

January 7, 2005

Mr. H. L. Sumner, Jr.  
Vice President - Nuclear  
Hatch Project  
Southern Nuclear Operating  
Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 - EVALUATION OF  
RELIEF REQUEST (RR) NO. 39, AND RR-40 (TAC NOS. MC2383, MC2384,  
MC2385, AND MC2386)

Dear Mr. Sumner:

By letter dated March 29, 2004, as supplemented by letter dated September 13, 2004, Southern Nuclear Operating Company, Inc. (SNC or the licensee), submitted proposed alternatives to the requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) under the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(ii) for the Edwin I. Hatch Nuclear Plant, Units 1 and 2 (Hatch, Units 1 and 2).

The following paragraphs summarize the Nuclear Regulatory Commission (NRC) staff's findings regarding your requests for RR-39 and RR-40. SNC submitted a third relief request, RR-38, as part of the March 29, 2004, application. RR-38 is currently under review by NRC staff and will be addressed in a separate evaluation.

#### RR-39

In RR-39, the licensee proposed to adopt the guidance contained in the Electric Power Research Institute (EPRI) proprietary report TR-113932, "BWR Vessel and Internals Project, Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules (BWRVIP-75)," dated October 1999, as revised by the NRC staff's final Safety Evaluation (SE) dated May 14, 2002, in lieu of the licensee's present commitments to Generic Letter 88-01, "NRC Position on IGSCC [Intergranular Stress Corrosion Cracking] in BWR [Boiling Water Reactor] Austenitic Stainless Steel Piping," dated January 25, 1988, and NUREG-0313, Revision 2, "Technical Report on Material Selection and Process Guidelines for BWR Coolant Pressure Boundary Piping," dated January 1988. The licensee proposed to use the schedules and frequencies specified in the BWRVIP-75 in lieu of the ASME Code Section XI, 1989 Edition, requirements when examining high alloy steel welds and high nickel alloy welds.

Based on the review of the information the licensee provided, the NRC staff concluded that the licensee's proposed alternative to use the BWRVIP-75 report, as revised to reflect the response to the open items in the NRC staff's final SE for the BWRVIP-75, dated May 14, 2002, provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year inservice inspection (ISI) interval.

RR-40

In RR-40, the licensee proposed to use ASME Code Case-663, "Alternative Requirements for Class 1 and 2 Surface Examinations," in lieu of the surface examination requirements in ASME Code Section XI, Table IWB-2500-1, Examination Categories B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1, and C-F-2.

Based on the review of the information the licensee provided, the NRC staff concluded that the proposed alternative in RR-40 provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval, or until Code Case-663 is published in a future version of Regulatory Guide (RG) 1.147. At that time, if the licensee intends to continue implementing this code case, the licensee must follow all provisions of Code Case-663 with limitations or conditions specified in RG 1.147, if any.

The NRC staff's SE is enclosed. If you have any questions, please contact Christopher Gratton at 301-415-1055.

Sincerely,

*/RA/*

John A. Nakoski, Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure: As stated

cc w/encl: See next page

RR-40

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Based on the review of the information the licensee provided, the NRC staff concluded that the proposed alternative in RR-40 provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval, or until Code Case-663 is published in a future version of Regulatory Guide (RG) 1.147. At that time, if the licensee intends to continue implementing this code case, the licensee must follow all provisions of Code Case-663 with limitations or conditions specified in RG 1.147, if any.

The NRC staff's SE is enclosed. If you have any questions, please contact Christopher Gratton at 301-415-1055.

Sincerely,

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\* See SE input dated 10/23/04

\*\* No Legal Objection

ADAMS ACCESSION NUMBER: ML043650283

NRR-028

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO RELIEF REQUEST (RR) NOS. RR-38, RR-39 AND RR-40  
SOUTHERN NUCLEAR OPERATING COMPANY, INC.  
EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-321 AND 50-366

## 1.0 INTRODUCTION

By letter dated March 29, 2003, Southern Nuclear Operating Company, Inc., (the licensee) for the Edwin I. Hatch Nuclear Plant, Units 1 and 2 (Hatch, Units 1 and 2), submitted three relief requests. Relief Request No. 39 (RR-39) was submitted to adopt the guidance contained in the Electric Power Research Institute proprietary report TR-113932, "BWR Vessel and Internals Project, Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules (BWRVIP-75)," dated October 1999, as revised by the Nuclear Regulatory Commission (NRC, the Commission) staff's final Safety Evaluation (SE) dated May 14, 2002, in lieu of the licensee's present commitments to Generic Letter 88-01, "NRC Position on IGSCC [Intergranular Stress Corrosion Cracking] in BWR [Boiling Water Reactor] Austenitic Stainless Steel Piping," dated January 25, 1988, and NUREG-0313, Revision 2, "Technical Report on Material Selection and Process Guidelines for BWR Coolant Pressure Boundary Piping," dated January 1988. RR-40 was submitted to use American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Case-663, "Alternative Requirements for Class 1 and 2 Surface Examinations," in lieu of the ASME Code Section XI requirements. RR-38 is currently under evaluation by the NRC staff and will be evaluated in a separate letter.

## 2.0 REGULATORY EVALUATION

The inservice inspection (ISI) of the ASME Code Class 1, Class 2, and Class 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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 pre-service 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 Code incorporated by

reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The third 10-year ISI intervals for the Hatch, Units 1 and 2, began in December 1995 and will end in December 2005. The ISI Code of record for Hatch, Units 1 and 2, third 10-year intervals is the 1989 Edition with no Addenda. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

### 3.0 TECHNICAL EVALUATION

The following section provides the NRC staff's evaluation of RR-39 and RR-40.

#### 3.1 RR-39 EVALUATION

##### 3.1.1 Components for Which Relief is Requested

This relief request applies to Hatch, Units 1 and 2, Class 1 piping's high alloy steel welds and high nickel alloy welds.

##### 3.1.2 Code Requirements

ASME Code Section XI, 1989 Edition, requires the following:

- IWB-2412 requires that except for the examinations that may be deferred until the end of the inspection interval, examinations shall be completed in accordance with Table IWB-2414-1. Table IWB-2412-1 defines a minimum and maximum number of examinations to be performed each inspection period.
- IWB-2500 requires components to be examined as specified in Table IWB-2500-1. The *Extent and Frequency of Examination* requires that all Category B-F welds be examined and that a minimum of 25 percent of Category B-J welds be examined over the ten-year ISI interval.

##### 3.1.3 Relief Requested

The licensee proposes to use the schedules and frequencies specified in the BWRVIP-75 in lieu of the ASME Section XI, 1989 Edition, Code requirements when examining high alloy steel welds and high nickel alloy welds. The examination method listed in Table IWB-2500-1 is not affected by this request.

##### 3.1.4 Licensee's Basis

By letter dated May 14, 2002, the NRC issued its final SE of BWRVIP-75 (Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules). In that safety evaluation, the NRC staff concluded that, "licensee implementation of the guidelines of the BWRVIP-75 report, as modified, will provide an acceptable level of quality for inspection of the safety-related components." Additionally, the NRC concluded that, "the revised BWRVIP-75 guidance is acceptable for licensee referencing as the technical basis for relief from, or as an alternative to,

the ASME Code and 10 CFR 50.55a, in order to use the sample schedules and frequencies specified in the revised BWRVIP-75 report that are less than those required by the ASME Code.”

The NRC staff determined that the BWRVIP-75 provides an acceptable level of quality and provides an acceptable alternative to the requirements of the ASME Code for inspection of these subject welds. The licensee concludes that the use of BWRVIP-75 as defined by the NRC final SE in lieu of the above specified IWB-2500 requirements, will provide an acceptable level of quality and safety. Therefore, approval should be granted pursuant to 10 CFR 50.55a(a)(3)(i).

### 3.1.5 NRC Staff Evaluation

The BWRVIP-75 report was submitted to the NRC for staff review by letter dated October 27, 1999. The BWRVIP-75 report proposed revisions to the scope and frequencies of inspections of Category A through E welds as defined in Generic Letter (GL) 88-01 and NUREG-0313, Revision 2, for both normal water chemistry and hydrogen water chemistry (HWC) conditions. The proposed revisions were based on the consideration of inspection results and service experience gained by the industry since the issuance of GL 88-01, and included additional knowledge regarding the benefits of improved BWR water chemistry.

The NRC staff reviewed the BWRVIP-75 report, as supplemented, and found that the revised guidance of the BWRVIP-75 report, with the modifications as described in the NRC staff’s final SE dated May 14, 2002, is acceptable for inspection of the subject safety-related Class 1 piping welds. One significant modification is the NRC staff’s evaluation of Open Item 3.8 (Effective HWC and NMCA Programs) in the NRC staff’s final SE dated May 14, 2002, that states:

The staff agrees that it is not necessary to monitor ECP [electrochemical corrosion potential] in multiple locations or at the most conservative location; however, it should be clearly stated in the BWRVIP-75 report that licensees which take credit for HWC should verify and validate that an effective HWC program (i.e., available at least 80 percent of the time and an ECP of -230 mV or less), in accordance with the staff-approved BWRVIP-62 guidelines, has been achieved for welds in every piping system for which HWC credit is taken. Based on the discussions held with the BWRVIP during the public meeting on this issue, the BWRVIP agreed to incorporate this into a revised BWRVIP-75 report. Regarding the use of factors of improvement (FOI) to determine the effectiveness of a licensee’s HWC program, the staff disagrees with the BWRVIP on this issue; therefore, at this time, the staff is not approving the use of FOI for BWR austenitic stainless steel piping. With this modification to the BWRVIP-75 report, the staff considers Open Item 3.8 to be adequately resolved.

Currently, BWRVIP-62 has not been approved by the NRC staff. In order for the licensee to take credit for HWC, the licensee would be required to verify and validate their program in accordance with the yet to be determined “staff-approved BWRVIP-62 guidelines,” or the NRC staff’s September 15, 2000, initial SE’s Open Item 3.1 recommendations, which are also provided in the NRC staff’s May 14, 2002, final SE Open Item 3.8.

The licensee's alternative examination would use sample scope and frequencies specified in the BWRVIP-75 report that are less than those required by the ASME Code. The NRC staff has concluded that licensee implementation of the guidelines in the BWRVIP-75 report, as modified, will provide an acceptable level of quality for inspection of the safety-related components addressed. Further, the NRC staff found that the BWRVIP-75 guidance, as revised by the NRC staff's final SE dated May 14, 2002, is acceptable for licensee referencing as the technical basis for relief from, or as an alternative to, the ASME Code and 10 CFR 50.55a.

While these inspections can be credited toward ASME Section XI requirements, inspections of those welds outside the GL 88-01 scope are not affected and are not included in this relief approval. The findings and conclusions in the NRC staff's final BWRVIP-75 SE are not applicable to any welds or piping (e.g., socket welds, carbon steel piping, etc.) other than those within the original scope of GL 88-01 and NUREG-0313, Rev. 2 (e.g., those in BWR piping made of austenitic stainless steel four inches or larger in nominal diameter and exposed to reactor coolant at a temperature above 200 EF during power operation, and to reactor pressure vessel attachments and appurtenances).

### 3.1.6 Conclusion for RR-39

The NRC staff has reviewed the licensee's proposal, RR-39, to adopt and utilize the guidance contained in the BWRVIP-75 report as an alternative, in accordance with 10 CFR 50.55a(3)(i), in lieu of its present commitments to inspect in accordance with GL 88-01. Based on the NRC staff's review of the licensee's proposed justification, the NRC staff finds the licensee's usage of the BWRVIP-75 report, as revised to reflect the response to the open items in the NRC staff's May 14, 2002, final BWRVIP-75 SE, provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternative, RR-39, described in the licensee's letter dated March 29, 2004, for the Hatch, Units 1 and 2, for the third 10-year ISI.

## 3.2 RR-40 EVALUATION

### 3.2.1 Code Requirements

IWB-2500 and IWC-2500 of the 1989 Edition of ASME Section XI, requires components to be examined as specified in Tables IWB-2500-1 and IWC-2500-1, respectively. These tables require inspection of a sampling of piping welds using volumetric, surface, or both examinations and inspection during pressure testing using visual examinations such as VT-2.

### 3.2.2 Licensee's Code Relief Request and its Proposed Alternative

In lieu of the surface examination requirements for piping welds of Examination Category B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1 and C-F-2, the licensee proposes to use Code Case-663, in its entirety.

### 3.2.3 Components for which Relief Is Requested

This RR applies to Hatch, Units 1 and 2, ASME Code Section XI, Class 1 and 2 piping welds of Examination Category B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1 and C-F-2.

### 3.2.4 Licensee's Basis for Proposed Alternative

Two risk-informed methodologies have been developed for the examination of piping welds and approved by the NRC:

- EPRI TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure" (NRC SE dated 10/28/99).
- WCAP-14572, Revision 1-NP-A, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report" (NRC SE dated 12/15/98)

Although the two methodologies use different approaches, they reach a similar conclusion that the only degradation mechanism that requires a surface examination is O.D. (outside diameter) chloride cracking, and consequently, surface examinations only need to be considered when O.D. chloride cracking is identified to be the degradation mechanism affecting the structural integrity of applicable welds.

This conclusion led to the investigation of the value of requiring surface examination in the ASME Section XI Code. The ASME Section XI Task Group on ISI Optimization, Report No. 92-01-01, "Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds in Piping," dated July 1995, concluded, with 50 units responding and a total of 9333 welds inspected, that only 2 welds (0.02 percent) were found to have flaws detected by Section XI surface examinations. These flaws were determined to be fabrication-induced. Subsequently ASME Section XI developed Code Case-663, which was approved by the ASME Boiler and Pressure Vessel Code Committee on September 17, 2002, but is not yet included in the most recent listing of NRC-approved code cases provided in Revision 13 of Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability - ASME Section XI Division 1."

Code Case-663 provides that "... in lieu of the surface examination requirements for piping welds of Examination Category B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1 and C-F-2, surface examinations may be limited to areas identified by the Owner as susceptible to outside surface attack." The susceptibility criteria are listed in Table 1 of Code Case-663 for two types of degradation mechanisms: 1) external (i.e., O.D.) chloride stress corrosion cracking and 2) other outside surface initiated mechanisms. These alternate requirements are acceptable because the inspection requirements defined in Code Case-663 are equivalent to the corresponding inspection requirements approved by the NRC and adopted by using risk-informed ISI programs. Further, Code Case-663 requires that licensees conduct a plant specific service history review to identify other mechanisms susceptible to outside surface attack, and to include plant-specific processes and programs that minimize chlorides and other contaminants. Hence, the alternative provides reasonable assurance that the proposed inspections will not lead to degraded piping performance when compared to the existing performance levels.

### 3.2.5 NRC Staff Evaluation

The proposed use of Code Case-663 by the licensee to replace the ASME Code Section XI required surface examinations for piping welds of Examination Categories B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1 and C-F-2 is consistent with the approved underlying EPRI and Westinghouse methodologies on risk-informed ISI contained in TR-112657, Revision B-A, and WCAP-14572, Revision 1-NP-A. Although the two topical reports use different approaches, both have reached their objectives of identifying the risk-important areas of the piping systems and defining the appropriate examination methods, examination volumes, procedures, and evaluation standards necessary to address the degradation mechanisms of concern and the ones most likely to occur at each location to be inspected. Risk-informed ISI analyzes specific pipe segments for probability of failure and operational safety significance.

With regard to the current issue of surface examinations for piping welds of Examination Categories B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1 and C-F-2, all plants that performed risk-informed ISI of their Class 1 and 2 piping systems in accordance with the topical reports referenced above arrived at the conclusion that the only degradation mechanism that requires surface examination is O.D. chloride cracking. Consequently, within these plants, surface examination should be considered when O.D. chloride cracking is identified as the degradation mechanism affecting the structural integrity of the subject piping welds.

The NRC staff determined that the surface inspection requirements of Code Case-663 are acceptable because the inspection requirements defined in the code case are comparable to the corresponding inspection requirements approved by the NRC and adopted by using risk-informed ISI programs. Further, the code case requires that licensees conduct a plant-specific service history review to identify other mechanisms that can result in outside surface attack, and to implement plant-specific processes and programs that minimize chlorides and other contaminants. Hence, the alternative provides reasonable assurance that the proposed inspections will not lead to degraded piping performance when compared to the existing performance levels.

### 3.2.6 Conclusion for RR-40

The NRC staff has reviewed the licensee's proposal, RR-40, to use of Code Case-663 for Class 1 and 2 surface examinations, in lieu of the Table IWB-2500-1, Examination Categories B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1 and C-F-2 requirements. Based on the NRC staff's review of the licensee's proposed justification, the NRC staff finds RR-40 will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the use of Code Case-663 as stated in RR-40 for Hatch, Units 1 and 2, for the third 10-year ISI interval, or until Code Case-663 is published in a future version of RG 1.147. At that time, if the licensee intends to continue implementing this code case, the licensee must follow all provisions of Code Case-663 with limitations or conditions specified in RG 1.147, if any.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.