UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 22, 2010

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear
P.O. Box 236, N09
Hancocks Bridge, NJ 08038

SUBJECT: SAFETY EVALUATION OF RELIEF REQUESTS TO EXTEND THE INSERVICE INSPECTION INTERVAL FOR REACTOR VESSEL EXAMINATIONS FOR SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 (TAC NOS. ME1478, ME1479, ME1480 AND ME1481)

Dear Mr. Joyce:

By letter dated June 11, 2009, as supplemented by letters dated December 23, 2009, and January 13, 2010, PSEG Nuclear LLC (the licensee) submitted relief requests S1-I3R-93, S2-I3R-94, and SC-I3R-95 which proposed alternatives to certain requirements specified in Section XI of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code) for the inservice inspection (ISI) of components at Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. Specifically, the proposed alternatives would extend the ISI interval for examination of certain reactor vessel welds.

The U.S. Nuclear Regulatory Commission staff has completed its review of the subject relief requests as documented in the enclosed Safety Evaluation (SE). Our SE concludes the following:

1) With respect to relief request S1-I3R-93, the proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the remainder of the current operating license for Salem Unit No. 1 (i.e., until August 13, 2016).

2) With respect to relief request S2-I3R-94, the proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the remainder of the current operating license for Salem Unit No. 2 (i.e., until April 18, 2020).

3) With respect to relief request SC-I3R-95, the proposed alternative provides reasonable assurance of the structural integrity of the subject components. Furthermore, the NRC staff also concludes that the licensee's compliance with the ASME Code requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative is authorized for the remainder of the respective operating licenses for Salem Unit Nos. 1 and 2 (i.e., August 13, 2016, for Salem Unit No. 1 and April 18, 2020, for Salem Unit No. 2).

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

If you have any questions concerning this matter, please contact the Salem Project Manager, Mr. Richard Ennis, at (301) 415-1420.

Sincerely,

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUESTS TO EXTEND THE INSERVICE INSPECTION INTERVAL

FOR REACTOR VESSEL WELD EXAMINATIONS

PSEG NUCLEAR LLC

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated June 11, 2009, as supplemented by letters dated December 23, 2009, and January 13, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091740140, ML100040070, and ML100260272, respectively), PSEG Nuclear LLC (PSEG or the licensee) submitted relief requests S1-I3R-93, S2-I3R-94, and SC-I3R-95 which proposed alternatives to certain requirements specified in Section XI of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code) for the inservice inspection (ISI) of components at Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. The proposed alternatives would extend the ISI interval for examination of certain reactor pressure vessel (RPV) welds.

In relief request S1-I3R-93, the licensee requested approval to extend the ISI interval, for examination of the Salem Unit No. 1 RPV Category B-A and B-D welds. The examinations, currently scheduled for 2010, would be performed in 2020 pending extension of the current operating license (currently scheduled to expire in 2016). The licensee's proposed alternative was submitted pursuant to 10 CFR 50.55a(a)(3)(i), on the basis that the alternative provides an acceptable level of quality and safety.

In relief request S2-I3R-94, the licensee requested approval to extend the ISI interval, for examination of the Salem Unit No. 2 RPV Category B-A and B-D welds. The examinations, currently scheduled for 2012, would be performed in 2021 pending extension of the current operating license (currently scheduled to expire in 2020). The licensee's proposed alternative was submitted pursuant to 10 CFR 50.55a(a)(3)(i), on the basis that the alternative provides an acceptable level of quality and safety.

In relief request SC-I3R-95, the licensee requested approval to extend the ISI interval, for examination of the Salem Unit Nos. 1 and 2 RPV Category B-N-2 and B-N-3 welds. The intent of this relief request is to allow deferral of the subject examinations to the same time as the Category B-A and B-D welds included in relief requests S1-I3R-93 and S2-I3R-94 (i.e., 2020 for Salem Unit No. 1 and 2021 for Salem Unit No. 2). The licensee's proposed alternative was submitted pursuant to 10 CFR 50.55a(a)(3)(ii), on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The licensee's letter dated June 11, 2009, stated that the technical and regulatory basis for decreasing the frequency is based on Westinghouse topical report WCAP-16168-NP-A, Revision 2, "Risk-Informed Extension of Reactor Vessel In-Service Inspection Interval," dated June 2008.

The subject relief requests are for the respective third 10-year interval of the ISI program at Salem Unit Nos. 1 and 2. For Salem Unit No. 1, the third interval began on May 19, 2001, and will end on May 20, 2011. For Salem Unit No. 2, the third interval began on November 27, 2003, and will end on November 27, 2013.

2.0 REGULATORY EVALUATION

The ISI of ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific relief has been granted by the Nuclear Regulatory Commission (NRC or Commission) pursuant to 10 CFR 50.55a(g)(6)(i). Pursuant to 10 CFR 50.55a(a)(3), 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.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulation requires that inservice examination of components 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 Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of Record for the third 10-year ISI interval for Salem Unit Nos. 1 and 2 is the ASME Code, Section XI, 1998 Edition through 2000 Addenda.

2.1 Background

The ISI of Category B-A and B-D components (relief requests S1-I3R-93 and S2-I3R-94) consists of visual and ultrasonic examinations intended to discover whether flaws have initiated, whether pre-existing flaws have extended, and whether pre-existing flaws may have been missed in prior examinations. The ISI of the Category B-N-2 and B-N-3 RPV internal attachments and core support structure (relief request SC-I3R-95) consist of visual examinations. The examinations associated with each of the subject relief requests are required to be performed once each 10-year ISI interval in accordance with the ASME Code.

2.2 Summary of WCAP-16168-NP

By letter dated January 26, 2006 (ADAMS Accession No. ML060330504), the Westinghouse Owners Group (WOG) submitted topical report WCAP-16168-NP, Revision 1, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval" to the NRC in support of making a risk-informed assessment of extensions to the ISI intervals for Category B-A and Category B-D components. In the report, the WOG took data associated with three different pressurized-water reactor (PWR) plants (referred to as the pilot plants), designed respectively by the three main nuclear steam supply system manufacturers for nuclear power plants in the U.S., and performed the necessary studies on each of the pilot plants required to justify the proposed extension for the ISI interval for Category B-A and Category B-D components from 10 to up to 20 years.

The analyses in WCAP-16168-NP used probabilistic fracture mechanics (PFM) methodology and inputs from the work described in the NRC's pressurized thermal shock (PTS) risk re-evaluation, specifically NUREG-1806, "Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening Limit in the PTS Rule (10 CFR 50.61): Summary Report," (ADAMS Accession No. ML061580318), and NUREG-1874, "Recommended Screening Limits for Pressurized Thermal Shock (PTS)," (ADAMS Accession No. ML070860156). The WOG analyses incorporated the effects of fatigue crack growth and ISI. Design-basis transient data was used as input to the fatigue crack growth evaluation. The effects of ISI were modeled consistently with the previously-approved PFM codes contained in WCAP-14572-NP-A, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report," (ADAMS Accession Nos. ML012630327, ML012630349, and ML012630313). These effects were evaluated using the Fracture Analysis of Vessels: Oak Ridge (FAVOR) computer code as described in report ORNL/NRC/LTR-04/18 (ADAMS Accession No. ML042960391). All other inputs were identical to those used in the PTS risk re-evaluation.

From the results of the studies, the WOG concluded that the ASME Code, Section XI 10-year inspection interval for Category B-A and Category B-D components in PWR reactor vessels can be safely extended to 20 years. The WOG's conclusion from the results for the pilot plants was considered applicable to any plant designed by Westinghouse, Combustion Engineering, and Babcock and Wilcox as long as the critical, plant-specific parameters (defined in Appendix A of the WCAP) are bounded by the pilot plants.

By letter dated June 13, 2008 (ADAMS Accession No. ML082820046), the PWR Owners Group (PWROG) issued WCAP-16168-NP-A, Revision 2, which includes responses to the NRC staff's request for additional information and the NRC staff's safety evaluation (SE) on the topical report.

2.3 Summary of NRC SE for WCAP-16168-NP

The NRC staff's conclusion in its SE dated May 8, 2008 (ADAMS Accession No. ML081060053), for Revision 2 of WCAP-16168-NP indicates that the methodology presented is acceptable for referencing in requests to implement alternatives to ASME Code inspection requirements for PWR plants in accordance with the limitations and conditions in the SE. In addition to showing that the subject plant is bounded by the pilot plants' information from Appendix A in WCAP-16168-NP, the key points of the SE are summarized below:

The dates identified in the request for alternative should be within plus or minus one refueling cycle of the dates identified in the implementation plan contained in PWROG letter OG-06-356 to the NRC dated October 31 2006 (ADAMS Accession No. ML082210245). Any deviations from the implementation plan should be discussed in detail in the request for alternative ISI interval. The maximum interval for proposed ISI is 20 years.

1. The request for alternative ISI interval can use any NRC-approved method to calculate the Charpy transition temperature shift at the 30 ft-lb energy level (ΔT_{30}) and the fracture resistance against flaws in each RPV material X ($RT_{MAX\text{-}X}$)[1] as defined in the draft and/or final alternative PTS Rule, 10 CFR 50.61a. However, if the request uses the NUREG-1874 methodology to calculate ΔT_{30}, then the request should include the analysis described in paragraph (6) of subsection (f) to the voluntary PTS rule. The analysis should be done for all of the materials in the beltline area with at least three surveillance data points.

2. If the subject plant is a Babcock and Wilcox plant, licensees must:

   - verify that the fatigue crack growth based on 12 heat-up/cool-down transients per year bounds the fatigue crack growth for all of its design basis transients, and

   - identify the design basis transients that contribute to significant fatigue crack growth.

3. If the subject plant has RPV forgings that are susceptible to underclad cracking or if the RPV includes forgings with $RT_{MAX\text{-}FO}$ values exceeding 240 degrees Fahrenheit (°F) then the WCAP analyses are not applicable. The licensee must submit a plant-specific evaluation for any extension to the 10-year inspection interval for ASME Code, Section XI, Category B-A and Category B-D RPV welds.

At the time of issuance of the NRC staff's SE for WCAP-16168-NP, Revision 2, it was the NRC's intent to establish a process by which licensees could receive approval to implement 20-year ISI intervals for the subject component examinations through the end of their facility's current operating license. This objective led to the following condition in Section 4.0 of the staff's SE:

> Licensees that do not implement 10 CFR 50.61a must amend their licenses to require that the information and analyses requested in Section (e) of the final 10 CFR 50.61a (or the proposed 10 CFR 50.61a, given in 72 FR 56275 prior to issuance of the final 10 CFR 50.61a) will be submitted for NRC staff review and approval. The amendment to the license shall be submitted at the same time as the request for alternative.

As discussed in an NRC staff letter dated June 12, 2009 (ADAMS Accession No. ML091600158), the NRC staff has modified its position. Based on the current position, the NRC

[1] RT_{MAX} stands for PTS Reference Temperature.

staff will grant ISI interval extensions for the subject components on an interval-by-interval basis (i.e., only a facility's current ISI interval will be extended for a period of up to 20 years). Licensees will have to submit subsequent requested alternatives, for NRC review and approval, to extend each following ISI interval from 10 years to 20 years, as needed. Based on this modified position, the condition in the staff's SE on WCAP-16168-NP for submittal of a license amendment request is no longer necessary. However, subsequent requested alternatives which seek to extend additional ISI intervals from 10 to 20 years for the subject component examinations should include the evaluation of a facility's most recent ISI data in accordance with the criteria in the final alternative PTS Rule, 10 CFR 50.61a, in order to obtain NRC staff approval.

3.0 LICENSEE'S PROPOSED ALTERNATIVES

3.1 Description of Proposed Alternatives

In the submitted relief requests S1-I3R-93 and S2-I3R-94, the licensee proposes to defer performance of the ASME Code-required Category B-A and B-D weld ISI of Salem Units Nos. 1 and 2 until 2020 (Salem Unit No. 1) and 2021 (Salem Unit No. 2). For Salem Unit No. 1, this schedule is consistent with the information in PWROG letter OG-06-356. The proposed date for Salem Unit No. 2, however, differs from the information provided in PWROG letter OG-06-356, which contains a date of 2012.

In the submitted relief request SC-I3R-95, the licensee proposes the interval for Category B-N-2 and B-N-3 inspections be the same as that for Category B-A and B-D inspections.

3.2 Components for Which Relief is Requested

The affected components are the Salem Unit Nos. 1 and 2 RPVs and the interior attachments and core support structures. The following examination categories and item numbers from IWB-2500 and Table IWB-2500-1 of the ASME Code, Section XI, are addressed in this request:

For Relief Request S1-I3R-93:

Examination Category	Item Number	Description
B-A	B1.11	Circumferential Shell Weld
B-A	B1.12	Longitudinal Shell Welds
B-A	B1.21	Circumferential Head Welds
B-A	B1.22	Meridional Shell Welds
B-A	B1.30	Shell-to-Flange Weld
B-D	B3.90	Nozzle-to-Vessel Welds
B-D	B3.100	Nozzle Inner Radius Areas

For Relief Request S2-I3R-94:

Examination Category	Item Number	Description
B-A	B1.11	Circumferential Shell Weld
B-A	B1.12	Longitudinal Shell Welds
B-A	B1.21	Circumferential Head Welds
B-A	B1.22	Meridional Shell Welds
B-A	B1.30	Shell-to-Flange Weld
B-D	B3.90	Nozzle-to-Vessel Welds
B-D	B3.100	Nozzle Inner Radius Areas

For Relief Request SC-I3R-95:

Examination Category	Item Number	Description
B-N-2	B13.60	Core Barrel Support Lugs (6 each)
B-N-3	B13.70	Upper Internals to Lower Internals Keys
B-N-3	B13.70	Upper Core and Support Plate
B-N-3	B13.70	Flow Nozzles at Flange Area
B-N-3	B13.70	Circ Weld above Core Barrel Shroud
B-N-3	B13.70	Thermal Shield Pins in Core Barrel
B-N-3	B13.70	Upper Core Plate Keys in Core Barrel
B-N-3	B13.70	Top of Formers (0 to 360 degrees) Plan View
B-N-3	B13.70	Inside Core Barrel Top Flange-to-Shell Weld
B-N-3	B13.70	Core Barrel and RPV Outlet Nozzle Interface
B-N-3	B13.70	Lower Core Plate (Distribution Plate) Forging
B-N-3	B13.70	Outside Core Barrel Bottom Flange Weld
B-N-3	B13.70	Outside Core Barrel Top Flange Weld
B-N-3	B13.70	Anti-Rotation Lugs Top and Bottom (4 each)
B-N-3	B13.70	Circ Weld Outside Barrel above Shroud
B-N-3	B13.70	Outside Outlet Nozzles of Barrel (4 each)

3.3 Licensee's Basis for Proposed Alternatives

3.3.1 Basis for S1-I3R-93 and S2-I3R-94

The basis for the alternatives are found in the NRC-approved version of the WCAP which was issued by the PWROG by letter dated June 13, 2008 (ADAMS Accession No. ML082820046), WCAP-16168-NP-A, Revision 2 (referred to as WCAP-A in the rest of this document). Plant-specific parameters for Salem Unit Nos. 1 and 2 are summarized in Tables 1, 2 and 3 of the subject relief requests as shown in the licensee's letter dated June 11, 2009. The format of the information is patterned after that found in Appendix A of WCAP-A. Additional information regarding chemistry values was provided by PSEG's letters dated December 23, 2009, and January 13, 2010.

3.3.2 Basis for SC-I3R-95

The basis for the alternative is that performing the visual inspection of the B-N-2 and B-N-3 components on a different schedule than the Category B-A and B-D components would result in significant hardship without a compensating increase in safety. The licensee points out that the Category B-N-2 and B-N-3 components have been inspected in the past and no significant indications were noted. The licensee also noted that a review of the same Category B-N-2 and B-N-3 inspections at other, similar nuclear power plants have been performed many times without any significant findings relevant to the Salem RPV design. In addition, the licensee notes that Category B-N-1 visual inspections and B-P pressure tests are performed during each refueling outage and are not affected by this alternative.

3.4 Duration of Proposed Alternatives

As discussed in relief requests S1-IR3-93, S2-IR3-94 and SC-I3R-95, the licensee requested that the proposed alternatives be applicable for the remainder of the current operating license period for the applicable Salem unit. Currently, the Salem Unit No. 1 operating license expires on August 13, 2016, and the Salem Unit No. 2 operating license expires on April 18, 2020.

Note, on August 18, 2009, PSEG submitted license renewal applications for Hope Creek Generating Station and Salem Unit Nos. 1 and 2. The NRC is currently reviewing the submittals and is scheduled to complete the review by June 14, 2011.

4.0 <u>NRC STAFF TECHNICAL EVALUATION</u>

4.1 Relief Requests S1-IR3-93 and S2-IR3-94

The NRC staff reviewed the licensee's submittal dated June 11, 2009, and supplemental letters dated December 23, 2009, and January 13, 2010, to perform this evaluation.

Table 1 in each relief request (i.e., S1-IR3-93 and S2-IR3-94) provides information to demonstrate that the Salem plant-specific parameters are bounded by the corresponding pilot plant parameters evaluated in WCAP-A. The dominant PTS transients in the NRC PTS Risk Study are applicable to Salem Unit Nos. 1 and 2. The through-wall cracking frequency (TWCF) of both units is bounded by the pilot plant basis. The "Frequency and Severity of Design Transients" of Salem Unit Nos. 1 and 2 were found to be bounded by the pilot plant evaluations in WCAP-A. Also, the Salem Unit Nos. 1 and 2 RPVs are single-layer clad and, therefore, are bounded by the pilot plant evaluations in WCAP-A.

Table 2 in each relief request includes additional information pertaining to previous RPV inspections and the schedule for future ones. For Salem Unit No. 1, 45 indications were identified in the beltline region during the most recent inservice inspection. Of these, 33 indications were in the inner $3/8^{th}$ of the vessel inside diameter in the beltline region and were acceptable in accordance with IWB-3500 of Section XI of the ASME Code. The licensee confirmed that the flaws were acceptable under sub-article IWB-3510 via Table IWB-3510-1 of the ASME Code. Six indications were within the inner $1/10^{th}$ or 1" of the RPV thickness. All indications were in the weld material and were summarized in Table 2 of relief request

S1-IR3-93 to demonstrate the number of indications was lower than the number allowable in the proposed alternative PTS Rule. For Salem Unit No. 2, no indications were identified in the beltline region during the most recent inservice inspection.

The calculation of the 95th percentile TWCF (i.e., $TWCF_{95\text{-}TOTAL}$) was performed by the licensee for each Salem unit as documented in Table 3 of the respective relief request (i.e., S1-IR3-93 and S2-IR3-94). The licensee calculated ΔT_{30} values using the methodology of Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials" (ADAMS Accession No. ML003740284). The NRC staff verified these values and the $TWCF_{95\text{-}TOTAL}$ was found to be acceptably low as calculated through the methodology prescribed in WCAP-A. The licensee's letters dated December 23, 2009, and January 13, 2010, provided corrections to the chemical composition data and calculated chemistry factors shown in the licensee's letter dated June 11, 2009. The corrected values did not affect the calculation of the $TWCF_{95\text{-}TOTAL}$.

As discussed in Section 4.0, "Conditions and Limitations," of the NRC staff's SE for WCAP-16168-NP, Revision 2:

> In its request for an alternative, each licensee shall identify the years in which future inspections will be performed. The dates provided must be within plus or minus one refueling cycle of the dates identified in the implementation plan provided to the NRC in PWROG letter OG-06-356...

As noted above in SE Section 3.1, for relief request S2-I3R-94, the licensee's proposed examination date of 2021 differs from the information provided in PWROG letter OG-06-356, which contains a date of 2012. The licensee's letter dated June 11, 2009, stated that the proposed inspection dates improve the distribution of examinations. The NRC staff reviewed the information provided by the licensee and concludes that the proposed examination schedule is acceptable and maintains the goal of spacing inspections throughout the extended interval.

Based on the review of the information provided by the license, the NRC staff finds that the plant-specific information is bounded by the WCAP-A analyses and is acceptable with respect to the limitations and conditions in the NRC staff's SE for the WCAP. On this basis, the staff concludes that there is no significant additional risk associated with extending the current Salem Unit Nos. 1 and 2 ISI intervals for the subject Category B-A and B-D components from 10 years to 20 years (although the current action only extends the ISI intervals to approximately 15 years for Salem Unit No. 1 and approximately 17 years for Salem Unit No. 2 as discussed in the next paragraph). Therefore, the staff further concludes that the proposed alternatives in relief requests S1-IR3-93 and S2-IR3-94 provides an acceptable level of quality and safety. As such, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Although the NRC staff has concluded that there is no significant additional risk associated with extending the current ISI interval for the subject Category B-A and B-D components from 10 years to 20 years, the proposed examination dates (i.e., 2020 for Salem Unit No. 1 and 2021 for Salem Unit No. 2) are later than the current operating license expiration dates (i.e., August 13, 2016, for Salem Unit No. 1 and April 18, 2020, for Salem Unit No. 2). As such, and consistent with the licensee's request as discussed above in SE Section 3.4, the duration of the proposed alternative is applicable only to the remainder of the current operating license period for the applicable Salem unit. If PSEG's pending license renewal application is granted for Salem Unit Nos. 1 and 2, the licensee will need to submit additional relief requests to extend the ISI period beyond the term of the current operating licenses (i.e., to the proposed examination dates of 2020 for Salem Unit No. 1 and 2021 for Salem Unit No. 2).

4.2 Relief Request SC-IR3-95

The licensee's relief request stated that:

> Since the core support structure (called a core barrel on Combustion Engineering manufactured vessel) requires removal to facilitate examination of the Reactor Vessel shell, lower head, and nozzle welds, the visual examinations of ASME examination categories B-N-2 and B-N-3 have historically been performed during the same outage at the end of the ISI interval.
>
> Performing all core barrel removed related examinations during the same refueling outage will result in significant savings in dose and outage duration since the same equipment and personnel used for visual and volumetric examination of the Reactor Vessel shell welds and nozzle welds from the RPV interior can be used to implement the required Reactor Vessel Interior examinations. Additionally, removing the Reactor Vessel internals only once to accommodate all the examinations discussed in this relief request would result in significant savings in radiation exposure.

The relief request also stated that the increase in the inspection interval reduces the frequency for which the RPV lower internals need to be removed, thereby reducing the possibility for human error and damage to the core.

As discussed in the licensee's relief request, the visual examinations of the RPV interior attachments and the core support structure were performed during the 2nd ISI intervals on both Salem Unit Nos. 1 and 2 with no relevant indications noted during the examinations. The licensee also noted that their review of industry surveys indicate that these examinations have been performed many times in the industry without any significant findings relevant to the RPV design for Salem Unit Nos. 1 and 2. Based on these considerations, the NRC staff concludes that the proposed alternative provides reasonable assurance of the structural integrity of the subject components. Furthermore, since the proposed alternative is consistent with maintaining personnel radiation exposure as low as reasonably achievable, the NRC staff also concludes that the licensee's compliance with the ASME Code requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, the proposed alternative in relief request SC-I3R-95 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

Consistent with the discussion above for relief requests S1-IR3-93 and S2-IR3-94, the proposed alternative is authorized for the remainder of the respective operating licenses for Salem Unit Nos. 1 and 2 (i.e., August 13, 2016, for Salem Unit No. 1 and April 18, 2020, for Salem Unit No. 2). If PSEG's pending license renewal application is granted for Salem Unit Nos. 1 and 2, the licensee will need to submit an additional relief request to extend the ISI period beyond the term of the current operating licenses (i.e., to the proposed examination dates of 2020 for Salem Unit No. 1 and 2021 for Salem Unit No. 2).

5.0 CONCLUSION

The following summarizes the NRC staff conclusions based on the technical evaluation discussed above.

With respect to relief request S1-I3R-93, the proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the remainder of the current operating license for Salem Unit No. 1 (i.e., until August 13, 2016).

With respect to relief request S2-I3R-94, the proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the remainder of the current operating license for Salem Unit No. 2 (i.e., until April 18, 2020).

With respect to relief request SC-I3R-95, the proposed alternative provides reasonable assurance of the structural integrity of the subject components. Furthermore, the NRC staff also concludes that the licensee's compliance with the ASME Code requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative is authorized for the remainder of the respective operating licenses for Salem Unit Nos. 1 and 2 (i.e., August 13, 2016, for Salem Unit No. 1 and April 18, 2020, for Salem Unit No. 2).

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributors: C. Fairbanks
R. Ennis

Date: February 22, 2010

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

If you have any questions concerning this matter, please contact the Salem Project Manager, Mr. Richard Ennis, at (301) 415-1420.

Sincerely,

/ra/

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

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DATE	2/22/10	2/22/10	2/18/10	2/22/10

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