
INSPECTION PROCEDURE 60855

OPERATION OF AN ISFSI

PROGRAM APPLICABILITY: 2690 and 2515

SALP FUNCTIONAL AREA: Plant Operations (OPS)

60855-01 INSPECTION OBJECTIVE

For the purposes of this procedure, the term "licensee" may refer to a 10 CFR Part 72 site-specific license holder or to a reactor licensee using a 10 CFR Part 72 general license. This procedure can be viewed, in three distinct phases:

- a. Loading - Activities relating to transferring spent fuel from the spent fuel pool to the dry cask storage system (DCSS), preparing the cask or canister for storage, and moving the DCSS to the Independent Spent Fuel Storage Installation (ISFSI).
- b. Normal Operations - Activities relating to long-term operation and monitoring of the ISFSI.
- c. Unloading - Activities relating to retrieving spent fuel from a loaded DCSS in the ISFSI and transferring it either back into the spent fuel pool or into a separate storage component (storage or transportation).

01.01 To determine, by direct observation and independent evaluation, whether the licensee is operating the ISFSI in conformance with the commitments and requirements contained in the Safety Analysis Report (SAR), the NRC's Safety Evaluation Report (SER), the Certificate of Compliance (C of C) or, if applicable, the site-specific ISFSI license and technical specifications, as well as the requirements of the licensee's Quality Assurance (QA) program and 10 CFR Part 72.

60855-02 INSPECTION REQUIREMENTS

02.01 Before any on-site activity, review the SAR, SER, C of C, and, if applicable, the site-specific license and technical specifications for the DCSS being used. If a general license is used, review the written evaluations required by 10 CFR 72.212(b).

02.02 Determine by review of selected licensee procedures, that responsibilities for specific activities relating to the ISFSI (i.e., design, component fabrication, construction, preoperational testing, operations, maintenance, and surveillance testing) have been defined and the licensee has integrated responsibilities for these activities into the appropriate plant programs listed below. Verify that these procedures fulfill the commitments and requirements

specified in the SAR, SER, C of C, 10 CFR Part 72, and, if applicable, the site-specific license and technical specifications.

- a. Plant Operations
- b. Radwaste Storage and Handling
- c. Control of Heavy Loads
- d. Radiation Protection
- e. Security and Safeguards
- f. Emergency Preparedness
- g. Maintenance
- h. Surveillance
- i. Fire Protection
- j. Training
- k. Environmental Monitoring
- l. QA Activities
- m. Administrative Procedures

02.03 Evaluate the effectiveness of the licensee's plans and preparations for controlling radiological activities, by reviewing documents and interviewing selected individuals. Specific areas should include, as a minimum:

- a. ALARA reviews and planning (As Low As Reasonably Achievable)
- b. Radiation Work Permits
- c. Hot particle controls
- d. Contamination, exposure, and airborne controls
- e. Alarms and monitoring systems
- f. Response to significant crud releases

02.04 Verify that the licensee has developed procedures for conducting loading and unloading activities. Verify that necessary equipment and space in the spent fuel pool for DCSS unloading can be made available within a reasonable period of time. Verify that the licensee has developed procedures for implementing normal operations of the ISFSI.

02.05 Verify, by direct observation of selected activities and independent evaluation, that the licensee has performed either loading or unloading, as applicable, in a safe manner and in compliance with approved procedures. Verify, by direct observation or review of selected records, that radiation dose and contamination levels are within prescribed limits after a DCSS has been installed at the ISFSI.

02.06 Verify, by direct observations or review of selected records, that the licensee has identified each fuel assembly placed in the ISFSI, has recorded the parameters and characteristics of each fuel assembly, and has maintained a record of each fuel assembly as a controlled document.

02.07 Verify, by direct observations or review of selected records, that the following safeguards activities have been completed in accordance with approved procedures:

- a. Records have been established for all spent fuel in storage at the ISFSI.
- b. Duplicate records, of spent fuel stored in the ISFSI, are being kept at a separate location sufficiently remote from the original records that a single event would not destroy both sets of records.
- c. During normal operations, a physical inventory has been conducted on all spent fuel stored in the ISFSI at least every 12 months.

02.08 During normal operations, verify, by direct observation or review of selected records, that routine activities are performed in accordance with approved procedures and surveillance activities have been conducted at the specified periods.

02.09 Evaluate the effectiveness of the licensee's management oversight and QA assessments of ISFSI activities, for loading, unloading, or normal operations, as applicable.

60855-03 INSPECTION GUIDANCE

General Guidance

Structures, systems, and components (SSCs) involved in ISFSIs are not safety-related, but are classified as important to safety (10 CFR 72.3). This is based on the reduced risk associated with the reduced source term, from the spent fuel, which has decayed for a considerable period of time before being placed in the ISFSI. Consequently, the licensee needs to provide a reasonable assurance that the spent fuel can be handled, stored, and retrieved without undue risk to the health and safety of the public. However, activities inside the reactor or fuel buildings (e.g., lifting of heavy loads or movement of spent fuel) may have a direct impact on safety-related SSCs. Therefore, activities potentially affecting safety-related SSCs should receive additional attention. Questions on ISFSI activities affecting safety-related SSCs should be referred to the NRR project manager (PM). If requested, assistance on inspections may be obtained from Spent Fuel Project Office (NMSS/SFPO) and NRR.

If the licensee intends to use a different model or type of DCSS, then applicable portions of IP 60854 and this procedure should be revisited.

Specific Guidance

03.01 SARs and SERs describing the operation of particular DCSS components have been written for each type of approved DCSS. Information about commitments for particular DCSS may also be found in the C of C. DCSS designs vary and care must be taken to review the correct documentation. Copies may be obtained from the Division of Reactor Safety or NMSS/SFPO. While the SER can document or clarify commitments made by the licensee or vendor, it does not serve as an independent basis for enforcement actions.

03.02 Additional guidance for the review of licensee procedures may be found in IP 42700. Procedures should have been formally reviewed and approved consistent with the licensee's administrative programs, including any reviews required by the plant operations review committee (PORC). Requirements contained in the SAR, SER, C of C, and, if applicable, the site-specific license and technical specifications should have been procedurally established.

Supplemental guidance may also be found in the inspection procedures used for evaluating these program areas in the MC 2515 program (e.g., IPs 71707, 61726, 62703, 37551, and 71750). Supplemental guidance on the quality classification of DCSS components may be found in the references. Further questions should be referred to NMSS/SFPO for assistance.

- a. Procedures should include normal, abnormal, and emergency conditions. They may include guidance on contingency plans for placing the DCSS in a safe configuration during an emergency or abnormal conditions.
- b. No specific guidance.
- c. For control of heavy loads, those programs should be examined closely to determine whether the licensee has properly evaluated the impact of lifting loaded DCSS' against the operating reactor facility, in accordance with 10 CFR 50.59. Areas where problems have arisen were heavy load pathways, single-failure-proof cranes, and loaded casks or canisters exceeding crane capacity limits. Supplemental guidance may be found in the references.
- d. Requirements for radiation protection program activities may be found in 10 CFR 72.104, 72.106, 72.126, and 72.212, in addition to 10 CFR Part 20.
- e. For safeguards activities such as material control and accounting, supplemental guidance can be found in IP 85102. The inspector may also refer to 10 CFR 72.72 and 72.212.

- Records of the specific activities are required for any spent fuel placed in the ISFSI, including: receipt, inventory (including location), disposal, acquisition, and transfer.
- f. No specific guidance.
 - g. No specific guidance.
 - h. Surveillance requirements may be found in the C of C or site-specific license and technical specifications.
 - i. The fire protection program should consider the impact of transient combustible loading on the ISFSI (e.g., fuel oil for multiple cranes).
 - j. For training programs, a systems-based approach should be used that identifies required knowledge and skills, provides the training, and examines the individual to ensure he/she understands the training. For a site-specific license, additional requirements are specified in 10 CFR 72.192. Supplemental guidance may also be found in IP 41500.
 - k. No specific guidance.
 - l. Supplemental guidance may be found in IP 40500.
 - m. No specific guidance.

03.03 Supplemental guidance on inspecting these activities can be found in IPs 83750, 83729, and other MC 2515 radiation protection procedures. Licensee procedures and planning should consider the possibility of major crud releases, when moving spent fuel bundles. The licensee should be prepared to analyze any major crud releases to determine if indications of cladding damage are present.

03.04 Examples of the types of activities that should be covered by written procedures can be found in IP 60854, section 02.03. For all procedures responsibilities should be clearly defined, with direction provided if steps cannot be performed as written. If the licensee's procedures were reviewed as part of the inspection of preoperational testing activities (IP 60854), then this section need not be performed. Supplemental guidance on inspecting procedures can be found in IP 42700.

For loading activities, hold and inspection points should be clearly identified. Guidance should be provided on whom to notify if abnormal or emergency conditions arise and what criteria must be met to resume activities. Alternatively, the licensee's problem identification and corrective action systems may be referenced for those actions. Guidance should be provided for dealing with casks suspended in mid-air; this may include compensatory actions. (Problems have occurred where casks have been suspended in mid-air for over 15 hours, because of problems with the crane.)

For unloading activities, attention should be paid to how the licensee has prepared to deal with the potential hazards associated with that task. Some potential issues may include: the radiation exposure associated with drawing and analyzing a sample of the canister's potentially radioactive atmosphere; steam flashing and pressure control as water is added to the hot canister; and filtering or scrubbing the hot steam/gas mixture vented from the canister, as it is filled with water.

Unloading the cask and returning the spent fuel to the spent fuel pool is one method of retrieval. 10 CFR 72.122(l) requires that spent fuel in an ISFSI be retrievable (e.g., if a DCSS is subsequently found to be defective or a loaded DCSS component is subjected to accident conditions as defined in the SAR, then the DCSS must be unloaded). Retrieval could also involve transfer of the spent fuel to another storage canister. Requirements for an unloading capability may be found in the C of C. Although the Commission has not defined how quickly retrieval must occur, the licensee should have established plans and procedures for unloading the DCSS back into the spent fuel pool. Issues with special circumstances should be referred to NMSS/SFPO for assistance.

03.05 Pre-job briefings should be observed. These briefings should include discussions of planned activities, hold and inspection points, contingency plans, and radiation safety issues. The inspector is encouraged to select activities with potential safety consequences, such as control of heavy loads, canister sealing activities, or leak testing.

03.06 The licensee is required to identify and characterize each fuel assembly stored in DCSS' in its ISFSI to meet the conditions for cask and canister use as specified in the C of C and, if applicable,

the site-specific license. Records should be maintained as quality documents under the licensee's QA Program. The C of C or site-specific license and technical specifications typically include requirements that the Zircaloy cladding of spent fuel loaded into the DCSS contain no known or suspected gross cladding failures. A licensee should establish written procedures to address this issue. These procedures should define the inspections process and specific acceptance criteria.

03.07 10 CFR 72.72(b) requires that a physical inventory be conducted annually. Because it would not be prudent to open the sealed DCSS - solely inventory the contents - alternate material control and accounting (MC&A) methods should be used. For example, licensee verification that tamper-indicating seals or other methods were present and intact would provide an adequate indication that the specific spent fuel bundles loaded into the DCSS were still in place.

03.08. Observe, on a rotating basis, the various operations, maintenance, surveillance, engineering and plant support activities performed at the ISFSI. Normal activities might include: monitoring temperatures, calibrating instruments, inspecting ventilation openings for obstructions, surveying radiation levels, or testing security systems. Additional guidance on inspecting those activities may be found in IPs 71707, 61726, 62703, 37551, and 71750. These observations may be credited against applicable portions of the MC 2515 core program.

03.09 This can include reviewing QA audits or surveillances, interviewing auditors, observing supervisory involvement and oversight, and reviewing deficiencies and corrective actions.

60855-04 INSPECTION RESOURCES

04.01 To prepare for inspection of loading or unloading activities, each inspector should spend approximately 16 hours for in-office review. Inspection activities will require approximately 40 hours, each, by three inspectors. Documentation is estimated at 16 hours per inspector. This procedure may be used as credit for applicable portions of the MC 2515 core program (plant operations, maintenance, engineering, and plant support). It is expected that regional inspection personnel will perform this procedure, with assistance from NMSS and NRR staff, as requested.

04.02 Estimates for routine performance of normal operations activities is 3 hours per inspector every 6 months. These activities may also be used as credit for applicable portions of the 2515 core program (plant operations, maintenance, and plant support). It is expected that regional inspection personnel will accomplish this portion of the procedure.

60855-05 REFERENCES

ANSI/N14.6-1993, "For Radioactive Materials - Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More."

NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," July 1980. Licensee implementation of this NUREG may vary and specific commitments to this guidance are covered by responses to NRC Generic Letters 80-113 and 85-11.

NUREG/CR-6407, "Quality Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety," October 1995 (DRAFT).

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