

MAR 05 2004

LR-N04-0096



U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

**RELAXATION REQUEST TO FIRST REVISED NRC ORDER (EA-03-009)
ESTABLISHING INTERIM INSPECTION REQUIREMENTS FOR REACTOR
PRESSURE VESSEL HEADS AT PRESSURIZED WATER REACTORS (RELIEF
REQUEST S1-RR-I3-B22)
SALEM GENERATING STATION UNIT 1
FACILITY OPERATING LICENSE NO. DPR-70
DOCKET NO. 50-272**

Reference: Letter LR-N03-0079, *Response To Issuance Of Order Establishing Interim Inspection Requirements For Reactor Pressure Vessel Heads At Pressurized Water Reactors*, dated February 26, 2003

PSEG Nuclear LLC (PSEG) in letter LR-N03-0079, dated February 26, 2003, stated that both Salem Units 1 & 2 were in full compliance with NRC Order EA-03-009. However, should relief be necessary, PSEG would submit a relief request in accordance with Section IV.F of the Order. Subsequently on February 20, 2004, the NRC issued First Revised NRC Order (EA-03-009).

First Revised NRC Order, Section IV.C.(5)(b)(i), C.(5)(b)(ii), and C.(5)(b)(iii) involve nondestructive examination (ultrasonic, eddy current, and dye penetrant testing) of the penetration nozzles below the J-groove weld that attaches the nozzle to the head. This inspection is not required for the head vent penetration at Salem Unit 1. This letter requests relief from those requirements for Salem Unit 1. Attachment 1 to this letter, provides justification for exempting the head vent penetration and is in compliance with IV.F.(2) of the Order.

The next refueling outage for Salem Unit 1 is scheduled for Spring 2004. Therefore, PSEG requests approval of this relief request on an expedited basis.

PSEG considers that, upon approval by the NRC, the exemption proposed in Attachment 1 constitutes a condition of the Order rather than a regulatory commitment. Therefore, there are no new commitments identified in this letter.

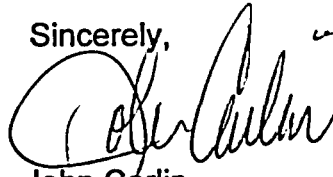
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If you have any questions or require additional information, please contact Mr. Michael Mosier at (856) 339-5434.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 3/5/04

Sincerely,

A handwritten signature in black ink, appearing to read "John Carlin", written in a cursive style.

John Carlin

Vice President – Nuclear Assessments

Attachments (1)

C: Mr. H. J. Miller, Administrator - Region I
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USNRC Senior Resident Inspector (X24)

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**RELAXATION REQUEST FROM FIRST REVISED NRC ORDER EA-03-009,
SECTION IV.C.(5)(b)(i), (ii), and (iii)
SALEM NUCLEAR GENERATING STATION UNIT NO. 1
RELIEF REQUEST S1-RR-I3-B21**

1. Components Affected

Salem Unit I Reactor Pressure Vessel (RPV) head vent penetration nozzle. (Note the original head vent nozzle is currently being used for reactor vessel level indication. Presently the vessel head is vented through a different penetration. This relief request is only for the original head vent (i.e., the reactor vessel level indication nozzle). This relief request refers to the original head vent nozzle as the head vent nozzle.)

2. Applicable Document

First Revised NRC Order EA-03-009, "Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 20, 2004.

3. Applicable Requirement

First Revised NRC Order EA-03-009 requires ultrasonic, eddy current, and/or dye penetrant testing of RPV head penetration nozzles at various intervals, depending on their susceptibility to primary water stress corrosion cracking. The Salem Unit 1 RPV head is currently in the high susceptibility category. The requirements governing ultrasonic, eddy current, and/or dye penetrant testing for RPV head in the high susceptibility category are stated in Section IV.C.(5)(b)(i), (ii), and (iii) of the Order. Figures IV-1, IV-2, IV-3, and IV-4 referenced below are part of the Order and not included in this submittal. These sections require:

Section IV.C.(5)

- (b) *For each penetration, perform a nonvisual NDE in accordance with either (i), (ii) or (iii):*
 - (i) *Ultrasonic testing of the RPV head penetration nozzle volume (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-1]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the*

- (ii) *lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-2). In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.*
- (iii) *Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches [see Figure IV-3]); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater (see Figure IV-4).*
- (iv) *A combination of (i) and (ii) to cover equivalent volumes, surfaces and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:*

 - 1. *On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.*
 - 2. *On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed.*

Exemption is requested from parts IV.C.(l)(b)(i), (ii), and (iii) of the Order. Specifically, the exemption is related to ultrasonic, eddy current, and dye

penetrant testing of the Salem Unit 1 RPV head vent penetration nozzle, which is not susceptible to primary water stress corrosion cracking (PWSCC).

4. Reason for Request

As described in Section 3 above, First Revised NRC Order EA-03-009 requires that ultrasonic, eddy current, and/or dye penetrant testing be performed on all RPV nozzles. This would include the head vent nozzle for Salem Unit 1. PSEG is requesting relief to exclude the head vent nozzle from inspection since it is not subject to the phenomena of PWSCC as identified in the Order.

For a penetration and its associated attachment weld to be susceptible to PWSCC, the following three conditions must be present.

- The nozzle and associated weld material must be fabricated from susceptible material.
- The penetration and the associated weld must be in contact with the primary coolant water.
- A stress riser must be present.

It can be demonstrated that none of these conditions exist for the Salem Unit I head vent nozzle and attachment weld. See Figure 1 attached.

Control rod drive mechanism (CRDM) penetrations and head vent penetrations are fabricated from Nickel-based alloys (e.g., Alloy 600) on most RPV heads. The weld material used to attach these penetrations to the head is also Alloy 600 on most RPV heads. Nickel-based alloys, and Alloy 600 in particular, are highly susceptible to PWSCC.

The Salem Unit I head vent nozzle is fabricated from SA-508-64 low-alloy steel, and is not susceptible to PWSCC. Also, the weld filler material is low alloy steel that is not susceptible to PWSCC. The inner diameter (ID) surface of the Salem Unit I head vent nozzle and the ID surface to the attachment weld are clad with type 316 stainless steel. Therefore, the only material in contact with the primary coolant is Type 316 stainless steel, which is not susceptible to PWSCC.

The CRDM housings at Salem Unit I are attached to the head with a partial penetration J-groove weld. These weld joints have high residual stresses present because post weld stress relief was not performed following welding. However, the Salem Unit I head vent nozzle is a forged nozzle that is attached with a full penetration weld. The nozzle was installed prior to the post-weld heat treatment of the head, and was stress relieved. Therefore, the residual stresses in this

nozzle are low. Based on the above, the Salem Unit I head vent nozzle is not susceptible to PWSCC and is exempt from the inspection required by First Revised NRC Order EA-03-009.

5. **Proposed Exemption and Basis for Use**

The head vent nozzle at Salem Unit I does not require inspection since it is not susceptible to PWSCC. Therefore, it should be exempted from the inspection required by Order EA-03-009

6. **Duration of Proposed Exemption**

The proposed exemption would apply only during the period in which the First Revised NRC Order EA-03-009 is in effect.

Figure 1
Salem Unit 1
RPV Head Vent Nozzle

