed every 12 months in accordance with 10 CFR 72.72(b). Refer to IP 71130.11 for additional information.

c. Emergency Preparedness Program

This requirement affects the occupational and public exposure safety focus areas. The inspectors should review the emergency plan changes made by the licensee since the last inspection was performed. The licensee shall have a program in place that evaluates whether changes decrease the effectiveness of the emergency plan. If changes to the emergency plan decrease emergency plan effectiveness, prior NRC approval must be obtained before implementing the change.

Emergency plan implementing procedures used by the licensee should be reviewed along with the training offered to both onsite and offsite personnel. It should be verified that the required training has been conducted for onsite responders and offered to offsite responders. Changes made to the emergency plan should be distributed to appropriate personnel and organizations. The inspectors should interview several individuals from organizations that received the training to determine if the training program has been effective and notices of program changes were made.

The licensee's performance of drills and exercises should be reviewed along with drill and exercise critiques since the last inspection. The licensee shall follow emergency plan requirements. The latest revision of the emergency plan shall be available in the designated emergency response facilities. Emergency offsite support groups shall be invited to participate in licensee drills and exercise if required by the licensee's emergency plan.

The licensee's corrective action program should be reviewed to determine any deficiencies that were identified related to emergency response. The inspectors should determine whether deficiencies identified during drills and exercises were entered into the corrective action program and adequately resolved. It should be verified that the licensee is conducting audits of the emergency plan program on a routine basis. The inspectors should determine if the scope and depth of the audits are comprehensive enough to provide a complete overview of the emergency response program.

d. Maintenance and Surveillance Program

This requirement affects all safety focus areas except plant operations and criticality. The CoC or specific license for maintenance and surveillance requirements that apply to the ISFSI should be reviewed to ensure the licensee's maintenance and surveillance program meets the applicable requirements.

The inspectors should observe maintenance and surveillance activities that are scheduled during the inspection. A risk-informed review of completed maintenance and surveillance documentation should also be performed. An example of activities for a standard DSS may include: monitoring DSS temperatures, calibrating instruments, inspecting DSS ventilation openings for obstructions, inspecting DSS internals, evaluation of slope stability of nearby geography, evaluation of the height of shielding berms, or monitoring the structural condition of the DSS and ISFSI pad.

The inspectors should perform a walkdown of the ISFSI and independently assess the overall material condition of the ISFSI facility as it pertains to its safe operation. The results of any deficiencies identified during the walkdown should be compared to those identified by the licensee and if not previously identified, should be placed in the corrective action program by the licensee. Examples of deficiencies may include significant spallation of concrete, signs of corrosion, or washout of soils that could lead to a loss of slope stability near the ISFSI. Additional guidance on the acceptability of deficiencies can be found in the licensee's FSAR.

The inspectors should perform a walkdown of the ISFSI and surrounding areas and identify if there are combustibles near the ISFSI. Any identified combustibles should be compared to the licensee's evaluations for fire and explosion hazards for the ISFSI. The inspectors should verify that significant un-analyzed combustible materials are not present near the ISFSI facility and that the fire loading does not exceed prescribed limits.

e. Environmental Monitoring Program

This requirement affects the public exposure safety focus area. Inspectors should review whether the licensee is adequately performing surveys in accordance with 10 CFR 20.1302, which requires licensees take appropriate surveys of the unrestricted and controlled areas and effluents released into these areas to demonstrate compliance with the dose limits for individual members of the public.

Either the 10 CFR Part 50 license and CoC, or the 10 CFR Part 72 specific license should be reviewed to identify the site-specific program requirements for environmental and, as required, effluent monitoring at the facility. If the licensee only possesses DSSs with leak tight sealed canisters, effluent monitoring may not be required. For sites that have vented storage systems or are in wet storage, effluent monitoring may be required.

The inspectors should verify the licensee is monitoring their facility in accordance with site-specific environmental and effluent monitoring programs. A walkdown of a selection of air sampling stations and thermoluminescent dosimeter (TLD) monitoring stations, as required, should be performed to determine whether they are located as described in the environmental and effluent monitoring programs and to determine the equipment material condition. For any air sampling stations selected, calibration and maintenance records should be reviewed to verify that the records demonstrate adequate operability of these instruments.

Results of environmental and effluent monitoring reports should be reviewed, and it should be verified that doses to the nearest real individual are within limits prescribed by 10 CFR 72.104. The inspector should verify that the results of environmental and effluent monitoring are reported to the NRC in accordance with the applicable requirements. 10 CFR 72.104 requires that licensees limit, during normal operations and anticipated occurrences, the annual dose equivalent to any real individual who is located beyond the controlled to 0.25 mSv (25 mrem) to the whole body, 0.75 mSv (75 mrem) to the thyroid, and 0.25 mSv (25 mrem) to any other critical organ.

f. Quality Assurance (QA) Program

This requirement affects all safety focus areas except plant operations. The inspector should review a list of the licensee's corrective action program condition reports since the last inspection and select several for a detailed review. The licensee and/or contractor should have assigned an appropriate significance level for the condition report in accordance with its CAP. The inspector should review the selected condition reports and all apparent cause and root cause analyses conducted by the licensee. Conditions adverse to quality should be promptly identified and corrected and for any significant condition identified as adverse to quality, the cause of the condition should be determined, and corrective action should be taken to preclude repetition.

Administrative procedures that control the conduct of self-assessments, audits and quality-related surveillances should be reviewed. The licensee's audit plan should be reviewed to verify that audits of the major program areas are scheduled and executed on a periodic basis in accordance with the licensee's QA program. The inspectors should review selected audits and self-assessments performed by the licensee. The inspectors should verify that personnel performing audits were qualified in accordance with the QA program requirements. Individuals performing audits are required by 10 CFR 72.176 to be sufficiently independent from the line organization that was being audited. Audit findings should be reviewed and the inspectors should verify that adverse findings were entered into the licensee CAP. If applicable, onsite and/or offsite plant review committee meeting minutes should be reviewed. The inspectors should evaluate the effectiveness of the audits, self-assessments and surveillances in identifying programmatic weaknesses and potential areas of declining licensee performance.

g. Aging Management Activities

This requirement may impact all safety focus areas except plant operations. The inspectors should become familiar with the renewed ISFSI license or renewed CoC in use at the ISFSI, the NRC SER for the renewal, license or CoC conditions and technical specification related to aging management, and the aging management FSAR supplement. The inspectors should evaluate whether the licensee implemented the

AMPs and TLAAs provided in the renewed license or renewed CoC. The evaluation should include how the licensee incorporated the ten elements into their AMP.

60858-04 INSPECTION RESOURCES

Storage Operations Onsite - the estimated average time to complete the inspection requirements is 24 +/- 4 hours of direct inspection per triennial cycle.

60858-05 PROCEDURE COMPLETION

Inspection procedure completion is based upon completion of the inspection procedure requirements. The inspection procedure shall be completed in accordance with the inspection procedure frequency requirements specified in IMC 2690 Appendix A.

60858-06 REFERENCES

IMC 2690, "Inspection Program for Storage of Spent Reactor Fuel and Reactor Related Greater than Class C Waste at Independent Spent Fuel Storage Installations and for 10 CFR Part 71 Transportation Packagings"

IMC 2691, "Technical Basis for the Independent Spent Fuel Storage Installation Inspection Program"

IP 60854, "Preoperational Testing of an Independent Spent Fuel Storage Installation"

IP 60856, "Review of 10 CFR 72.212 Evaluations"

IP 60857, "Review of 10 CFR 72.48 Evaluations"

NEI 12-04, "Guidelines for 10 CFR 72.48 Implementation," Revision 2

NEI 14-03, Revision 2, "Format, Content and Implementation Guidance for Dry Cask Storage Operations-Based Aging Management," (ML16356A210)

NUREG-1927, Revision 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel," (ML16179A148)

NUREG-2214, "Managing Aging Processes in Storage (MAPS) Report," Draft Report for Comment, (ML17289A237)

Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," Revision 1

Regulatory Guide 3.72, "Guidance for Implementation of 10 CFR 72.48, Changes, Tests, and Experiments," Revision 1

RIS 2012-05, "Clarifying the Relationship Between 10 CFR 72.212 and 10 CFR 72.48 Evaluations"

TI 2690/011, "Review of Aging Management Plans at Independent Spent Fuel Storage Installations," (ML20023A016)

END

Attachment 1: Revision History for IP 60858

| Commitment Tracking Number | Accession Number Issue Date Change Notice | Description of Change | Description of Training Required Completion Date | Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information) |
|----------------------------|---|--|--|---|
| N/A | ML070430095 05/03/07 CN 07-015 | This document has been revised to change SFPO to SFST and some minor editorial changes. No other major changes are proposed by 10/22/2007. | N/A | N/A |
| N/A | ML20294A520 11/12/20 CN 20-062 | Major revision. Revised to update inspection hours. Also revised to clarify and enhanced the inspection requirements and guidance as a result of the risk-informed review of the inspection process. | Yes. Verbal discussion of changes during inspector training session on revised ISFSI inspection program. Due date is 12/31/2020 | ML20294A516 |
| | ML25108A101 05/27/25 CN 25-013 | Revised to incorporate resource estimate ranges and include additional guidance. | N/A | N/A |