

NRC INSPECTION MANUAL

SFPO/NMSS

INSPECTION PROCEDURE 60852

ISFSI COMPONENT FABRICATION BY OUTSIDE FABRICATORS

PROGRAM APPLICABILITY: 2690

60852-01 INSPECTION OBJECTIVES

01.01 To determine whether a dry cask storage system (DCSS), fabricated by an offsite entity and for use in an independent spent fuel storage installation (ISFSI), is constructed in accordance with the commitments and requirements specified in the safety analysis report (SAR), the NRC's corresponding safety evaluation report (SER), 10 CFR Part 72 and, as applicable, the certificate of compliance (CoC) or the site-specific license and technical specifications.

01.02 To determine whether the outside fabricator's activities are conducted in accordance with NRC-approved Quality Assurance (QA) program requirements.

60852-02 INSPECTION REQUIREMENTS

02.01 Determine whether the fabrication specifications are consistent with the design commitments and requirements documented in the SAR, and, as applicable, the CoC or the site-specific license and technical specifications.

02.02 Determine whether corrective actions for identified fabrication deficiencies have been implemented in a time frame commensurate with their significance, and whether nonconformance reports documenting the deficiencies have been initiated and resolved.

02.03 Determine whether individuals performing quality-related activities are trained and certified where required.

02.04 Determine whether the offsite fabricator's personnel are familiar with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the DCSS.

02.05 Determine whether:

- a. Materials, components, and other equipment received by the fabricator meet DCSS design procurement specifications.
- b. The procurement specifications conform to the design commitments and requirements contained in the SAR and, as applicable, the CoC or the site-specific license and technical specifications.

02.06 Determine whether DCSS components are being fabricated per approved QA and 10 CFR Part 21 implementing procedures and fabrication specifications.

02.07 With regard to fabrication activities, determine whether:

- a. They are conducted under an NRC-approved QA program (10 CFR 72.140).
- b. The provisions of 10 CFR Part 21, "Reporting of Defects and Noncompliance," for reporting defects that could cause a substantial safety hazard have been implemented.
- c. The fabricator's personnel are familiar with the reporting requirements of 10 CFR Part 21.
- d. The fabricator has complied with 10 CFR 21.6, "Posting requirements."

02.08 With regard to quality assurance activities, determine whether

- a. The fabricator has been audited by either the licensee or CoC holder.
- b. For selected audits and inspection findings from (as applicable) QA audit or surveillance and/or inspection reports issued in the previous 2 years, the findings were appropriately handled with corrective actions implemented in a time frame commensurate with their safety significance.
- c. Supervision and quality control/quality assurance personnel perform appropriate oversight during fabrication activities.

60852-03 INSPECTION GUIDANCE

Definitions

- a. Participants. The terms "licensee," "vendor," "CoC holder," "fabricator," "general licensee," and "site-specific licensee" are terms you will commonly encounter while reviewing ISFSI activities. Refer to Inspection Manual Chapter (IMC) 2690, "Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations," Section 03, for definitions of these terms.
- b. Safety Classification. ISFSI systems, structures, and components (SSCs) are classified as either "important to safety" or "not important to safety" by the ISFSI designer.

If "important to safety," the SSC will typically either

1. maintain the functions or conditions (i.e., confinement, criticality, shielding, and heat removal) necessary to store spent fuel safely;
2. prevent significant damage to the spent fuel container (DCSS) during handling and storage; or
3. provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to public health and safety.

If an SSC does not perform any of the preceding functions, it may be classified as "not important to safety."

General Guidance

- a. Overall Focus. The inspection focus is to determine whether the fabricator is constructing ISFSI components in accordance with an NRC approved QA program, and whether the DCSS component, as fabricated, will perform its intended function as stated in the SAR and, as applicable, the CoC or the site-specific license and technical specifications. DCSS components must be constructed under an NRC-approved QA program, which may be either the licensee's, CoC holder's, or the fabricator's. Refer to IP 60851, "Design Control of ISFSI Components," for guidance on inspecting design changes.
- b. Additional Assistance. You may obtain additional assistance for both technical and design questions from the cognizant Spent Fuel Project Office (SFPO) project manager (PM).
- c. ISFSI SSCs Safety Classification. Before performing an inspection of ISFSI SSCs, the inspector should review the licensee's design basis documents to determine whether the licensee has applied an appropriate safety classification to a particular SSC. Note that site-specific variations in ISFSI designs may affect the safety classification of some SSCs.
- d. ISFSI SSCs Not Important to Safety. For this class of SSCs, the licensee's use of generally accepted commercial-grade standards, practices, and materials in design, fabrication, and construction activities is acceptable. However, these SSCs must still conform to the design requirements described in the safety analysis report (SAR) and supporting engineering documents.
- e. Design Changes. Each DCSS design has been approved by the NRC through the licensing process, for a site-specific license, or the 10 CFR Part 72, Subpart L, process for a general license. All changes to the design described in the SAR must be approved by the licensee or CoC holder. Approval authority for changes can be difficult for the inspector to determine. In such cases, you can find additional guidance in IMC 2690, Section 05.10. (NOTE: Recent changes to Part 72 have extended the provisions of 72.48 to CoC holders, not just licensees.)
- f. Component Functionality. Functionality is the ability of a component to meet its design requirements. Some components may have multiple design requirements and several functions. These requirements and functions are defined in the SAR, safety evaluation report (SER), and, as applicable, the CoC or the site-specific license and technical specifications for the DCSS. For example, the cask support basket that separates the individual fuel bundles serves several functions: structural integrity, criticality control, heat transfer, and radiation shielding. Assistance in identifying the function(s) of a given component may be obtained from SFPO.
- g. Document Review Before any onsite inspection activity, for each DCSS in use, review (as applicable) the
 - 1. safety analysis report and corresponding NRC safety evaluation report;
 - 2. certificate of compliance;
 - 3. site-specific license and technical specifications; and
 - 4. 72.48 evaluations performed since the last update to the DCSS SAR.

SARs and SERs describing DCSS components have been written for each type of approved DCSS. Information on operational commitments for a particular DCSS may also be found in the CoC or the site-specific license and technical specifications. As DCSS designs vary, be careful to review the appropriate documentation. You can obtain copies of these documents from the appropriate regional division or cognizant SFPO PM.

- h. Since fabricators build components for several licensees, the fabricators may have been previously inspected by NMSS, NRR, or regional staff. You can obtain information on inspections of ISFSI vendors and fabricators from NMSS/SFPO. These reports should be reviewed for identified fabricator program weaknesses that you may want to consider inspecting to assess the fabricator's effectiveness in addressing the weaknesses.

Specific Guidance

(Note: The following inspection activities should be performed primarily at the fabricator's facility. However, document reviews may be performed elsewhere as conditions require. It may also be advantageous to inspect subcontractors used by the fabricator if time permits.)

03.01 Fabrication specifications include, but are not limited to, component material specifications, fabrication techniques, examination techniques, and required dimensions and tolerances. Previously identified problems related to DCSS component fabrication include:

- a. Incomplete documentation of actual fabrication activities in fabrication traveler documents;
 - 1. failure to explicitly state required critical component dimensions, such as minimum allowable wall thickness, on fabrication traveler documents;
 - 2. failure to require verification of critical component dimensions using a specified non-destructive examination (NDE) technique (i.e.- ultrasonic testing) as required in the DCSS design documentation;
 - 3. design changes made outside of the approved design change process (e.g., by letter or memorandum);
 - 4. inadequate oversight of fabrication activities by the licensee or CoC holder; and
 - 5. fabrication of a component to a different safety classification than that shown in the design specifications.

03.02 For nonconformance reports in which the adverse condition is determined to be acceptable "as is," the report should contain sufficient information to justify why the nonconforming condition does not compromise the ability of the component to perform its intended function(s). Nonconformances should be dispositioned before the DCSS is released to the licensee, unless otherwise authorized by the licensee. Review nonconforming conditions that are resolved by design changes to ensure that component function is not compromised. You may obtain assistance in determining component function from NMSS/SFPO. Also, you can find supplemental information on inspecting design changes in IP 60851.

03.03 Fabricator personnel performing quality functions may be welders, NDE inspectors, quality control (QC) staff, and QA auditors. A program for certification of each of these personnel should have been defined and implemented by the fabricator and approved by the licensee prior to performance of quality activities by these individuals.

03.04 No specific guidance.

03.05 Verify that the procurement specifications conform to the design requirements contained in the SAR, CoC, and other applicable engineering documents. Place emphasis on instances in which components or raw materials do not meet the procurement specifications thus representing a nonconforming condition. Verify that the licensee's or CoC holder's design change process has evaluated and handled these nonconformances. Reference Section 03.02 of this procedure for guidance on the evaluation of nonconformances.

You can find supplemental guidance on the quality classification levels of ISFSI components from references found in Section 05 of this inspection procedure.

03.06 You may find a discussion of the required methods of fabrication in the SAR or CoC and, if applicable, the site-specific license.

03.07 No specific guidance.

03.08 Determine if and when the licensee's QA staff or other licensees' QA staffs have audited fabricator activities. You can obtain information about audits of specific fabricators from the owners' groups for specific DCSS designs, the licensee's QA staff, or NMSS/SFPO.

You should obtain and review copies of audits and surveillances performed by onsite QA personnel (the fabricator's or other oversight groups such as the CoC holder's or licensee's). Assess the quality and depth of the audits and surveillances and determine if appropriate corrective actions were implemented for negative findings. You should also review fabrication documents, such as travelers, to ensure that hold points are identified and QA signatures made where required.

60852-04 INSPECTION RESOURCES

To prepare for these inspections, each inspector should spend approximately 16 hours on in-office review. Inspection activities will require approximately 30 hours, each, by three inspectors at the vendor's or fabricator's facilities. Documentation is estimated to require 16 hours for each inspector. SFPO transportation and storage safety inspection section will primarily conduct the inspection of fabricators and vendors, with assistance from other NMSS and regional inspectors. Inspection hours may vary, depending on the amount of activity occurring at the fabricators.

60852-05 REFERENCES

NRC Information Notice 95-29, "Oversight of Design and Fabrication Activities for Metal Components Used in Spent Fuel Dry Storage Systems," June 7, 1995.

NRC Inspection Manual Chapter 2690, "Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations," February, 1997
NRC Inspection Procedure, "Design Control of ISFSI Components."

NUREG/CR-6407, "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety," February 1996.

10 CFR Part 21, "Reporting of Defects and Noncompliance."

10 CFR 72, Subpart L, "Approval of Spent Fuel Storage Casks."

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