



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

August 18, 2015


Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
Post Office Box 1295, Bin - 038
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT 1 (HNP) – REQUEST FOR
ADDITIONAL INFORMATION ON ALTERNATIVE HNP-ISI-ALT-15-01
(TAC NO. MF6453)

Dear Mr. Pierce:

By letter dated July 2, 2015, the Southern Nuclear Operating Company (SNC) proposed an In-service Inspection (ISI) Alternative to install full structural weld overlays (FSWOL) on four welds at the HNP, Unit 1, during the spring 2016 refueling outage. The licensee has used a previously U.S. Nuclear Regulatory Commission (NRC)-approved ISI Alternative, HNP-ISI-ALT-08-02, through a majority of the fourth ISI interval for the installation of FSWOLs on both units. However, the licensee submitted the new ISI alternative, HNP-ISI-ALT-15-01, on the unique configuration of the four subject welds. In particular, existing weld overlay material is either adjacent to or located at those locations which are scheduled for the installation of new FSWOLs. To complete its review, the NRC staff requests the following additional information.

Sincerely,


Bob Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-321

cc: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION (RAI)

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2

By letter dated July 2, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15183A354), Southern Nuclear proposed an In-service Inspection (ISI) Alternative to install full structural weld overlays (FSWOL) on four welds at Edwin I. Hatch Nuclear Plant, Unit 1, during the spring 2016 refueling outage. The licensee has used a previously U.S. Nuclear Regulatory Commission (NRC)-approved ISI Alternative, HNP-ISI-ALT-08-02, through a majority of the fourth ISI interval for the installation of FSWOLs on both units. However, the licensee submitted the new ISI alternative, HNP-ISI-ALT-15-01, on the unique configuration of the four subject welds. In particular, existing weld overlay material is either adjacent to or located at those locations which are scheduled for the installation of new FSWOLs. To complete its review, NRC staff requests the following additional information.

1. In the cover letter dated July 2, 2015, the licensee states that the proposed ISI Alternative involves applying FSWOL on four welds. However, page 1 of Enclosure identifies only three welds, 1E11-1RHR-24A-R-12, 1B31-1RC-12BR-C-5 and 1B31-1RC-12BR-E-5. Also, the last sentence on page 2 of the ISI Alternative states that "the RHR weld and two recirculation welds". The proposed ISI Alternative does mention weld 1E11-1RHR-24A-R-13 which has already been weld overlaid in 1984.

(a) It is not clear to the NRC staff exactly how many welds are affected. Confirm that the affected welds are welds 1E11-1RHR-24A-R-12, 1E11-1RHR-24A-R-13, 1B31-1RC-12BR-C-5 and 1B31-1RC-12BR-E-5.

(b) Clarify whether the original weld 1E11-1RHR-24A-R-13 is made of Alloy 82/182 filler material or stainless steel filler material.

2. Figures 1 and 2 in Appendix 6 present the weld configurations of the RHR piping and Recirculation riser line, respectively. Figure 1 shows the existing weld overlay on R-13 weld.

(a) Confirm that weld R-12 has no weld overlay at present.

(b) Describe what represents the hash lines on the nozzle that is located horizontally in Figure 1.

(c) Figure 2 in Appendix 6 shows one weld is made of stainless steel and one weld is made of Alloy 82/182 material on the recirculation riser line. However, Page 1 of the ISI Alternative appears to suggest that both C-5 and E-5 are dissimilar metal welds. Clarify which of the two welds 1B31-1RC-12BR-C-5 and 1B31-1RC-12BR-E-5 is the alloy 82/182 weld and which is the stainless steel weld? Include both weld identification number on Figure 2.

Enclosure

(d) Page 1 of the ISI Alternative discusses the base materials that are adjacent to weld R-12, but not adjacent to weld R-13. Page 1 also discusses the base materials that are adjacent to C-5 or E-5, but it is not clear to the NRC staff the exact base materials that are associated with welds C-5 and E-5. Discuss the adjacent base materials to welds R-13, C-5 and E-5.

3. Fourth paragraph on page 3 of the ISI Alternative states that "...In the present configuration, the Inconel weld overlay does not completely cover the weld and buttering but tapers to approximately the centerline of the weld. These two weld overlays have seen continuous service since that outage with UT examinations performed during several outages..." Figure 2 of Appendix 6 does not show the existence of the current weld overlay.

(a) Provide a sketch or draw on Figure 2 of the current weld overlay configuration on 1B31-1RC-12BR-C-5 and 1B31-1RC-12BR-E-5 including dimensions.

(b) Clarify where the two existing weld overlays are located as referenced in the above quote.

4. Discuss the maximum and minimum design thickness of the proposed FSWOL.

5. Section 1.0 of the ISI Alternative states that "...The surface of the existing weld overlays will be ground to prepare the surface for receipt of a new Alloy 52M overlay... After performance of a satisfactory liquid penetrant surface examination, a stainless steel buffer layer (ER308L) will be deposited over the stainless steel... The portion of the overlay deposited over the low alloy steel material will be applied directly at ambient temperature using the temper bead technique and the Alloy 182 butt weld will be spanned and tied into the stainless steel material using a single layer of Alloy 82..."

(a) Identify the stainless steel surfaces that the buffer layer will be applied on Figures 1 and 2 of Appendix 6 (or on sketches) of the four weld configurations and draw the buffer layer on the diagrams.

(b) Provide a step-by-step welding of how the Alloy 82, Alloy 182, and Alloy 52M layers are deposited on the subject welds. Illustration these layers on Figures 1 and 2 of Appendix 6 (or on sketches).

6. Section 1.0(b), second paragraph states that: "...Depending on the chemical composition of the base materials where the weld overlay is to be applied, there may be different ways to apply the first layer of weld material..." Explain the "different ways" to apply the first layer of weld material (different from standards?).

7. Section 2, page 6 states that "This report will be submitted within 90 days after plant startup." Confirm that the report is referring to the crack growth calculation of the postulated flaw(s).

8. Section 3, under the Pre-Overlay Examination heading, the licensee stated that "...For welds overlaid because of unacceptable indications, the flaw size would be defined by qualified ultrasonic examinations..." This statement appears that the licensee will perform a pre-overlay examination. However, on page 12 of the ISI Alternative the licensee stated that it will not perform ultrasonic examination of the weld prior to FSWOL application. (a) Clarify whether a pre-overlay ultrasonic

examination will be performed. If not, explain why a pre-overlay examination will not be performed.

9. Sections 3(a)4 and 3(b)2 state that: "...Reexamination per IWB-2420 is not required because unacceptable indications will be removed and the volume will be re-welded..." Explain why re-examination is not required after an unacceptable indication is removed and the excavated volume is backfilled.

10. Section 3(c) states that inservice examinations of the FSWOLs will be performed in accordance with Q-4300 and 4310 of Appendix Q to the 2004 Edition of Section XI with Addenda through 2005 with modifications. Appendix 8 presents the modified Inservice examination requirements. (1) Clarify whether paragraphs (a), (b), and (c) as stated in the Modified Q-4300 Inservice Flaw Evaluation Requirements will replace paragraphs (a) and (b) in the existing Q-4300 Inservice Examination Requirements of the ASME Code, Section XI. (2) If the Modified Q-4300 requirements will replace the existing Q-4300(a) and Q-4300(b), discuss when the subject overlaid welds will receive their first ultrasonic examination after weld overlay installation. (3) Modified Q-4300 Inservice Examination Requirement Paragraphs (b) and (c) mention the "unacceptable indications". What are the acceptance criteria for the unacceptable indications and based on which subarticle of the ASME Code? (4) ASME Code, Section XI, Q-4300 contains paragraphs a, b, c, d, e, and f. Discuss whether Q-4300 paragraphs c, d, e and f will be followed because Modified Q-4300 did not mention these four subparagraphs.

11. Appendix 8, Modified Q-4300 Re-examination Requirements (b) specifies that "...If inservice examinations reveal *acceptable* crack growth or new cracking *in the upper 25% of the original weld or base materials...*" Discuss whether the crack is caused by stress corrosion cracking or some other degradation mechanism. The NRC staff noted that paragraph (c) provides requirements of the non-SCC flaws. However, Paragraph (b) does not reference whether the flaws are caused by SCC.

12. Provide a sketch or diagram of each subject weld that is applied with a FSWOL demonstrating that the ultrasonic examination of the overlaid weld will achieve 100 percent coverage of the required volume per the ISI Alternative. The sketch/diagram should include lines that represent the ultrasonic beam angles and signal path that cover the required volume.

13. Appendix 9 presents the inspection history and results of all 4 subject welds. Welds 1E11-1RHR-24A-R-13, 1B31-1RC-12BR-C-5 and 1B31-1RC-12BR-E-5 have previously detected indications. The indications in welds E-5 and R-13 have considerable depth with respect to the wall thickness. (a) Discuss whether these indications will be removed or reduce in size prior to applying FSWOL. If not, justify. (b) Page 12 of the ISI Alternative states that ultrasonic examination will not be performed prior to FSWOL application. The indications in the above 3 welds were detected in 1984 and 1988. Without performing the ultrasonic testing prior to the FSWOL application, the current indication size would not be known. Section 2 of the ISI Alternative requires a crack growth calculation based on an initial flaw size. However, the indications in these three welds may have grown since the initial detection in the 1980's. Explain how the crack growth calculation can be performed if the initial flaw size is not known prior to the FSWOL application.

14. Appendix 3 to the ISI Alternative presents the preservice examination volume which is illustrated in Figure 3. Figure 3 identifies Note 1. However, Note 1 is not shown in Figure 3, nor Appendix 3. Please clarify.

15. In Section 2.1, "Procedure qualifications," on page 16, paragraph (g) of the July 2, 2015 submittal, the licensee stated:

"The average lateral expansion value of the heat affected zone (HAZ) Charpy V-notch specimens shall be equal to or greater than the average lateral expansion value of the three unaffected base metal specimens. However, if the average lateral expansion value of the HAZ Charpy V-notch specimens is less than the average value of the unaffected base metal specimens and the procedure qualification meets all the other requirements of the Appendix 1 of the submittal, either of the following shall be performed:

- (1) The welding procedure shall be requalified.
- (2) An Adjustment Temperature for the procedure qualification shall be determined in accordance with the applicable provisions of NB-4335.2 of Section III, 2001 Edition with 2002 Addenda. The RT_{NDT} or lowest service temperature of the materials for which the welding procedure will be used shall be increased by a temperature equivalent to that of the Adjusted Temperature."

Based on the above information, the staff requests that the licensee provide the following information:

- (a) Identify whether aforementioned option (1) or option (2) was used in the temperbead weld qualification for Hatch weld overlays.
- (b) If the welding procedure specification (WPS) was qualified with option (2), provide the value for the new Adjusted Temperature for the vessel component (where temperbead structural overlay is to be applied). Identify if this Adjusted Temperature value was considered in the evaluation of the vessel integrity analyses (e.g., pressure-temperature curves-if applicable).

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Division of Operating Reactor Licensing
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