PSEG Nuclear LLC
P.O. Box 236,, Hancocks Bridge, NJ 08038-0236

PSEG
Nuclear L.L.C.

10 CFR 50.55a

JUN 11 2009
LR-N09-0126

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

Salem Nuclear Generating Station, Units 1 and 2
Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: Relief Requests to Extend the Inservice Inspection Interval for Reactor Vessel Weld Examinations

In accordance with 10 CFR 50.55a(a)(3), "Codes and standards," PSEG Nuclear, LLC (PSEG), hereby requests NRC approval of proposed Relief Requests S1-I3R-93, S2-I3R-94 and SC-I3R-95 as alternatives to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection and Testing of Components of Light-Water Cooled Plants," for visual examinations of reactor vessel welds.

PSEG requests approval of the proposed requests by 03/01/2010 to permit the proposed alternatives to be implemented during the refueling outages in Spring 2010 (Unit 1) and Fall 2012 (Unit 2). For Unit 1 the third interval will end on May 20, 2011 and for Unit 2 the third interval will end on November 27, 2013. The Code of Record for the third interval is ASME Code, Section XI, 1998 Edition through 2000 Addenda.

The technical and regulatory basis for decreasing the frequency of inspections in documented in Westinghouse Topical Report WCAP-16168-NP-A, Revision 2. The Nuclear Regulatory Commission approved the topical report by letter dated May 8, 2008. To implement the approved changes PSEG is submitting Attachment 1 and Attachment 2 in accordance with the Safety Evaluation to request an alternative from the Code requirements pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative provides an acceptable level of quality and safety. Attachment 3 is being submitted in conjunction with the Safety Evaluation to request an alternative from the Code requirements pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis of hardship or unusual difficulty without compensating increase in level of quality or safety.

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As referenced in the WCAP-16168-NP-A, Revision 2, PSEG is not submitting a license amendment request concurrent with the attached relief requests. Waterford 3 recently withdrew their license amendment due to a change in the agency's position on the requirement. (ADAMS Accession No. ML091560028)

There are no commitments contained in this letter.

If you have any questions or require additional information, please contact Mrs. Erin West of my staff at 856-339-5411.

Sincerely,

Jeffrie J. Keenan
Manager - Licensing
PSEG Nuclear LLC

Attachments:
1. Relief Request S1-I3R-93
1. Relief Request S2-I3R-94
2. Relief Request SC-I3R-95

cc: S. Collins, Administrator, Region I, NRC
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector Salem
P. Mulligan, Manager IV, NJBNE
H. Berrick - Salem Commitment Tracking Coordinator
L. Marabella - Corporate Commitment Tracking Coordinator

ATTACHMENT 1

Salem Nuclear Generating Station, Unit No. 1
Facility Operating License No. DPR-70
NRC Docket No. 50-272

Relief Request S1-I3R-93

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)
Acceptable level of quality and safety

1. ASME Code Component(s) Affected

Code Class: 1
Examination Category: B-A and B-D
Unit/Inspection: Unit 1/ Third (3rd) and Fourth (4th) 10-Year Interval

Examination Category	Item No.	Description
B-A	B1.11	Circumferential Shell Welds
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

The affected component is the Salem Unit 1 reactor vessel, specifically the above American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code Section XI (Reference 1) examination categories and item numbers covering examinations of the reactor vessel (RV). These examination categories and item numbers are from IWB-2500 and Table IWB-2500-1 of the ASME BPV, Code Section XI.

(Throughout this request the above examination categories are referred to as "the subject examinations" and the ASME BPV Code, Section XI, is referred to as "the Code.")

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection and Testing of Components of Light-Water Cooled Plants," 1998 Edition through 2000 Addenda for the current third ISI 10 Year Interval. The fourth ISI 10 Year Interval will be implemented in accordance with the ASME Section XI Edition and Addenda referenced in Code of Federal Regulation 10CFR50.55a 12 months prior to entering into the fourth ISI 10 Year Interval, scheduled to begin May 20, 2011. Therefore, the approved

ASME Section XI code as of May 20, 2010 will be used for the fourth ISI Inspection Interval.

3. Applicable Code Requirement

IWB-2412, Inspection Program B, requires volumetric examination of essentially 100% of reactor vessel pressure retaining welds identified in Table IWB-2500-1 once each ten year interval. ISI third inspection interval began on May 19, 2001 and is scheduled to end on May 20, 2011; the fourth ISI inspection interval is scheduled to begin May 20, 2011 and is scheduled to end May 20, 2021.

4. Reason for Request

An alternative is requested for IWA-2412, Inspection Program B, which requires that volumetric examination of essentially 100% of reactor vessel pressure retaining, Examination Category B-A and B-D welds, because extending the inspection interval for these welds from 10 years up to 20 years will result in a reduction in person-rem exposure and examination costs.

5. Proposed Alternative and Basis for Use

PSEG proposes to defer the ASME Code required volumetric examination of the Unit 1 reactor pressure vessel (RPV) full penetration pressure retaining Category B-A and B-D welds for the third inservice inspection, currently scheduled for 2010, through 2020. These dates are consistent with the information provided to the Staff in PWR Owners Group letter OG-06-356 (Reference 2). Therefore, the third inservice inspection is proposed to be performed in 2020 pending extension of the current Unit 1 Operating License. There would be a fourth RPV volumetric examination inspection in 2030. An additional Relief Request would be submitted in the event that PSEG submits for an extended Operating License.

Pursuant to 10 CFR 50.55a(a)(3)(i), an alternate inspection interval is requested on the basis that the current inspection interval can be extended based on a negligible change in risk by satisfying the risk criteria specified in Regulatory Guide 1.174 (Reference 3).

The methodology used to demonstrate the acceptability of extending the inspection intervals for Category B-A and B-D welds based on a negligible change in risk is contained in WCAP-16168-NP-A, Revision 2 (Reference 4). This methodology was used to develop a pilot plant analysis for Westinghouse, Combustion Engineering, and Babcock and Wilcox reactor vessel designs and is an extension of the work that was performed as part of the NRC PTS Risk Re-Evaluation (Reference 5). The critical parameters for demonstrating that this pilot plant analysis is applicable on a plant specific basis, as identified in WCAP-16168-NP-A, Revision 2, are identified in Table 1. By demonstrating that each plant specific parameter is bounded by the corresponding pilot plant parameter, the application of the methodology to the Salem Unit 1 reactor vessel is acceptable as shown in Table 1 below.

Table 1 Critical Parameters for Application of Bounding Analysis

Parameter	Pilot Plant Basis	Plant Specific Basis	Additional Evaluation Required?
Dominant Pressurized Thermal Shock (PTS) Transients in the NRC PTS Risk Study are applicable	NRC PTS Risk Study (Reference 5)	PTS Generalization Study (Reference 6)	No
Through Wall Cracking Frequency	1.76E-08 Events per year (Reference 4)	1.59E-08 Events per year (Calculated per Reference 4)	No
Frequency and Severity of Design Basis Transients	7 heatup/cooldowns per year (Reference 4)	Bounded by 7 heatup/cooldowns per year	No
Cladding Layers (Single/Multiple)	Single Layer (Reference 4)	Single Layer	No

Additional information relative to the Salem Unit 1 reactor vessel inspection is provided in Table 2. This information confirms that satisfactory examinations have been performed on the Salem Unit 1 reactor vessel.

<table>
<tr><th colspan="2">Table 2 Additional Information Pertaining to Reactor Vessel Inspection</th></tr>
<tr><td>Inspection methodology:</td><td>The most recent inservice inspection of the Category B-A and B-D welds (from the Vessel ID) was performed to ASME Section XI Appendix VIII requirements. Future inservice inspections will also be performed to ASME Section XI Appendix VIII requirements.</td></tr>
<tr><td>Number of past inspections:</td><td>Two 10-Year inservice inspections have been performed.</td></tr>
<tr><td>Number of indications found:</td><td>45 indications were identified in the beltline region during the most recent inservice inspection. 33 of these indications were within the inner $3/8^{th}$ of the vessel thickness and were acceptable per Table IWB-3510-1 of Section XI of the ASME Code. Six of these indications were within the inner $1/10^{th}$ or 1" of the reactor vessel thickness. All indications were in the weld material. A summary of these indications is provided in the table below. The column to the right indicates the number allowed per the proposed PTS rule (Reference 7). This number is based on the length of weld inspected in the beltline region.
<table>
<tr><th>No. of Indications</th><th>Range of TWE (in)</th><th># Allowable</th></tr>
<tr><td>2 axial</td><td>$0.075 \leq TWE < 0.125$</td><td>163</td></tr>
<tr><td>1 axial</td><td>$0.125 \leq TWE < 0.175$</td><td>89</td></tr>
<tr><td>2 axial</td><td>$0.175 \leq TWE < 0.225$</td><td>23</td></tr>
<tr><td>1 axial</td><td>$0.225 \leq TWE < 0.275$</td><td>9</td></tr>
</table>
</td></tr>
<tr><td>Proposed inspection schedule for balance of plant life:</td><td>The third inservice inspection is currently scheduled for 2010. The proposed third inservice inspection is to be performed in 2020 pending an extension of the current Unit 1 Operating License.</td></tr>
</table>

Table 3 provides additional information relative to the calculation of the TWCF for Salem Unit 1.

Table 3	**Details of TWCF Calculation for 42 EFPY of Operation**							
Inputs								
Reactor Coolant System Temperature, T_{RCS}[°F]:			N/A			T_{wall} [inches]:		8.84
#	Region/Component Description	Material /Flux Type	Cu [wt%]	Ni [wt%]	R.G. 1.99 Pos.	CF [°F]	Un-Irradiated $RT_{NDT(u)}$ [°F]	Fluence [10^{19} Neutron/cm^2, E>1 MeV]
1	Inter. Plate B2402-1	A 533B	.24	.53	2.1	155.8	45	1.59
2	Inter. Plate B2402-2	A 533B	.24	.53	2.1	142.8	-5	1.59
3	Inter. Plate B2402-3	A 533B	.22	.51	2.1	107.7	-3	1.59
4	Lower Plate B2403-1	A 533B	.19	.48	1.1	128.8	4	1.57
5	Lower Plate B2403-2	A 533B	.19	.49	1.1	129.9	18	1.57
6	Lower Plate B2403-3	A 533B	.19	.48	1.1	128.8	6	1.57
7	Inter. Ax. Weld 2-042A	Linde 1092	.18	1.04	1.1	217.2	-56	1.16
8	Inter. Ax. Weld 2-042B	Linde 1092	.18	1.04	1.1	217.2	-56	1.16
9	Inter. Ax. Weld 2-042C	Linde 1092	.18	1.04	1.1	217.2	-56	0.599
10	Low. Ax. Weld 3-042A	Linde 1092	.1826	.9825	1.1	213.2	-56	0.961
11	Low. Ax. Weld 3-042B	Linde 1092	.1826	.9825	1.1	213.2	-56	0.961
12	Low. Ax. Weld 3-042C	Linde 1092	.1826	.9825	1.1	213.2	-56	1.57
13	Circ Weld 9-042	Linde 1092	.22	.73	1.1	196.6	-56	1.57

Outputs						
Methodology Used to Calculate ΔT_{30}:		Regulatory Guide 1.99, Revision 2				
	Controlling Material Region # (From Above)	RT_{MAX-XX} [R]	Fluence [10^{19} Neutron/cm^2, E>1 MeV]	Fluence Factor	ΔT_{30} [°F]	$TWCF_{95-XX}$
Axial Weld – AW	1	666.95	1.16	1.041	162.26	6.54E-09
Circumferential Weld - CW	1	679.91	1.57	1.125	175.22	1.73E-12
Plate – PL	1	680.44	1.59	1.128	175.75	5.34E-10
$TWCF_{95-TOTAL}$ (α_{AW}(2.25)$TWCF95_{-AW}$ + α_{PL}(2.17)$TWCF_{95-PL}$ + α_{CW}(2.17)$TWCF_{95-CW}$):						1.59E-08

6. Duration of Proposed Alternative

This request is applicable to the Unit 1 inservice inspection program for the remainder of the current Unit 1 Operating License.

7. Precedents

In Reference 8, the NRC authorized Calvert Cliffs Nuclear Power Plant Unit 2 to perform Reactor Pressure Vessel examinations of Category B-A and B-D welds at a 20-year inspection interval.

In Reference 9, the NRC authorized Indian Point to extend the Unit 2 and 3 Inservice Inspection Interval for the Reactor Vessel Welds. IP2 Welds inspections were last performed in 1995 and will now be due in 2012. For IP3, the inspections were last performed in 1999 and will now be due in 2015. These inspections fall within the current operating license period.

In Reference 10, the NRC staff authorized Palisades the extension of the third 10-year ISI interval until December 12, 2015, for Reactor Pressure Vessel ASME Code, Section XI Category B-A welds and Category B-D nozzle-to-vessel welds and nozzle inner radius areas.

8. References

1. *ASME Boiler and Pressure Vessel Code,* Section XI, 1989 Edition with the 1989 Addenda up to and including the 2004 Edition with the 2005 Addenda, American Society of Mechanical Engineers, New York.
2. OG-06-356, "Plan for Plant Specific Implementation of Extended Inservice Inspection Interval per WCAP-16168-NP, Revision 1, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval." MUHP 5097-99, Task 2059," October 31, 2006.
3. NRC Regulatory Guide 1.174, Revision 1, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," November 2002.
4. WCAP-16168-NP-A, Revision 2, "Risk-Informed Extension of Reactor Vessel In-Service Inspection Interval," June 2008.
5. NUREG-1874, "Recommended Screening Limits for Pressurized Thermal Shock," March, 2007.
6. NRC Letter Report, "Generalization of Plant-Specific Pressurized Thermal Shock (PTS) Risk Results to Additional Plants," December 14, 2004.

7. SECY-07-0104, "Proposed Rulemaking - Alternate Fracture Toughness Requirements for Protection against Pressurized Thermal Shock," June 25, 2007 (ADAMS Accession Number ML070570141)

8. NRC Safety Evaluation dated April 8, 2009 for Relief Requests ISI-020 and 021 Reactor Vessel Weld Examination Extension -Calvert Cliffs Nuclear Power Plant, Unit No.2 (TAC NOS. MD9773 AND MD9774) Docket No. 50-318, ML090920077.

9. NRC Safety Evaluation dated April 20, 2009, Indian Point Nuclear Generating Units 2 and 3 - Relief Requests of Reactor Vessel Weld Examinations (TAC NOS. MD9196 and MD9197). Docket Nos. 50-247 and 50-286, ML090360460.

10. NRC Safety Evaluation dated February 11, 2009, Palisades-Evaluation of Relief Request to Extend the Third 10 -Year Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MD9265) Docket No. 50-255, ML090120896.

ATTACHMENT 2

Salem Nuclear Generating Station, Unit No. 2
Facility Operating License No. DPR-75
NRC Docket No. 50-311

Relief Request S2-I3R-94

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)
Acceptable level of quality and safety

1. ASME Code Component(s) Affected

Code Class: 1
Examination Category: B-A and B-D
Unit/Inspection: Unit 2/ Third (3^{rd}) and Fourth (4^{th}) 10-Year Intervals

Examination Category	Item No.	Description
B-A	B1.11	Circumferential Shell Welds
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

The affected component is the Salem Unit 2 reactor vessel, specifically the above American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code Section XI (Reference 1) examination categories and item numbers covering examinations of the reactor vessel (RV). These examination categories and item numbers are from IWB-2500 and Table IWB-2500-1 of the ASME BPV, Code Section XI.

(Throughout this request the above examination categories are referred to as "the subject examinations" and the ASME BPV Code, Section XI, is referred to as "the Code.")

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection and Testing of Components of Light-Water Cooled Plants," 1998 Edition through 2000 Addenda for the current third ISI 10 Year Interval. The fourth ISI 10 Year Interval will be implemented in accordance with the ASME Section XI Edition and Addenda referenced in Code of Federal Regulation 10CFR50.55a 12 months prior to entering into the fourth ISI 10 Year Interval, scheduled to begin November 27, 2013. Therefore, the approved ASME Section XI code as of November 27, 2012 will be used for the fourth ISI Inspection Interval.

3. Applicable Code Requirement

IWB-2412, Inspection Program B, requires volumetric examination of essentially 100% of reactor vessel pressure retaining welds identified in Table IWB-2500-1 once each ten year interval. ISI third inspection interval began on November 27, 2003 and is scheduled to end on November 27, 2013; the fourth ISI inspection interval is scheduled to begin November 27, 2013 and is scheduled to end November 27, 2023.

4. Reason for Request

An alternative is requested from IWA-2412, Inspection Program B, which requires volumetric examination of essentially 100% of reactor vessel pressure retaining, Examination Category B-A and B-D welds, because extending the intervals from 10 years to up to 20 years will result in a reduction in person-rem exposure and examination costs.

5. Proposed Alternative and Basis for Use

PSEG proposes to defer the ASME Code required volumetric examination of the Salem Unit 2 reactor vessel full penetration pressure retaining Category B-A and B-D welds for the third inservice inspection, currently scheduled for 2012, until 2021. While these dates differ from the information provided to the Staff in PWR Owners Group letter OG-06-356 (Reference 2), the proposed inspection dates improve the distribution of examinations. OG-06-356 indicates that Unit 2 is scheduled to inspect in 2012. Five examinations will be performed in 2012 while only one will be performed in 2021. Deferring the examination until 2021 would result in 4 examinations being performed in 2012 and two examinations in 2021. Therefore, the third inservice inspection is proposed to be performed in 2021 pending an extension of the current Unit 2 Operating License.

Pursuant to 10 CFR 50.55a(a)(3)(i), an alternate inspection interval is requested on the basis that the current inspection interval can be extended based on a negligible change in risk by satisfying the risk criteria specified in Regulatory Guide 1.174 (Reference 3).

The methodology used to demonstrate the acceptability of extending the inspection intervals for Category B-A and B-D welds based on a negligible change in risk is contained in WCAP-16168-NP-A, Revision 2 (Reference 4). This methodology was used to develop a pilot plant analysis for Westinghouse, Combustion Engineering, and Babcock and Wilcox reactor vessel designs and is an extension of the work that was performed as part of the NRC PTS Risk Re-Evaluation (Reference 5). The critical parameters for demonstrating that this pilot plant analysis is applicable on a plant specific basis, as identified in WCAP-16168-NP-A, Revision 2, are identified in Table 1. By demonstrating that each plant specific parameter is bounded by the corresponding pilot plant parameter, the application of the methodology to the Unit 2 reactor vessel is acceptable as shown in Table 1 below.

Table 1 Critical Parameters for Application of Bounding Analysis

Parameter	Pilot Plant Basis	Plant Specific Basis	Additional Evaluation Required?
Dominant Pressurized Thermal Shock (PTS) Transients in the NRC PTS Risk Study are applicable	NRC PTS Risk Study (Reference 5)	PTS Generalization Study (Reference 6)	No
Through Wall Cracking Frequency	1.76E-08 Events per year (Reference 4)	4.00E-11 Events per year (Calculated per Reference 4)	No
Frequency and Severity of Design Basis Transients	7 heatup/cooldowns per year (Reference 4)	Bounded by 7 heatup/cooldowns per year	No
Cladding Layers (Single/Multiple)	Single Layer (Reference 4)	Single Layer	No

Additional information relative to the Unit 2 reactor vessel inspection is provided in Table 2. This information confirms that satisfactory examinations have been performed on the Unit 2 reactor vessel.

Table 2	**Additional Information Pertaining to Reactor Vessel Inspection**
Inspection methodology:	The most recent inservice inspection of the Category B-A and B-D welds (from the Vessel ID) was performed to ASME Section XI Appendix VIII requirements. Future inservice inspections will also be performed to ASME Section XI Appendix VIII requirements.
Number of past inspections:	Two 10-Year inservice inspections have been performed.
Number of indications found:	No indications were identified in the beltline region during the most recent inservice inspection.
Proposed inspection schedule for balance of plant life:	The third inservice inspection is scheduled for 2012. The proposed third inservice inspection is to be performed in 2021 pending an extension of the current Unit 2 Operating License.

Table 3 provides additional information relative to the calculation of the TWCF for Salem Unit 2.

Table 3 Details of TWCF Calculation for 50 EFPY of Operation

Inputs

Reactor Coolant System Temperature, T_{RCS}[°F]:			N/A		T_{wall} [inches]:			8.84
#	Region/Component Description	Material /Flux Type	Cu [wt%]	Ni [wt%]	R.G. 1.99 Pos.	CF [°F]	Un-Irradiated $RT_{NDT(u)}$ [°F]	Fluence [10^{19} Neutron/cm^2, E>1 MeV]
1	Inter. Plate B4712-1	A 533B	.13	.56	1.1	89.8	0	1.95
2	Inter. Plate B4712-2	A 533B	.12	.61	2.1	102.2	12	1.95
3	Inter. Plate B4712-3	A 533B	.11	.57	1.1	73.7	10	1.95
4	Lower Plate B4713-1	A 533B	.12	.60	1.1	83.0	8	1.96
5	Lower Plate B4713-2	A 533B	.12	.57	1.1	82.4	8	1.96
6	Lower Plate B4713-3	A 533B	.12	.58	1.1	82.6	10	1.96
7	Int. Ax. Weld 2-442A	Linde 1092	.221	.732	1.1	189.1	-56	0.722
8	Int. Ax. Weld 2-442B	Linde 1092	.221	.732	1.1	189.1	-56	1.41
9	Int. Ax. Weld 2-442C	Linde 1092	.221	.732	1.1	189.1	-56	1.41
10	Low. Ax. Weld 3-442A	Linde 1092	.213	.867	1.1	208.6	-56	1.43
11	Low. Ax. Weld 3-442B	Linde 1092	.213	.867	1.1	208.6	-56	0.727
12	Low. Ax. Weld 3-442C	Linde 1092	.213	.867	1.1	208.6	-56	1.43
13	Circ Weld 9-442	Linde 0091	.197	.06	1.1	91.4	-56	1.96

Outputs

Methodology Used to Calculate ΔT_{30}:		Regulatory Guide 1.99, Revision 2				
	Controlling Material Region # (From Above)	RT_{MAX-XX} [R]	Fluence [10^{19} Neutron/cm^2, E>1 MeV]	Fluence Factor	ΔT_{30} [°F]	$TWCF_{95-XX}$
Axial Weld – AW	10, 12	632.99	1.43	1.099	229.30	1.52E-11
Circumferential Weld - CW	2	592.68	1.96	1.184	120.99	5.52E-29
Plate – PL	2	592.54	1.95	1.182	120.85	1.05E-12
$TWCF_{95-TOTAL}$ ($\alpha_{AW}(2.45)TWCF_{95-AW} + \alpha_{PL}(2.5)TWCF_{95-PL} + \alpha_{CW}(2.5)TWCF_{95-CW}$):						4.00E-11

6. Duration of Proposed Alternative

This request is applicable to the Unit 2 inservice inspection program for the remainder of the current Unit 2 Operating License.

7. Precedents

In Reference 8, the NRC authorized Calvert Cliffs Nuclear Power Plant Unit 2 to perform Reactor Pressure Vessel examinations of Category B-A and B-D welds at a 20-year inspection interval.

In Reference 9, the NRC authorized Indian Point to extend the Unit 2 and 3 Inservice Inspection Interval for the Reactor Vessel Welds. IP2 Welds inspections were last performed in 1995 and will now be due in 2012. For IP3, the inspections were last performed in 1999 and will now be due in 2015. These inspections fall within the current operating license period.

In Reference 10, the NRC staff authorized Palisades the extension of the third 10-year ISI interval until December 12, 2015, for Reactor Pressure Vessel ASME Code, Section XI Category B-A welds and Category B-D nozzle-to-vessel welds and nozzle inner radius areas.

8. References

1. *ASME Boiler and Pressure Vessel Code,* Section XI, 1989 Edition with the 1989 Addenda up to and including the 2004 Edition with the 2005 Addenda, American Society of Mechanical Engineers, New York.
2. OG-06-356, "Plan for Plant Specific Implementation of Extended Inservice Inspection Interval per WCAP-16168-NP, Revision 1, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval." MUHP 5097-99, Task 2059," October 31, 2006.
3. NRC Regulatory Guide 1.174, Revision 1, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," November 2002.
4. WCAP-16168-NP-A, Revision 2, "Risk-Informed Extension of Reactor Vessel In-Service Inspection Interval," June 2008.
5. NUREG-1874, "Recommended Screening Limits for Pressurized Thermal Shock," March, 2007.
6. NRC Letter Report, "Generalization of Plant-Specific Pressurized Thermal Shock (PTS) Risk Results to Additional Plants," December 14, 2004.

7. SECY-07-0104, "Proposed Rulemaking - Alternate Fracture Toughness Requirements for Protection against Pressurized Thermal Shock," June 25, 2007 (ADAMS Accession Number ML070570141)
8. NRC Safety Evaluation dated April 8, 2009 for Relief Requests ISI-020 and 021 Reactor Vessel Weld Examination Extension for Calvert Cliffs Nuclear Power Plant, Unit No.2 (TAC NOS. MD9773 and MD9774) Docket No. 50-318, ML090920077.
9. NRC Safety Evaluation dated April 20, 2009, Indian Point Nuclear Generating Units 2 and 3 - Relief Requests of Reactor Vessel Weld Examinations (TAC NOS. MD9196 and MD9197). Docket Nos. 50-247 and 50-286, ML090360460.
10. NRC Safety Evaluation dated February 11, 2009, Palisades-Evaluation of Relief Request to Extend the Third 10 -Year Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MD9265) Docket No. 50-255, ML090120896.

ATTACHMENT 3

Salem Nuclear Generating Station, Unit Nos. 1 and 2
Facility Operating License No. DPR-70 and 75
NRC Docket No. 50-272 and 50-311

Relief Request SC-I3R-95

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Hardship or Unusual Difficulty without Compensating
Increase in Level of Quality or Safety

1. ASME Code Component(s) Affected

Code Class:	1
Examination Category:	B-N-2 & B-N-3
Item Number:	B13.60 & B13.70
Description:	Interior Attachments Beyond Beltline Region (B-N-2) Core Support Structure (B-N-3)
Unit/Inspection:	Salem Unit 1 & 2 / Third (3rd) and Fourth (4th) 10-Year ISI Intervals

Affected components consist of Class 1 Reactor Vessel Internals:

ASME_Cat	ASME_Item	Description
B-N-2	B13.60	CORE BARREL SUPPORT LUGS (6 EA.)
B-N-3	B13.70	UPPER INTERNALS TO LOWER INTERNALS KEYS
B-N-3	B13.70	UPPER CORE & 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 DEG.) PLAN VIEW
B-N-3	B13.70	INSIDE CORE BARREL TOP FLG-TO-SHELL WELD
B-N-3	B13.70	CORE BARREL & RPV OUTLET NOZZLE INTERFAC
B-N-3	B13.70	LOWER CORE PLATE (DISTR. PLATE) FORGING
B-N-3	B13.70	OUTSIDE CORE BARREL BOTTOM FLG WELD
B-N-3	B13.70	OUTSIDE CORE BARREL TOP FLG WELD
B-N-3	B13.70	ANTI ROTATION LUGS TOP & BOTTOM (4 EA.)
B-N-3	B13.70	CIRC WELD OUTSIDE BARREL ABOVE SHROUD
B-N-3	B13.70	OUTSIDE OUTLET NOZZLES OF BARREL (4 EA.)

2. **Applicable Code Edition and Addenda**
American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection and Testing of Components of Light-Water Cooled Plants," 1998 Edition 2000 Addenda. The fourth ISI 10 Year Intervals will be implemented in accordance with the ASME Section XI Edition and Addenda referenced in Code of Federal Regulation 10CFR50.55a 12 months prior to entering into the fourth ISI 10 Year Intervals.

3. **Applicable Code Requirement**
Table IWB-2500-1, examination categories B-N-2 and B-N-3, item numbers B13.60, and B13.70 requires a visual examination of the accessible interior attachment welds within and beyond the beltline region and a visual examination of the accessible core support structure surfaces of the RPV once each ten-year interval. The Unit 1 Third Ten-Year Inservice Inspection (ISI) interval is scheduled to end May 20, 2011 and Unit 2 Third Ten-Year Inservice Inspection (ISI) interval is scheduled to end November 27, 2013.

4. **Reason for Request**
In Westinghouse Topical Report WCAP-16168-NP-A, Revision 2 (Reference 2), the Pressurized Water Reactor Owners Group provided the technical and regulatory basis for decreasing the frequency of inspections by extending the ASME Code Section XI ISI interval from the current 10 years to 20 years for ASME Code Section XI examination categories B-A and B-D RPV welds.

The Nuclear Regulatory Commission approved the topical report by letter dated May 8, 2008 (Reference 3). To implement the change presented in Reference 2, PSEG is submitting Attachment 3, in conjunction with the Safety Evaluation (Reference 3) to request an alternative from the Code requirements pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative inspection interval (20 years) provides an acceptable level of quality and safety.

For weld examination categories B-A and B-D the Reactor Vessel weld examinations will be performed in 2020 (Unit 1) and 2021 (Unit 2). The intent of this relief request (SC-I3R-95) is to allow deferral of the subject examinations to the same time (2020 and 2021) as the examination categories B-A and B-D Reactor Vessel welds described in Attachments 1 and 2.

During the ten-year ISI of the Reactor Vessel shell, lower head, and nozzle welds in 2001 & 2002, PSEG also performed visual examinations of the RPV interior attachments and the core support structure. 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.

5. Proposed Alternative and Basis for Use

PSEG proposes to defer the ASME Code required visual examination of the Salem Unit 1 and Unit 2 reactor vessel internals Category B-N-2 and B-N-3 welds for the third inservice inspection, currently scheduled for 2010 through 2020 for Unit 1 and 2012 through 2021 for Unit 2.

The proposed alternative inspection would enable the subject examinations to be performed during the refueling outages with the risk-informed extension of the Reactor Vessel ISI. In accordance with 10 CFR 50.55a(a)(3)(ii), this interval extension is requested on the basis that performing the examination of the Reactor Vessel interior attachments and core support structure separate in time from the Reactor Vessel shell, head, and nozzle welds would result in hardship or unusual difficulty without a compensating increase in quality or safety.

The full scope examination required by ASME examination categories B-N-2 and B-N-3 requires the removal of all the fuel and the core barrel from the Reactor Vessel. An unnecessary risk is created by removal of the core barrel to perform a visual examination without a compensating increase in quality or safety. Further, the radiation exposure to establish the conditions for and perform the ASME examination categories B-N-2 and B-N-3 examinations would essentially double if the subject examinations were performed separate in time from the RPV shell, lower head, and nozzle weld examinations. The visual examinations of the Reactor Vessel interior attachments and the core support structure have been performed during the 2nd ISI Intervals on both Unit 1 and Unit 2 with no relevant indications noted during the examinations.

Additionally, review of industry surveys indicate that these examinations have been performed many times in the industry without any significant findings relevant to the Salem reactor vessel design. As stated in Reference 2, *"...it must be recognized that all reactor coolant pressure boundary failures occurring to date have been identified as a result of leakage, and were discovered by visual examination. The proposed RV ISI interval extension does not alter the visual examination interval. The reactor vessel would undergo, as a minimum, the Section XI Examination Category B-P pressure tests and visual examinations conducted at the end of each refueling before plant start-up, as well as leak tests with visual examinations that precede each start-up following maintenance or repair activities."* The minimum visual examinations discussed in Reference 2 are not the subject examinations (i.e., B-N-2 and B-N-3) of this relief request. During refueling outages, PSEG performs the ASME examination category B-N-1 visual examinations, which includes the space that is made accessible for examination by the removal of components during normal refueling outages. This examination is required once each period and will provide reasonable assurance of structural integrity.

As discussed further in Reference 2, defenses against human errors are preserved with the increase in inspection interval. Specifically, the increase in the inspection interval reduces the frequency for which the Reactor Vessel lower internals need to be removed thereby reducing the possibility for human error and damage to the core. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), this interval change from 10 but no more than 20 years for the subject examinations is requested 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.

6. Duration of Proposed Alternative

This proposed alternative is applicable to the Unit 1 and Unit 2 inservice inspection program for the remainder of the current 40-year operating licenses.

7. Precedents

In Reference 4, the NRC authorized Calvert Cliffs Nuclear Power Plant Unit 2 to perform visual inspections of Category B-N-2 and B-N-3 Welded Core Support Structures and Interior Attachment Welds on the same 20-year interval as the Category B-A and B-D components.

8. Reference

1. ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition 2000 Addenda

2. WCAP-16168-NP-A, Revision 2, Risk-Informed Extension of Reactor Vessel In-Service Inspection Interval, June 2008

3. Final Safety Evaluation for Pressurized Water Reactor Owners Group (PWROG) Topical Report (TR) WCAP-16168-NP, Revision 2, "Risk-Informed Extension Of The Reactor Vessel In-Service Inspection Interval" (TAC No. MC9768), Dated May 8, 2008

4. NRC Safety Evaluation dated April 8, 2009 for Relief Requests ISI-020 and 021 Reactor Vessel Weld Examination Extension -Calvert Cliffs Nuclear Power Plant, Unit No.2 (TAC NOS. MD9773 AND MD9774) Docket No. 50-318, ML090920077.