



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

August 30, 2021

Mr. Scott P. Murray
Manager, Facility Licensing
GE Hitachi Nuclear Energy
3901 Castle Hayne Road
P.O. Box 780, M/C K-84
Wilmington, NC 28402

**SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE TECHNICAL REVIEW
OF THE APPLICATION FOR RENEWAL OF THE MORRIS OPERATION
LICENSE NO. SNM-2500 (CAC/EPID NOS. 001028/L-2020-RNW-0024)**

Dear Mr. Murray:

By letter dated June 30, 2020, as supplemented February 26, 2021, March 19, 2021, and March 24, 2021, GE Hitachi Nuclear Energy Americas LLC (GEH) submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for renewal of License No. SNM-2500 for the Morris Operation (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20182A699, ML21057A119, ML21085A859, and ML21083A200). In my letter dated April 20, 2021, I acknowledged acceptance of your application for a detailed technical review and provided a proposed schedule for the NRC review (ADAMS Accession No. ML21104A080).

In connection with the NRC staff's technical review, we need the information identified in the enclosed request for additional information (RAI). Discussion of the RAI and RAI response date occurred on August 25, 2021 (ADAMS Accession No. ML21242A281). We request that you provide this information by January 28, 2022. Inform us at your earliest convenience, but no later than 2 weeks before the response date, if you are not able to provide the information by that date. To assist us in rescheduling your review, you should include a new proposed submittal date and the reasons for any delays.

S. Murray

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Please reference Docket No. 72-01 and CAC/EPID Nos. 001028/L-2020-RNW-0024 in future correspondence related to this request. If you have any questions regarding this matter, please contact me at 301-415-7116 or Kristina.Banovac@nrc.gov.

Sincerely,

Kristina L. Banovac, Project Manager
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-01
License No. SNM-2500

CAC/EPID Nos. 001028/L-2020-RNW-0024

Enclosure:
Request for Additional Information

cc:
Morris Operation Service List

Morris Operation Service List

cc:

Scott P. Murray
Manager, Facility Licensing
GE Hitachi Nuclear Energy
3901 Castle Hayne Road
P.O. Box 780, M/C K-84
Wilmington, NC 28402

Bobbie Lockwood
General Manager, Services Operations
GE Hitachi Nuclear Energy
3901 Castle Hayne Rd
Wilmington, NC 28402

Tony McFadden
Site Manager, Morris Operation
GE Hitachi Nuclear Energy
7555 East Collins Road
Morris, IL 60450

Grundy County Clerk
111 East Washington Street
P. O. Box 675
Morris, IL 60450-0675

Adnan Khayyat
Division Chief, Division of Nuclear Safety
Illinois Emergency Management Agency
1035 Outer Park Dr
Springfield, IL 62704

Steven Reynolds
Manager, Nuclear Facilities Inspection
Illinois Emergency Management Agency
245 W. Roosevelt Rd
Bldg. 8, Suite 55
West Chicago, IL 60185

Region III Administrator
U.S. Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE TECHNICAL REVIEW OF THE APPLICATION FOR RENEWAL OF THE MORRIS OPERATION LICENSE NO. SNM-2500 (CAC/EPID NOS. 001028/L-2020-RNW-0024)

DOCUMENT DATE: August 30, 2021

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ADAMS Accession Number: ML21214A310

***via email**

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Request for Additional Information
GE Hitachi Nuclear Energy Americas LLC
Docket No. 72-01
License Renewal

By letter dated June 30, 2020, as supplemented February 26, 2021, March 19, 2021, and March 24, 2021, GE Hitachi Nuclear Energy Americas LLC (GEH) submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for renewal of License No. SNM-2500 for the Morris Operation (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20182A699, ML21057A119, ML21085A859, and ML21083A200). This request for additional information (RAI) identifies information needed by the NRC staff in connection with its technical review of the renewal application. The staff used NUREG-1927, Revision 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel" (ADAMS Accession No. ML16179A148), NUREG-1801, Revision 2, "Generic Aging Lessons Learned (GALL) Report" (ADAMS Accession No. ML103490041), and NUREG-2191, "Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report," (ADAMS Accession Nos. ML17187A031 and ML17187A204) in its review of the renewal application.

Each individual RAI describes information needed by the staff for it to complete its review of the renewal application and to determine whether the applicant has demonstrated compliance with the regulatory requirements.

Note that any revisions made to the Consolidated Safety Analysis Report (CSAR), in response to these RAIs, do not need to be submitted as a revised, implemented CSAR. Rather, GEH may submit proposed changes to the CSAR as a proposed CSAR supplement (i.e., proposed additions and changes to the CSAR to address aging management activities) to support the license renewal application, consistent with the guidance in NUREG-1927. The NRC staff will include a condition in the license renewal for GEH to submit to the NRC an updated CSAR that includes the aging management information provided in the proposed CSAR supplement. This will provide for a timely CSAR update after the license renewal that reflects the aging management information submitted in the renewal application and revised through the review process.

Aging Management Review

RAI-1

Justify the exclusion of the fuel basin crane, fuel handling crane, and cask crane from the aging management review. Revise the proposed CSAR supplement, as appropriate, to demonstrate that the effects of aging of the cranes will be adequately managed.

CSAR Section 11.3 includes the fuel basin crane, fuel handling crane, and cask crane that are determined to be structures, systems, and components (SSCs) important to safety within the scope of renewal. However, these SSCs are missing from the aging management review provided in Table 1, Aging Management Program Review, of CSAR Appendix A.8, Aging Management.

The NRC staff notes that CSAR Appendix A.8 designates the cranes and grapples as ancillary equipment important to safety that are on a routine maintenance schedule or inspected prior to use. Table 1 of CSAR Appendix A.8 includes the grapples subject to an aging management

review, but not the cranes. NUREG-1927 states that all important-to-safety SSCs should be within the scope of renewal and addressed with an aging management review. Also, 10 CFR 72.42(a) states that renewal applications should include descriptions of aging management programs (AMPs) for the management of aging issues for SSCs important to safety.

The staff notes that existing site processes can be credited for managing the effects of aging; however, the CSAR does not provide any details on the credible aging mechanisms and effects for the cranes or how the maintenance activities adequately manage the effects of aging.

This information is required to demonstrate compliance with 10 CFR 72.42(a).

RAI-2

Justify the exclusion of the Zircaloy cladding from the aging management review. Revise the proposed CSAR supplement, as appropriate, to demonstrate that the effects of aging of the Zircaloy cladding will be adequately managed.

CSAR Section 11.3 includes the spent fuel cladding fabricated from stainless steel or Zircaloy, which is determined to be an SSC important to safety within the scope of renewal. However, the Zircaloy cladding is missing from the aging management review provided in Table 1 of CSAR Appendix A.8. The NRC staff notes that Table 1 of CSAR Appendix A.8 includes the stainless steel cladding subject to an aging management review, but not the Zircaloy cladding. NUREG-1927 states that all important-to-safety SSCs should be within the scope of renewal and addressed with an aging management review. Also, 10 CFR 72.42(a) states that renewal applications should include descriptions of AMPs for the management of aging issues for SSCs important to safety.

This information is required to demonstrate compliance with 10 CFR 72.42(a).

RAI-3

Clarify whether the coatings applied to the steel building structures are relied on to manage the aging effects for the SSCs within the scope of renewal and, if so, provide details on the type and quality of the coatings and the aging management activities that will ensure that the coatings remain intact. Revise the proposed CSAR supplement, as appropriate.

The “Detection of Aging Effects” program element of the Structures Monitoring AMP states that the 5-year visual inspections are supplemented with annual visual inspections for deterioration of the steel building structures due to corrosion and coating degeneration. Table 2 of CSAR Appendix A.8 provides acceptance criteria for coatings on the steel structures. However, the information for the coating materials is not included in the CSAR. It is unclear whether the coatings are credited with performing an important-to-safety function or protecting an important-to-safety component that meets the scoping criteria in NUREG-1927. An additional AMP may be necessary to manage protective coatings that perform an important-to-safety function.

This information is required to demonstrate compliance with 10 CFR 72.42(a).

Aging Management Program

RAI-4

Clarify the inspection coverage in the Structures Monitoring AMP that demonstrates that potential aging-related degradation will be identified and appropriately evaluated. Revise the AMP in the proposed CSAR supplement, as appropriate.

The “Detection of Aging Effects” program element of the Structures Monitoring AMP states that the visual inspections will be performed every 5 years by qualified inspectors in accordance with Morris Operation Standard Operating Procedure (SOP) 16-17 and American Concrete Institute (ACI) 349.3R-02. As neither SOP 16-17 nor ACI 349.3R-02 has specific requirements for inspection coverage, the staff requires clarification of whether 100 percent of readily accessible surfaces will be inspected, or whether inspections will involve some justified lower extent of coverage.

This information is required to demonstrate compliance with 10 CFR 72.42(a).

RAI-5

Clarify inspection activities in the Structures Monitoring AMP for managing stress corrosion cracking and loss of material due to pitting and crevice corrosion of the fuel basin liner. Revise the AMP in the proposed CSAR supplement, as appropriate, to demonstrate that the effects of aging of the liner will be adequately managed.

The Structures Monitoring AMP in the CSAR states that the AMP elements are consistent with those in AMP XI.S6 (Structures Monitoring) from NUREG-1801, Rev. 2. NUREG-1801, Rev. 2 and NUREG-2191 recommend the Water Chemistry AMP and monitoring of the spent fuel pool water level and leakage from the leak chase channels to manage cracking due to stress corrosion cracking and loss of material due to pitting and crevice corrosion of the fuel pool liner. However, the Structures Monitoring AMP in the CSAR includes various inspection activities at 5-year intervals, the details of which are unclear.

The “Detection of Aging Effects” program element of the Structures Monitoring AMP states that qualified inspectors will examine the stainless steel basin liner at 5-year intervals. Table 1 of CSAR Appendix A.8 identifies stress corrosion cracking and loss of material due to pitting and crevice corrosion as credible aging effects/mechanisms for the liner. The parameters inspected in the “Parameters Monitored or Inspected” program element and the acceptance criteria for the stainless steel liner in Table 2 of CSAR Appendix A.8 are associated with evidence of bulges or depressions in the liner plate, the measurement of leakage rate via the leak chase channels, and monitoring of the basin water chemistry.

Provide the following clarifying details of the liner inspections in the Detection of Aging Effects AMP element:

1. Clarify which of the five listed basin inspection/monitoring activities includes the periodic, 5-year, inspections of the liner plate. The staff notes that activity “c” cites a 5-year inspection, but it does not specifically mention the liner. Activity “d” appears that it may address the liner, but only in the context of an opportunistic inspection when fuel baskets are moved.

2. Describe the area of coverage of the 5-year inspections of the liner plate (i.e., to what extent the liner is normally accessible and inspected for these periodic inspections).
3. Explain how evidence of bulges or depressions in the liner plate are indicators of cracking and loss of material of the plate.

This information is required to demonstrate compliance with 10 CFR 72.42(a).

RAI-6

Clarify the role of the acceptance criteria for the basin water radioactivity for the management of the effects of aging in the Water Chemistry AMP, and revise the AMP in the proposed CSAR supplement, as appropriate.

The "Acceptance Criteria" program element of the Water Chemistry AMP states that basin water has the following radioactivity and conductivity limits.

- a) Conductivity must be $<1.35 \mu\text{Mho/cm}$.
- b) Basin water activity (gross beta) must be less than $0.02 \mu\text{Ci/ml}$

CSAR Section 10.4.5, Basin Water Chemical Characteristics, states that a conductivity value of $1.35 \mu\text{Mho/cm}$ is equivalent to a pH value of 5.5 to 8.0, which is commensurate with a benign environment for fuel and equipment stored in the basin water. Technical Specification 4.6, Basin Water Radioactive Contaminants, states that the basin water beta activity value of $0.02 \mu\text{Ci/ml}$ is consistent with current decontamination practices, above which additional basin water cleanup measures shall be initiated. The technical specification and the CSAR (Sections 4.3.8.2, 5.5.2.2, 7.3.2, 7.5, 10.4, 10.4.6) further indicate that this activity level assures that concentration of radioactive materials remain as low as is reasonably achievable (ALARA), in terms of radiation protection and keeping exposures ALARA. However, it is not clear how the basin water activity level is an indication of age-related degradation (i.e., how an aging mechanism is linked to this monitored parameter). Also, if this activity level is tied to degradation of an SSC (or fuel), clarify how this value is chosen as an acceptance criterion for timely identification of an aging effects and implementation of corrective actions.

This information is required to demonstrate compliance with 10 CFR 72.42(a).