



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

February 11, 2020

Mr. David A. Lochbaum
865 Traditions Drive
Chattanooga, TN 37415

Dear Mr. Lochbaum:

I am responding to your e-mail, dated October 2, 2019,¹ to Ms. Sujata Goetz, in which you stated that you were unable to determine the design basis rating for the reactor building crane at Fermi 2. You stated that the documents you reviewed in the licensing basis revealed both a 117-ton rating and a 125-ton rating for the reactor building crane.

Specifically, you requested that the NRC establish the current licensing basis for the rating of the reactor building crane at Fermi 2 and verify that all applicable testing, training, and maintenance procedures, are consistent with this basis. You also requested that the NRC make the relevant licensing basis and design basis documents publicly available.

Fermi 2 Reactor Building Crane Design Basis

The design basis for the Fermi 2 reactor building crane was established through the licensee's response, letter from Detroit Edison to the NRC, dated December 3, 1981,² to Generic Letter 80-113, "Control of Heavy Loads,"³ and the updated design basis is in Section 9.1.4 of the Fermi 2 Updated Final Safety Analysis Report (UFSAR), Revision 21.⁴ The UFSAR, Revision 21 is publicly available.⁵

As defined in 10 CFR 50.2, "Design bases" means that information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. Section 9.1.4.2.1, "Spent Fuel Shipping Cask," of Revision 10 to the Fermi 2 UFSAR⁶ states:

Arrangements are being made for the shipment and reprocessing of spent fuel. Since two types of spent fuel shipping casks are presently being used, the equipment and the handling techniques have been developed to utilize either type. To ensure the adequacy of equipment and techniques, the reactor building is designed to accept the larger spent fuel cask weighing not more than 116.8 tons.

This value established a reference bound for design of the reactor building equipment at the time of the license amendment request⁷ related to replacement of spent fuel storage racks. The licensee may make changes to procedures and the facility as described in the UFSAR, pursuant

¹ Agencywide Documents Access and Management System (ADAMS) Accession No. ML19295F531.

² NUDOS Accession No. 8112090167; Microform: 11181:349-362 (Public).

³ ADAMS Accession No. ML071080219, dated December 22, 1980.

⁴ ADAMS Accession No. ML17298B269, dated October 16, 2017.

⁵ ADAMS Package Accession No. ML17298B265.

⁶ ADAMS Accession No. ML20035D993.

⁷ ADAMS Accession No. ML993440109, dated November 19, 1999.

to 10 CFR 50.59, "Changes, tests, and experiments," without prior NRC approval. In Revision 16 to the Fermi 2 UFSAR,⁸ the licensee replaced the 116.8-ton value in the above paragraph with a revised value of 125 tons. The licensee made no further changes to this paragraph through Revision 21 to the Fermi 2 UFSAR.⁴

The change to the cask weight is consistent with the licensee's actions to establish an Independent Spent Fuel Storage Installation (ISFSI). By letter dated December 10, 2007⁹, Detroit Edison informed the NRC staff of its intent to first store fuel under a general license in 2010 using the HOLTEC HI-STORM 100 dry cask storage system listed in 10 CFR 72.214, "List of approved spent fuel storage casks," Certificate 1014. The HOLTEC HI-STORM system includes two transfer cask designs: a cask with a full loaded weight of up to 100 tons and a cask with additional shielding having a full loaded weight of up to 125 tons.

The rated load the licensee assigns to the crane is distinct from the manufacturer's design rated load. The crane manufacturer's specified design rated load is tied to the design of the crane by the crane design standard. As described in Section 9.1.4.2.2, "Reactor Building Crane," of the UFSAR, Revision 21, the crane is designed to the Electric Overhead Crane Institute Specification No. 61 for Class A service and the structural guidelines of Crane Manufacturer's Association of America Specification 70, "Specifications for Top Running Bridge & Gantry Type Multiple Girder Electric Overhead Travelling Cranes."

The licensee has repeatedly identified the design rated load of the crane as 125 tons. By letter dated July 12, 1974¹⁰, Detroit Edison submitted a technical report to the Atomic Energy Commission entitled "Fuel Cask Storage Pool – Reactor Building Crane Redundancy – Fuel Cask Drop Accident," which described the design features of a 125-ton overhead crane with redundant hoist features to prevent cask drops. The licensee cited this report in identifying the reactor building crane with a 125-ton capacity hoist as being single-failure-proof in its letter dated December 3, 1981,² which responded to NRC Generic Letter 80-113³. Furthermore, Revisions 10 through 21 of the Fermi 2 UFSAR include this report as Reference 9 to Section 9.1. Also, Section 9.1.4.2.2 of the UFSAR has consistently described that the crane girders and wire rope have a design rated lifting capacity of 125 tons.

Consistent with the 10 CFR 50.34(b), the Fermi 2 UFSAR includes a description of the facility and presents design bases information and limits on operation, including administrative controls for safe operation and plans for normal operation, maintenance, and testing of structures, systems and components. Fermi 2 UFSAR Section 9.1.4.4, "Control of Heavy Loads in Close Proximity to Irradiated Fuel or Safety Systems," which provides this information for the reactor building crane, states:

The training and qualification of crane and hoist operators are in accordance with NUREG-0612 guidelines. The testing, inspection, and maintenance of these cranes and hoists also conform to these guidelines. Hoisting of all heavy loads around critical equipment will be covered by written procedures.

The guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants,"¹¹ include conformance with the specifications in American National Standard B30.2.0, "Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)," 1976, which includes provisions to

⁸ ADAMS Accession No. ML20035D908.

⁹ ADAMS Accession No. ML073521312.

¹⁰ ADAMS Legacy Accession No. 3002002626; Microform: 50341-95 (Public).

¹¹ ADAMS Accession No. ML070250180.

preclude operators from loading the crane beyond its rated load, for periodic inspections of the crane, for routine maintenance of the crane, and for periodic testing of the crane. Licensees may reduce the rated load included in plant operating procedures and marked on the crane to values below the design rated load provided by the crane manufacturer if the change does not decrease the margin of safety for the crane.

NRC Oversight of the Reactor Building Crane

The NRC staff maintains oversight of the Fermi 2 reactor building crane through inspections and has concluded that the crane complies with its current licensing basis. In its oversight activities, the NRC staff verifies that the licensee operates within its licensing basis, which includes the provision to handle heavy loads with a single-failure-proof handling system near the reactor and fuel stored in the spent fuel pool. This verification consists of a sampling-based inspection program during which NRC inspectors confirmed the attached loads were within the design-rated load. As a generally licensed ISFSI, Fermi may choose to use any NRC approved spent fuel storage cask listed in 10 CFR 72.214. Spent fuel storage cask designs, including the design Fermi selected, often include transfer casks of different weights to suit the user's specific needs and possible load handling limitations. Dry cask storage operations were inspected in accordance with Inspection Manual Chapter 2690¹² prior to and during loading of spent fuel into a dry storage canister, and the transfer cask used at Fermi 2, when loaded, was found to be within the capacity of the reactor building crane.

Summary

The NRC staff reviewed the design basis documented in Fermi 2 UFSAR, and concludes that the design rated load of 125 tons for the reactor building rating crane is consistent with the licensing basis for dry cask storage operations. However, the design rated load of the crane, is subject to changes to maintain conformance with the specified design standards and a past decrease in the value alone do not indicate a safety concern. The NRC staff has evaluated the performance of heavy load handling activities at Fermi 2 by conducting inspections of licensed activities and have found that the handled loads are within the safe design capacity of the reactor building crane. Additionally, consistent with your request, staff is making relevant sections of Fermi 2 UFSAR, Revision 10 and Revision 16, publicly available by the date of this response. UFSAR, Revision 21 is already publicly available as referenced in this response.

If you have any further questions regarding this matter, please contact me at 301-415-2934, or via e-mail at booma.venkataraman@nrc.gov.

Sincerely,

/RA/

Booma Venkataraman, Project Manager
Division of Operating Reactor Licensing
Plant Licensing Branch III
Office of Nuclear Reactor Regulation

¹² Fermi 2 Inspection Reports: 05000341/2011003 and 07200071/2010001; 05000341/2014004 and 07200071/2014001; 05000341/2011002; and 05000341/2010003 (ADAMS Accession Nos. ML112140118; ML14303A534; ML111220240; and ML102110232), dated August 1, 2011, October 30, 2014, May 2, 2011, and July 30, 2010, respectively.

SUBJECT: RESPONSE TO MR. LOCHBAUM OCTOBER 2, 2019 E-MAIL RE: FERMI 2
 DESIGN BASIS FOR REACTOR BUILDING CRANE
 DATED FEBRUARY 11, 2020

DISTRIBUTION:**PUBLIC**

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ADAMS Accession No.: ML19343A029

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***By Email**

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| NAME | BVenkataraman | SRohrer | SJones | BWittick |
| DATE | 12/07/2019 | 12/10/2019 | 12/13/2019 | 12/13/2019 |
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| NAME | REdwards | RSkokowski | NSalgado | MYoung |
| DATE | 12/13/2019 | 12/13/2019 | 12/16/2019 | 02/04/2020 |
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