August 2, 2005

Mr. A. Christopher Bakken, III
President & Chief Nuclear Officer
PSEG Nuclear - X15
P.O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION - EVALUATION OF RELIEF REQUEST HC-RR-I2-30 (TAC NO. MC5174)

Dear Mr. Bakken:

By letter dated December 1, 2004, as supplemented by letters dated December 16, 2004, and February 18, 2005, PSEG Nuclear, LLC (PSEG) submitted a proposed alternative to the requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code relating to the qualification for examination of pressure-retaining welds in piping. This request was submitted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i) for the Hope Creek Generating Station. On December 27, 2004, the Nuclear Regulatory Commission (NRC) staff granted verbal authorization to PSEG for the relief request, to be followed up by the NRC staff's final review and written evaluation.

Based on the information provided, the NRC staff concludes that the proposed alternative, as described in Relief Request HC-RR-I2-30, will provide an acceptable level of quality and safety. Therefore, the NRC staff authorizes the proposed alternative, pursuant to 10 CFR 50.55a(a)(3)(i).

The NRC staff's Safety Evaluation is enclosed. If you have any questions, please contact G. Edward Miller, at 301-415-2481.

Sincerely,

/RA/

Darrell J. Roberts, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF HC-RR-I2-30

SECOND 10-YEAR INSERVICE INSPECTION INTERVAL

HOPE CREEK GENERATING STATION

PSEG NUCLEAR, LLC

DOCKET NO. 50-354

1.0 INTRODUCTION

By letter dated December 1, 2004, as supplemented by letters dated December 16, 2004, and February 18, 2005, PSEG Nuclear, LLC (PSEG or the licensee) submitted a proposed alternative to the requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) relating to the qualification for examination of pressure-retaining welds in piping. This request was pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i) submitted for Hope Creek Generating Station (Hope Creek). On December 27, 2004, the Nuclear Regulatory Commission (NRC or Commission) staff granted verbal authorization to PSEG for the relief request, to be followed up by the NRC staff's final review and written evaluation.

Authorization of the request would allow the use of an alternative to the Class 1 pressure retaining welds in piping examination requirements of ASME Code, Section XI, Appendix VIII, Supplement 11, "Qualification Requirements for Full Structural Overlaid Wrought Austentic Piping Welds," for the remaining portion of the second inservice inspection (ISI) interval.

2.0 REGULATORY EVALUATION

In a final rulemaking on September 22, 1999 (64 FR 51370), the NRC imposed a requirement for expedited implementation of Appendix VIII to Section XI of the ASME Code. That appendix contains several supplements, which licensees were to implement on a phased basis over a three-year period, with Supplement 11 scheduled to be implemented by November 22, 2001. The NRC concluded that the expedited implementation of Appendix VIII was "... necessary to bring the facilities described into compliance with General Design Criterion 14, Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, or similar provisions in the licensing basis for these facilities, and Criterion II, 'Quality Assurance Program,' and Criterion XVI, 'Corrective Actions,' of Appendix B to 10 CFR Part 50" (64 FR 51394).

Prior to November 22, 2001, the requirements for conducting full structural overlaid wrought austenitic piping weld qualifications and examinations using ultrasonic techniques were stipulated in Appendix III to Section XI of the ASME Code. Since that date, however, these requirements are stipulated in Appendix VIII to Section XI of the ASME Code. A significant difference between these appendices is that Appendix III consists of prescriptive-based criteria, while Appendix VIII consists of performance-based criteria. This is important because the

performance-based criteria substantially improve the ability of an examiner to detect and characterize flaws during ultrasonic examination of components and, thereby, provide for more reliable examination results.

In accordance with 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components must meet the requirements set forth in the 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 regulations require 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 the 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 Hope Creek, the 1998 Edition with 2000 Addenda of the ASME Code, Section XI, is the applicable edition for the current 10-year ISI interval.

Alternatives to requirements may be authorized or relief granted by the NRC pursuant to 10 CFR 50.55a(a)(3)(i), 10 CFR 50.55a(a)(3)(ii), or 10 CFR 50.55a(g)(6)(i). In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. 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.

The licensee submitted the request, 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 remaining portion of the second ISI interval.

3.0 TECHNICAL EVALUATION

3.1 ASME Code components affected:

The specific Class 1 components that are affected by this relief request are as follows:

> Class 1, Pressure Retaining Welds in piping, subject to ASME Code Section XI, Appendix VIII, Supplement 11, examination.

3.2 ASME Code requirements for which an alternative is proposed:

In its submittal, the licensee identified the following paragraphs of, and alternatives to, Appendix VIII, Supplement 11:

- Paragraph 1.1(b) would be changed from:

The specimen set must include at least one specimen with overlay thickness within -0.1 in. to +0.25 in. of the maximum nominal overlay thickness for which the procedure is applicable.

to: The specimen set shall include specimens with overlays not thicker than 0.1 in. more than the minimum thickness, nor thinner than 0.25 in. of the maximum nominal overlay thickness for which the examination procedure is applicable.

- Paragraph 1.1(d)(1) would be changed from:

(1) All flaws must be cracks in or near the butt weld heat affected zone, open to the inside surface, and extending at least 75% through the base metal wall. Flaws may extend 100% through the base metal and into the overlay material; in this case, intentional overlay fabrication flaws shall not interfere with the ultrasonic detection or characterization of the cracking. Specimens containing [intergranular stress-corrosion cracking] IGSCC shall be used when available.

to: (1) All flaws must be in or near the butt weld heat-affected zone, open to the inside surface, and extending at least 75% through the base metal wall. Intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the base metal flaws. Specimens containing IGSCC shall be used when available. At least 70% of the flaws in the detection and sizing tests shall be cracks and the remainder shall be alternative flaws. Alternative flaw mechanisms, if used, shall provide crack-like reflective characteristics and shall be limited by the following:

(a) The use of alternative flaws shall be limited to when the implantation of cracks produces spurious reflectors that are uncharacteristic of actual flaws.

(b) Flaws shall be semielliptical with a tip width of less than or equal to 0.002 inches.

- Paragraph 1.1(e)(2) would be changed from:

(2) Specimens shall be divided into base and over-lay grading unit. Each specimen shall contain one or both types of grading units.

to: (2) Specimens shall be divided into base metal and overlay fabrication grading units. Each specimen shall contain one or both types of grading unit. Flaws shall not interfere with ultrasonic detection or characterization of other flaws.

- Paragraph 1.1(e)(2)(a)(2) would be changed from:

(a)(2) When base metal cracking penetrates into the overlay material, the base grading unit shall include the overlay metal within 1 in. of the crack location. This portion of the overlay material shall not be used as part of any overlay grading unit.

to: (a)(2) When base metal flaws penetrate into the overlay material, the base metal grading unit shall not be used as part of any overlay fabrication grading unit.

- Paragraph 1.1(e)(2)(b)(3) would be changed from:

(b)(3) Detection sets shall be selected from Table VIII-S2-1. The minimum detection sample set is five flawed grading units, ten unflawed base grading units, five flawed overlay grading units, and ten unflawed overlay grading units. For each type of grading unit, the set shall contain at least twice as many unflawed as flawed grading units.

to: (b)(3) Detection sets shall be selected from Table VIII-S2-1. The minimum detection sample set is five flawed base metal grading units, ten unflawed base metal grading units, five flawed overlay fabrication grading units, and ten unflawed overlay fabrication grading units. For each type of grading unit, the set shall contain at least twice as many unflawed as flawed grading units. For initial procedure qualification, detection sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.

- Paragraph 1.1(f)(1) would be changed from:

(1) The minimum number of flaws shall be ten. At least 30% of the flaws shall be overlay fabrication flaws. At least 40% of the flaws shall be cracks open to the inside surface.

to: (1) The minimum number of flaws shall be ten. At least 30% of the flaws shall be overlay fabrication flaws. At least 40% of the flaws shall be open to the inside surface. Sizing sets shall contain a distribution of flaw dimensions to assess sizing capabilities. For initial procedure qualification, sizing sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.

- Paragraph 1.1(f)(3) would be changed from:

(2[3]) Base metal cracking used for length sizing demonstrations shall be oriented circumferentially.

to: (3) Base metal flaws used for length sizing demonstrations shall be oriented circumferentially.

- Paragraph 1.1(f)(4) would be changed from:

(4) Depth sizing specimen sets shall include at least two distinct locations where cracking in the base metal extends into the overlay material by at least 0.1 in. in the through-wall direction.

to: (4) Depth sizing specimen sets shall include at least two distinct locations where a base metal flaw extends into the overlay material by at least 0.1 in. in the through-wall direction.

- Paragraph 2.1 would be changed from:

  Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (base or overlay) that are present for each specimen.

to: Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (base metal or overlay fabrication) that are present for each specimen.

- Paragraph 2.2(d) would be changed from:

  (d) For flaws in base grading units, the candidate shall estimate the length of that part of the flaw that is in the outer 25% of the base wall thickness.

to: (d) For flaws in base metal grading units, the candidate shall estimate the length of that part of the flaw that is in the outer 25% of the base metal wall thickness.

- Paragraph 2.3 would be changed from:

  For the depth sizing test, 80% of the flaws shall be sized to a specific location on the surface of the specimen identified to the candidate. For the remaining flaws, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region

to: (a) The depth sizing test may be conducted separately or in conjunction with the detection test.

(b) When the depth sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements of 1.1(f), additional specimens shall be provided to the candidate. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.

(c) For a separate depth sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.

- Paragraph 3.1 would be changed from:

  Examination procedures, equipment, and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-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.

to: a) Examination procedures are qualified for detection when:

  1) All flaws within the scope of the procedure are detected and the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for false calls.

    (a) At least one successful personnel demonstration has been performed meeting the acceptance criteria defined in (b).

    (b) Examination equipment and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls.

    (c) The criteria in (a) and (b) shall be satisfied separately by the demonstration results for base metal grading units and for overlay fabrication grading units.

3.3 Supporting Basis for the Proposed Alternative

The licensee provided the following basis in support of the Proposed Alternative:

- Paragraph 1.1(b)

  The revision to paragraph 1.1(b) was made solely to clarify the intent of the original wording.

- Paragraph 1.1(d)(1)

  Paragraph 1.1(d)(1) requires that all base metal flaws be cracks. As illustrated below [see figure in 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 [Performance Demonstration Initiative] 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 semielliptical 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.

- Paragraph 1.1(e)(2):

  The terms base “metal” and overlay “fabrication” were applied for clarity and consistency throughout the Supplement. This change was made in several other areas. The proposed sample requirements allow a tighter mix of flaws and the last sentence was intended to prevent the location of flaws from precluding their detection.

- Paragraph 1.1(e)(2)(a)(2):

  The terms base “metal” and overlay “fabrication” were applied for clarity and consistency throughout the Supplement. This change was made in several other areas. The PDI removed the reference to “cracking” because the sample sets may contain “alternative flaws”. The requirement that the base metal grading unit include the overlay metal within 1 inch of the crack location is unnecessarily restrictive. It is PDI’s intention to allow a tighter mix of flaws, provided they don’t interfere with ultrasonic detection or characterization of other flaws.

- Paragraph 1.1(e)(2)(b)(3):

  The terms base “metal” and overlay “fabrication” were applied for clarity and consistency throughout the Supplement. This change was made in several other areas. The last two sentences were included to provide additional requirements for qualification of procedures and to make this Supplement consistent with the requirements in the other Supplements for procedure qualification.

- Paragraph 1.1(f)(1):

  The PDI removed the reference to “cracks” in the 2nd sentence because the sample sets may contain “alternative flaws”. An additional requirement that the sizing sets contain a distribution of sizes is intended to challenge the procedure over a wide variety of flaw sizes. The last two sentences were again included to provide additional requirements for qualification of procedures and to make this Supplement consistent with the requirements in the other Supplements to Appendix VIII of Section XI of the ASME Code.

- Paragraph 1.1(f)(3):

  The PDI removed the reference to “cracking” because the sample sets may contain “alternative flaws.”

- Paragraph 1.1(f)(4):

  The PDI removed the reference to “cracking” because the sample sets may contain “alternative flaws.”

- Paragraph 2.1:

  The terms base “metal” and overlay “fabrication” were applied for clarity and consistency throughout the Supplement. This change was made in several other areas.

- Paragraph 2.2(d):

  The term base “metal” was applied for clarity and consistency throughout the Supplement. This change was made in several other areas.

- Paragraph 2.3:

  Though not precluded in the original requirements, paragraph (a) specifically provides the latitude to conduct the sizing test separately or in conjunction with a detection test and was included for clarity. Though not precluded in the original requirements, paragraph (b) specifically allows for providing additional specimens to the candidate who is successful during detection, but detected less than the 10 flaws required for sizing. It was again included for clarity. Rather than identify a specific location the PDI proposal in paragraph (c) is to only identify the region of the flaw. It is then incumbent on the examiner to determine the maximum depth by searching along the flaw’s length. This is consistent with the way examinations are conducted in the field.

- Paragraph 3.1:

  The original requirements would allow qualification of procedures, equipment and personnel with only a personnel qualification. Paragraph (a)(1) includes the additional requirement that the procedure be capable of detecting all flaws within its scope. Paragraph (a)(1)(b) was included at the request of the NRC and basically states that a procedure cannot be qualified until a person is qualified to use it.

3.4 NRC Staff's Evaluation:

The U.S. nuclear utilities created the PDI to implement performance demonstration requirements contained in Appendix VIII of Section XI of the ASME Code. To this end, the PDI has developed a program for qualifying equipment, procedures, and personnel for examinations of weld overlays in accordance with the ultrasonic testing (UT) criteria of Appendix VIII, Supplement 11. Prior to the Supplement 11 program, the 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 is routinely assessed by the NRC staff for consistency with the current ASME Code and proposed changes. The PDI program does not fully comport with the existing requirements of Supplement 11. The 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. Based in part on the discussions at these public meetings, the staff determined that the PDI program provides an acceptable level of quality and safety.

Evaluations of the differences identified in the proposed Hope Creek PDI program with Supplement 11, Paragraphs 1.1(b), 1.1(d)(1), 1.1(e)(2), 1.1(e)(2)(a)(2), 1.1(e)(2)(b)(3), 1.1(f)(1), 1.1(f)(3), 1.1(f)(4), 2.1, 2.2(d), 2.3, and 3.1 are as follows:

Paragraph 1.1(b) of Supplement 11 states limitations to 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 overlays 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, the proposed alternative 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 that this PDI Program alternative maintains the intent of the Supplement 11 requirements and is acceptable.

Paragraph 1.1(d)(1) requires that all base metal flaws be cracks. The PDI determined that certain Supplement 11 requirements pertaining to location and size of cracks would be

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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 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 Memorandum from Donald G. Naujock to Terence Chan, "Summary of Public Meeting Held January 31 - February 2, 2002, with PDI Representatives," March 22, 2002. ML010940402

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

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, the 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% 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; "Flaws shall be limited to the cases where implantation of cracks produces spurious reflectors that are uncharacteristic of actual flaws." The NRC has reviewed the flaw fabrication process, compared the reflective characteristics between actual cracks and PDI-fabricated flaws, and found the fabricated flaws for this application provide assurance that the PDI program meets the intent of the Supplement 11 requirements. Therefore, the NRC staff finds that the proposed alternative to the Supplement 11 requirements 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 staff finds that the PDI alternative to the Supplement 11 requirements 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 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 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)(b)(3) requirements are retained in the PDI program. In addition, the PDI program requires that an initial procedure qualification contain three times the number of flaws required for a personnel qualification. To qualify new values of essential variables, the equivalent of at least one personnel qualification set is required. The staff concludes that PDI's additions enhance the ASME Code requirements and are, therefore, acceptable because they provide 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 an initial procedure qualification contain three times the number of flaws required for a personnel qualification. To qualify new values of essential variables, the

equivalent of at least one personnel qualification set is required. The NRC staff concludes that PDI's additions enhance the ASME Code requirements and are, therefore, acceptable because they provide 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 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 staff determined that the clarifications provide acceptable classification of the terms they are enhancing. Therefore, the 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% 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 performed separately. The 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, the 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 such that candidates will not attempt to size a different flaw. The staff determined that the above clarification provides a basis for implementing sizing tests in a systematic, consistent manner that meets the intent of Supplement 11. Thus, the NRC staff concludes that the PDI's 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, the 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. Thus, the staff concludes that the PDI program criteria 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.

4.0 CONCLUSION

The NRC staff has reviewed the licensee's submittal and determined that, in accordance with 10 CFR 50.55a(a)(3)(i), the proposed alternative program will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the staff authorizes the proposed alternative for the remainder of the Hope Creek second 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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Date: August 2, 2005