

From: Dawnmathews Kalathiveettil
Sent: Wednesday, December 21, 2022 12:31 PM
To: Quarles, Adam Graham
Cc: Chamberlain, Amy Christine; Michael Markley; John Lamb
Subject: RAI - Hatch, Units 1 and 2, 'RPV Head Studs' LAR (EPID: L-2022-LLA-0120)

Importance: High

Adam,

By letter dated August 19, 2022 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML22231B055), Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) for Edwin I. Hatch Nuclear Plant (Hatch), Units 1 and 2. Specifically, the licensee is proposing to relax the required number of fully tensioned reactor pressure vessel (RPV) head closure studs in Technical Specification (TSs) Table 1.1-1, "MODES" of the Hatch units.

The licensee included with the application calculations performed by its contractor, Dominion Engineering, Inc. (DEI) that determined the impact of out-of-service studs on RPV closure stresses, stud stresses, closure flange separation, and fatigue usage. These calculations are documented in C-037-2201-00-01, Revision 0, "Hatch Unit 1 Operation with One Stud Out of Service Evaluation" (Enclosure 2 to the application) and C-037-2201-00-02, Revision 0, "Hatch Unit 2 Operation with Two Studs Out of Service Evaluation" (Enclosure 3 to the application).

By letter dated November 17, 2022 (ADAMS Accession No. ML22320A072), the NRC informed SNC of the need for a regulatory audit from November 30, 2022, to January 31, 2023. Audit meetings were held between SNC, its contractor, and NRC staff on December 1st and December 14th, 2022.

To complete its review, the NRC staff requests additional information (RAI) as shown below. These questions were previously provided to SNC during the audit to make sure that the RAI is understandable, the regulatory basis is clear, to ensure there is no proprietary information, and to determine if the information was docketed previously.

This request is now released formally with a 30-day calendar response period from the date of this e-mail. If you have any questions, you may contact me at 301-415-5905.

REQUEST FOR ADDITIONAL INFORMATION

Title 10 of the Code of Federal Regulations (10 CFR) Part 50.36, "Technical Specifications," specifies the content required to be included in TSs.

10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," includes the following GDCs applicable to the licensee's LAR:

- GDC 1, "Quality Standards and Records," requires, in part, that structures, systems, and components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed.

- GDC 14, “Reactor coolant pressure boundary,” requires the design, fabrication, erection, and testing of the reactor coolant pressure boundary so as to have an extremely low probability of abnormal leakage, or rapidly propagating failure, and of gross rupture.
- GDC 30, “Quality of reactor coolant pressure boundary,” which requires in part, that components comprising the reactor coolant pressure boundary be designed, fabricated, erected, and tested to the highest quality standards practical.

Hatch Unit 1 was licensed to the applicable Atomic Energy Commission (AEC) preliminary general design criteria identified in Federal Register 32 FR 10213, published July 11, 1967 (ML043310029). The Hatch Unit 1 Updated Final Safety Analysis Report (UFSAR), Appendix F, “Conformance to the AEC Criteria,” contains the comparison of the applicable AEC criteria to the 10 CFR 50, Appendix A, GDCs.

NRC staff has reviewed the application and the information provided during the regulatory audit. To complete its review, the NRC staff requests additional information as shown below.

RAI-01

The NRC authorized relief requests, in 2017 and 2019 (ML17205A345 and ML19035A550 respectively), from inspection of RPV stud #33 based on impracticality. The 2017 authorization was a contingency in case the two planned stud removal techniques were not successful during refueling outage 2R24. Similarly, the 2019 relief was authorized, through the end of the current ISI interval (December 31, 2025), in case attempts to remove RPV stud #33 were not successful during the Hatch Unit No. 2 refueling outage 2R25.

- a) Please provide a summary of all attempts to inspect and/or remove stud #33 since the 2017 authorization, including techniques applied for removal of each attempt, results achieved, and acceptance criteria for terminating removal efforts.
- b) Also, please provide post-tensioning values for the as-left condition of stud #33 for each outage.

RAI-02

In its LAR dated August 19, 2022, the licensee states that Table 1.1-1 is proposed to be revised to address the increased possibility that a RPV head closure stud cannot be fully tensioned and avert the possible need for an exigent or emergency license amendment during the Spring 2023 refueling outage.

- a) Please describe the technical basis supporting the assertion that stud #33 or any other stud cannot be fully tensioned.
- b) Please provide any estimated calculations or inspection results that would indicate that the known flaw on stud #33 would propagate to a point such that sufficient tensioning is not achievable.

RAI-03

In its LAR dated August 19, 2022, the licensee requests approval of operation of Hatch, Unit 2, with two RPV studs less than fully tensioned and Hatch, Unit 1, with one stud less than fully tensioned. Based on the 2017 and 2019 relief requests, the NRC understands the impracticality

assessment regarding stud #33. Based on review of Section 2.3 of the SNC submittal, the NRC has concerns regarding the basis for the need regarding the request to allow a second stud to be less than fully tensioned in Hatch Unit 2 and the basis for any RPV studs to be less than fully tensioned in Hatch Unit 1.

Please provide the safety basis to have additional studs less than fully tensioned in Unit 1 and 2 when there is no apparent degradation or inspection results supporting such action.

RAI-04

In its 2019 relief request, the licensee told the NRC that it planned to remove stud #33 and requested relief as a contingency. In its LAR, the licensee states that, "There were no attempts to remove the stud during the 2021 refueling outage (2R26)," but asserts that these amendments are needed to "avert the possible need for an exigent or emergency license amendment during the Spring 2023 refueling outage." Because this condition has existed for more than six years and the licensee has had opportunities to remove/repair stud #33, the NRC has concerns that the entry conditions for an exigent or emergency amendment may be challenging to address. During the audit on December 14, 2022, SNC stated that there are no repair plans for stud #33 for the Spring 2023 refueling outage and that no inspection is planned because of the prior relief authorization through 2025.

- a) Please confirm outage-specific repair plans for stud #33 that are expected to be completed during the spring 2023 refueling outage for Hatch, Unit 2.
- b) Please provide justification for SNC's request for NRC approval and LAR issuance by February 25, 2023, prior to completion of the Spring 2023 outage.

RAI-05

During the audit on December 14, 2022, the NRC asked about industry operating experience at boiling water reactors concerning stuck reactor vessel studs and removal success. The licensee discussed some known pressurized water reactor (PWR) examples and mentioned the precedents in its LAR submittal.

- a) Please provide available industry operating experience for stuck RPV studs at other boiling water reactor (BWRs) and methods used to repair/replace such studs.
- b) If applicable, please confirm that this is the first request for a BWR to change its design and licensing basis to allow operation with one or more reactor vessel studs less than fully tensioned.

RAI-06

Table 3 of DEI Calculation C-037-2201-00-02 for Hatch Unit 2, the "Stud Condition" column indicates Cases B1, C1, B2, and C2 are for one untensioned/failed stud, but the description of the cases in Section 5.2.3 of DEI Calculation C-037-2201-00-02 states the cases are for two untensioned studs separated by nine tensioned studs (Cases B1 and B2) and two studs that fail in service separated by nine tensioned studs (Cases C1 and C2).

Please clarify that the stud conditions that were analyzed in Table 3 of DEI Calculation C-037-2201-00-02 for Hatch Unit 2 were for two untensioned studs separated by nine tensioned studs for Cases B1 and B2 and two studs (separated by nine tensioned studs) that fail in service for Cases C1 and C2.

RAI-07

The NRC staff noted that the application did not discuss the impact of the proposed change to the Hatch TS Table 1.1-1 to have less than a full set of tensioned studs on the RPV threads-in-flange. Because these are the threads into which the studs are installed in the RPV flange, there could be a potential impact of the licensee's proposed change on the RPV threads-in-flange. The NRC staff noted that American Society of Mechanical Engineers Section XI Code Case (CC) N-864 may be used by licensees to forgo the inservice inspection (ISI) examination of the RPV threads-in-flange for a certain number of ISI intervals without the need for an alternative request, because the Code Case is conditionally approved in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 20, which is incorporated by reference in 10 CFR 50.55a. The technical basis for CC N-864 is in EPRI Technical Report 3002007626, "Nondestructive Evaluation: Reactor Pressure Vessel Threads in Flange Examination Requirements," March 2016 (ML16221A068). The analysis of the RPV threads-in-flange in the EPRI report assumes a full set of tensioned studs, and is, therefore, inconsistent with the proposed change to the Hatch TS Table 1.1-1 to have less than a full set of tensioned studs. Therefore, if the licensee is using CC N-864 or will use CC N-864 in its ISI program for the Hatch RPV threads-in-flange. Please discuss this apparent inconsistency.

- a) Please state whether CC N-864 is used now or will be used in the future in the ISI program for the Hatch RPV threads-in-flange.
- b) If CC N-864 is used now or will be used in the future in the ISI program, please show that the impact of the proposed change during preload conditions is bounded by the maximum applied stress intensity factor for the "Preload" case in Table 6-1 of the EPRI report.

Best Regards,

Dawnmathews T. Kalathiveettil

Hatch Project Manager

Plant Licensing Branch (LPL 2-1)

DORL - O8 C02

Office of Nuclear Reactor Regulation

U.S. Nuclear Regulatory Commission

Office Phone: 301-415-5905

Email: Dawnmathews.Kalathiveettil@nrc.gov

Hearing Identifier: NRR_DRMA
Email Number: 1869

Mail Envelope Properties (BY5PR09MB5666220797CE5A2611105A9797EB9)

Subject: RAI - Hatch, Units 1 and 2, 'RPV Head Studs' LAR (EPID L-2022-LLA-0120)
Sent Date: 12/21/2022 12:30:59 PM
Received Date: 12/21/2022 12:30:00 PM
From: Dawnmathews.Kalathiveettil

Created By: Dawnmathews.Kalathiveettil@nrc.gov

Recipients:

"Chamberlain, Amy Christine" <ACCHAMBE@southernco.com>

Tracking Status: None

"Michael Markley" <Michael.Markley@nrc.gov>

Tracking Status: None

"John Lamb" <John.Lamb@nrc.gov>

Tracking Status: None

"Quarles, Adam Graham" <AGQUARLE@southernco.com>

Tracking Status: None

Post Office: BY5PR09MB5666.namprd09.prod.outlook.com

Files	Size	Date & Time
MESSAGE	10783	12/21/2022 12:30:00 PM

Options

Priority: High

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date: