



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

August 25, 2009

Mr. Mark J. Ajluni
Manager, Nuclear Licensing
Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
PO Box 1295
Birmingham, AL 35201

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 1, RELIEF REQUEST RR-01
REGARDING THE FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION
PROGRAM (TAC NO. ME0360)

Dear Mr. Ajluni:

By letter dated December 19, 2008, as supplemented May 14, 2009, Southern Nuclear Operating Company, Inc. (the licensee), submitted a request to the Nuclear Regulatory Commission (NRC) for relief from certain American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code* (ASME Code), Section XI, requirements for Edwin I. Hatch, Unit No. 1 (Hatch-1), to allow the licensee to achieve less than the required examination coverage for the unit's reactor pressure vessel (RPV) longitudinal welds

The NRC staff has reviewed the request and concludes, as set forth in the enclosed safety evaluation, that the code requirement is impractical due to inaccessibility and the weld coverage that was achieved provides reasonable assurance of the structural integrity of the RPV longitudinal welds. The NRC staff has determined that granting relief pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(g)(6)(i) 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. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), the proposed relief is granted for the fourth 10-year inservice inspection interval, which began December 31, 2005, and ends on December 31, 2015.

All other requirements of ASME Code, Section XI, for which relief has not been specifically requested and granted, remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector. If you have any questions, please contact the Project Manager, Donna Wright at (301) 415-1864.

Sincerely,

A handwritten signature in black ink, appearing to read "Undine Shoop". The signature is fluid and cursive, with the first name "Undine" written in a larger, more prominent script than the last name "Shoop".

Undine Shoop, Acting Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-321

Enclosure: Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
FOURTH 10-YEAR INTERVAL INSPECTION PROGRAM RELIEF REQUEST RR-01

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 1

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

DOCKET NO. 50-321

1.0 INTRODUCTION

By letter to the U.S. Nuclear Regulatory Commission (NRC, the Commission) dated December 19, 2008, as supplemented May 14, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML083570437 and ML091350206, respectively), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(5)(iii), Southern Nuclear Operating Company, Inc. (the licensee), submitted request for relief RR-01 for the fourth 10-year inservice inspection (ISI) interval for the Edwin I. Hatch Nuclear Plant, Unit No. 1 (Hatch-1). Approval of this request would allow the licensee to achieve less than the American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code* (ASME Code) required examination coverage for the unit's reactor pressure vessel (RPV) longitudinal welds. The licensee specified that the fourth 10-year inservice inspection (ISI) examinations of longitudinal welds C-2-A, C-2-B, C-2-C, C-3-A, C-3-B, C-3-C, C-4-A, C-4-B, and C-4-C did not meet ASME Code requirements and require relief. All of these welds are ASME Code Category B-A, Item Number B1.12, components (hereafter, B1.12 components).

2.0 REGULATORY EVALUATION

Section 50.55a(g) of 10 CFR requires that ISI of the ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME Code and applicable addenda, except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i).

Section 50.55a(g)(6)(i) of 10 CFR states that the Commission will evaluate determinations under paragraphs (g)(5) of this section [10 CFR 50.55a] that code requirements are impractical. The Commission 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 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.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2 and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the

Enclosure

components. The regulations require that inservice examination of component and system pressure tests conducted in the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b), 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ASME Code of record for the Hatch-1 fourth ISI interval is the 2001 Edition of the ASME Code, Section XI, with 2003 addenda.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Relief Request

The ASME Code, Section XI (2001 Edition with 2003 addenda) Category B-A, Table IWB-2500-1, Item No. B1.12, component examinations require a volumetric examination of the RPV longitudinal welds. The extent of the examination is listed in note 2 of Table IWB-2500-1 as essentially 100 percent of the weld length and the examination volume is shown in Figure IWB-2500-2 of the ASME Code. Relief is requested for the examination of the RPV longitudinal welds. Specifically, these welds are identified as C-2-A, C-2-B, C-2-C, C-3-A, C-3-B, C-3-C, C-4-A, C-4-B, and C-4-C, all of which are Item No. B1.12 components. Relief is requested from meeting the required inspection coverage from the ASME Code, Section XI, for these welds.

The licensee proposed:

Volumetric examinations for the [fourth] Inspection Interval were performed on the [Hatch, Unit 1] RPV longitudinal welds using a newly developed scanning tool. The tool scans from the inside surface of the reactor vessel and provided greatly improved coverage of the welds located in the high fluence areas of the beltline region and similar composite coverage of welds not in the beltline region when compared to the previous examination...

The licensee intends to take credit for the inspection which has been performed as being adequate to ensure the structural integrity of the RPV. As such, no further alternative actions are planned.

The licensee stated that:

Physical obstruction of some examination surfaces due to permanently attached equipment adjacent to the examination areas caused restricted coverage of the examination volume as required by Figure IWB-2500-2...

Compliance would require removal of the permanently attached adjacent structures located inside the reactor vessel to achieve a complete examination.

The licensee then stated that by using a "newly developed scanning tool" as quoted above:

Coverage for the higher fluence welds (C-3-A, C-3-B, C-3-C, C-4-A, C-4-B, and C-4-C) was an average of approximately 80 [percent]. This coverage, in addition to the coverage obtained for lower fluence welds C-2-A, C-2-B, and C-2-C, provides

reasonable assurance of structural integrity of these welds. Therefore, relief should be granted per 10 CFR 50.55a(g)(6)(i).

Finally, the licensee referenced as precedent a relief request from the third ISI interval examinations of the longitudinal welds for nearly the identical situation to this request. In the referenced application for the third ISI interval, the percent weld length examined was either the same or lower than achieved in the fourth ISI interval and the relief was granted by the NRC on March 11, 1999.

3.2 NRC Staff Evaluation

The 2001 Edition with 2003 Addenda of the ASME Code, Section XI, requires a volumetric examination of the longitudinal welds that include essentially 100 percent of the weld length. The volumetric examination of the longitudinal welds was conducted via ultrasonic testing (UT). The licensee included a listing of obstructions to weld examination in Table RR-01-1 of the submittal which cited obstructions including upper guide rods, feedwater spargers, core spray piping, specimen brackets, jet pump riser braces, gusset plates, and shroud repair hardware. The licensee also submitted figures illustrating all obstructions for each welds. Most, if not all of these items would have to be removed and refitted to comply with existing ASME Code inspection requirements. This process would be burdensome.

Of the B1.12 components listed for relief, weld C-2-A had a weld volume examination percentage of 12.3 percent, far lower than the other components listed for relief. The licensee provided Figure RR-01-01 in their December 19, 2008, letter which clearly sketches the significant obstructions above, around, and near weld C-2-A. The licensee further noted, in their letter dated May 14, 2009:

[Weld C-2-A] has a permanently installed steam dryer guide rod located directly above the weld. The distance between the inside of the guide rod and the RPV surface is only 4-inches and access beneath the rod could not be obtained, even with the newly developed lower profile scanning package. Additionally, as shown in Figure RR-01-01 of Relief Request RR-01, Core Spray piping (the "L" shaped piping) and the Feedwater Sparger (the horizontal piping) are mounted to the inside of the vessel wall. The proximity of this piping to the weld and the vessel wall prevented any scanning of the lower portion of the weld.

Based on the provided sketch and explanation, the NRC staff concluded that increasing examination weld volume coverage is impractical due to the nature of the obstructing components. The other welds listed for relief in RR-01 had weld volume examination percentages ranging from 69.3 percent to 90.0 percent. These examination percentages represent a significant and representative percentage of the weld volume including weld volume in high fluence areas. The interrogated weld volumes provide adequate assurance that any pattern(s) of degradation in the welds would have been identified.

Finally, the licensee stated in their May 14, 2009, letter that a low-profile UT examination device was developed specifically to increase the weld coverage attainable during the fourth 10-year ISI interval. This device allowed for increased weld volume examination but was unable to fully mitigate the significant geometric obstacles in the Hatch-1 RPV. The NRC staff has concluded

that the licensee's attempts to maximize the scan volume were responsible and proper and that the resulting scan coverage of approximately 80 percent represents a significant portion of the weld volume.

4.0 CONCLUSION

As set forth above, the NRC staff determines that due to the configuration of the Hatch-1 RPV, the ASME Code requirements with respect to weld coverage of the longitudinal welds C-2-A, C-2-B, C-2-C, C-3-A, C-3-B, C-3-C, C-4-A, C-4-B, and C-4-C are impractical. An imposition of the ASME Code requirements would result in a burden because the welds have limited accessibility and the RPV or its internal components would have to be redesigned. The weld coverage that was achieved provides reasonable assurance of the structural integrity of the RPV longitudinal welds. Therefore, the licensee's request for relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the Hatch-1, fourth 10-year ISI interval.

The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) 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 requirements of ASME Code, Section XI, for which relief has not been specifically requested and granted, remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: D. Widrevitz, NRR

Date of Issuance: August 25, 2009

M. Ajluni

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All other requirements of ASME Code, Section XI, for which relief has not been specifically requested and granted, remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector. If you have any questions, please contact the Project Manager, Donna Wright at (301) 415-1864.

Sincerely,

/RA/

Undine Shoop, Acting Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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