April 3, 2007

Mr. Rick A. Muench
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - AUTHORIZATION OF RELIEF REQUEST I3R-05, ALTERNATIVES TO STRUCTURAL WELD OVERLAY REQUIREMENTS (TAC NO. MD1813)

Dear Mr. Muench:

By letter dated May 19, 2006 (ET 06-0021), as supplemented by three letters dated August 4, September 27, and October 2, 2006 (ET 06-0031, -0042, and -0044, respectively), Wolf Creek Nuclear Operating Corporation (the licensee) requested relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME) Code, Section XI, requirements at Wolf Creek Generating Station (WCGS). In its application, the licensee submitted Relief Request (RR) I3R-05 and proposed alternatives to the ASME Code requirements in (1) Code Cases N-504-3 and N-638-1, and (2) Appendix VIII, Supplement 11, for the purpose of performing preemptive or repair full structural weld overlays on the pressurizer spray, relief, safety, and surge nozzle safe-ends at WCGS. RR I3R-05 was verbally authorized in a conference call on October 5, 2006, and the structural weld overlays were performed on the pressurizer spray, relief, safety, and surge nozzle safe-ends during the refueling outage conducted during the fall of 2006.

Based on the enclosed safety evaluation, the NRC staff concludes that the alternatives to the ASME Code requirements in (1) Code Cases N-504-3 and N-638-1, and (2) Appendix VIII, Supplement 11, in RR I3R-05 for the preemptive full structural overlay or weld repair at WCGS for the welds listed in the May 19, 2006, letter, will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternatives to Code Cases N-504-3 and N-638-1 for the remaining service life of the subject welds. Secondly, pursuant also to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternatives to Appendix VIII, Supplement 11, for the remainder of the third 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.

Sincerely,

/RA/

David Terao, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure: Safety Evaluation

cc w/encl: See next page

Wolf Creek Generating Station

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Based on the enclosed safety evaluation, the NRC staff concludes that the alternatives to the ASME Code requirements in (1) Code Cases N-504-3 and N-638-1, and (2) Appendix VIII, Supplement 11, in RR I3R-05 for the preemptive full structural overlay or weld repair at WCGS for the welds listed in the May 19, 2006, letter, will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternatives to Code Cases N-504-3 and N-638-1 for the remaining service life of the subject welds. Secondly, pursuant also to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternatives to Appendix VIII, Supplement 11, for the remainder of the third 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.

Sincerely,

/RA/

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cc w/encl: See next page

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ACCESSION NO.: ML070670514 NRR-028 * SE input dated 2/22/07.

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DATE	3/27/07	4/3/07	02/22/07	03/30/07	4/3/07

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO INSERVICE INSPECTION PROGRAM RELIEF REQUEST I3R-05

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By letter dated May 19, 2006, as supplemented by letters dated August 4, September 27, and October 2, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML061450319, ML062220292, ML062760295, and ML062850505), Wolf Creek Nuclear Operating Corporation (the licensee) submitted Relief Request (RR) I3R-05 for Wolf Creek Generating Station, Unit 1 (WCGS) and requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME) Code pursuant to paragraph 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (i.e., 10 CFR 50.55a(a)(3)(i)).

The licensee specifically requested relief from the ASME Code repair requirements of (1) Code Case N-504-3, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1 (N-504-3)" and Code Case N-638-1, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine, GTAW [Gas Tungsten Arc Weld] Temper Bead Technique (N-638-1)," and (2) Appendix VIII, Supplement 11 to the 1995 Edition including 1996 Addenda of the ASME Code, Section XI. The relief would be used to perform preemptive full structural weld overlays on dissimilar Alloy 82/182 butt welds and safe-end-to-piping stainless steel butt welds on the safety, relief, spray, and surge line connections to the pressurizer.

2.0 REGULATORY EVALUATION

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 (ISI) 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 examinations 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 Code of record for WCGS for the third 10-year ISI interval is the 1998 Edition of the ASME Code through the 2000 Addenda.

In accordance with 10 CFR 50.55a(g)(6)(ii)(C)(1), the implementation of Supplements 1 through 8, 10, and 11 of Appendix VIII to Section XI, 1995 Edition with the 1996 Addenda of the ASME Code was required on a phased schedule ending on November 22, 2002. Supplement 11 was required to be implemented by November 22, 2001. Additionally, 10 CFR 50.55a(g)(6)(ii)(C)(2) requires licensees implementing the 1989 Edition and earlier editions of paragraph IWA-2232 of Section XI of the ASME Code to implement the 1995 Edition with the 1996 Addenda of Appendix VIII and supplements to Appendix VIII of Section XI of the ASME Code.

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. Portions of editions and addenda may be used provided that related requirements of the respective editions and addenda are met.

Pursuant to 10 CFR 50.55a(a)(3), alternatives to requirements may be authorized by the Nuclear Regulatory Commission (NRC) if the licensee demonstrates that: (i) the proposed alternative provides 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 the subject relief request, pursuant to 10 CFR 50.55a(a)(3)(i), which proposed (1) alternatives to the implementation of the ASME Code, Section XI, Appendix VIII, Supplement 11, and (2) modifications to ASME Code Cases N-504-3 and N-638-1, for the deposition of preemptive full structural weld overlays.

3.0 TECHNICAL EVALUATION OF RR I3R-05

3.1 ASME Code Components Affected

The licensee listed the following welds in its application as the welds affected by RR I3R-05:

Description:	Nozzle-to-safe end dissimilar metal (DM) Alloy 82/182 butt welds and safe end-to-piping stainless steel (SS) butt welds on the safety, relief, spray, and surge line connections to the pressurizer.
[ASME] Code Class:	Class 1
Examination Categories:	R-A (risk informed designation for B-F and B-J categories)
Weld Numbers:	TBB03-2-W (4" spray nozzle-to-safe end weld) BB-04-F001 (4" spray safe end-to-piping weld) TBB03-3-A-W (6" safety “A” nozzle-to-safe end weld) BB-02-F001A (6" safety “A” safe end-to-piping weld) TBB03-3-B-W (6" safety “B” nozzle-to-safe end weld) BB-02-F005A (6" safety “B” safe end-to-piping weld) TBB03-3-C-W (6" safety “C” nozzle-to-safe end weld) BB-02-F006A (6" safety “C” safe end-to-piping weld) TBB03-4-W (6" relief nozzle-to-safe end weld) BB-02-F008 (6" relief safe end-to-piping weld)

TBB03-1-W (4" surge nozzle-to-safe end weld)
BB-01-F004B (4" surge safe end-to-piping weld)

The licensee proposes to place the full structural weld overlays on the pressurizer spray, relief, safety, and surge nozzle safe-ends to mitigate any possible cracks in the pressurizer nozzle welds. The full structural weld overlays would be made by the licensee whether or not crack indications were found in the nozzle. The weld overlays will be installed by the licensee as a preemptive measure against cracking in these welds due to primary water stress-corrosion cracking (PWSCC).

3.2 Applicable ASME Code Edition and Addenda

In its application, the licensee stated that the following editions and addenda of the ASME Code, Sections III and XL, are applicable to WCGS:

- ASME [Code,] Section XI, 1998 Edition through the 2000 Addenda for the [third 10-year] interval [for the ISI] and Repair/Replacement Programs.
- ASME [Code,] Section III, 1974 Edition through Summer 1974 Addenda [is the original Code of Construction for the pressurizer].
- ASME [Code,] Section III, 1974 Edition through Winter 1974 Addenda [is the original Construction Code for the pressurizer piping].
- ASME [Code,] Section III, 1974 Edition through Summer 1975 Addenda [is the original Construction Code for the bottom of pressurizer piping].

3.3 ASME Code Requirements for which Relief is Requested

In its application, the licensee addressed the ASME Code requirements for which relief is requested in RR I3R-05. Under the rules of IWA-4420 and IWA-4520(a), repairs shall be performed in accordance with the licensee's design specifications and the original Construction Code. IWA-4430 and IWA-4600 allow the use of alternative welding methods when the requirements of IWA-4420 cannot be met. IWA-4530 requires a preservice examination in accordance with IWB-2200. Table IWB-2500-1, Categories B-F and B-J, prescribe inservice examination requirements for Class 1 butt welds. IWA-4400 allows the use of (1) later editions and addenda of the plant construction code or of ASME Code, Section III, either in their entirety or portions thereof, and (2) ASME Code Cases.

ASME Code Cases N-504-3 and N-638-1, which are approved with conditions as specified in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 14, are applicable to this relief request. This regulatory guide lists code cases which the NRC has approved for use at nuclear power plants. The specific requirements are discussed in Sections 3.4 and 3.5 of this safety evaluation (SE). ASME Code, Section XI, 1995 Edition including Addenda through 1996, Appendix VIII, Supplement 11, is required to be implemented in accordance with 10 CFR 50.55a(g)(6)(ii)(C). The specific requirements are discussed below in Section 3.7 of this SE.

3.4 Licensee's Proposed Modification to Code Case N-504-3

As described in its letters, the licensee proposed to use a modified Code Case N-504-3 for the full structural weld overlays and provided the following information on the proposed modifications:

- Use of a nickel-based alloy weld material, Alloy 52/52M/152 rather than the low carbon (0.035 percent maximum) austenitic stainless steel.

- Relax the requirement to perform delta ferrite measurements to meet the 7.5 Ferrite Number (FN) requirement of Code Case N-504-3. The FN requirement cannot be met because the Alloy 52/52M/152 weld material is 100-percent austenitic and contains no delta ferrite.

- Modify the provisions of Appendix Q-3000(b) to be published in the 2006 Addenda of ASME Code, Section XI, which deletes the requirement that the overlay meet the plant construction code.

- Modify the provisions of Appendix Q-3000(b)(3) to be published in the 2006 Addenda of ASME Code, Section XI, which insert the wording "overlay design thickness."

- Perform a system leakage test, instead of a hydrostatic test, in accordance with the requirements of ASME Code, Section XI, IWA-5000 in the 2000 Addenda.

3.4.1 Licensee's Basis for Relief From Code Case N-504-3

In its letters, the licensee stated that the weld overlay was designed to be consistent with the requirements of Code Case N-504-3, with the specific thickness and length computed according to the guidance provided in the subject code case. The licensee stated that Alloy 52/52M/152 material is highly resistant to PWSCC and that industry operational experience has shown that PWSCC in Alloy 82/182 will blunt at the interface with stainless steel base metal, ferritic base metal, or Alloy 52/52M/152 weld metal. The 360° structural weld overlay will control growth in any PWSCC crack and maintain weld integrity. The weld overlay will induce compressive stress in the weld, thus impeding growth of any reasonably shallow cracks.

The weld metal used will be Alloy 52/52M/152, which is an austenitic nickel alloy. These filler materials were selected for their improved resistance to PWSCC. Alloys 52 and 52M contain about 28 - 31.5-percent chromium, which imparts excellent corrosion resistance. The existing Alloy 82/182 weld and the Alloy 52M/52M/152 overlay are nickel-based and have ductile properties and toughness similar to austenitic stainless steel piping welds at pressurized-water reactor operating temperature. These filler materials are suitable for welding over the ferritic nozzle, Alloy 82/182 weld, and the austenitic stainless steel materials.

Paragraph (e) of Code Case N-504-3 requires as-deposited delta ferrite measurements of at least 7.5 FN for the weld reinforcement. The licensee proposed that delta ferrite measurements not be performed for this overlay because the deposited Alloy 52/52M/152 is 100-percent austenitic and contains no delta ferrite due to the high-nickel composition (i.e., approximately 60-percent nickel).

The licensee stated further that the ASME Code approved a revision to Appendix Q which will be published in the 2006 Addenda of ASME Code, Section XI. This revised paragraph is intended to correct the wording in nonmandatory Appendix Q, which was first published in the 2005 Addenda and was approved in Code Case N-504-2. The first revision addresses a problem with Appendix Q-3000(b) and deletes the requirement that the design of the overlay satisfy the requirements of the construction code and owner's requirements. This revision is necessary because there is no similar wording in the approved Code Case N-504-2. The licensee stated that the wording in the codified version was inappropriate because meeting the requirements of the construction code required the absence of cracks, and the primary purpose of the code case and nonmandatory Appendix Q is to repair cracks with the external overlay.

The licensee also stated that a system hydrostatic test at 1.02 times Class 1 reactor coolant system operating pressure at normal operating temperature is of no value and provides no more assurance about the structural condition of the weld overlay than the system leakage test. For the application of weld overlays, extensive surface and volumetric examinations of the weld overlay are required by Code Case N-504-3 and nonmandatory Appendix Q, which provide equivalent assurance of the quality of the overlay.

3.4.2 NRC Staff Evaluation of Proposed Modifications to Code Case N-504-3

Under IWA-4120, editions and addenda up to and including the 1989 Edition with the 1990 Addenda require that repairs be performed in accordance with the Owner's Design Specification and the original construction code of the component or system. Later editions and addenda of the Construction Code, or of Section III, either in their entirety or in part, and code cases may be used. In addition to the above requirements, defects shall be removed or reduced in size in accordance with IWA-4300. Alternatively, the component may be evaluated and accepted in accordance with the design rules of either the construction code, or Section III, when alternatives to Section III were used for construction.

Code Case N-504-3 will be used by the licensee to perform full structural weld overlays on the pressurizer welds listed in Section 3.1 of this SE, which is Table 1 of the licensee's May 19, 2006 submittal. The overlays will be installed as a preemptive measure against cracking due to PWSCC if greater than 90 percent coverage is obtained and if no cracks are found using the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) qualified nondestructive examination (NDE) procedures. If 90 percent or better coverage cannot be obtained, or if flaws are identified, a full structural repair weld overlay will be performed.

Code Case N-504-2 was conditionally approved by the NRC staff for use by licensees in RG 1.147, Revision 14. The condition specified the use of nonmandatory Appendix Q, which provides the NDE methods, volume and acceptance criteria for the weld overlay. However, the licensee's relief request incorporates the methodology prescribed under the later Code Case N-504-3, which has not yet been endorsed by the NRC. The NRC staff notes that the licensee stated it will comply with Appendix Q.

The licensee provided (1) its proposed modifications to Code Case N-504-3 in Table 2 attached to its application, and (2) an in-depth comparison of the changes between Code Cases N-504-2 and 504-3 in Table A attached to its supplemental letter dated August 4, 2006. The licensee's first proposed modification to Code Case N-504-3 involves the use of a nickel-based alloy weld

material, rather than the low carbon austenitic stainless steel used in the code case. The licensee stated that paragraph (b) of the code case requires that the reinforcement weld material shall be low carbon (0.035 percent maximum) austenitic stainless steel. Instead of the stainless steel weld material, Alloy 52/52M/152, a consumable welding wire highly resistant to PWSCC, was proposed for the overlay weld material. The NRC staff notes that the licensee is performing a full structural overlay on dissimilar metal welds made of Alloy 182 material and, for material compatibility in welding, considers Alloy 52/52M/152 a better choice of filler material than austenitic stainless steel material for this weld joint configuration. Because Alloy 52/52M/152 contains about 28 to 30-percent chromium, which provides excellent resistance to PWSCC in the reactor coolant water environment, and is identified as F-No.43 Grouping for Ni-Cr-Fe, classification UNS N06052 Filler Metal, which has been approved by the NRC staff for similar applications, the NRC staff concludes that the licensee's proposed use of Alloy 52/52M/152 for the weld overlays as a modification to the requirements of N-504-3, paragraphs (b) and (e), is acceptable and will provide an acceptable level of quality and safety.

The second proposed modification to the code case involved paragraph (e), which requires as-deposited delta ferrite measurements of at least 7.5 FN for the weld reinforcement. The licensee proposed to not perform delta ferrite measurements for this overlay because the deposited Alloy 52/52M/152 material is 100-percent austenitic and contains no delta ferrite due to the high-nickel composition (approximately 60-percent nickel). Code Case N-504-3 allows the use of weld overlay repair by deposition of weld reinforcement on the outside surface of the pipe in lieu of mechanically reducing the defect to an acceptable flaw size. However, Code Case N-504-3 is only applicable to weld overlay repairs of austenitic stainless steel piping. Therefore, the material requirements regarding the carbon content limitation (0.035-percent maximum) and the delta ferrite content of at least 7.5 FN, as delineated in the code case, paragraphs (b) and (e), apply to austenitic stainless steel weld overlay materials. These requirements are not applicable to Alloy 52/52M/152, a nickel-based material, which the licensee will use for the weld overlays.

The third and fourth modifications to the code case involve the licensee's use of two corrections to nonmandatory Appendix Q-3000, which had not been published in the 2006 Addenda of ASME Code, Section XI, at the time of the licensee's application. The first correction involves the deletion of the phrase "the requirement for the design of the overlay to satisfy the requirements of the Construction Code and Owner's requirements" from paragraph Q-3000(b).

Construction Code NB-5300 acceptance criteria do not allow the presence of cracks, regardless of size. Both preemptive weld overlays (PWOLs) and full structural overlay repairs may require welding over existing cracks, which is considered a mitigation technique for crack growth. The second correction in Appendix Q-3000(b)(3) consisted of changing the words "pressure design" to "overlay design thickness." The licensee stated that the phrase "pressure design" is incorrect and was not used in Code Case N-504-2. The phrase "overlay design thickness" is considered a more appropriate description.

The NRC staff's review of the modifications confirms that the licensee is complying with the version of Appendix Q identified in the condition to N-504-2 in RG 1.147, Revision 14, and that the corrections are primarily editorial in nature. Based on its review, the NRC staff concludes that the third and fourth modifications to use the two corrections to nonmandatory Appendix Q, as discussed above, will provide reasonable assurance of the integrity of the weld overlays and,

therefore, provide an acceptable level of quality and safety. Based on this assessment, the NRC staff further concludes that the third and fourth modifications to Code Case N-504-3 are acceptable.

The fifth modification requested by the licensee is to use a system leakage test in accordance with ASME Code, Section XI, IWA-5000 in the 2000 Addenda. The licensee's proposed modification, to perform a system leakage test instead of a hydrostatic test, is supported by the NRC staff's position with respect to Code Case N-416-3. The NRC staff notes that Code Case N-416-3, "Alternative Pressure Test Requirement for Welded or Brazed Repairs, Fabrication Welds or Brazed Joints for Replacement Parts and Piping Subassemblies, or Installation of Replacement Items by Welding or Brazing, Classes 1, 2, and 3, Section XI, Division 1 (N-416-3)," was unconditionally approved for use in RG 1.147, Revision 14. The code case states that a system leakage test may be used provided the following requirements are met:

> [a] nondestructive examination (NDE) shall be performed on welded repairs, fabrication and installation joints in accordance with the methods, and acceptance criteria of the applicable Subsection of the 1992 Edition of Section III.

The above acceptance criteria do not allow the presence of cracks, regardless of length, and is geared more towards construction type welds. The licensee stated that it will conduct a system pressure test and post-repair NDE examinations, which are required by Code Case N-504-2, utilizing the appropriate PDI procedures, as discussed later in Section 3.8 of this SE. The post-repair examination volume includes the full thickness of the weld overlay plus 25 percent of the underlying base metal thickness. The specimen sets for PDI qualification for weld overlay examinations include construction type flaws. Therefore, use of PDI qualified personnel and procedures for the examination of the weld overlay will result in the reliable detection of construction type flaws and meets the intent of compliance with the applicable subsection of the 1992 Edition of Section III.

As discussed above, the NRC staff has reviewed Code Case N-504-3 and concludes that all its concerns have been addressed by the licensee in its relief request. Therefore, based on the discussion above, the NRC staff concludes that the modifications to N-504-3, as an alternative to the mandatory ASME Code repair provisions, is acceptable because the alternative will provide an acceptable level of quality and safety.

3.5 Licensee's Proposed Modifications to Code Case N-638-1

The licensee proposed to use Code Case N-638-1 with the following modifications to the code case for the full structural weld overlays:

1. The maximum area of an individual weld based on the finished surface over the ferritic material will be 300 square inches (in^2).

2. Full ultrasonic testing (UT) of the 1.5T band on the ferritic side of the overlay(s) will not be performed. The UT will be performed on the actual weld overlay, meeting the requirements of ASME Code, Section XI, nonmandatory Appendix Q-4100.

3. The condition specified for this code case as specified in RG 1.147, Revision 14, does not apply and post welding NDE will be in accordance with the condition specified under N-504-2, which is nonmandatory Appendix Q.

4. In lieu of weld-attached thermocouples and recording instruments, process temperatures will be monitored with non-attached devices, such as contact pyrometers.

3.5.1 Licensee's Basis for Relief

For the first modification, the licensee stated that the one-half base metal thickness limitation, which also includes the 100 in^2 surface area limitation under Paragraph 1.0(a) of Code Case N-638-1, applies only to excavations and repairs, and is not applicable to the weld overlays that are the subject of this relief request and, therefore, the 100 in^2 surface area limitation is not applicable to this configuration that consists of an overlay. The licensee also stated that weld shrinkage caused by the application of the overlays will be measured and evaluated for any system impacts, as required by Code Case N-504-3, paragraph (g)(3).

For the second modification, the licensee stated that in lieu of the requirement to perform a UT examination of the 1.5T band next to the overlay, the post overlay NDE will be performed in accordance with the requirements of Code Case N-504-3. The licensee further stated that Code Case N-638-1 applies to any type of welding where a temper bead technique is to be employed and is not specifically written for a weld overlay repair, if the cracking were to occur it would be beneath the weld overlay instead of the 1.5T area that is not covered by the overlay, and similar relief was granted for Millstone Unit 3 in an NRC SE dated January 20, 2006 (ADAMS Accession No. ML053260012).

For the third modification, the licensee stated that, with the modifications described, the NRC condition in RG 1.147, Revision 14, on the use of Code Case N-638-1 is not applicable, and will not be applied.

For the fourth modification, the licensee stated that temperatures will be monitored with non-attached devices and the instruments used will be calibrated in accordance with approved calibration and control program requirements.

3.5.2 NRC Staff Evaluation of Modification to Code Case N-638-1

With respect to the first modification by the licensee to the code case, Code Case N-638-1 allows the use of machine gas tungsten arc welding (GTAW) with ambient temperature preheat and no postweld heat treatment when draining the vessel is impractical. Code Case N-638-1, paragraph 1(a) limits the size of the repair to 100 in^2 maximum; however, because of the diameter of the components, the maximum area of the weld overlays on the ferritic material will be 300 in^2, according to the information provided by the licensee. In its letter dated August 4, 2006, the licensee stated that, since the nozzle-to-safe-end welds and the weld overlays are fabricated from austenitic materials with inherent toughness, no cracking in the overlays is expected to occur due to the shrinkage associated with the weld overlay application.

To eliminate the need for preheat and post-weld heat treatment under the construction code, the industry developed a temper bead welding technique, which was published as Code Case N-638-1. The NRC recently endorsed the code case in RG 1.147, Revision 14. The temper bead technique carefully controls heat input and bead placement which allows subsequent welding passes to stress-relieve and temper the heat affected zones of the base material and preceding weld passes. The welding is performed with low hydrogen electrodes under a blanket of inert gas. The inert gas shields the molten metal from moisture and hydrogen. Therefore, the need for the preheat and post-weld heat treatment specified by the ASME Construction Code is not necessary to produce a sound weld using the temper bead process in Code Case N-638-1.

In Table 3 attached to its August 4, 2006, letter, the licensee stated it intends to follow the methodology of Code Case N-638-1, except for paragraph 1.0(a) of the code case, which requires the maximum area of an individual weld, based on the finished surface, be limited to 100 in^2, and the depth of the weld to exceed one-half of the ferritic base metal thickness. This condition is not being met because the design for the weld overlay covers an area up to 300 in^2, which exceeds the area limitation of Code Case N-638-1.

The NRC staff notes that several similar weld overlays have been applied to boiling water reactor (BWR) facilities (such as Nine Mile Point 2, Perry, and Duane Arnold) with similar geometry and overlay dimensions. Firstly, EPRI has performed studies to qualify weld overlays for application in BWRs and, in these applications, the studies have not identified any issues with shrinkage stresses or weld contraction stresses and the WCGS weld overlay design is generally similar to the design applied in BWR feedwater, core spray, and recirculation nozzles. Secondly, no clear basis has been documented by the ASME Code Working Group on Welding and Special Repair Processes (the ASME Code group responsible for Code Case N-638-1) for the 100 in^2 area limitation. Also, thirdly, published literature shows that compressive stress remains on the inside surface near the weld, which supports mitigation of some degradation mechanisms, such as PWSCC. Thus, the residual stresses remain in compression on the inside surface of the weld as the nozzle overlay area increases. This supports mitigation of the degradation mechanism. Based on these three items, the NRC staff concludes that increasing the overlay area is acceptable for this specific application, i.e., to support the mitigation of the PWSCC degradation mechanism and for enhancement of NDE of the geometries involved.

In Code Case N-504-3, paragraphs (g)(2) and (g)(3) require the consideration of the residual stresses produced by the weld overlay with other applied loads on the system. The evaluation of other welds and components in the system is necessary to consider potential increases in loading, including shrinkage effects, due to all the weld overlays in the reactor coolant system. These welds and components must meet the applicable stress limits of the plant construction code. The NRC staff considers this evaluation important in assuring that the reactor coolant system will not be adversely effected after PWOLs are deposited. The weld shrinkage effects on the attached piping and support systems will be assessed prior to the weld overlay based on estimated weld shrinkage. Confirmatory analyses based on actual weld shrinkage measurements after the weld overlay will be completed prior to plant startup.

In its response to NRC questions 3 and 4, in its letter dated August 4, 2006, the licensee stated it would measure and evaluate the axial weld shrinkage after the overlays are completed in accordance with Code Case N-504-3. As required by the code case, the evaluation would be

completed before the weld overlays are placed in service, which will be prior to plant startup from the refueling outage conducted during the fall of 2006. The licensee informed the NRC staff that this evaluation was done in the fall 2006 refueling outage when the weld overlays were performed prior to plant startup.

Based on the preceding discussions and the licensee's commitment to complete the analyses required under N-504-3, paragraphs g(2) and (3), prior to startup, the NRC staff concludes that the modification to increase the PWOL beyond the 100 in^2 maximum to 300 in^2, will provide an acceptable level of quality and safety and is, therefore, acceptable.

The second modification to Code Case N-638-1 requested by the licensee is that the full UT examination of the 1.5T band will not be performed, which is required under paragraph 4.0(b) of the code case. The NRC staff notes that the post weld overlay area, as defined under Appendix Q, is a half inch on either side of the overlay for surface examination and the completed overlay for UT examination. Appendix Q is a condition to the use of Code Case N-504-2, which is imposed by the NRC staff in RG 1.147, Revision 14, and which the licensee specifically states in its letters that it will comply with when implementing Code Case N-504-3. See Section 3.4.2 of this SE.

Using Code Case N-638-1, the temperbead weld is for filling a cavity in the base metal. The licensee's application, however, is for structural weld overlay above the base metal, which results in a contour that is UT inspectible except for the edge taper where the overlay transitions to the nozzle surface and on the curvature of the nozzle. The proposed weld edge configuration has the same UT examination difficulties considered under ASME Code, Section XI, Appendix Q. In addition to verifying the soundness of the weld, one purpose of the UT examination is to assure that delayed cracking, which may be caused by hydrogen introduced during the temperbead welding process or cracking in unannealed ferritic material, is not present. In the unlikely event cracking does occur, it would be initiated on the surface on which the welding is actually performed or in the heat affected zone immediately adjacent to the weld. The most appropriate technique to detect surface cracking is the surface examination technique. Therefore, the NRC staff concludes that the use of a surface examination in the area of the weld overlay taper and band beyond the toe of the overlay on the ferritic material provides an adequate level of safety and quality and is, therefore, acceptable.

For the third modification, in its supplemental letter dated August 4, 2006, the licensee stated that it will be measuring and evaluating axial shrinkage for impact on the materials and on the piping system after the weld overlay is deposited, which is in accordance with the requirements of N-504-3. Also, any cracking that might occur should be detected by the final NDE of the weld overlay required under Appendix Q, which provides additional assurance of the deposition of a defect-free, structurally-sound overlay. The assessment of the shrinkage stresses on the piping, plus post weld NDE volumes under Appendix Q, provide reasonable assurance that defect-free welds maintain the structural integrity of the piping. Based on this assessment, the NRC staff concludes that the examination under Appendix Q will provide an acceptable level of quality and safety and, therefore, authorizes the modification to the 1.5T band ultrasonic examination requirement under Code Case N-638-1.

The fourth modification requested by the licensee is to manually record process temperatures using calibrated instruments, such as contact pyrometers. Paragraph 4.0(c) of Code

Case N-638-1 states that, when weld-attached thermocouples and recording instruments are used, the area from which the thermocouples have been removed will be ground and examined using a surface examination. Published literature clearly identifies grinding as a method of cold working which acts as a crack initiation site for PWSCC sensitive materials. Because the opportunity to reduce the amount of cold work in these materials is considered by the NRC staff an effective tool to prevent cracking, the licensee's modification to the code case to monitor process temperatures with contact instrumentation that eliminates welding and grinding is considered a good practice and an effective remedy to minimize cold work. Based on this assessment, the NRC staff concludes that the proposed alternative, to monitor process temperatures with calibrated contact temperature monitoring devices, will provide an acceptable level of quality and safety, and therefore, is acceptable.

The NRC staff's review of the licensee's justification for the use of ASME Code, Section XI acceptance criteria for weld overlays in lieu of ASME Code, Section III, Construction Code acceptance criteria as specified in Code Case N-638-1 is as follows. ASME Code, Section III flaw acceptance standards are derived from the capability of radiography to detect and size flaws originating from the fabrication process used during new facility construction. The ASME Code, Section III acceptance criteria do not allow for the presence of any cracks or crack-like indications, regardless of their size, and are geared more towards volumetric flaws. The capability of radiography is a function of density differences such as 2 percent or greater changes in density. The density changes normally associated with cracks, depending on orientation, are much less than the detection capability of radiography. There is an inherent, unknown tolerance in the Section III acceptance criteria for radiography which encompasses tight cracks and densities below the detection capabilities of radiography. Flaws detected using radiography are not precise enough for applying Section XI crack growth analyses, as flaw depth cannot be measured with radiography. Section III radiography is not applicable for evaluating flaws for continued plant operations because of the difficulty associated with depth sizing flaws.

The weld overlays of this request will be installed to mitigate PWSCC in dissimilar metal welds in an operating power plant. The application of Code Case N-504-3 is for applying austenitic (Alloy 52\52M) weld metal on austenitic base material. The application of Code Case N-638-1 is to apply austenitic weld metal on ferritic base material using a controlled heat input that relieves welding stresses and prevents crack sensitive microstructures in the ferritic material. The purpose of Code Case N-638-1 is to establish an austenitic surface for the application of Code Case N-504-3 to complete the structural weld overlay. The Code Case N-638-1 applied weld metal is sandwiched between base metal and the Code Case N-504-2 weld metal. Detecting a flaw in the Code Case N-638-1 weld metal using Section III radiography would be extremely difficult.

Many flaws that are not detected or accurately sized with radiography have a high likelihood of being detected and sized with UT, depending on orientation. These flaws are normally detected with UT during the Section XI preservice inspection. Also, the preservice UT is used to characterize flaws detected during the Section III radiography examination. The flaws of concern are the ones that cause failure immediately or grow to failure in the future. The Section XI preservice acceptable flaw standards were developed to consider the materials in which the flaw indications are detected, the orientation and size of the indications, and ultimately their potential structural impact of the flaw on the component. The flaws detected

during preservice inspections are subjected to periodic inservice inspections as established in Appendix Q, Q-4300.

This preservice inspection includes inspection frequencies for monitoring existing crack growth and identifying new cracks. Thus, the established preservice NDE acceptance criteria in Code Case N-504-3 for weld overlays made with Alloy 52/52M weld metal also apply to the portion of the weld overlay made during the application of Code Case N-638-1, as modified above in this Section of this SE. The NRC staff, therefore, concludes that the NDE acceptance criteria proposed by the licensee are appropriate for this application and will provide an acceptable level of quality and safety, and are acceptable.

3.6 Code Requirements for which Relief is Requested

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee requested relief from the weld overlay requirements in the following nine paragraphs to Section XI, Appendix VIII, Supplement 11, where only those items considered by the NRC staff to be modifications to Appendix VIII, Supplement 11, are listed:

1. Paragraph 1.1(b) limits the maximum thickness for which a procedure may be qualified. Also, the specimen set must include at least one specimen with overlay thickness within minus 0.10 in to plus 0.25 in of the maximum nominal overlay thickness for which the procedure is applicable.

2. Paragraph 1.1(d)(1) requires that all base metal flaws be cracks in or near the butt weld heat-affected zone, open to the inside surface, and extending at least 75 percent through the base metal wall.

3. 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 axial direction.

4. 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. Specimens are divided into base and overlay grading units with each specimen containing one or both types of grading units.

5. Paragraph 1.1(e)(2)(a)(1) requires that a base grading unit include at least 3 inches of the length of the overlaid weld and the outer 25 percent of the overlaid weld and base metal on both sides.

6. 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 exist on either side of the base grading unit.
7. Paragraph 1.1(e)(2)(b)(1) requires that an overlay grading unit include the overlay material and the base metal-to-overlay interface of at least 6 in^2. The overlay grading unit shall be rectangular, with minimum dimensions of 2 inches.

8. Paragraph 3.1 requires examination procedures, equipment, and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VII-S2-1 for both detection and false calls. The criteria shall be satisfied

separately by the demonstration results for base grading units and for overlay grading units.

9. Paragraph 3.2(b) requires that all extensions of base metal cracking into the overlay material by at least 0.1 inch are reported as being intrusions into the overlay material.

3.7 Licensee's Proposed Modification to Appendix VIII, Supplement 11

In lieu of the requirements of ASME Code, Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 11, the licensee proposed that the PDI program, as described in Table 4 of its application, be used. The duration of the relief is for the remainder of the third 10-year ISI interval.

3.7.1 Licensee's Basis for Relief

The licensee stated that the UT examination of the completed preemptive weld overlays will be accomplished in accordance with ASME Code, Section XI, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 11 with the modifications described in Table 4 of its application. These modifications were developed by the EPRI PDI program to implement the requirements of Appendix VIII, Supplement 11.

3.7.2 NRC Staff Evaluation of Modifications to Appendix VIII, Supplement 11

The U.S. nuclear utilities created the PDI program to implement performance demonstration requirements contained in Appendix VIII of Section XI of the ASME Code. To this end, the PDI program has developed a program for qualifying equipment, procedures, and personnel in accordance with the UT criteria of Appendix VIII, Supplement 11. Prior to the Supplement 11 program, EPRI was maintaining a performance demonstration program (the precursor to the PDI program) for weld overlay qualification under the Tri-party Agreement with NRC in the NRC letter dated July 3, 1984 (ADAMS Accession No. 8407090122). This NRC letter to EPRI defined a coordination plan for training and qualification activities of NDE personnel employed in performance of ultrasonic examination of piping weldments during ISI of BWR power plants. Instead of having two programs with similar objectives, the NRC staff recognized the EPRI PDI program for weld overlay qualifications as an acceptable alternative to the Tri-party Agreement in its letter dated January 15, 2002, to the PDI Chairman (ADAMS Accession No. ML020160532). As stated in the January 15, 2002, letter issued by the NRC, the purpose of the letter was to inform the PDI program that the PDI's performance demonstration program for weld overlays was an acceptable alternative to the performance demonstration recommendations of NRC Generic Letter (GL) 88-01, "NRC Position on IGSCC [Intragranular Stress-Corrosion Cracking] in BWR Austenitic Stainless Steel Piping," dated January 25, 1988.

Although the PDI program was developed during ISIs at BWR plants, it is applicable to weld overlay qualification for PWR plants, like Callaway, because the weld overlays for BWRs are the same as weld overlays for PWRs.

The PDI program does not fully comply with the existing requirements in Supplement 11. 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. The ten differences to Appendix VIII, Supplement 11, in this relief request are addressed below:

1. Paragraph 1.1(b) states that limitations to the maximum thickness for which a procedure may be qualified.

The ASME Code states that "[t]he 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. Because the proposed wording eliminates confusion while maintaining the intent of the overlay thickness tolerance, the NRC staff finds that this PDI program revision is acceptable.

2. Paragraph 1.1(d)(1) requires that all base metal flaws be cracks.

The PDI program determined that certain Supplement 11 requirements pertaining to location and size of cracks 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 UT examination more difficult and not representative of actual field conditions. In an effort to satisfy the requirements, the PDI program 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 licensee provided further information describing a revision to the PDI program alternative to clarify when real cracks, as opposed to fabricated flaws, will be used; "[f]laws shall be limited to the cases where implantation of cracks produces spurious reflectors that are uncharacteristic of actual flaws." The NRC has reviewed the PDI flaw fabrication process, compared the reflective characteristics between actual cracks and PDI-fabricated flaws, and found the fabricated flaws acceptable for this application.

3. Paragraph 1.1(e)(1) requires that at least 20 percent but not less than 40 percent of the flaws be oriented within ±20 degrees of the axial direction [of the piping test specimen].

Flaws contained in the original base metal heat-affected zone satisfy this requirement; however, the PDI program excludes axial fabrication flaws in the weld overlay material. The PDI program 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. Based upon its engineering judgment, the NRC staff agrees with the PDI program and concludes that this approach to implantation of fabrication flaws is reasonable for meeting the intent of the Supplement 11 requirement and, therefore, the PDI application of flaws oriented in the axial direction is acceptable.

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

The PDI program treats each flaw as an individual flaw and not as part of a system of closely spaced flaws, and 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 and, thus, potentially making the performance demonstration more challenging. Based on this criteria in the PDI program, the NRC staff concludes that the PDI program's application for closely spaced flaws is acceptable.

5. Paragraph 1.1(e)(2)(a)(1) requires that a base grading unit 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, the NRC staff concludes that the PDI program'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.

6. 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 requirement is intended to minimize the number of false identifications of extraneous reflectors. The PDI program stipulates that unflawed overlaid weld and base metal should 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 ASME Code. Based on this requirement, the NRC staff concludes that the PDI program's application of the variable flaw-free area adjacent to the grading unit is acceptable.

7. Paragraph 1.1(e)(2)(b)(1) requires that an overlay grading unit include the overlay material and a base metal-to-overlay interface of at least 6 in^2. 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 (instead of a minimum of two inches) and eliminates the minimum rectangular dimension. This PDI program criterion is necessary to allow the licensee to use existing examination specimens that were fabricated in order to meet GL 88-01. This criterion may be more challenging than the ASME Code criterion in Supplement 11 because of the variability associated with the shape of the grading unit. Based on its engineering judgment, the NRC staff concludes that the PDI application of the overlay grading unit is an acceptable alternative to the Supplement 11 requirement and is acceptable.

8. Paragraph 2.3 states 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.

The PDI program 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 five of the regions will similarly be determined. In addition, the PDI program 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. Because the above clarification provides a basis for implementing sizing tests in a systematic, consistent manner that meets the intent of Supplement 11, the NRC staff concludes that this method is acceptable.

9. Paragraphs 3.1 and 3.2 of Supplement 11 state that 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 UT 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, the PDI program 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 Supplement 11. Therefore, because it exceeds ASME Code requirements for personnel, procedures, and equipment qualification, the NRC staff concludes that this method of the PDI program is acceptable.

10. Paragraph 3.2(b) requires that all extensions of base metal cracking into the overlay material by at least 0.10 inch be 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 of 0.125 inch as specified in the ASME Code. Since the ASME Code tolerance is close to the 0.10-inch value of paragraph 3.2(b) of Supplement 11, any crack extending beyond 0.10 inch into the overlay material would be identified as such from the characterized dimensions. The reporting of an extension in the overlay material is redundant for performance demonstration testing because of the flaw sizing tolerance. Based on this redundancy, the NRC staff concludes that the PDI program's omission of highlighting a crack extending beyond 0.10 inch into the overlay material is acceptable.

Based on the evaluation of the differences in the PDI program to the requirements in Supplement 11, the NRC staff concludes that differences provide an acceptable level of quality and safety and, therefore, the differences to Supplement 11 are acceptable.

3.8 Conclusion

Based on the evaluations in Sections 3.4 and 3.5 of this SE, the NRC staff concludes that the Code Case N-504-3 and N-638-1 modifications proposed in RR I3R-05, for the preemptive full structural overlay or weld repair of the WCGS welds listed in its May 19, 2006 application, will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed modifications for the remaining service life of the subject welds.

Secondly, based on the evaluation in Section 3.7 of this SE, the NRC staff concludes that the alternatives to ASME Code, Appendix VIII, Supplement 11, will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternatives for the remainder of the third 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.

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