November 9, 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, UNITS 1 AND 2 RE: REQUEST FOR RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERED (ASME) BOILER AND VESSEL CODE (CODE) (TAC NOS. MC6526, MC6530, MC6531, MC6534, MC6535, MC6536, MC6537, MC6538, AND MC6539)

Dear Mr. Sumner:

By letter dated March 30, 2005, Southern Nuclear Operating Company, Inc. (SNC, the licensee), submitted various requests to authorize the use of licensee-proposed alternatives to certain ASME Code Section XI requirements at Edwin I. Hatch (Hatch), Units 1 and 2 in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55a(a)(3).

This letter provides the Nuclear Regulatory Commission (NRC) staff evaluations for Enclosures 2, 4, 6, 7, and 8 of SNC letter dated March 30, 2005. Requests documented in Enclosures 3, 5, and 9 will be addressed in separate communications. The request made in Enclosure 1 was evaluated and issued on June 15, 2005.

Based on the information provided in the relief requests, the NRC staff concluded that the following requests for relief were acceptable: RR-41, ISI-ALT-04, and ISI-ALT-06. The NRC staff's review found that the alternative proposed by the licensee provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 55a(a)(3)(i), the NRC staff authorizes the use of the licensee's proposed alternative RR-41 for the third 10-year interval for Hatch, Unit 1, and the licensee's proposed alternatives ISI-ALT-04, ISI-ALT-05, and ISI-ALT-06 at Hatch, Units 1 and 2 for the fourth 10-year inservice inspection (ISI) interval. In addition, based on the information provided in the relief requests, the NRC staff concluded that ISI-ALT-02 and ISI-ALT-05, were also acceptable. The NRC staff reviewed the licensee's submittal and determined that compliance with the requirements of the ASME Code, Section XI, 2001 Edition through the 2003 Addenda, paragraph IWA-2610, results in a hardship or difficulty without a compensating increase in the level of quality and safety. The NRC staff's review also found that the alternatives proposed by the licensee in ISI-ALT-02 and ISI-ALT-05 provide reasonable assurance of structural integrity. Therefore, pursuant to 10 CFR 55a(a)(3)(ii), the NRC staff authorizes the use of the licensee's proposed alternatives in ISI-ALT-02 and ISI-ALT-05 at Hatch, Units 1 and 2 for the fourth 10-year ISI interval.

All other requirements of the ASME Code Section XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Detailed results of the NRC staff's reviews are provided in the Safety Evaluation in the enclosure to this letter. If you have any questions concerning this matter, please contact Christopher Gratton of my staff at (301) 415-1055.

Sincerely,

/RA/

Evangelos C. Marinos, Chief,
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure: As stated

cc w/encls: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NOS. RR-41, ISI-ALT-02, ISI-ALT-04, ISI-ALT-05, AND ISI-ALT-06

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

EDWIN I. HATCH, UNITS 1 AND 2

DOCKET NOS. 50-321 AND 50-366

1.0 INTRODUCTION

By letter dated March 30, 2005, Southern Nuclear Operating Company, Inc. (SNC, the licensee), submitted various requests to authorize the use of licensee-proposed alternatives to certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Section XI requirements at Edwin I. Hatch (Hatch), Units 1 and 2 in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55a(a)(3).

The following NRC staff evaluations provide the technical bases for the authorization alternatives proposed in Enclosures 2, 4, 6, 7, and 8 of SNC letter dated March 30, 2005. Requests documented in Enclosures 3, 5, and 9 will be addressed in separate communications. The request made in Enclosure 1 was evaluated and issued on June 15, 2005.

2.0 RELIEF REQUEST RR-41, VERSION 1.0

2.1 Introduction

The NRC staff has reviewed and evaluated the information provided by SNC in its letter dated March 30, 2005, that proposed its third 10-year inservice inspection (ISI) interval Request for Relief (RR) RR-41, Version 1.0 for Hatch, Unit 1. The request for relief is to support the 22nd refueling outage ISI activities scheduled to begin in February 2006.

2.2 Regulatory Requirements

ISI of the ASME Code Class 1, 2, and 3 components is performed in accordance with applicable editions and addenda of Section XI of the ASME Code "Rules for Inservice Inspection of Nuclear Power Plant Components," as required by 10 CFR 50.55a(g), except where specific relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (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.

ENCLOSURE

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 components. The regulation requires 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) 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, Unit 1, third 10-year ISI interval is the 1989 Edition with no Addenda. By letter dated June 15, 2005, the NRC staff approved the use of the 2001 Edition through the 2003 Addenda in lieu of 1989 Edition with no Addenda of ASME Code, Section XI for the remainder of examinations for the third 10-year ISI interval at Hatch, Unit 1. The third 10-year ISI interval at Hatch, Unit 1 is scheduled to be completed during the 22nd refueling outage.

2.3 Technical Evaluation

ASME Code Requirement:

The 2001 Edition through the 2003 Addenda of ASME Code, Section XI, Table IWB-2500-1, Examination of integral attachments for reactor pressure vessel (RPV) Category B-K, Item B10.10, Footnote 4 requirements are as follows:

ASME Code, Section XI, Examination Category B-K, Item B10.10, Footnote 4 states that for multiple RPVs of similar design, function, and service, only one welded attachment of only one of the multiple RPVs shall be selected for examination.

System/Component(s) for Which Relief is Requested:

Class 1, RPV welded attachments (i.e., stabilizer bracket welds, support skirt weld)

Code Requirement from Which Relief is Requested:

Relief is requested to use the alternatives of ASME Code Case N-700, “Alternative Rules for Selection and Class 1, 2, and 3 Vessel Welded Attachments for Examinations, Section XI, Division 1,” for the selection of Class 1, 2, and 3 RPV welded attachments for examination.

Licensee’s Proposed Alternative Examination:

In lieu of the requirements specified in the 2001 Edition through 2003 Addenda of ASME Code, Section XI, ASME Code Case N-700 will be used for selection of Class 1 RPV welded attachments for examination. ASME Code Case N-700 was approved by the ASME Code Committee on November 18, 2003.

Licensee’s Basis for Requesting Relief:

The Hatch, Unit 1 ISI program is updated to comply with the requirements of the 2001 Edition through 2003 Addenda of ASME Code, Section XI. NRC approved this update request on June 15, 2005.

ASME Code Case N-509, "Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, Section XI, Division," and the 2003 Addenda of ASME Code, Section XI state in Examination Category B-K that "for multiple RPVs of similar design, function and service, only one welded attachment of only one of the multiple RPVs shall be selected for examination." There is no criterion for selection of the one welded attachment that must be examined. ASME Code Case N-509 and the 2003 Addenda of ASME Code, Section XI do not specifically address selection criteria for a single RPV.

ASME Code Case N-509 was originally incorporated in the ASME Code, Section XI 1995 Edition, 1995 Addenda. The technical basis for the development of ASME Code Case N-509 concluded that operational transients/water hammers are the major potential causes for welded attachment failures (with some possibility for corrosion related failures). The technical basis of ASME Code Case N-509 also concluded that welded attachment failures have been identified as a result of connected support member deformation and have not been identified by the present ASME Code examinations. That is the basis for ASME Code Case N-509 and the 1995 Addenda, and later addenda, which require welded attachments to be examined whenever component support deformation is identified.

ASME Code Case N-700 utilizes the basis for development of ASME Code Case N-509 to provide criteria for selection of Class 1, 2, and 3 vessel welded attachments for examination. ASME Code Case N-700 requires that for multiple RPVs of similar design, function, and service, only one welded attachment of only one of the multiple RPVs shall be selected for examination. ASME Code Case N-700 requires that only one welded attachment on a single RPV be examined. However, ASME Code Case N-700 also requires that the attachment selected for examination on one of the multiple RPVs or the single RPV, as applicable, be an attachment under continuous load during operation if such an attachment exists.

The licensee determined that for Hatch, Unit 1 the RPV skirt weld is under continuous load during normal system operation and the stabilizer bracket welds are potentially loaded only during a major seismic event. The licensee, therefore, concluded that examination of RPV skirt weld will satisfy the requirements of Code Case N-700 and this examination will provide an acceptable level of quality and safety under the provisions of 10 CFR 50.55a(a)(3)(i).

2.4 Staff Evaluation

The 2001 Edition through the 2003 Addenda of ASME Code, Section XI, Table IWB-2500-1, Examination Category B-K, Footnote 4 requires that for multiple RPVs of similar design, function, and service, only one welded attachment of only one of the multiple RPVs shall be selected for examination. This examination requirement for the RPV attachment welds was

originally developed in ASME Code Case N-509. ASME Code Case N-509 was originally incorporated in the ASME Code, Section XI 1995 Edition, 1995 Addenda. ASME Code Case N-509 and the 2003 Addenda of ASME Code, Section XI do not specifically address the selection criteria for the examination of attachment welds of a single RPV. Therefore, ASME Code Case N-700 was developed to clarify examination requirements of attachment welds of a single RPV.

As an alternative to the 2003 Addenda of ASME Code, Section XI requirements, the licensee has proposed to invoke ASME Code Case N-700 for the selection of Class 1 RPV welded attachments for examination. ASME Code Case N-700 requires that only one welded attachment on a single RPV is to be examined. ASME Code Case N-700 utilizes the basis for development of ASME Code Case N-509.

The technical basis for the development of ASME Code Case N-509 concluded that operational transients and water hammers are the major potential causes for welded attachment failures and that the possibility for corrosion related failures also existed. The attachment selected for examination on one of the multiple RPVs or the single RPV, as applicable, is to be an attachment under continuous load during operation if such an attachment exists.
Industry experience found that welded attachment failures have been identified as a result of connected support member deformation and have not been identified by the present ASME Code examinations. ASME Code, Section XI, 2003 Addenda requires welded attachments be examined whenever component support deformation is identified.

ASME Code Case N-700 maintains the same sampling philosophy for welded attachments on RPVs as does ASME Code Case N-509 and most of the ASME Code examination requirements. The sampling philosophy ensures the detection of service-induced degradation. For multiple RPVs the ASME Code Case N-700 sampling plan requires only one welded attachment of only one of the multiple RPVs to be selected for examination and for a single RPV only one welded attachment is to be examined. ASME Code Case N-700 also requires that the attachment selected for examination is to be an attachment under continuous load during operation if such an attachment exists. The licensee's selection of the RPV skirt weld for examination, which is under continuous load, will comply with the requirements of ASME Code Case N-700 and will provide an acceptable level of quality and safety.

2.5 Conclusion

The NRC staff concludes that the licensee's proposed alternative to use ASME Code Case N-700 for the examination of the RPV welded attachments at Hatch, Unit 1 provides an acceptable level of quality and safety. Therefore, the licensee's alterative is authorized pursuant to 10 CFR 55.55a(a)(3)(i) for the Hatch, Unit 1 third 10-year ISI interval, or until ASME Code Case N-700 is approved for general use by reference in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." After that time, the licensee must follow the conditions, if any that are specified in Regulatory Guide 1.147.

All other requirements of the ASME Code, Sections III and XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

3.0 RELIEF REQUEST ISI-ALT-02, VERSION 1.0

3.1 Introduction

By letter dated March 30, 2005, SNC submitted a relief request for Hatch, Units 1 and 2. The submittal requested relief from selected requirements of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition through the 2003 Addenda, paragraph IWA-2610, which requires a reference markings and identification system be established for all welds and areas subject to surface or volumetric examination.

3.2 Regulatory Requirements

The ISI of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with applicable editions and addenda of ASME Code, Section XI as required by 10 CFR 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, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulation requires 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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The fourth 10-year ISI interval for Hatch, Units 1 and 2 begins on January 1, 2006, and will end on December 31, 2015.

The ASME Code of record for Hatch's fourth 10-year ISI interval was recently updated to the 2001 Edition through the 2003 Addenda. By letter dated June 15, 2005, the NRC staff approved the use of the ASME Code, Section XI, 2001 Edition through the 2003 Addenda, in lieu of ASME Code, Section XI, 1989 Edition with no Addenda, for the fourth 10-year ISI interval at Hatch, Units 1 and 2. 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.

3.3 Technical Evaluation

ASME Code Requirements:

ASME Code, Section XI, 2001 Edition through the 2003 Addenda, paragraph IWA-2610 requires a reference markings and identification system be established for all welds and areas subject to surface or volumetric examination.

Components For Which Relief Is Requested:

All welds and areas in the ISI program that are subject to surface or volumetric examination at Hatch, Units 1 and 2.

Code Requirement for which Relief is Requested:

The licensee is requesting relief from the ASME Code requirement in paragraph IWA-2610, which requires a reference markings and identification system be established for all welds and areas subject to surface or volumetric examination. The system shall permit identification of each weld, location of each weld centerline, and designation of regular intervals along the length of the weld.

Licensee's Proposed Alternative:

The licensee is proposing to provide a reference markings and identification system for only those welds that undergo a surface or volumetric examination in lieu of all welds in the ISI program. This alternative was submitted during the third 10-year interval (RR-10) and was approved by the NRC staff on June 16, 1997. RR-10 was based on the requirements of ASME Code, Section XI, 1989 Edition with no Addenda.

The subject request, ISI-ALT-02, Version 1.0, which is applicable to the fourth 10-year interval, is based on the requirements of ASME Code, Section XI, 2001 Edition through the 2003 Addenda.

Licensee's Basis for Requesting Relief:

For an operating plant, establishing a weld reference markings and identification system for all welds and areas subject to surface or volumetric examination is a major effort and, in some cases, is prohibitive due to inaccessibility and/or high radiation areas. Establishment of a comprehensive weld reference system for all ISI welds would require many man-hours of work and many man-rem of exposure to locate welds, remove the insulation, mark the welds, and reinstall the insulation. Since only a small percentage of welds are normally examined, the

majority of the welds that would be marked and identified in accordance with the ASME Code, Section XI requirement would never receive an inservice examination. Therefore, the licensee determined that the establishment of a reference markings and identification system for all the ISI welds as mandated by the ASME Code, Section XI would result in a hardship without a compensating increase in quality and safety. The licensee's proposed alternative entails marking only those welds that undergo ISI examination. This method, according to the licensee, will provide assurance that when performing subsequent examinations, the correct weld is being re-examined and that recorded indications can be correlated with previous examination results. The licensee determined that not marking and identifying the welds which are not receiving examinations will have little, if any, effect on safety and quality. Thus, compliance with this specific ASME Code requirement results in unnecessary hardship pursuant to 10 CFR 50.55a(a)(3)(ii) without a sufficient compensating increase in the level of quality and safety.

3.4 Staff Evaluation

The ASME Code, Section XI requires that a reference markings and identification system shall be established for all welds and areas subject to surface or volumetric examinations. This requirement is a major effort and requires many man-hours of work and many man-rem of exposure to locate welds, remove the insulation, mark the welds, and re-install the insulation, regardless of whether or not the weld is scheduled for examination. The licensee's proposed alternative provides unique identification markings for only those welds that undergo surface or volumetric examinations. The licensee's basis for the proposed alternative states that the unique identification markings of the welds that are scheduled to be examined will enable the licensee to accurately identify any given weld during the subsequent examination. In addition, the identification markings will facilitate accurate identification of the previously recorded indications that are associated with the subject weld. Since only a limited number of welds will undergo either surface or volumetric examinations, the NRC staff believes that establishing a comprehensive reference markings and identification system for only those welds that undergo ISI examinations will not compromise safety and quality. By letter dated June 16, 1997, the NRC staff approved the licensee's similar proposed alternative for the Hatch's third 10-year ISI interval (Relief Request RR-10). The NRC staff concludes that imposing the ASME Code, Section XI requirements to establish a comprehensive reference markings and identification system which includes welds that do not undergo examination will result in a burden without a compensating increase in quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the Hatch, Unit 1 and 2 fourth 10-year ISI interval.

3.5 Conclusion

The NRC staff has reviewed the licensee's submittal and determined that compliance with the requirements of the ASME Code, Section XI, 2001 Edition through the 2003 Addenda, paragraph IWA-2610, results in a hardship or difficulty without a compensating increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance

of structural integrity of the ISI welds. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the proposed alternative (ISI-ALT-02, Version 1.0), described in the licensee's letter dated March 30, 2005, for the Hatch, Units 1 and 2 fourth 10-year ISI interval. 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.

4.0 RELIEF REQUEST ISI-ALT-04, VERSION 1.0

4.1 Introduction

In a letter dated March 30, 2005, SNC proposed an alternative to the ASME Code, Section XI, Appendix VIII, Supplement 11, "Qualification Requirements for Full Structural Overlaid Wrought Austenitic Piping welds," requirements for Hatch, Units 1 and 2. In lieu of the ASME Code requirements, the licensee proposed using the qualification process as administered by the Electric Power Research Institute - Performance Demonstration Initiative (PDI) for weld overlay qualifications.

4.2 Regulatory Evaluation

In accordance with 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components must meet the requirements set forth in ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulation requires that all inservice examinations 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 ASME Code, Section XI, incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 10-year interval. For Hatch, Units 1 and 2, the 2001 Edition through the 2003 Addenda to ASME Code, Section XI, is the applicable edition for the fourth 10-year ISI interval scheduled to start January 1, 2006.

In accordance with 10 CFR 50.55a(g)(6)(ii)(C), the implementation of Supplements 1 through 8, and 10 through 13 of Appendix VIII to Section XI, 1995 Edition with the 1996 Addenda of the ASME Code is required on a phased schedule ending on November 22, 2002. Supplement 11 was required to be implemented by November 22, 2001. Pursuant to 10 CFR 50.55a(g)(4)(iv), ISI items may meet the requirements set forth in subsequent editions and addenda of the ASME Code that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed, therein, and subject to Commission approval. 10 CFR 50.55a(b)(2)(xxiv) prohibits the use of Appendix VIII and the supplements to Appendix VIII of the ASME Code 2002 Addenda through the latest edition and addenda incorporated by reference in 10 CFR 50.55a(b)(2). Therefore, the licensee is required to use Appendix VIII and Supplements to Appendix VIII to Section XI of the 2001 Edition of the ASME Code.

Pursuant to 10 CFR 50.55a(a)(3), alternatives to requirements may be authorized by the NRC if the licensee demonstrates that: (i) the proposed alternatives 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.

The licensee submitted relief request ISI-ALT-04, Version 1.0, pursuant to 10 CFR 50.55a(a)(3)(i), as a proposed alternative to the implementation of ASME Code Section XI, Appendix VIII, Supplement 11 for the fourth 10-year ISI interval at Hatch Units 1 and 2.

4.3 Technical Evaluation

Code Requirements:

The ASME Code requirements for which relief is requested are contained in ASME Code Section XI, Appendix VIII, Supplement 11 (2001 Edition, no Addenda), "Qualification Requirements For Full Structural Overlaid Wrought Austenitic Piping Welds".

System/Component(s) for which Relief is Requested:

The licensee's request for relief applies to Class 1, pressure retaining welds in piping, subject to ASME Section XI, Appendix VIII, Supplement 11, weld overlay examinations.

Licensee's Proposed Alternative and Bases:

In lieu of the requirements of ASME Section XI, 2001 Edition, Appendix VIII, Supplement 11, the requirements of the PDI Program will be used. Major differences between 2001 Edition Appendix VIII requirements and PDI Program requirements are discussed below.

Paragraph 1.1(d)(1) requires that all base metal flaws be cracks. As illustrated below [see figure in Enclosure 6 of the May 30, 2005, submittal], implanting a crack requires excavation of the base material on at least one side of the flaw. While this may be satisfactory for ferritic materials, it does not produce a useable axial flaw in austenitic materials because the sound beam, which normally passes only through base material, must now travel through weld material on at least one side, producing an unrealistic flaw response. To resolve this issue, the PDI Program revised this paragraph to allow use of alternative flaw mechanisms under controlled conditions. For example, alternative flaws shall be limited to when implantation of cracks precludes obtaining an effective ultrasonic response, flaws shall be semi-elliptical with a tip width of less than or equal to 0.002 inches, and at least 70 percent of the flaws in the detection and sizing test shall be cracks and the remainder shall be alternative flaws.

Relief is requested to allow closer spacing of flaws provided they didn't interfere with detection or discrimination. The existing specimens used to date for qualification to the Tri-party (NRC/BWROG/EPRI) agreement have a flaw population density greater than allowed by the current Code requirements. These samples have been used successfully for all previous

qualifications under the Tri-party agreement program. To facilitate their use and provide continuity from the Tri-party agreement program to Supplement 11, the PDI Program has merged the Tri-party test specimens into their weld overlay program. For example; the requirement for using IWA-3300 for proximity flaw evaluation in paragraph 1.1(e)(1) of Supplement 11 was excluded, instead indications will be sized based on their individual merits; paragraph 1.1(d)(1) includes the statement that intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the base metal flaws; paragraph 1.1(e)(2)(a)(1) was modified to require that a base metal grading unit include at least 1-inch of the length of the overlaid weld, rather than 3 inches; paragraph 1.1(e)(2)(a)(3) was modified to require sufficient unflawed overlaid weld and base metal to exist on all sides of the grading unit to preclude interfering reflections from adjacent flaws, rather than the 1-inch requirement of Supplement 11; paragraph 1.1(e)(2)(b)(1) was modified to define an overlay fabrication grading unit as including the overlay material and the base metal-to-overlay interface for a length of at least 1-inch, rather than the 6 square inch requirement of Supplement 11; and paragraph 1.1(e)(2)(b)(2) states that overlay fabrication grading units designed to be unflawed shall be separated by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1-inch at both ends, rather than around its entire perimeter.

Additionally, the requirement for axially oriented overlay fabrication flaws in paragraph 1.1(e)(1) was excluded from the PDI Program as an improbable scenario. Weld overlays are typically applied using automated gas tungsten arc welding techniques with the filler metal being applied in a circumferential direction. Because resultant fabrication induced discontinuities would also be expected to have major dimensions oriented in the circumferential direction axial overlay fabrication flaws are unrealistic.

The PDI Program revised paragraph 2.0 allowing the overlay fabrication and base metal flaw tests to be performed separately. The requirement in paragraph 3.2(b) for reporting all extensions of cracking into the overlay is omitted from the PDI Program because it is redundant to the root mean square calculations performed in paragraph 3.2(c), and it's presence adds confusion and ambiguity to depth sizing as required by paragraph 3.2(c). This also makes the weld overlay program consistent with the Supplement 2 depth sizing criteria.

In Paragraph 1.1 (e)(2)(a)(1) the phrase *"and base metal on both sides",* was inadvertently included in the description of a base metal grading unit. The PDI Program intentionally excludes this requirement because some of the qualification samples include flaws on both sides of the weld.

To avoid confusion several instances of the term "cracks" or "cracking" were changed to the term "flaws" because of the use of alternative flaw mechanisms. Additionally, to avoid confusion, the overlay thickness tolerance contained in paragraph 1.1(b) last sentence, was reworded and the phrase *"and the remainder shall be alternative flaws"* was added to the next to last sentence in paragraph 1.1(d)(1). Additional editorial changes were made to the PDI Program to address an earlier NRC “request for additional information.”

PDI and the NRC have worked closely to reach agreement on the criteria related to the subject examination requirements and both agree that the PDI Program is an acceptable alternative to Appendix VIII, Supplement 11. Compliance with the PDI Program will provide an adequate level of quality and safety for examination of the affected welds (i.e., weld overlay repairs). Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), SNC requests approval to use the PDI Program, in lieu of the ASME Section XI, Appendix VIII, Supplement 11 requirements.

4.4 Staff Evaluation

Nuclear utilities in the United States created the PDI to implement performance demonstration requirements contained in Appendix VIII of Section XI of the ASME Code. To this end, PDI has developed a program for qualifying procedures, equipment, and personnel for examination of weld overlays in accordance with the ultrasonic testing (UT) criteria of Appendix VIII, Supplement 11. Prior to the Supplement 11 program, Electric Power Research Institute (EPRI) maintained a performance demonstration program for weld overlay qualification under the Tri-party Agreement[1]. Instead of having two programs with similar objectives, the NRC staff recognized the PDI Program for weld overlay qualifications as an acceptable alternative to the Tri-party Agreement[2].

The PDI Program does not fully comport with the existing requirements of Supplement 11. PDI presented the differences at public meetings in which the NRC participated[3,4]. The differences are in flaw location within test specimens and fabricated flaw tolerances. The changes in flaw location permitted using test specimens from the Tri-party agreement and the changes in fabricated flaw tolerances provide UT acoustic responses similar to the responses associated with intergranular stress corrosion cracking.

There are differences between the PDI Program and Supplement 11. The differences identified in the following Supplement 11 paragraphs: 1.1(b), 1.1(d)(1), 1.1(e)(1), 1.1(e)(2), 1.1(e)(2)(a)(1), 1.1(e)(2)(a)(2), 1.1(e)(2)(a)(3), 1.1(e)(2)(b)(1), 1.1(e)(2)(b)(2), 1.1(e)(2)(b)(3), 1.1(f)(1), 1.1(f)(3), 1.1(f)(4), 2.0, 2.1, 2.2(d), 2.3, 3.1, 3.2(a), 3.2(b) and 3.2(c) are evaluated below:

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1 The Tri-party Agreement is between NRC, EPRI, and the Boiling Water Reactor Owners Group (BWROG), “Coordination Plan for NRC/EPRI/BWROG Training and Qualification Activities of NDE (Nondestructive Examination) Personnel,” July 3, 1984.

2 NRC Letter from William H. Bateman to Michael Bratton, “Weld Overlay Performance Demonstration Administered by PDI as an Alternative for Generic Letter 88-01 Recommendations,” January 15, 2002. ML020160532

3 NRC Memorandum from Donald G. Naujock to Terence Chan, "Summary of Public Meeting Held January 31 - February 2, 2001," with PDI Representatives, March 22, 2001. ML010940402

4 NRC Memorandum from Donald G. Naujock to Terence Chan, "Summary of Public Meeting Held June 12 through June 14, 2001," with PD1 Representatives, November 29, 2001. ML013330156

Paragraph 1.1(b) of Supplement 11 limits the maximum thickness for which a procedure may be qualified. The ASME Code states that "The specimen set must include at least one specimen with overlay thickness within minus 0.10-inch to plus 0.25-inch of the maximum nominal overlay thickness for which the procedure is applicable." The ASME Code requirement addresses the specimen thickness tolerance for a single specimen set, but is confusing when multiple specimen sets are used. The PDI proposed alternative states that "the specimen set shall include specimens with overlay not thicker than 0.10-inch more than the minimum thickness, nor thinner than 0.25-inch of the maximum nominal overlay thickness for which the examination procedure is applicable." The proposed alternative provides clarification on the application of the tolerance. The tolerance is unchanged for a single specimen set, however, it clarifies the tolerance for multiple specimen sets by providing tolerances for both the minimum and maximum thicknesses. The proposed wording eliminates confusion while maintaining the intent of the overlay thickness tolerance. Therefore, the NRC staff finds this PDI Program revision acceptable.

Paragraph 1.1(d)(1) requires that all base metal flaws be cracks. PDI determined that certain Supplement 11 requirements pertaining to location and size of cracks in test specimens would be extremely difficult to achieve. For example, flaw implantation requires excavating a volume of base material to allow a pre-cracked coupon to be welded into this area. This process would add weld material to an area of the specimens that typically consists of only base material, and could potentially make ultrasonic examination more difficult, and not representative of actual field conditions. In an effort to satisfy the requirements, PDI developed a process for fabricating flaws that exhibit crack-like reflective characteristics. Instead of all flaws being cracks as required by Paragraph 1.1(d)(1), the PDI weld overlay performance demonstrations contain at least 70 percent cracks with the remainder being fabricated flaws exhibiting crack-like reflective characteristics. The fabricated flaws are semi-elliptical with tip widths of less than 0.002 inches. The PDI alternative also states that, "The use of Alternative flaws shall be limited to when the implantation of cracks produces spurious reflectors that are uncharacteristic of actual flaws." The NRC staff has reviewed the flaw fabrication process, compared the reflective characteristics between actual cracks and PDI-fabricated flaws, and found the fabricated flaws acceptable for this application.

Paragraph 1.1(e)(1) requires that at least 20 percent but not less than 40 percent of the flaws shall be oriented within ± 20 degrees of the pipe axial direction. Flaws contained in the original base metal heat-affected zone satisfy this requirement. However, PDI excludes axial fabrication flaws in the weld overlay material. PDI has concluded that axial flaws in the overlay material are improbable because the overlay filler material is applied in the circumferential direction (parallel to the girth weld), therefore, fabrication anomalies would also be expected to have major dimensions in the circumferential direction. The NRC staff finds this approach to implantation of fabrication flaws to be reasonable. Therefore, PDI's application of flaws oriented in the axial direction is acceptable.

Paragraph 1.1(e)(1) also requires that the rules of IWA-3300 be used to determine whether closely spaced flaws should be treated as single or multiple flaws. PDI treats each flaw as an

individual flaw and not as part of a system of closely spaced flaws. PDI controls the flaws going into a test specimen set such that the flaws are free of interfering reflections from adjacent flaws. In some cases, this permits flaws to be spaced closer than what is allowed for classification as a multiple set of flaws by IWA-3300, thus, potentially making the performance demonstration more challenging. Hence, PDI's application for closely spaced flaws is acceptable.

Paragraph 1.1(e)(2) requires that specimens be divided into base metal and overlay grading units. The PDI Program adds clarification with the addition of the word "fabrication" and ensures flaw identification by ensuring all flaws will not be masked by other flaws with the addition of, "Flaws shall not interfere with ultrasonic detection or characterization of other flaws." PDI's alternative provides clarification and assurance that the flaws are identified. Therefore, the NRC staff finds the PDI alternative to the Supplement requirements is acceptable.

Paragraph 1.1(e)(2)(a)(1) requires that a base grading unit shall include at least 3 inches of the length of the overlaid weld, and the base grading unit includes the outer 25 percent of the overlaid weld, and base metal on both sides. The PDI Program reduced the criteria to 1-inch of the length of the overlaid weld and eliminated from the grading unit the need to include both sides of the weld. The proposed change permits the PDI Program to continue using test specimens from the existing weld overlay program which have flaws on both sides of the welds. These test specimens have been used successfully for testing the proficiency of personnel for over 16 years. The weld overlay qualification is designed to be a near-side [relative to the weld] examination, and it is improbable that a candidate would detect a flaw on the opposite side of the weld due to the sound attenuation and re-direction caused by the weld microstructure. However, the presence of flaws on both sides of the original weld (outside the PDI grading unit) may actually provide a more challenging examination, as candidates must determine the relevancy of these flaws, if detected. Therefore, PDI's use of the 1-inch length of the overlaid weld base grading unit and elimination from the grading unit the need to include both sides of the weld, as described in the revised PDI Program alternative, is acceptable.

Paragraph 1.1(e)(2)(a)(2) requires, when base metal cracking penetrates into the overlay material, that a portion of the base grading unit shall not be used as part of the overlay grading unit. The NRC staff finds that the PDI Program adjusts for the changes in Paragraph 1.1(e)(2)(a)(2) and conservatively states that when base metal flaws penetrate into the overlay material, no portion of it shall be used as part of the overlay fabrication grading unit. The NRC staff finds that the PDI Program also provided clarification by the addition of the term "flaws" for "cracks" and the addition of "fabrication" to "overlay grading unit." The NRC staff concludes that the PDI Program alternative provides clarification and conservatism, and therefore, is acceptable.

Paragraph 1.1(e)(2)(a)(3) requires that for unflawed base grading units, at least 1-inch of unflawed overlaid weld and base metal shall exist on either side of the base grading unit. This is to minimize the number of false identifications of extraneous reflectors. The PDI Program

stipulates that unflawed overlaid weld and base metal exist on all sides of the grading unit and that flawed grading units must be free of interfering reflections from adjacent flaws which addresses the same concerns as Code. Hence, the NRC staff concludes that the PDI's application of the variable flaw-free area adjacent to the grading unit is acceptable.

Paragraph 1.1(e)(2)(b)(1) requires that an overlay grading unit shall include the overlay material and a base metal-to-overlay interface of at least 6 square inches. The overlay grading unit shall be rectangular, with minimum dimensions of 2 inches. The PDI Program reduces the base metal-to-overlay interface to at least 1-inch (in lieu of a minimum of 2 inches) and eliminates the minimum rectangular dimension. This criterion is necessary to allow use of existing examination specimens that were fabricated in order to meet NRC Generic Letter 88-01 (Tri-party Agreement, July 1984)[1]. This criterion may be more challenging than the ASME Code because of the variability associated with the shape of the grading unit. Hence, the NRC staff concludes that the PDI's application of the grading unit is acceptable.

Paragraph 1.1(e)(2)(b)(2) requires that unflawed overlay grading units shall be surrounded by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1-inch around it's entire perimeter. The PDI Program redefines the area by noting unflawed overlay fabrication grading units shall be separated by at least 1-inch of unflawed material at both ends and sufficient area on both sides to preclude interfering reflections from adjacent flaws. The NRC staff determined that the relaxation in the required area on the sides of the specimens, while still ensuring no interfering reflections, may provide a more challenging demonstration than required by ASME Code because of the possibility for having a parallel flaw on the opposite side of the weld. Therefore, based on engineering judgement, the NRC staff concludes that the PDI's application is an acceptable alternative to the Supplement 11 requirements.

Paragraph 1.1(e)(2)(b)(3) requirements are retained in the PDI Program. In addition, the PDI Program requires that initial procedure qualification contain three times the number of flaws required for a personal qualification. To qualify new values of essential variables, the equivalent of at least one personal qualification set is required. The NRC staff concludes that PDI's additions enhance the ASME Code requirements and are, therefore, acceptable because it provides for a more stringent qualification criteria.

Paragraph 1.1(f)(1) requirements are retained in the PDI Program, with the clarification change of the term "flaws" for "cracks." In addition, the PDI Program includes the requirements that sizing sets shall contain a distribution of flaw dimensions to verify sizing capabilities. The PDI Program also requires that initial procedure qualification contain three times the number of flaws required for a personal qualification. To qualify new values of essential variables, the equivalent of at least one personal qualification set is required. The NRC staff concludes that PDI's additions enhance the ASME Code requirements and are, therefore, acceptable because it provides a more stringent qualification criteria.

Paragraphs 1.1(f)(3) and 1.1(f)(4) requirements are clarified by the PDI Program by replacing the term “cracking” with “flaws” because of the use of alternative flaw mechanisms. The NRC staff concludes that this clarification in the PDI Program meets the intent of the ASME Code requirements, and is, acceptable.

Paragraph 2.0 requirements are retained in the PDI Program alternative. In addition, the PDI Program provides clarification that the overlay fabrication flaw test and the base metal flaw test may be performed separately. The NRC staff concludes that this clarification in the PDI Program meets the intent of the ASME Code requirements and is acceptable.

Paragraphs 2.1 and 2.2(d) requirements are clarified by the PDI Program by the addition of the terms “metal” and “fabrication”. The NRC staff determined that the clarifications provide acceptable classification of the terms they are enhancing. Therefore, the NRC staff concludes that the PDI Program meets the intent of the ASME Code requirements, and is, acceptable.

Paragraph 2.3 requires that, for depth sizing tests, 80 percent of the flaws shall be sized at a specific location on the surface of the specimen identified to the candidate. This requires detection and sizing tests to be separate. PDI revised the weld overlay program to allow sizing to be conducted either in conjunction with, or separately from, the flaw detection test. If performed in conjunction with detection, and the detected flaws do not meet the Supplement 11 range criteria, additional specimens will be presented to the candidate with the regions containing flaws identified. Each candidate will be required to determine the maximum depth of flaw in each region. For separate sizing tests, the regions of interest will also be identified and the maximum depth and length of each flaw in the region will similarly be determined. In addition, PDI stated that grading units are not applicable to sizing tests, and that each sizing region will be large enough to contain the target flaw, but small enough that candidates will not attempt to size a different flaw. The above clarification provides a basis for implementing sizing tests in a systematic, consistent manner that meets the intent of Supplement 11. As such, the NRC staff concludes that this method is acceptable.

Paragraph 3.1 requires that examination procedures, equipment and personnel (as a complete ultrasonic system) are qualified for detection or sizing of flaws, as applicable, when certain criteria are met. The PDI Program allows procedure qualification to be performed separately from personnel and equipment qualification. Historical data indicate that, if ultrasonic detection or sizing procedures are thoroughly tested, personnel and equipment using those procedures have a higher probability of successfully passing a qualification test. In an effort to increase this passing rate, PDI has elected to perform procedure qualifications separately in order to assess and modify essential variables that may affect overall system capabilities. For a procedure to be qualified, the PDI Program requires three times as many flaws to be detected (or sized) as shown in Supplement 11 for the entire ultrasonic system. The personnel and equipment are still required to meet the Supplement 11 requirement; therefore, the PDI Program criteria exceeds the ASME Code requirements for personnel, procedures, and equipment qualification. Therefore, the NRC staff concludes that the PDI Program criteria is acceptable.

Paragraph 3.2(a) requirements are clarified by the PDI Program by replacing the term "cracking" with "flaws" because of the use of alternative flaw mechanisms. The NRC staff concludes that this clarification in the PDI Program maintains the intent of the ASME Code requirements, and is, acceptable.

Paragraph 3.2(b) requires that all extensions of base metal cracking into the overlay material by at least 0.10-inch are reported as being intrusions into the overlay material. The PDI Program omits this criterion because of the difficulty in actually fabricating a flaw with a 0.10-inch minimum extension into the overlay, while still knowing the true state of the flaw dimensions. However, the PDI Program requires that cracks be depth-sized to the tolerance specified in the ASME Code which is 0.125-inches. Since the ASME Code tolerance is close to the 0.10-inch value of Paragraph 3.2(b), any crack extending beyond 0.10-inch into the overlay material would be identified as such from the characterized dimensions. The NRC staff determined that reporting of an extension in the overlay material is redundant for performance demonstration testing because of the flaw sizing tolerance. Therefore, the NRC staff concludes that PDI's omission of highlighting a crack extending beyond 0.10-inch into the overlay material is acceptable.

Paragraph 3.2(c) is renumbered to Paragraph 3.2(b) in the PDI Program. The NRC staff concludes that this PDI Program change is administrative in nature and is, therefore, acceptable.

Based on the above evaluation, the NRC staff has determined that the licensee's proposed alternative to use the PDI qualification program for the ultrasonic examination of overlay repaired piping welds is acceptable, because it will provide an acceptable level of quality and safety.

4.5 Conclusion

The NRC staff has determined that the licensee's proposed alternative to use the PDI Program for weld overlay qualifications as described in its submittal, in lieu of Supplement 11 to Appendix VIII of Section XI of the Code, will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative under Relief Requests ISI-ALT-04, Version 1.0 is authorized for the fourth 10-year ISI interval at Hatch, Units 1 and 2. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

5.0 RELIEF REQUEST ISI-ALT-05, VERSION 1.0

5.1 Introduction

By letter dated March 30, 2005, SNC submitted a relief request ISI-ALT-05, Version 1.0 Hatch, Units 1 and 2. The submittal requested relief from selected requirements of ASME Code,

Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” 2001 Edition through the 2003 Addenda, paragraph IWB-5222 (b), which requires a system leakage test for all ASME Code Class 1 pressure retaining components.

5.2 Regulatory Requirement

The ISI of ASME Code Class 1, 2, and 3 components is to be performed in accordance with applicable editions and addenda of ASME Code, Section XI as required by 10 CFR 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, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulation requires 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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The fourth 10-year ISI interval for Hatch, Units 1 and 2 begins on January 1, 2006, and will end on December 31, 2015.

The ASME Code of record for Hatch’s fourth 10-year ISI interval was recently updated to the 2001 Edition through the 2003 Addenda. By letter dated June 15, 2005, the NRC staff approved the use of the ASME Code, Section XI, 2001 Edition through the 2003 Addenda, in lieu of ASME Code, Section XI, 1989 Edition with no Addenda, for the fourth 10-year ISI interval at Hatch, Units 1 and 2. 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.

5.3 Technical Evaluation

ASME Code Requirements:

ASME Code, Section XI, 2001 Edition through the 2003 Addenda, paragraph IWB-5222 (b) requires a system leakage test to include all ASME Code Class 1 pressure retaining components.

ASME Code, Section XI, 2001 Edition through the 2003 Addenda, Table IWB-2500-1, Examination Category B-P, Item B15.10 requires the system leakage test to include all ASME Code Class 1 pressure retaining components during each refueling outage.

ASME Code, Section XI, 2001 Edition through the 2003 Addenda, paragraph IWB-5221 (a) states that "system leakage test shall be conducted at a pressure not less than the pressure corresponding to 100% rated reactor power."

Components For Which Relief Is Requested:

Small bore (#1-inch), ASME Code Class 1 Reactor Coolant Pressure Boundary (RCPB) vent, drain and branch (VTDB) lines and connections at Hatch, Units 1 and 2.

Code Requirement for which Relief is Requested:

The licensee is requesting relief from the ASME Code requirement in paragraph IWB-5222 (b), which requires a system leakage test to include all ASME Code Class 1 pressure retaining components.

Licensee's Proposed Alternative Examination:

The licensee is proposing to perform the fourth 10-year interval ASME Code Class 1 system leakage test with the VTDB lines and connections in the closed position. This alternative examination was submitted during the third 10-year interval (Relief Request RR-17) and was approved by the NRC staff on September 3, 1998. RR-17 was based on the requirements of ASME Code, Section XI, 1989 Edition with no Addenda. The subject request, ISI-ALT-05 Version 1.0, which is applicable to the fourth 10-year interval, is based on the requirements of ASME Code, Section XI, 2001 Edition through the 2003 Addenda.

Licensee's Basis for Requesting Relief:

The VTDB lines and connections are equipped with manual valves which provide double isolation of the RCPB. These valves are generally maintained closed during normal operation. The piping outboard of the first isolation valve is not normally pressurized. Under normal operating conditions, the VTDB lines and connections see reactor coolant system pressures and temperatures only if leakage through the inboard valves occurs. To perform the ASME Code-required test, it would be necessary to manually open the inboard valves to pressurize the VTDB lines and connections. Pressurization by this method defeats the double isolation and potentially presents safety concerns for the personnel performing the test. Furthermore, performing the test with the inboard isolation valves open requires several man-hours to position the valves for the test and restore the valves after the test is complete. These valves are located in close proximity of the RCPB main loop piping and, thus, require personnel entry into high radiation areas within the containment. Based on previous outage data, estimated radiation exposure associated with valve alignment and realignment would be approximately

1.6 man-Rem per test. Since this test would be performed near the end of an outage when all RCPB work has been completed, the time required to open and close these VTDB lines and connections would impact the outage schedule. Thus, compliance with this specific ASME Code requirement results in unnecessary hardship pursuant to 10 CFR 50.55a(a)(3)(ii) without a sufficient compensating increase in the level of quality and safety.

The proposed alternative provides an acceptable level of safety and quality based on the following:

A. ASME Code, Section XI, paragraph IWA-4540 provides the requirements for hydrostatic pressure testing of piping and components after repairs by welding to the pressure boundary. IWA-4540(b)(6) excludes component connections, piping and associated valves that are 1-inch nominal pipe size and smaller from the hydrostatic pressure test requirement after welded repairs. Therefore, requiring a system leakage test and visual examination of these RCPB VTDB lines and connections (#1-inch diameter) once each 10-year interval is unwarranted considering that hydrostatic pressure testing a repair weld on the same connections is not required by the ASME Code, Section XI.

B. The non-isolable portion of the RCPB VTDB lines and connections will be pressurized and visually examined as required. Only the isolable portion of those small diameter VTDB lines and connections will not be pressurized.

C. A typical VTDB line and connection includes two manual valves separated by a short pipe nipple, which is connected to the RCPB via another short pipe nipple and a half coupling. All connections are typically socket-welded and the welds receive a surface examination after installation. The piping and valves are normally heavy wall (Schedule 160 pipe and 600-pound valve bodies). The VTDB lines and connections are not subject to high stresses or cyclic loads and design ratings are significantly greater than RCPB operating or design pressure.

D. The Technical Specification (TS) requires reactor coolant system (RCS) leakage monitoring during normal operation. When a leakage exceeds TS limits, corrective actions are taken, which may include shutting the plant down, identifying the source of leakage, and restoring the RCS boundary integrity.

5.4 Staff Evaluation

The ASME Code requires that all Class 1 components within the RCS boundary undergo a system leakage test at or near the end of each inspection interval. The licensee has proposed an alternative to the system leakage test requirements of the ASME Code for some line segments as described in the subject relief request ISI-ALT-05, Version 1.0. The line segments, as stated by the licensee, include two manually operated valves separated by a short pipe nipple that is connected to the RCS via another short pipe nipple and half coupling. The line configuration provides double isolation of the RCS. Under normal plant operating

conditions the subject line segments would see RCS temperatures and pressures only if leakage through the inboard valves occurs. For the licensee to perform the ASME Code-required test, it would be necessary to manually open the inboard valves to pressurize the line segments. Pressurization by this method would defeat the RCS double isolation and may cause safety concerns for the personnel performing the examination.

Typical VTDB lines and connections are in close proximity to the high radiation area in the RCS boundary. Manual actuation (opening and closing) of the VTDB lines and valves is estimated to expose plant personnel to 1.6 man-rem per test. Therefore, the ASME Code requirement to perform the system leakage test on these normally isolated line segments presents a hardship for the licensee. The licensee proposed to visually examine the isolation valves in the normally closed position for leaks and evidence of past leakage during the system leakage test each refueling outage. Also, the RCS vent and drain connections will be visually examined with the isolation valves in the normally closed position during the 10-year ISI system leakage test. The system leakage test is conducted at a pressure not less than the pressure corresponding to 100 percent rated reactor power. Therefore, the licensee's proposed alternative will provide reasonable assurance that structural integrity is maintained for the subject line segments. By letter dated September 3, 1998, the NRC staff approved the licensee's similar proposed alternative examination of the VTDB lines during the Hatch's third 10-year interval (Relief Request RR-17). The NRC staff concludes that imposition of the subject ASME Code requirement on Hatch, Units 1 and 2 would result in hardship without a compensating increase in the level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the Hatch, Units 1 and 2 fourth 10-year ISI interval.

5.5 Conclusion

The NRC staff has reviewed the licensee's submittal and determined that compliance with the requirements of the ASME Code, Section XI, 2001 Edition through the 2003 Addenda, paragraph IWB-5222 (b), results in a hardship or difficulty without a compensating increase in the level of quality and safety. The licensee's proposed alternative inspection provides reasonable assurance of structural integrity. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the proposed alternative (ISI-ALT-05, Version 1.0), described in the licensee's letter dated March 30, 2005, for the Hatch, Units 1 and 2 fourth 10-year ISI interval. 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.

6.0 RELIEF REQUEST ISI-ALT-06

6.1 Introduction

By letter dated March 30, 2005, SNC submitted a request for relief, ISI-ALT-06, for Hatch, Units 1 and 2. The licensee proposed an alternative to use certain ASME Code requirements. Specifically, the licensee proposed an alternative to selected provisions of ASME Code,

Section XI, Appendix VIII, Supplement 10, "Qualification Requirements for Inspection of Dissimilar Metal Piping Welds", for the fourth 10-year ISI interval.

6.2 Regulatory Requirements

The ISI of ASME Code Class 1, 2, and 3 components will be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by 10 CFR 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) will meet the requirements, except the 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 regulation requires 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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ISI ASME Code of record for Edwin I. Hatch Nuclear Plant, Units 1 and 2, fourth 10-year ISI interval is the 2001 Edition through the 2003 Addenda of the ASME Code. 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.

6.3 Technical Evaluation

Code Requirement for which Relief is Requested:

The licensee is required to use the 2001 Edition of the ASME Code, Section XI, Appendix VIII, Supplement 10, Table VIII-S2-1 which provides the false call criteria when the number of unflawed grading units are at least twice the number of flawed grading units.

Licensee's Proposed Alternative to Code:

The licensee proposed using the 2001 Edition of the ASME Code, Section XI, Appendix VIII, Supplement 10, with modifications to Table VIII-S2-1. In the licensee's submittal, the modifications to Table VIII-S2-1 are shown as Table VIII-S10-1.

Licensee's Basis for Requesting Relief:

The alternative is a re-submittal of applicable portions of NRC-approved third interval relief request GR-03-01, which allowed the licensee to use the PDI Program in lieu of Section XI, Appendix VIII requirements. GR-03-01 was based on the 1995 Edition with 1996 Addenda of the Supplement 10 while this new fourth interval request is based on the 2001 Edition of Supplement 10.

GR-03-01 listed eleven items from the 1995 Edition with 1996 Addenda of the ASME Code that were different from PDI's implementation of Supplement 10. In the 2001 Edition of the ASME Code, ten of the items were subsequently incorporated. However, the modifications to Table VIII-S2-1 were not made part of the 2001 Edition. Therefore, approval to continue using the PDI modified version of Table VIII-S2-1 is needed.

There have been no substantive changes to the ASME Code requirements or the basis for use which would alter the previous NRC Safety Evaluation conclusion, dated August 6, 2003 (ADAMS Accession No. ML032180002).

6.4 Staff Evaluation

The 2001 Edition of the ASME Code, Section XI, Appendix VIII, Supplement 10 requires that detection sets meet the requirements of Table VIII-S2-1 which specifies the minimum number of flaws in a test set to be 5 with 100 percent detection. The 2001 Edition of the ASME Code also requires the number of unflawed grading units to be two times the number of flawed grading units. The proposed alternative, as shown in the licensee's submittal as Table VIII-S10-1, would follow the detection criteria of the Table VIII-S2-1 beginning with a minimum number of flaws in a test set starting at 10, while reducing the number of unflawed grading units to one and one-half (1.5) times the number of flawed grading units. The proposed change was evaluated by the Pacific Northwest National Laboratory (PNNL). The PNNL evaluation concluded that the statistical design basis used in Table VIII-S10-1 for screening personnel participating in the performance demonstrations required by Supplement 10 would provide the same screening results as Table VIII-S2-1. The NRC staff agrees with PNNL's conclusion. Therefore, the proposed alternative satisfies the pass/fail objective established for the Supplement 10 performance demonstration acceptance criteria. The NRC staff finds that the proposed alternative will provide an acceptable level of quality and safety and, therefore, is acceptable.

6.5 Conclusion

Based on the above evaluation, the NRC staff concludes that the licensee's proposed alternative ISI-ALT-06 to use Table VIII-S10-1 in lieu of Table VIII-S2-1 will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the Edwin I. Hatch Nuclear Plant, Units 1 and 2, for the

fourth 10-year inservice inspection interval which will begin on January 1, 2006, and end on December 31, 2015.

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