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PSEG Nuclear LLC

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NO. NPF-57
DOCKET NO. 50-354

Subject: **RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION, RELIEF REQUEST HC-RR-I2-W02 PROPOSED ALTERNATIVE REPAIR METHOD**

References: (1) PSEG Letter LR-N07-0273
RELIEF REQUEST HC-RR-I2-W02
PROPOSED ALTERNATIVE REPAIR METHOD
Dated: October 19, 2007

In Reference 1, PSEG Nuclear LLC (PSEG) proposed an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components. This proposed alternative would permit the use of a full structural weld overlay repair for an indication identified in the N2A recirculation inlet nozzle safe-end to nozzle weld joint.

On October 29, 2007, the NRC provided PSEG a draft Request for Additional Information (RAI) on the Reference 1 submittal. The response to the RAI is provided in the attachment to this letter.

If you have any questions or require additional information, please contact Mr. Philip J. Duca at (856) 339-1640.

Sincerely,

Carl J. Fricker
Vice President – Operations Support

Attachment

A047
NRR

CC Mr. S. Collins, Administrator - Region I
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USNRC Senior Resident Inspector – Hope Creek (X24)

Attachment
LR-N07-0282

RESPONSE TO RAI #3 FOR RELIEF REQUEST HC-RR-I2-W02

NRC RAI #3:

This relief request references Code Case N-504-3 and on page 11 of 13 of the relief request, it states that this code case has been conditionally accepted in Regulatory Guide (RG) 1.147, Revision 15. It is correct that Code Case N-504-3, has been conditionally accepted in Regulatory Guide 1.147, Revision 15; however, 10 CFR 50.55a(b)(5) currently incorporates by reference RG 1.147, Revision 14. Revision 14 of RG 1.147 states that Code Case N-504-2 is conditionally acceptable. Therefore, based on the current regulations, the licensee may use Code Case N-504-2. If the licensee still desires the use of Code Case N-504-3, a detailed basis for use of all of the parts of Code Case N-504-3 must be submitted.

PSEG RESPONSE:

PSEG has already completed the weld overlay (WOL) repair on the weld identified as RPV1-N2ASE. The repair was performed in accordance with a Design Change Package (DCP) prepared in accordance with the relief request submitted on October 19, 2007.

Additionally, related procedures, the weld traveler, and repair/replacement activities were conducted in accordance with the relief request, as submitted. All weld overlay documentation has been completed in accordance with the submitted relief request. The welding vendor's National Board (NR) Repair program was utilized for this repair, resulting in issuance and approval of a NR-1 report. All of these documents invoked Code Case N-504-3.

The use of Code Case N-504-3 was based on the conditional approval contained within Revision 15 of Regulatory Guide 1.147, which was made available on the NRC website on or before October 19, 2007. Additionally, a notice of the issuance and availability of this Regulatory Guide was published in the Federal Register (72 FR 60695).

PSEG provides the following evaluation of the changes and the basis for those changes between Code Case N-504-2, which has already been conditionally approved within Regulatory Guide 1.147, Revision 14, and Code Case N-504-3, which has already been conditionally approved within Regulatory Guide 1.147, Revision 15.

Based upon the evaluation that follows, PSEG has confirmed that the weld overlay repair satisfies the technical provisions of both revisions of the Code Case, and has elected to retain use of N-504-3 as it is referenced in the repair documentation for the completed weld overlay. It would pose an undue burden to revise said documentation without any increase in technical merit or margins for safety.

Hope Creek N2A Nozzle Weld Overlay Relief Request HC-RR-I2-WO2 RAI#4 Response - N-504-3 vs N-504-2 Evaluation of Changes and Basis for Their Use

***Rev 3 changes in italicized bold underlined font,* Basis in bold font**

N-504-2	N-504-3
Reply: It is the opinion of the Committee that, in lieu of the requirements of IWA-4120 in Editions and Addenda up to and including the 1989 Edition with the 1990 Addenda, in IWA- 4170(b) in the 1989 Edition with the 1991 Addenda up to and including the 1995 Edition, and in IWA-4410 in the 1995 Edition with the 1995 Addenda and later Editions and Addenda, defect in austenitic stainless steel piping may be reduced to a flaw of acceptable size in accordance with IWB-3640 from the 1983 Edition with the Winter 1985 Addenda, or later Editions and Addenda, by deposition of weld reinforcement (weld overlay) on the outside surface of the pipe, provided the following requirements are met.	*Reply:* It is the opinion of the Committee that, in lieu of the requirements of IWA-4120 in Editions and Addenda up to and including the 1989 Edition with the 1990 Addenda, in IWA- 4170(b) in the 1989 Edition with the 1991 Addenda up to and including the 1995 Edition, and in IWA-4410 in the 1995 Edition with the 1995 Addenda ***up to and including the 1996 Addenda, and in IWA-4420 in the 1995 Edition with the 1997 Addenda*** and later Editions and Addenda, ***in IWA-4810(a) in the 1992 Edition with the 1994 Addenda through the 1995 Edition, and in IWA-4520(a) in the 1995 Edition with the 1995 Addenda and later Editions and Addenda, a*** defect in austenitic stainless steel piping may be reduced to a flaw of acceptable size in accordance with IWB-3640 from the 1983 Edition with the Winter 1985 Addenda, or later Editions and Addenda, by deposition of weld reinforcement (weld overlay) on the outside surface of the pipe, provided the following requirements are met. **Basis: These changes were intended to make the case usable to all versions of Section XI from Summer 1978 Addenda through 2004 Edition. This updated Case now refers to applicable paragraphs of ASME XI, 1998 Edition including Addenda through 2000 applicable to the Nozzle N2A weld overlay activities.**
(b) Reinforcement weld metal shall be low carbon (0.035% max.) austenitic stainless steel applied 360° around the circumference of the pipe, and shall be deposited in accordance with a qualified welding procedure specification identified	*(b)* Reinforcement weld metal shall be low carbon (0.035% max.) austenitic stainless steel applied 360° around the circumference of the pipe, and shall be deposited in accordance with a qualified welding procedure specification identified

N-504-2	N-504-3
in the Repair Program.	in the Repair Program. ***The submerged arc method shall not be used for weld overlay.*** **Basis: The machine GTAW process was used so this change is not pertinent to the Nozzle N2A overlay activities.**
(f)(1) For circumferentially oriented flaws greater than 10% of the pipe circumference, axial flaws greater than 1.5 in., in length, or more than 5 axial flaws of any length, the weld reinforcement shall provide the necessary wall thickness to satisfy the flaw evaluation procedures of IWB-3640 from the 1983 Edition with the Winter 1985 Addenda, or later Editions and Addenda...	*(f)(1)* For circumferentially oriented flaws greater than 10% of the pipe circumference, axial flaws ***equal to or*** greater than 1.5 in. in length, 5 ***or more*** axial flaws of any length, the weld reinforcement shall provide the necessary wall thickness to satisfy the flaw evaluation procedures of IWB-3640 from the 1983 Edition with the Winter 1985 Addenda, or later Editions and Addenda. **Basis: Revision to eliminate the oversight of the case of an axial flaw exactly 1.5 in. long, and exactly five axial flaws of any length.**
(g)(2) For repaired welds the evaluation shall consider residual stresses produced by the weld overlay with other applied loads on the system. The effects of water backing on the repair weld shall be considered. The evaluation shall demonstrate that the requirements of IWB-3640 from the 1983 Edition with the Winter 1985 Addenda, or later Editions and Addenda, are satisfied for the design life of the repair, considering potential flaw growth due to fatigue and the mechanism believed to have caused the flaw. The flaw growth evaluation shall be performed in accordance with Appendix C. When structural credit is taken for SAW or SMAW weld metal in the original pipe weldment or the weld overlay, the evaluation requirements of Tables IWB-364I-5 and IWB-3641-6 shall be applied.	*(g)(2)* For repaired welds the evaluation shall consider residual stresses produced by the weld overlay with other applied loads on the system. The effects of water backing on the repair weld shall be considered. The evaluation shall demonstrate that the requirements of IWB-3640 from the 1983 Edition with the Winter 1985 Addenda, or later Editions and Addenda, are satisfied for the design life of the repair, considering potential flaw growth due to fatigue and the mechanism believed to have caused the flaw. The flaw growth evaluation shall be performed in accordance with Appendix C. When structural credit is taken for SAW or SMAW weld metal in the original pipe weldment or ***SMAW weld metal in*** the weld overlay, the evaluation requirements of ***IWB-3640 for SAW or SMAW welds, as applicable,*** shall be applied.

N-504-2	N-504-3
	Basis: The applicable requirements in N-504-3 now refer to IWB-3640 rather than referring to each applicable table therein as previously done prior to 1996 Addenda.
(i) Preservice examination of the completed repair shall be performed in accordance with IWB-2200. For all classes of components, liquid penetrant and ultrasonic examination of the completed weld repair shall be performed. Examination procedures shall be specified in the Repair Program. The acceptance standards of Table IWB-3514-2 shall apply. Ultrasonic examinations shall verify the integrity of the newly applied weld reinforcement. Examinations shall also be performed to identify the original flaws in the outer 25% of the underlying pipe wall as a benchmark for subsequent examinations of the overlay. Grinding and machining of the as-welded overlay surface may he used to improve the surface finish for such examinations, when the overlay thickness is not reduced below design requirements.	*(i)* Preservice examination of the completed repair shall be performed in accordance with IWB-2200. For all classes of components, liquid penetrant and ultrasonic examination of the completed weld repair shall be performed. Examination procedures shall be specified in the Repair Program. The acceptance standards of Table IWB-3514-2 shall apply ***for planar flaws. The acceptance standards of Table IWB-3514-3 shall apply for laminar flaws provided the reduction in coverage of the examination volume is less than 10%. The dimensions of the uninspectable volume are dependent on the coverage achieved with the angle beam examination. Additionally, any uninspectable volume in the weld overlay shall be assumed to contain the largest radial planar flaw that could exist within that volume. The assumed planar flaw shall meet the inservice examination acceptance standards of Table IWB-3514-2. Both axial and circumferential flaws shall be assumed. As an alternative to the assumed planar flaw radiography in accordance with the Construction Code shall be used to examine the uninspectable volume in the weld overlay. The radiographic acceptance criteria of the Construction Code shall apply***. Ultrasonic examinations shall verify the integrity of the newly applied weld reinforcement. Examinations shall also be performed to identify the original flaws in the outer 25% of the underlying pipe wall as a benchmark for subsequent examinations of the overlay. Grinding and machining of the as-

N-504-2	N-504-3
	welded overlay surface may he used to improve the surface finish for such examinations, when the overlay thickness is not reduced below design requirements. **Basis: The revision here clarifies which acceptance criteria applies to the different types of flaws and should have been included in previous revision of the Case.**
(m) Use of this Case shall be documented on an NIS-2 form.	(m) Use of this Case shall be documented on ***Form*** NIS-2. **Basis: Editorial change**
Footnote 1 When applying this Case to Editions and Addenda later than the 1989 Edition, reference to Repair Program shall be read as Repair Plan.	Footnote 1 When applying this Case to Editions and Addenda later than the 1989 Edition, reference to Repair Program shall be read as Repair Plan ***or Repair/Replacement Plan as applicable***. **Basis: Editorial change to update terminology included in later versions of Section XI.**

Ref: ASME Section XI, 1998 Edition, including Addenda through 2000