

SEP 24 2003

LRN-03-0329



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

**RELAXATION REQUEST TO NRC ORDER (EA-03-009) INTERIM INSPECTION
REQUIREMENTS FOR REACTOR PRESSURE VESSEL HEADS AT PRESSURIZED
WATER REACTORS (RELIEF REQUEST S1-RR-I3-B21)
SALEM GENERATING STATION UNIT 1
FACILITY OPERATING LICENSE NO. DPR-70
DOCKET NO. 50-272**

Reference: Letter LRN-03-0079, *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 (LRN-03-0079) 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.

Section IV, paragraph C.(1)(b)(i) and C.(1)(b)(ii) 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. These inspections cannot be completed as required. This letter requests relief from those requirements for Salem Unit 1. As demonstrated in Attachment 1 to this letter, the requested relaxation meets IV.F.(2) of the Order, as compliance with this order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety. This request is similar to those already approved for other PWRs.

The next refueling outage for Salem Unit 1 is scheduled for Spring 2004. Therefore, PSEG requests approval of this relief request by the end of February 2004.

PSEG considers that, upon approval by the NRC, the alternative 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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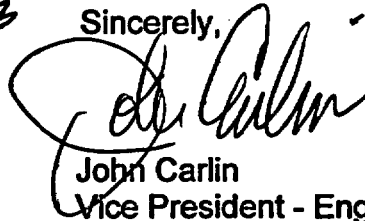
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If you have any questions or require additional information, please contact Mr. Michael Mosier at (856) 339-5434.

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

Executed on September 24, 2003

Sincerely,

A handwritten signature in black ink, appearing to read "John Carlin", written over the printed name and title.

John Carlin

Vice President - Engineering

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

1. Components Affected

Salem Unit I Reactor Pressure Vessel (RPV) head penetration nozzles.

2. Applicable Document

Nuclear Regulatory Commission (NRC) Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 11, 2003.

3. Applicable Requirement

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 and eddy current testing for RPV head in the high susceptibility category are stated in Section IV.C.(I)(b)(i) and IV.C.(I)(b)(ii) of the Order, respectively. These sections require:

IV.C.(I)

(b) Either.

(i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle... OR

(ii) Eddy Current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.

Relaxation is requested from parts IV.C.(I)(b)(i) and IV.C.(I)(b)(ii) of the Order. Specifically, the relaxation is related to ultrasonic, eddy current, and dye penetrant testing of a limited bottom portion of the RPV penetration nozzles, which are not part of the pressure boundary.

4. Reason for Request

As described in Section 3 above, NRC Order EA-03-009 requires that ultrasonic or eddy current testing extend to the bottom of the nozzle. PSEG is requesting approval of a proposed alternative to requirements that are appropriate to the ultrasonic and eddy current probes used at Salem Unit 1, the geometric design of the bottom portion of the nozzles, and the phenomena of concern as identified in the Order. Reasons for requesting the proposed alternative are as follows:

- a. Ultrasonic probes used to detect circumferential flaws are not effective near the end of the nozzle. These probes have separate transducers for sending and receiving the ultrasonic signal that are arranged vertically. The transducers in the probe are approximately one inch apart. With this configuration, the lower transducer will not contact the inside wall of the nozzle unless the upper transducer is inserted greater than approximately one inch into the nozzle. Since the scanning process requires that both transducers be in contact with the surface, the probe cannot scan the lower end of the nozzle. Based on the geometry involved in the transducer location and the radius at the lower end of the nozzle, the portion that cannot be scanned is the portion extending from the bottom of the nozzle upward for a distance of approximately one inch.
- b. Eddy current probes do not maintain adequate contact with the nozzle at its lower end due to nozzle geometry. The bottom of each nozzle terminates in a rounded surface that begins more than two (2) inches below the J-groove weld. This curvature causes lift-off of the probe as it approaches the bottom end of the nozzle. Based on the geometry involved in the transducer location and the radius at the lower end of the nozzle, the portion that cannot be scanned is the portion extending from the bottom of the nozzle upward for a distance of approximately one inch.
- c. Ultrasonic or eddy current testing of portions of the nozzle significantly below the J-groove weld is not significant to the phenomena of concern. The phenomena that are of concern are leakage through the J-groove weld and circumferential cracking in the nozzle above the J-groove weld. This is appropriately reflected in the requirement (as stated in Section 3 above) that the ultrasonic or eddy current testing extend to two (2) inches above the J-groove weld. However, the Order also requires that ultrasonic or eddy current testing be extended to the bottom of the nozzle. The nozzle is essentially an open-ended tube and the nozzle wall below the J-groove weld is not part of the reactor coolant system pressure boundary.
- d. The Order allows for performing dye penetrant testing in lieu of eddy current or ultrasonic testing. Performing dye penetrant testing on the bottom nozzle area

would result in significant radiation exposure to personnel without a compensating increase in the level of quality or safety.

5. Proposed Alternative and Basis for Use

PSEG proposes to utilize inspection option (b)(i) and anticipates achieving UT coverage reaching from two (2) inches above the J-groove weld down to the lowest elevation that can be practically inspected on each nozzle with the probe being used.

Item (b) option (i) under each step of paragraph C requires ultrasonic testing (UT) of the RPV head penetration nozzles from two (2) inches above the J-groove weld to the bottom of the nozzle. PSEG is unable to completely comply with the requirement for UT to the bottom of the four (4) inch diameter penetration nozzles (used for CRDMs, thermocouples, spares, etc.) due to the physical configuration of the nozzles and the limitations of the test equipment. The bottom ends of these nozzles are externally threaded, internally tapered, or both. Loss of UT probe coupling due to the internal taper and/or disruption of the UT signal due to the external thread will prevent UT data acquisition in a zone extending to approximately one and one-half (1 - 1/2) inches above the bottom of each nozzle.

PSEG believes compliance with the requirement for UT coverage to the bottom of the nozzle is unnecessary in that the cited inspection limitation for the four (4) inch diameter nozzles does not preclude UT examination of the portions of these nozzles that are of primary interest.

This is because:

- UT of the most highly stressed portion of the nozzle (the weld heat affected zone) is unaffected by this limitation,
- UT of the interference fit zone above the weld (for leakage assessment) is unaffected by this limitation, and cracks initiating in the unexamined bottom portion (non-pressure boundary) of the nozzle would be of minimal safety significance with respect to pressure boundary leakage or nozzle ejection, since this portion of the nozzle is several inches below the pressure boundary and any cracks would have to grow through a significant examined portion of the tube to reach the pressure boundary.

In conclusion, this requested relaxation meets item IV.F.(2) of the Order, in that compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

6. Duration of Proposed Alternative

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