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

March 29, 2017

Mr. James J. Hutto
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
P.O. Box 1295 / Bin - 038
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 – RELIEF REQUEST ISI-RR-15 REGARDING CONTROL ROD DRIVE HOUSING WELD INSERVICE INSPECTION REQUIREMENTS (CAC NOS. MF9024 AND MF9025)

Dear Mr. Hutto:

By letter dated December 27, 2016, Southern Nuclear Operating Company (SNC, the licensee) submitted 11 requests for relief from certain inservice inspection (ISI) requirements of Section IX of the 2001 Edition through the 2003 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPV Code) for the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2.

For one of the eleven requests, ISI-RR-15, the licensee requested relief from specified BPV Code requirements pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(g)(5)(iii), on the basis that the code requirements are impractical. Specifically, the licensee requested relief from the ASME BPV Code requirements for inspection of 10 percent of the peripheral control rod drive housing welds with either a surface or volumetric examination.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the subject request, and concludes that SNC has adequately addressed all of the regulatory requirements and that the ASME BPV Code requirements are impractical for the subject welds. Therefore, the NRC staff grants relief in accordance with 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI program interval, which began on January 1, 2006, and ended on December 31, 2015. The NRC staff's safety evaluation is enclosed.

All other ASME 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,

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

Docket Nos. 50-321 and 50-366

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST ISI-RR-15

REGARDING INSERVICE INSPECTION OF CONTROL ROD DRIVE HOUSING WELDS

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2

SOUTHERN NUCLEAR OPERATING COMPANY

DOCKET NOS. 50-321 AND 50-366

1.0 INTRODUCTION

By letter dated December 27, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML16362A273), Southern Nuclear Operating Company (SNC, the licensee) submitted 11 requests for relief from certain inservice inspection (ISI) requirements of Section IX of the 2001 Edition through the 2003 Addenda of the of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPV Code) for the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2.

For one of the eleven requests, ISI-RR-15, the licensee requested relief and proposed to use alternative examination methods for ISI inspection items, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(5)(iii), on the basis that the code requirements are impractical. Specifically, the licensee requested relief from the requirements of the ASME BPV Code for inspection of 10 percent of the peripheral control rod drive (CRD) housing welds with either a surface or volumetric examination, for the fourth 10-year ISI interval at HNP, Units 1 and 2.

2.0 REGULATORY EVALUATION

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1 components shall meet the requirements, except design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME BPV Code incorporated by reference in 10 CFR 50.55a(a) twelve months prior to the start of the 120-month interval, subject to the conditions listed in 10 CFR 50.55a(b). The Code of Record for the fourth 10-year interval ISI program, which began on January 1, 2006 and ended on December 31, 2015, is the 2001 Edition through the 2003 Addenda of Section XI of the ASME BPV Code.

The regulation in 10 CFR 50.55a(g)(5)(iii) states, in part, that licensees may determine that conformance with certain ASME BPV Code requirements is impractical and that the licensee shall notify the U.S. Nuclear Regulatory Commission (NRC) and submit information in support of the determination. Determination 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 ISI interval for which the request is being submitted. Requests for relief made in accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial 120-month inspection interval or subsequent 120-month inspection interval for which relief is sought.

The regulation in 10 CFR 50.55a(g)(6)(i), states that the NRC will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The NRC may grant such relief and may impose such alternative requirements as it determines are authorized by law and 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.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the NRC to grant the relief requested by the licensee.

3.0 TECHNICAL EVALUATION

3.1 Applicable ASME Code Requirements

ASME BPV Code, Section XI, Table IWB-2500-1, "Examination Categories", Examination Category B-O, Item B14.10, states that either a volumetric or service examination of the pressure retaining welds, as defined by Figure IWB-2500-18, must be performed for 10 percent of the peripheral CRD housings. HNP, Units 1 and 2, both have 36 peripheral CRD housings, thus, Section XI of the ASME BPV Code requires that the applicable welds on four peripheral CRD housings from each unit be examined. Each CRD housing has a housing-to-flange weld and a housing-to-housing weld outside the reactor pressure vessel (RPV) lower head. Thus, for each unit, a total of eight CRD housing welds require examination, which would consist of four CRD housing-to-flange welds and four CRD housing-to-housing welds.

ASME BPV Code, Section XI, Table IWB-2500-1, Category B-P, Item 15.10, required a VT-2 examination in conjunction with the Class 1 system leakage test each refueling outage. The acceptance standards for the VT-2 examination are contained in Article IWB-3522 and the system leakage test is performed in accordance with Article IWB-5220.

3.2 Requested Relief

The licensee stated that the 36 peripheral CRD housing-to-flange welds on both units are not accessible for the required inspections due to the close proximity of adjacent CRD housing flanges, neutron monitoring instrumentation and associated cabling, and the horizontal beams supporting the CRD piping in the Subpile room. The licensee stated that the CRD housing-to-housing welds are located near the RPV bottom head inside the RPV support skirt. The HNP, Unit 1, RPV was designed prior to the development of the ASME BPV Code, Section XI, requirements and access through the support skirt was not provided. However, the HNP, Unit 2

vessel design addressed ASME BPV Code Section XI requirements and an access port was included, which provides access into the vessel support skirt. Due to accessibility issues for HNP, Unit 1, the licensee stated that no CRD housing-to-housing welds and no CRD housing-to-flange welds were examined. For HNP, Unit 2, eight CRD housing-to-housing welds were examined; however, no CRD housing-to-flange welds were examined, also due to the lack of accessibility.

The licensee explained that to appreciably increase the examinations of the CRD housing-to-housing welds for HNP, Unit 1, and the CRD housing-to-flange welds at both units, a redesign of the RPV bottom head would be required, which would be an undue burden. Therefore, the licensee concluded that the ASME BPV Code requirements are impractical.

3.3 Licensee's Proposed Alternative and Basis for Use

For HNP, Unit 1, in lieu of the required examination, the licensee stated that performing a VT-2 examination, in conjunction with the Class 1 system leakage test following each refueling outage, would provide adequate assurance that any flaws that might have propagated through the subject welds are identified and repaired prior to returning the plant to power operation. In addition, the licensee explained that leakage can be determined during plant operation by the leak detection system located in the drywell, as described in the HNP, Unit 1, Final Safety Analysis Report (FSAR), Section 4.10 (ADAMS Accession No. ML17010A336).

For HNP, Unit 2, surface examinations for four CRD housing-to-housing welds were performed as required by the ASME BPV Code, Section XI. Furthermore, an additional four CRD housing-to-housing welds were selected for surface examinations. In summary, a total of eight CRD housing-to-housing welds from eight different peripheral CRD housings were examined, as identified in Table RR-15-1. The licensee confirmed that no limitations were observed nor were any surface indications recorded. Thus, for HNP, Unit 2, in lieu of the required examination, the licensee stated that the surface examination of the eight CRD housing-to-housing welds and the VT-2 examination, performed in conjunction with the Class 1 system leakage test following each refueling outage, provides adequate assurance that any flaws that might have propagated through the subject welds are identified and repaired prior to returning the plant to power operation. Furthermore, leakage can be determined during plant operation by the leak detection system located in the drywell, as described in the HNP, Unit 2, FSAR, Section 5.2.7 (ADAMS Accession No. ML17010A357).

3.4 NRC Staff Evaluation

The licensee stated that the general configuration of the CRD housing-to-housing and housing-to-flange welds are similar for HNP, Units 1 and 2. Specifically, the bottom head of the RPV has a penetration for each CRD location, and outside of the RPV, there is a housing-to-flange weld (located in the Subpile room under the RPV) and an intermediate housing-to-housing weld (located inside the RPV support skirt).

The licensee provided diagrams in its submittal for the configuration of the CRD housings for each unit, including the subject housing-to-housing and housing-to-flange welds. The NRC staff noted that these figures, and Section 4.2.3.2.3.1 of the HNP, Unit 2, FSAR, indicate that,

for both units, the CRD housings are fabricated of Type 304 austenitic stainless steel and the flange material is forged Type 304 stainless steel.

The NRC staff reviewed the photos provided in the submittal that illustrate the configuration of the CRDs from the Subpile room floor and provide views of a specific CRD housing flange (i.e., pictures RR-15-1, RR-15-2 and RR-15-3). These photos illustrate the close proximity of adjacent CRD housing flanges, the neutron monitoring instrumentation and associated cabling, and the horizontal beams supporting the CRD piping in the Subpile room. Based on the these photos and the licensee's discussion, the NRC staff finds that physical limitations and lack of accessibility would prevent the licensee from performing the required inspections of the CRD housing-to-flange welds at HNP, Units 1 and 2.

The licensee stated that access to the CRD housing-to-housing welds at HNP, Unit 1, through the RPV support skirt was not provided in the plant's design; thus, the NRC staff finds that examination of these welds in HNP, Unit 1, is not possible unless the RPV support skirt is modified. However, the design of the RPV support skirt at HNP, Unit 2, included an access port that provides the ability to examine the CRD housing-to-housing welds. Table RR-15-1 of the submittal identifies eight CRD housing-to-housing welds that were examined at HNP, Unit 2. The licensee stated that 100 percent examination coverage was obtainable with no limitations, and no surface indications were recorded during the examinations at HNP, Unit 2.

The NRC staff finds the examination of the eight CRD housing-to-housing welds at HNP, Unit 2, provides reassurance that any generic degradation mechanisms occurring in the CRD housing-to-housing welds and CRD housing-to-flange welds would have been detected in the examined surfaces. Additionally, based on the similarity in plant operation and material fabrication of the CRD housings for HNP, Units 1 and 2, the NRC staff finds it acceptable to assume that any generic degradation mechanisms and the associated manifestation would be applicable to both units.

In accordance with the ASME BPV Code, Section XI, Table IWB-2500-1, Category B-P, Item 15.10, the licensee is required to perform a VT-2 examination in conjunction with the Class 1 system leakage test each refueling outage. The NRC staff finds that performing this VT-2 examination during the Class 1 system leakage test would identify any leakage from the CRD housing-to-housing and housing-to-flange welds each refueling outage prior to returning the plant to power operation.

Based on the photos of the CRDs and the additional discussion in the licensee's submittal, the NRC staff finds that physical limitations exist that prevent the licensee from performing 100 percent of the ASME Code-required surface examinations on 10 percent of peripheral CRD housing-to-flange welds for HNP, Units 1 and 2. Furthermore, imposing the inspection requirement would be a burden on the licensee that would require the redesign and modification of the RPV bottom head; therefore, the NRC staff concludes performing the required housing-to-flange weld inspection is impractical.

In addition, access to the HNP, Unit 1, CRD housing-to-housing welds through the RPV support skirt is not available due to the RPV design, thereby preventing the licensee from performing 100 percent of the ASME Code-required surface examinations on 10 percent of peripheral CRD housing-to-housing welds. Imposing the inspection requirement would be a burden on the licensee that would require the redesign and modification of the RPV support skirt; therefore,

the NRC staff concludes that performing the required housing-to-housing weld inspections for HNP, Unit, 1, is impractical.

Finally, the NRC staff finds that the required VT-2 examination in conjunction with the Class 1 system leakage test each refueling outage, along with the capability of the leakage detection system, provide reasonable assurance of the leak tightness of the HNP, Units 1 and 2, CRD housing-to-housing welds and CRD housing-to-flange welds, prior to returning the plant to power operation and during plant operation, respectively.

4.0 CONCLUSION

As set forth above, the NRC staff concludes that the ASME BPV Code, Section XI, ISI requirements are impractical for the housing-to-housing and housing-to-flange welds described in relief request ISI-RR-15 for the HNP, Units 1 and 2, for the fourth 10-year ISI interval. Additionally, the NRC staff concludes that the required VT-2 visual examinations performed for each unit during the Class 1 system leakage test each refueling outage, the surface examinations performed on the HNP, Unit 2, CRD housing-to-housing welds, and the capability provided by each unit's leak detection system, provide reasonable assurance of the leak tightness of the CRD housing-to-housing welds and CRD housing-to-flange welds. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), the NRC staff grants relief request ISI-RR-15 for HNP, Units 1 and 2, for the fourth 10-year ISI interval, which began on January 1, 2006, and ended on December 31, 2015.

The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) for relief request ISI-RR-15 is authorized by law and will not endanger life or property, or the common defense and security, and is 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. All other ASME BPV Code, Section XI, requirements for which relief was not specifically requested and approved in the subject relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principle Contributor: On Yee

Date:

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 – RELIEF REQUEST ISI-RR-15 REGARDING CONTROL ROD DRIVE HOUSING WELDS INSERVICE INSPECTION REQUIREMENTS (CAC NOS. MF9024 AND MF9025) DATED: MARCH 29, 2017.

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