



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

February 6, 2019

Ms. Cheryl A. Gayheart
Regulatory Affairs Director
Southern Nuclear Operating Co., Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2 – RELIEF REQUEST
HNP-ISI-RR-05-02 REGARDING REACTOR PRESSURE VESSEL HEAD STUD
INSERVICE INSPECTION REQUIREMENTS (EPID L-2018-LLR-0137)

Dear Ms. Gayheart:

By letter dated November 5, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18309A272), Southern Nuclear Operating Company, Inc. (SNC) submitted relief request HNP-ISI-RR-05-02, requesting relief from certain inservice inspection (ISI) requirements of Section XI of the 2007 Edition through the 2008 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPV), for the Edwin I. Hatch Nuclear Plant (HNP), Unit No. 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50.55a(g)(5)(iii), SNC requested relief from the required surface examination of ASME BPV Code IWB 3515.2(c), which specifies surface examination requirements for the reactor pressure vessel (RPV) studs. HNP Unit No. 2 RPV stud number 33 could not be removed during the previous refueling outage for the required examination, and the U.S. Nuclear Regulatory Commission (NRC) staff granted the licensee's previous relief request for this same issue in a letter dated August 10, 2017 (ADAMS Accession No. ML17205A345). SNC plans to remove RPV stud number 33 and conduct the required examination during the HNP Unit No. 2 refueling outage scheduled to begin on February 4, 2019. However, in the event that SNC is again unable to remove RPV stud number 33, the licensee maintains that compliance with the Code-required examination would be impractical and requested relief as a contingency.

Based upon our review of relief request HNP-ISI-RR-05-02, the NRC staff concludes that the ASME Code, Section XI, required surface examination of IWB-3515.2(c) is impractical for HNP Unit No. 2 RPV stud number 33. Furthermore, the NRC staff finds that the licensee has provided reasonable assurance of structural integrity of the remaining RPV studs and surrounding RPV components, and reasonable assurance of leak integrity and detection of the RPV closure flange interface at HNP Unit No. 2, in the event that RPV stud number 33 is left untensioned or fails in service. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(5)(iii) and that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law, will not endanger life or property, or the common defense and security, and is otherwise in the public interest given

due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, in accordance with 10 CFR 50.55a(g)(6)(i), the NRC staff authorizes relief request HNP-ISI-RR-05-02 at HNP Unit No. 2 for the current ISI interval that ends December 31, 2025.

All other ASME BPV Code requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable.

If you have any questions, please contact the Project Manager, Randy Hall, at 301-415-4032 or by e-mail at Randy.Hall@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Markley".

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-366

Enclosure:
Safety Evaluation

cc: Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST HNP-ISI-RR-05-02

REGARDING INSERVICE INSPECTION OF

REACTOR PRESSURE VESSEL HEAD STUD NO. 33

SOUTHERN NUCLEAR OPERATING COMPANY

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2

DOCKET NO. 50-366

1.0 INTRODUCTION

By letter dated November 5, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18309A272), Southern Nuclear Operating Company (SNC, the licensee) submitted relief request HNP-ISI-RR-05-02 requesting relief from certain inservice inspection (ISI) requirements of Section XI of the 2007 Edition through the 2008 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code (ASME Code) for the Edwin I. Hatch Nuclear Plant (HNP), Unit No. 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* 50.55a(g)(5)(iii), the licensee requested relief from the required surface examination of IWB-3515.2(c) for the reactor pressure vessel (RPV) studs. The licensee asserts that compliance with the specified ASME Code requirement is impractical.

2.0 REGULATORY EVALUATION

The licensee is requesting relief from the ASME Code, Section XI, in accordance with 10 CFR 50.55a(g)(5)(iii). ASME BPV Code Class 1, 2, and 3 components must meet the requirements of Section XI of the ASME BPV Code as required by 10 CFR 50.55a(g)(4), which states, in part, that:

Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components, (including supports) that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in Section XI of editions and addenda of the ASME BPV Code...

The licensee may request relief from portions of the ASME Code as provided in 10 CFR 50.55a(g)(5)(iii), which states, in part, that:

Enclosure

If the licensee has determined that conformance with a Code requirement is impractical for its facility the licensee must notify the NRC and submit, as specified in §50.4, information to support the determinations. Determinations of impracticality in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the Code requirements during the inservice inspection interval for which the request is being submitted.

And, the U.S. Nuclear Regulatory Commission (NRC) staff may grant relief from ASME Code requirements as provided in 10 CFR 50.55a(g)(6)(i), which states that:

The Commission will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines are authorized by law, will not endanger life or property or the common defense and security, and are otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Given that 10 CFR 50.55a(g)(4) requires the use of the ASME Code, Section XI, that 10 CFR 50.55a(g)(5)(iii) permits the licensee to request relief, and that 10 CFR 50.55(g)(6)(i) permits the NRC staff to grant relief for requests submitted under 10 CFR 50.55a(g)(5), the NRC staff finds that, subject to the following technical evaluation, the licensee may request relief from the ASME Code, Section XI, and the NRC staff has the regulatory authority to grant the relief.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Relief Request

3.1.1 Component for Which Relief Is Requested

Relief request HNP-ISI-RR-05-02 applies to the HNP Unit No. 2 RPV head stud at location number 33. This stud is an ASME BPV Code, Section XI, Examination Category B-G-1, Item No. B6.20 component.

3.1.2 Code Edition and Addenda of Record

The applicable ASME BPV Code of record is the 2008 Addenda to the 2007 Edition of the ASME Code, Section XI.

3.1.3 ASME Code Requirements

The required examination for the RPV studs is a volumetric examination of 100 percent of the volume defined in Figure IWB-2500-12, "Closure Stud and Threads in Flange Stud Hole" of Section XI of the ASME Code, as specified in Table IWB-2500-1, "Examination Categories" for Examination Category B-G-1, "Pressure Retaining Bolting Greater Than 2 in. (50.8 mm) in Diameter," Item No. B6.20, "Closure Studs." In addition, IWB-3515.2(c) of Section XI of the ASME Code states that a flaw detected by volumetric examination in the stud shall be investigated by a surface examination.

3.1.4 Reason and Basis for Relief Request

In HNP-ISI-RR-05-02, the licensee is requesting relief from the required surface examination of IWB-3515.2(c) for RPV stud number 33, stating that the surface examination is impractical, based on not being able to remove RPV stud number 33. The licensee included a structural evaluation of the RPV closure flange to support its basis. HNP-ISI-RR-05-02 contains the same basis and the same structural evaluation to support the relief request as HNP-ISI-RR-05-01, submitted by letter dated February 17, 2017, and approved by the NRC on August 10, 2017 (ADAMS Accession Nos. ML17048A090 and ML17205A345, respectively), with the following differences:

- The licensee has had ample time to plan and schedule the removal of RPV stud number 33.
- To ensure that the flaw does not propagate into the surrounding RPV flange, the licensee will examine the RPV threads-in-flange using ultrasonic testing (UT) per Table IWB-2500-1, Examination Category B-G-1, Item B6.40, once per inspection period instead of once per ISI interval. Concurrent with the UT examination, the licensee will perform visual testing (VT-1) examination of the 1-inch annular surface of the flange surrounding RPV stud number 33.
- The duration of the relief request is through the end of the current ISI interval.

3.1.5 Duration of Relief Request

The licensee is requesting relief through the end of the current ISI interval (December 31, 2025), if attempts to remove RPV stud number 33 are not successful during the HNP Unit No. 2 February 2019 refueling outage (2R25).

3.2 NRC Staff Evaluation

3.2.1 Evaluation of Impracticality

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the surface examination requirements of IWB-3515.2(c), stating that the surface examination was impractical, based on the previous unsuccessful attempts to remove RPV stud number 33 in 2017, and contingent upon further unsuccessful attempts to remove it during outage 2R25. The NRC staff reviewed the licensee's basis for impracticality of the surface examination. The licensee has adequately scheduled and planned for the removal of RPV stud number 33 during HNP Unit No. 2 refueling outage 2R25. The licensee's relief request is applicable only if the licensee's scheduled and planned attempts to remove RPV stud number 33 during outage 2R25 are not successful. The NRC staff finds this basis for impracticality acceptable.

3.2.2 Structural Evaluation

The licensee enclosed an evaluation by Dominion Engineering, Inc. (DEI) to support the basis for having one inoperable RPV stud. This DEI evaluation addressed the effects of a single stud left untensioned and a stud that fails in service (from an all-stud tensioned condition) on the structural integrity of the RPV closure flange and leak integrity of the RPV flange interface. The DEI evaluation also addressed structural integrity of the 55 remaining studs. The structural integrity evaluation included a fatigue usage assessment for the full service life of the RPV stud and affected components. The DEI evaluation is the same evaluation enclosed in the licensee's February 17, 2017 request. The NRC staff determined that, with respect to structural integrity of the subject components, since the fatigue usage assessment in the DEI evaluation (Section 5.2.4.4

"Fatigue" of Enclosure 2 of the current submittal) is for the full service life, the requested relief duration to the end of the current ISI interval (December 31, 2025) is acceptable.

The NRC staff evaluated and found acceptable the licensee's structural evaluations and leak integrity evaluation in Section 3.2.2 "Primary Membrane Stress in Studs with One Untensioned Stud," Section 3.2.3 "Finite Element Analysis, Stress Results, and Fatigue Usage," and Section 3.4 "RPV Flange Interface Separation," of the August 10, 2017, SE approving the licensee's February 17, 2017 request. Thus, the NRC staff finds the structural integrity evaluations of the RPV closure flange and 55 remaining studs, and leak integrity of the RPV flange interface acceptable.

3.2.3 Evaluation of Condition Monitoring

The NRC staff noted that the licensee is requesting HNP-ISI-RR-05-02 to the end of the current ISI interval (December 31, 2025) if attempts to remove RPV stud number 33 are not successful in outage 2R25. This requested relief duration is longer than the relief duration of one operating cycle requested in the licensee's February 17, 2017, letter. The NRC staff reviewed the licensee's plan to monitor the condition of the RPV threads-in-flange at RPV stud number 33 for the duration of the current ISI interval for indications that could potentially initiate at the threads and propagate into the flange. The licensee will examine the RPV threads-in-flange by UT per Table IWB-2500-1, Examination Category B-G-1, Item B6.40, once per inspection period instead of once per ISI interval and will perform VT-1 examination of the 1-inch annular surface of the flange surrounding RPV stud number 33. The NRC staff finds the UT and VT-1 examinations acceptable for monitoring the condition of the RPV threads-in-flange. The NRC staff also finds that since the RPV threads-in-flange will be examined more frequently (once per inspection period), the requested relief duration to the end of the current ISI interval (December 31, 2025) is acceptable with respect to condition monitoring. Finally, the NRC staff finds that the licensee's current continuous monitoring of the bleed-off line between the double o-rings of the flange seal and the required visual testing for leaks provide reasonable assurance of leak detection through the RPV closure flange interface should a leak occur.

4.0 CONCLUSION

As set forth above, the NRC staff finds that the ASME Code, Section XI, required surface examination of IWB-3515.2(c) is impractical for the HNP, Unit No. 2, RPV stud number 33 as described in relief request HNP-ISI-RR-05-02. Furthermore, the NRC staff finds that the licensee has provided reasonable assurance of structural integrity of the remaining RPV studs and surrounding RPV components, and reasonable assurance of leak integrity and detection of the RPV closure flange interface, at HNP Unit No. 2, if RPV stud number 33 is left untensioned or fails in service. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(5)(iii) and granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law, will not endanger life or property, or the common defense and security, and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, in accordance with 10 CFR 50.55a(g)(6)(i), the NRC staff authorizes relief request HNP-ISI-RR-05-02 at HNP Unit No. 2 for the current ISI interval that ends December 31, 2025.

Principal Contributor: D. Dijamco

Date: February 6, 2019

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HNP-ISI-RR-05-02 REGARDING REACTOR PRESSURE VESSEL HEAD STUD
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