

November 27, 2002

Mr. Harold W. Keiser  
Chief Nuclear Officer & President  
PSEG Nuclear LLC - X04  
Post Office Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 (SALEM 1 AND 2) - EVALUATION OF RELIEF REQUEST SC-RR-A06 (TAC NOS. MB6091 AND MB6092)

Dear Mr. Keiser:

By letter dated July 8, 2002, as supplemented on October 10, 2002, PSEG LLC submitted 12 requests for relief from Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) under the provisions of 10 CFR 50.55a(a)(3)(i). The enclosed safety evaluation refers to one of these 12 requests; specifically, it refers to relief request SC-RR-A06 regarding the use of ASME Code Case N-566-2 alternatives to certain requirements of IWA-5250(a)(2) for detected leakage location and evaluation.

Based on the information provided, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that for SC-RR-A06 your proposal to use ASME Code Cases N-566-2 provides an acceptable level of quality and safety. Therefore, the NRC staff authorizes you to use of the proposed alternatives pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year interval for Salem 1 and the second 10-year interval for Salem 2. Use of Code Case N-566-2 is authorized until such time as the Code Case is published in a revision to Regulatory Guide 1.147. At that time, if you intend to continue to implement this Code Case, you must follow all provisions in Code Case N-566-2 with limitations issued in Regulatory Guide 1.147, if any.

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact your Project Manager, Robert Fretz, at 301-415-1324.

Sincerely,

*/RA/*

James W. Andersen, Acting Chief, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure: As stated

cc w/encl: See next page

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DATE	11/06/02	11/5/02	11/26/02	11/25/02	11/18/02

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Unit Nos. 1 and 2

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND AND THIRD 10-YEAR INSERVICE INSPECTION INTERVALS

REQUESTS FOR RELIEF

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

PSEG NUCLEAR LLC

DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated July 8, 2002, as supplemented on October 10, 2002, PSEG Nuclear LLC, the licensee, submitted requests for relief from Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code(ASME Code) for Salem Nuclear Generating Station, Unit Nos. 1 and 2 (Salem 1 and 2). This U.S. Nuclear Regulatory Commission (NRC) staff's safety evaluation applies to relief request SC-RR-A06 regarding the use of ASME Code Case N-566-2 "Corrective Action for Leakage at Bolted Connections, Section XI, Division 1," as an alternative to certain requirements of IWA-5250(a)(2) for detected leakage location and evaluation. The NRC staff will document its review of the other requests for relief contained in the July 8, 2002, letter under separate cover.

2.0 BACKGROUND

Inservice inspection (ISI) of the ASME Code Class 1, 2, and 3, components is to be performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). As stated in 10 CFR 50.55a(a)(3)(i), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (i) the proposed alternatives would provide 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.

3.0 EVALUATION

3.1 LICENSEE'S REQUEST (As Stated)

Component Description

Bolted connections for Class 1, 2, & 3 components.

Enclosure

ASME Section XI Class 1, 2, & 3 bolted connections.

Code Requirement

For Salem, Unit 1, sub-paragraph IWA-5250(a)(2) of the 1995 Edition, including the 1996 Addenda of Section XI requires the removal of the bolt closest to the source of the leakage, performance of VT-3 visual examination of the bolt, and performance of an evaluation in accordance with IWA-3100 when leakage occurs at bolted connections on systems other than gaseous systems.

For Salem, Unit 2, sub-paragraph IWA-5250(a)(2) of the 1986 Edition, without Addenda of Section XI requires the removal of all the bolting, performance of VT-3 visual examination of all the bolting, and performance of an evaluation in accordance with IWA-3100 when leakage occurs at bolted connections.

Basis for Relief

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative provides an acceptable level of quality and safety.

PSEG Nuclear, LLC requests the use of Code Case N-566-2, titled 'Corrective Action for Leakage at Bolted Connections, Section XI, Division 1' for the Third Inspection Interval.

Removal of bolts for VT-3 visual examination is not always the most prudent action when leakage is discovered at a bolted connection. Leakage at bolted connections is typically identified during system leakage tests. For Class 1 systems, this leakage test is conducted prior to plant startup following each refueling outage. This test is performed at full operating pressure (2235 psig) and temperature. When leakage is discovered during this test, the corrective action (i.e. removal of bolts) must be performed with the system at full temperature and pressure, or the plant must be cooled down. The removal of a bolt at full temperature and pressure conditions can be extremely physically demanding due to the adverse heat environment. Cooling down the plant subjects the plant to additional heat up and cool down cycles, and can add 3-4 days to the duration of the refueling outage. Bolted connections associated with pumps and valves are typically studs threaded into the body of the component. Removal of these studs is typically very difficult and time consuming due to length of time they have been installed and are often damaged during the removal process. This difficulty is compounded when the removal must be performed under heat stress conditions.

The requirements of IWA-5250(a)(2) must be applied regardless of the significance of the leakage or the corrosion resistance of the materials used in the bolted connection. Implementation of Code Case N-566-2 permits factors such as the number and service age of the bolts, the bolting materials, the corrosiveness of the system fluid, the leakage location and system function, leakage history at the connection or at other system components, and visual evidence of corrosion at the bolted connection be used to evaluate the need for corrective measures.

Alternate Requirements

PSEG Nuclear, LLC proposes to implement the alternative requirements of Code Case N-566-2 when leakage occurs at bolted connections (other than gaseous systems).

Applicability

This Relief Request is applicable to the following:

Salem, Unit 1 - Third Ten-Year Inservice Inspection Interval.

Salem, Unit 2 - Second Ten-Year Inservice Inspection Interval.

3.2 STAFF EVALUATION

IWA-5250(2) requires that all bolts be removed from leaking bolted connections and that the bolts be VT-3 visually examined for corrosion and evaluated in accordance with IWA-3100. The Code requirements provide assurance that bolting corroded by system leakage will be detected and that corrective actions will be taken. This paragraph of the Code does not take into account the location of the leakage, nor does it allow an engineering evaluation as allowed for other components with unacceptable conditions. This is inconsistent with the rest of the Code which allows engineering evaluation for continued service; furthermore, removal and examination of all bolts may not be necessary to ensure continued integrity of the bolted connection.

As an alternative to the requirements of IWA-5250(a)(2), Code Case N-566-2 requires that either (a) or (b) below are met

(a) The leakage shall be stopped, and the bolting and component material shall be evaluated for joint integrity as described in paragraph (c) below.

(b) If the leakage is not stopped, the owner shall evaluate the integrity and consequences of continuing operation and the effect of the system of continued leakage. This evaluation shall include the considerations in paragraph (c) below.

(c) The evaluation referred to in (a) and (b) above shall include the following:

1. Number and service age of the bolts
2. Bolt component material
3. Corrosiveness of process fluid
4. Leakage location and system function
5. Leakage history at the connection of other system components
6. Visual evidence of corrosion at the assembled connection

The staff considers this to be a reasonable approach, consistent with the rest of the Code in evaluating components for continued service.

Based on the discussion above, the staff concludes that the use of Code Case N-566-2 under the alternative proposed in Relief Request SC-RR-A06 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 third 10-year ISI interval at Salem 1 and for the second 10-year ISI interval at Salem 2.

#### 4.0 CONCLUSION

The NRC staff has evaluated the licensee's request to implement alternatives to Code requirements contained in Code Case N-566-2. The staff has determined that implementation of this Code Case will continue to provide an acceptable level of quality and safety. The alternatives contained in request for relief SC-RR-A06 are approved for use pursuant to 10 CFR 50.55a(a)(3)(i) provided that all requirements of the Code Case are satisfied. Use of Code Case N-566-2 is authorized until such time as the Code Case is published in a revision to Regulatory Guide 1.147. At that time, if the licensee intends to continue to implement this Code Case, the licensee must follow all provisions in Code Case N-566-2 with limitations issued in Regulatory Guide 1.147, if any.

Principal Contributor: G. Wunder

Date: November 27, 2002