

10CFR50.55a

January 7, 2011

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

**Subject: Docket Nos. 50-361 and 50-362
Third Ten-Year Inservice Inspection (ISI) Interval
10CFR50.55a Requests ISI-3-32, ISI-3-33, and ISI-3-34
San Onofre Nuclear Generating Station, Units 2 and 3**

Dear Sir or Madam,

Pursuant to 10 CFR 50.55a(a)(3)(i), Southern California Edison (SCE) requests NRC approval of the following request for the San Onofre Nuclear Generating Station (SONGS) Third Ten-Year Interval Inservice Inspection (ISI) Program: Extension of the interval for volumetric examination of essentially 100% of reactor vessel pressure retaining, Examination Category B-A and B-D welds, from 10 years to 20 years. Approval of this request would result in a reduction in man-rem exposure and examination costs. Enclosure 1 provides the details of this request as Third Ten-Year ISI 10CFR50.55a request ISI-3-32 for Unit 2. Enclosure 2 provides the details of this request as Third Ten-Year ISI 10CFR50.55a request ISI-3-33 for Unit 3.

Pursuant to 10 CFR 50.55a(a)(3)(ii), SCE also requests NRC approval of the following request for the SONGS Third Ten-Year Interval ISI Program: Extension of the interval from 10 to 20 years for visual examination under ASME Section XI Table IWB-2500-1 examination categories B-N-2 and B-N-3, Item Nos. B13.50, B13.60, and B13.70. Enclosure 3 of this letter provides the details of this request as Third Ten-Year ISI 10CFR50.55a request ISI-3-34 for Units 2 and 3.

This letter and the Enclosures contain no new commitments.

Should you have any questions, please contact Ms. Linda T. Conklin at (949) 368-9443.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Hall". The signature is fluid and cursive, with a large initial "R" and a long, sweeping tail.

Enclosure 1: ISI-3-32 for Unit 2
Enclosure 2: ISI-3-33 for Unit 3
Enclosure 3: ISI-3-34 for Units 2 and 3

cc: E. E. Collins, Regional Administrator, NRC Region IV
R. Hall, NRC Project Manager, San Onofre Units 2 and 3
G. G. Warnick, NRC Senior Resident Inspector, San Onofre Units 2 and 3

Enclosure 1

**10 CFR 50.55a Request ISI-3-32
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides
Acceptable Level of Quality or Safety
San Onofre Nuclear Generating Station, Unit 2**

San Onofre Unit 2

**10 CFR 50.55a Request ISI-3-32
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

1. ASME Code Component(s) Affected

The affected component is the San Onofre Nuclear Generating Station (SONGS) Unit 2 reactor vessel, specifically the following 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.

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-A	B1.40	Head-to-Flange Weld
B-D	B3.90	Nozzle-to-Vessel Welds
B-D	B3.100	Nozzle Inside Radius Section

(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

ASME Code Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” Code 1995 Edition with the 1996 Addenda.

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. The SONGS Unit 2 third 10-year in-service inspection interval ends in 2013. The applicable Code for the fourth 10-year in-service inspection interval will be selected in accordance with the rules of 10 CFR 50.55a.

**10 CFR 50.55a Request ISI-3-32
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

4. Reason for Request

An alternative is requested from the requirement of IWB-2412, Inspection Program B, that volumetric examination of essentially 100% of reactor vessel pressure retaining, Examination Category B-A and B-D welds, be performed once each ten-year interval. Extension of time frame between Examination Category B-A and B-D welds from 10 years to 20 years will result in a reduction in man-rem exposure and examination costs.

5. Proposed Alternative and Basis for Use

Southern California Edison proposes to not perform the ASME Code required volumetric examination of the SONGS Unit 2 reactor vessel full penetration pressure retaining Examination Category B-A and B-D welds for the third in-service inspection interval. These examinations would need to be performed in 2012 without approval of this relief request. Southern California Edison will perform the ASME Code required volumetric examination of the SONGS Unit 2 reactor vessel full penetration pressure retaining Examination Category B-A and B-D welds for the fourth in-service inspection interval in 2022. These dates are within one refueling outage of the dates provided in PWR Owners Group letter OG-06-356 (Reference 2) and the revised implementation plan (Reference 3). In accordance with IWA-2430(d)(1), the proposed inspection date of 2022 may be reduced or extended by as much as one year.

In accordance with 10 CFR 50.55a(a)(3)(i), an alternate inspection interval is requested on the basis that the current time frame can be extended based on a negligible change in risk by satisfying the risk criteria specified in Regulatory Guide 1.174 (Reference 4).

The methodology used to conduct this analysis is based on that defined in the study WCAP-16168-NP-A, Revision 2, "Risk Informed Extension of the Reactor Vessel In-Service Inspection Interval" (Reference 5). This study focuses on risk assessments of materials within beltline region of the RV wall. The results of the time frame calculations for SONGS Unit 2 were compared to those obtained from the CE pilot plant evaluated in WCAP-16168-NP-A, Revision 2. Appendix A of the WCAP identifies the parameters to be compared. Demonstrating that the parameters for SONGS Unit 2 are bounded by the results of the CE pilot plant qualifies SONGS Unit 2 for an ISI interval extension. Table 1 below lists these critical parameters investigated in the WCAP and compares the results of the CE pilot plant to that SONGS Unit 2. Tables 2 and 3 provide additional information that was requested by NRC and included in Appendix A of Reference 5.

San Onofre Unit 2

**10 CFR 50.55a Request ISI-3-32
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

Table 1: Critical Parameters for Application of Bounding Analysis – SONGS Unit 2			
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 6)	PTS Generalization Study (Reference 7)	No
Through-Wall Cracking Frequency (TWCF)	3.16E-7 Events per year (Reference 5)	9.24E-13 Events per year (Calculated per Reference 5)	No
Frequency and Severity of Design Basis Transients	13 heatup/cooldown cycles per year (Reference 5)	Bounded by 13 heatup/cooldown cycles per year	No
Cladding Layers (Single/Multiple)	Single Layer (Reference 5)	Single Layer	No

Table 2 below provides a summary of the latest reactor vessel inspection for SONGS Unit 2 and evaluation of the recorded indications. This information confirms that satisfactory examinations have been performed on the SONGS Unit 2 reactor vessel.

Table 2: Additional Information Pertaining to Reactor Vessel Inspection – SONGS Unit 2	
Inspection methodology:	During the most recent in-service inspection, all Category B-A shell-to-shell welds, including those located within the beltline region of the RV, were inspected according to ASME Section XI Appendix VIII 1995 Edition with the 1996 Addenda, as modified by 10CFR50.55a(b)(2)(xiv, xv and xvi) (Reference 1) requirements. All other Category B-A and B-D weld inspections were performed to ASME Section XI and Section V 1989 Edition requirements for examinations applicable to operational Interval 2. USNRC Regulatory Guide 1.150, Revision 1 (Reference 8) was applicable to flange-to-shell and nozzle examinations from the nozzle bore requirements. Future in-service inspections will 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:	There were three recordable indications identified during the most recent in-service inspection but none were in the beltline region. The recorded indications were evaluated per ASME Code Section XI, 1989 Edition IWB-3510 and found to be acceptable with no further evaluation required.
Proposed inspection schedule for balance of plant life:	The third in-service inspection must be performed in 2012. Pending approval of this relief request, this inspection will be performed in 2022. These dates are within one refueling outage of the dates provided in OG-06-356 (Reference 2) and the revised implementation plan (Reference 3).

San Onofre Unit 2

**10 CFR 50.55a Request ISI-3-32
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

Table 3 summarizes the inputs and outputs for the calculation of through-wall cracking frequency (TWCF).

Table 3: Details of TWCF Calculation – SONGS Unit 2 at 54 Effective Full Power Years (EFPY)								
Inputs								
Reactor Coolant System Temperature, T_{RCS} [°F]:			N/A		T _{wall} [inches]:			8.84375
No.	Region/Component Description	Material Heat No./Type	Cu ⁽¹⁾ [wt%]	Ni ⁽¹⁾ [wt%]	R.G. 1.99 Pos.	CF ⁽²⁾ [°F]	RT _{NDT(u)} ⁽¹⁾ [°F]	Fluence [10^{19} Neutron/cm ² , E > 1.0 MeV]
1	Inter. Shell Long. Weld 2-203 A	E8018	0.03	0.90	1.1	41	-60	7.27
2	Inter. Shell Long. Weld 2-203 B	E8018	0.03	0.91	1.1	41	-60	7.27
3	Inter. Shell Long. Weld 2-203 C	E8018	0.03	0.95	1.1	41	-60	7.27
4	Lower Shell Long. Weld 3-203 A	83637	0.05	0.12	1.1	40	-50	7.38
5	Lower Shell Long. Weld 3-203 B	83637	0.04	0.06	1.1	30	-50	7.38
6	Lower Shell Long. Weld 3-203 C	83637	0.06	0.11	1.1	42	-50	7.38
7	Lower-Inter. Shell Girth Weld 9-203	90130	0.07	0.29	1.1	69	-60	7.38
8	Intermediate Shell C-6404-1	SA-533B Cl.1	0.10	0.56	1.1	65	20	7.27
9	Intermediate Shell C-6404-2	SA-533B Cl.1	0.10	0.59	1.1	65	20	7.27
10	Intermediate Shell C-6404-3	SA-533B Cl.1	0.10	0.56	1.1	65	20	7.27
11	Lower Shell C-6404-4	SA-533B Cl.1	0.10	0.62	1.1	65	20	7.38
12	Lower Shell C-6404-5	SA-533B Cl.1	0.11	0.64	1.1	75	10	7.38
13	Lower Shell C-6404-6	SA-533B Cl.1	0.10	0.58	1.1	65	-10	7.38
Outputs								
Methodology Used to Calculate ΔT_{30} :				Regulatory Guide 1.99, Revision 2 ⁽³⁾				
	Controlling Material Region No. (From Above)	RT _{MAX-XX} [°R]	Fluence [10^{19} Neutron/cm ² , E > 1.0 MeV]	FF (Fluence Factor)	ΔT_{30} [°F]	TWCF _{95-XX}		
Limiting Axial Weld - AW		12	580.0	7.38	1.471	110.34	0.00E+00	
Limiting Plate - PL		12	580.0	7.38	1.471	110.34	3.70E-13	
Circumferential Weld - CW		12	580.0	7.38	1.471	110.34	0.00E+00	
TWCF _{95-TOTAL} ($\alpha_{AW}TWCF_{95-AW} + \alpha_{PL}TWCF_{95-PL} + \alpha_{CW}TWCF_{95-CW}$):							9.24E-13	

- (1) Reference 9
- (2) Reference 10
- (3) Reference 11

San Onofre Unit 2

10 CFR 50.55a Request ISI-3-32 In Accordance with 10 CFR 50.55a(a)(3)(i) Proposed Alternative Provides Acceptable Level of Quality and Safety

6. Duration of Proposed Alternative

This request is applicable to the SONGS Unit 2 inservice inspection program for the third and fourth 10-year inspection intervals.

Precedents:

- Letter from M. D. Flaherty, (Calvert Cliffs Nuclear Power Plant) to Document Control Desk (NRC), dated February 18, 2009 (ADAMS Accession No. ML090540062); Subject: "Unit 1; Docket No. 50-317, Request to Extend the Inservice Inspection Interval for Reactor Vessel Weld Examinations - Relief Requests (ISI-022 and ISI-023)
- Letter from N. L. Salgado (NRC) to J. A. Spina (Calvert Cliffs Nuclear Power Plant, dated November 9, 2009 (ADAMS Accession No. ML093030052); Subject: "Relief Requests Inservice Inspection (ISI)-022 and ISI-023 to Extend Reactor Vessel and Reactor Vessel Internal Weld Examinations - Calvert Cliffs Nuclear Power Plant, Unit No. 1 (TAC Nos. ME0668 and ME0669)

7. References

1. ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with the 1996 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. OG-09-454, "Revised 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." PA-MS-0120," December 1, 2009.
4. 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.
5. WCAP-16168-NP-A, Revision 2, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval," June 2008.
6. NUREG-1874, 10 CFR Part 50.61a, "Alternate Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," 10/3/07 (ADAMS Accession Number ML070860156).

San Onofre Unit 2

**10 CFR 50.55a Request ISI-3-32
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

7. NRC Letter Report, "Generalization of Plant-Specific Pressurized Thermal Shock (PTS) Risk Results to Additional Plants," December 14, 2004 (ADAMS Accession Number ML042880482).
8. NRC Regulatory Guide 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," February 1983.
9. BAW-2408, "Analysis of the 263° Capsule Southern California Edison Company San Onofre Unit 2 Nuclear Generating Station," 10/2001.
10. WCAP-16005-NP, Revision 6, "San Onofre Nuclear Generating Station Unit 2 RCS Pressure and Temperature Limits Report", 10/2008.
11. NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials", May 1988.

Enclosure 2

**10 CFR 50.55a Request ISI-3-33
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides
Acceptable Level of Quality and Safety
San Onofre Nuclear Generating Station, Unit 3**

San Onofre Unit 3

10 CFR 50.55a Request ISI-3-33 In Accordance with 10 CFR 50.55a(a)(3)(i) Proposed Alternative Provides Acceptable Level of Quality and Safety

1. ASME Code Component(s) Affected

The affected component is the San Onofre Nuclear Generating Station (SONGS) Unit 3 reactor vessel, specifically the following 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.

Examination

<u>Category</u>	<u>Item No.</u>	<u>Description</u>
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-A	B1.40	Head-to-Flange Weld
B-D	B3.90	Nozzle-to-Vessel Welds
B-D	B3.100	Nozzle Inside Radius Section

(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

ASME Code Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” Code 1995 Edition with the 1996 Addenda.

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. The SONGS Unit 3 third 10-year in-service inspection interval ends in 2013. The applicable Code for the fourth 10-year in-service inspection interval will be selected in accordance with the rules of 10 CFR 50.55a.

**10 CFR 50.55a Request ISI-3-33
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

4. Reason for Request

An alternative is requested from the requirement of IWB-2412, Inspection Program B, that volumetric examination of essentially 100% of reactor vessel pressure retaining, Examination Category B-A and B-D welds, be performed once each ten-year interval. Extension of time frame between Examination Category B-A and B-D welds from 10 years to up to 20 years will result in a reduction in man-rem exposure and examination costs.

5. Proposed Alternative and Basis for Use

Southern California Edison proposes to not perform the ASME Code required volumetric examination of the SONGS Unit 3 reactor vessel full penetration pressure retaining Examination Category B-A and B-D welds for the third in-service inspection interval. These examinations would need to be performed in 2012 without approval of this relief request. Southern California Edison will perform the ASME Code required volumetric examination of the SONGS Unit 3 reactor vessel full penetration pressure retaining Examination Category B-A and B-D welds for the fourth in-service inspection interval in 2022. These dates are within one refueling outage of the dates provided in PWR Owners Group letter OG-06-356 (Reference 2) and the revised implementation plan (Reference 3). In accordance with IWA-2430(d)(1), the proposed inspection date of 2022 may be reduced or extended by as much as one year.

In accordance with 10 CFR 50.55a(a)(3)(i), an alternate inspection interval is requested on the basis that the current time frame can be extended based on a negligible change in risk by satisfying the risk criteria specified in Regulatory Guide 1.174 (Reference 4).

The methodology used to conduct this analysis is based on that defined in the study WCAP-16168-NP-A, Revision 2, "Risk Informed Extension of the Reactor Vessel In-Service Inspection Interval" (Reference 5). This study focuses on risk assessments of materials within beltline region of the RV wall. The results of the time frame calculations for SONGS Unit 3 were compared to those obtained from the CE pilot plant evaluated in WCAP-16168-NP-A, Revision 2. Appendix A of the WCAP identifies the parameters to be compared. Demonstrating that the parameters for SONGS Unit 3 are bounded by the results of the CE pilot plant qualifies SONGS Unit 3 for an ISI interval extension. Table 1 below lists these critical parameters investigated in the WCAP and compares the results of the CE pilot plant to that SONGS Unit 3. Tables 2 and 3 provide additional information that was requested by NRC and included in Appendix A of Reference 5.

San Onofre Unit 3

**10 CFR 50.55a Request ISI-3-33
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

Table 1: Critical Parameters for Application of Bounding Analysis – SONGS Unit 3			
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 6)	PTS Generalization Study (Reference 7)	No
Through-Wall Cracking Frequency (TWCF)	3.16E-7 Events per year (Reference 5)	6.78E-12 Events per year (Calculated per Reference 5)	No
Frequency and Severity of Design Basis Transients	13 heatup/cooldown cycles per year (Reference 5)	Bounded by 13 heatup/cooldown cycles per year	No
Cladding Layers (Single/Multiple)	Single Layer (Reference 5)	Single Layer	No

Table 2 below provides a summary of the latest reactor vessel inspection for SONGS Unit 3 and evaluation of the recorded indications. This information confirms that satisfactory examinations have been performed on the SONGS Unit 3 reactor vessel.

Table 2: Additional Information Pertaining to Reactor Vessel Inspection – SONGS Unit 3	
Inspection methodology:	The most recent in-service inspection of the Category B-A and B-D welds was performed to ASME Section XI Appendix VIII 1995 Edition with the 1996 Addenda, as modified by 10CFR50.55a(b)(2)(xiv, xv and xvi) (Reference 1). USNRC Regulatory Guide 1.150, Revision 1 (Reference 8) was applicable to the flange-to-shell weld as examined manually from the flange seal surface. Future in-service inspections will be performed to ASME Section XI Appendix VIII requirements.
Number of past inspections:	Two 10-Year in-service inspections have been performed.
Number of indications found:	There were four recordable indications identified during the most recent in-service inspection, but only one indication was in the beltline region. This indication was acceptable per Table IWB-3510 of Section XI of the ASME Code. The indication is within the inner 1/10 th or 1” of the reactor vessel thickness, has a through-wall extent of 0.18”, and is located within the weld material of the RV beltline. Twenty three indications of this size would be allowable per the requirements of the Alternate PTS Rule, 10 CFR 50.61a (Reference 9). The remaining three indications were evaluated per ASME Code IWB-3510 for a Category B-A weld, IWB-3512 for a B-D weld, and IWB-3514 for a B-J weld and found to be acceptable with no further evaluation required.
Proposed inspection schedule for balance of plant life:	The third in-service inspection must be performed in 2012. Pending approval of this relief request, this inspection will be performed in 2022. These dates are within one refueling outage of the dates provided in OG-06-356 (Reference 2) and the revised implementation plan (Reference 3).

San Onofre Unit 3

**10 CFR 50.55a Request ISI-3-33
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

Table 3 summarizes the inputs and outputs for the calculation of through-wall cracking frequency (TWCF).

Table 3: Details of TWCF Calculation – SONGS Unit 3 at 54 Effective Full Power Years (EFPY)								
Inputs								
Reactor Coolant System Temperature, T_{RCS} [°F]:			N/A		T _{wall} [inches]:			8.84375
No.	Region/Component Description	Material Heat No./Type	Cu ⁽¹⁾ [wt%]	Ni ⁽¹⁾ [wt%]	R.G. 1.99 Pos.	CF ⁽²⁾ [°F]	RT _{NDT(u)} ⁽¹⁾ [°F]	Fluence [10^{19} Neutron/cm ² , E > 1.0 MeV]
1	Inter. Shell Long. Weld 2-203 A	83650	0.04	0.17	1.1	40	-40	6.73
2	Inter. Shell Long. Weld 2-203 B	83650	0.05	0.21	1.1	50	-40	6.73
3	Inter. Shell Long. Weld 2-203 C	83650	0.04	0.08	1.1	32	-40	6.73
4	Lower Shell Long. Weld 3-203 A	88114	0.04	0.21	1.1	44	-70	6.52
5	Lower Shell Long. Weld 3-203 B	88114	0.04	0.19	1.1	42	-70	6.52
6	Lower Shell Long. Weld 3-203 C	88114	0.04	0.21	1.1	44	-70	6.52
7	Lower-Inter. Shell Girth Weld 9-203	90069 and 90144	0.06	0.04	1.1	34 ⁽³⁾	-50 ⁽³⁾	6.73
8	Intermediate Shell C-6802-1	SA-533B Cl.1	0.06	0.58	1.1	72	40	6.73
9	Intermediate Shell C-6802-2	SA-533B Cl.1	0.04	0.57	1.1	26	10	6.73
10	Intermediate Shell C-6802-3	SA-533B Cl.1	0.06	0.58	1.1	37	20	6.73
11	Lower Shell C-6802-4	SA-533B Cl.1	0.05	0.56	1.1	31	10	6.52
12	Lower Shell C-6802-5	SA-533B Cl.1	0.04	0.55	1.1	26	10	6.52
13	Lower Shell C-6802-6	SA-533B Cl.1	0.06	0.62	1.1	37	20	6.52
Outputs								
Methodology Used to Calculate ΔT_{30} :				Regulatory Guide 1.99, Revision 2 ⁽⁴⁾				
	Controlling Material Region No. (From Above)	RT _{MAX-XX} [°R]	Fluence [10^{19} Neutron/cm ² , E > 1.0 MeV]	FF (Fluence Factor)	ΔT_{30} [°F]	TWCF _{95-XX}		
	Limiting Axial Weld - AW	8	604.5	6.73	1.457	104.87	0.00E+00	
	Limiting Plate - PL	8	604.5	6.73	1.457	104.87	2.71E-12	
	Circumferential Weld - CW	8	604.5	6.73	1.457	104.87	0.00E+00	
TWCF _{95-TOTAL} ($\alpha_{AW}TWCF_{95-AW} + \alpha_{PL}TWCF_{95-PL} + \alpha_{CW}TWCF_{95-CW}$):							6.78E-12	

(1) Reference 10

(2) Reference 11

(3) Maximum value for two heats of material

(4) Reference 12

**10 CFR 50.55a Request ISI-3-33
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

6. Duration of Proposed Alternative

This request is applicable to the SONGS Unit 3 inservice inspection program for the third and fourth 10-year inspection intervals.

Precedents:

- Letter from M. D. Flaherty, (Calvert Cliffs Nuclear Power Plant) to Document Control Desk (NRC), dated February 18, 2009 (ADAMS Accession No. ML090540062); Subject: "Unit 1; Docket No. 50-317, Request to Extend the Inservice Inspection Interval for Reactor Vessel Weld Examinations - Relief Requests (ISI-022 and ISI-023)
- Letter from N. L. Salgado (NRC) to J. A. Spina (Calvert Cliffs Nuclear Power Plant, dated November 9, 2009 (ADAMS Accession No. ML093030052); Subject: "Relief Requests Inservice Inspection (ISI)-022 and ISI-023 to Extend Reactor Vessel and Reactor Vessel Internal Weld Examinations - Calvert Cliffs Nuclear Power Plant, Unit No. 1 (TAC Nos. ME0668 and ME0669)

7. References

1. ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with the 1996 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. OG-09-454, "Revised 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." PA-MS-0120," December 1, 2009.
4. 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.
5. WCAP-16168-NP-A, Revision 2, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval," June 2008.
6. NUREG-1874, 10 CFR Part 50.61a, "Alternate Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," 10/3/07 (ADAMS Accession Number ML070860156).

San Onofre Unit 3

**10 CFR 50.55a Request ISI-3-33
In Accordance with 10 CFR 50.55a(a)(3)(i)
Proposed Alternative Provides Acceptable Level of Quality and Safety**

7. NRC Letter Report, "Generalization of Plant-Specific Pressurized Thermal Shock (PTS) Risk Results to Additional Plants," December 14, 2004 (ADAMS Accession Number ML042880482).
8. NRC Regulatory Guide 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," February 1983.
9. Code of Federal Regulations, 10 CFR Part 50.61a, "Alternate Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," U.S. Nuclear Regulatory Commission, Washington D. C., Federal Register, Volume 75, No. 1, dated January 4, 2010 and No. 22 with corrections to part (g) dated February 3, 2010.
10. BAW-2454, "Analysis of the 263° Capsule Southern California Edison Company San Onofre Unit 3 Nuclear Generating Station," 1/2004.
11. WCAP-16167-NP, Revision 2, "San Onofre Nuclear Generating Station Unit 3 RCS Pressure and Temperature Limits Report", 10/2008.
12. NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials", May 1988.

Enclosure 3

**10 CFR 50.55a Request ISI-3-34
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Hardship without a Compensating Increase
in the Level of Quality and Safety
San Onofre Nuclear Generating Station, Units 2 and 3**

San Onofre Units 2 and 3

10 CFR 50.55a Request ISI-3-34

In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship without Compensating Increase in the Level of Quality and Safety

American Society of Mechanical Engineers (ASME) Code Component(s)

Affected

The affected components are the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 reactor pressure vessels (RPVs), specifically the following ASME Boiler and Pressure Vessel (BPV) Code Section XI (Reference 1) examination categories and item numbers covering examinations of the RPVs. These examination categories and item numbers are from IWB-2500 and Table IWB-2500-1 of the ASME BPV, Code Section XI.

<u>Examination Category</u>	<u>Item No.</u>	<u>Description</u>
B-N-2	B13.50	Interior Attachments Within Beltline Region
B-N-2	B13.60	Interior Attachments Beyond Beltline Region
B-N-3	B13.70	Core Support Structure

(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”.)

Applicable Code Edition and Addenda

ASME Code Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” Code 1995 Edition with the 1996 Addenda.

Applicable Code Requirement

In accordance with IWA-2430(d)(1), each inspection interval may be reduced or extended by as much as one year. Adjustments shall not cause successive intervals to be altered more than one year from the original pattern of intervals.

Additionally, Table IWB-2500-1, Examination Categories B-N-2 and B-N-3, Item Numbers B13.50, 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 current SONGS Unit 2 and Unit 3 third 10-year ISI interval began on August 18, 2003 and is scheduled to end on August 17, 2013.

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).

San Onofre Units 2 and 3

10 CFR 50.55a Request ISI-3-34

In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship without Compensating Increase in the Level of Quality and Safety

To implement the change presented in Reference 2, we are submitting Enclosures 1 and 2 (ISI-3-32 and ISI-3-33 for Units 2 and 3, respectively), in accordance 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. In Enclosures 1 and 2 SCE identified 2022 for Units 2 and 3 as the year in which future inspection of the Examination Categories B-A and B-D RPV welds will be performed. The intent of this relief request (ISI-3-34) is to allow deferral of the subject examinations to the same time (2022) as the Examination Categories B-A and B-D RPV welds described in Enclosures 1 and 2.

During the ten-year ISI of the RPV shell, lower head, and nozzle welds performed in 2002 for Unit 2 and 2003 for Unit 3, SONGS 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 designed plants) requires removal to facilitate examination of the RPV 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 RPV shell welds and nozzle welds from the RPV interior can be used to implement the required RVI examinations. Additionally, removing the RPV internals only once to accommodate all the examinations discussed in this relief request would result in significant savings in radiation exposure.

Proposed Alternative and Basis for Use

The current SONGS Unit 2 and Unit 3 third 10-year ISI interval began on August 18, 2003 and is scheduled to end on August 17, 2013. An extension of one year is allowed in ASME, Section XI, IWA-2430(d)(1).

SONGS proposes to perform the subject examinations during the fourth ten-year ISI interval for both Units 2 and 3. The subject examinations would need to be performed during the 1st quarter 2012 refueling outage for Unit 2 and the 4th quarter 2012 outage for Unit 3, pending approval of this relief request. The proposed alternative inspection would enable the subject examinations to be performed during refueling outages in 2022 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 RPV interior attachments and core support structure separate in time from the RPV shell, head, and nozzle welds would result in hardship or unusual difficulty without a compensating increase in quality or safety.

San Onofre Units 2 and 3

10 CFR 50.55a Request ISI-3-34

In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship without Compensating Increase in the Level of Quality and 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 RPV. 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 RPV interior attachments and the core support structure have been performed twice per unit at SONGS. During the second ten-year ISI interval visual inspection on Unit 3, three indications were noted. These indications were evaluated as non-relevant conditions and acceptable for continued operation. There were no other relevant indications noted during the examinations. The examinations were last performed during the 2002 refueling outage for Unit 2 and the 2003 outage for Unit 3 with acceptable results. Additionally, review of industry surveys indicate that these examinations have been performed many times by the industry without any significant findings relevant to the SONGS 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 the 2012 refueling outages for Units 2 and 3, SONGS will be performing the ASME Examination Category B-N-1 visual examination. This examination will include 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 to 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.

San Onofre Units 2 and 3

10 CFR 50.55a Request ISI-3-34

In Accordance with 10 CFR 50.55a(a)(3)(ii)

Hardship without Compensating Increase in the Level of Quality and Safety

Duration of Proposed Alternative

This proposed alternative is applicable to the third and fourth ten-year ISI for the Examination Categories B-N-2 and B-N-3, Item Numbers B13.50, B13.60, and B13.70 visual examinations.

Precedents:

- Letter from M. D. Flaherty, (Calvert Cliffs Nuclear Power Plant) to Document Control Desk (NRC), dated February 18, 2009 (ADAMS Accession No. ML090540062); Subject: "Unit 1; Docket No. 50-317, Request to Extend the Inservice Inspection Interval for Reactor Vessel Weld Examinations - Relief Requests (ISI-022 and ISI-023)
- Letter from N. L. Salgado (NRC) to J. A. Spina (Calvert Cliffs Nuclear Power Plant, dated November 9, 2009 (ADAMS Accession No. ML093030052); Subject: "Relief Requests Inservice Inspection (ISI)-022 and ISI-023 to Extend Reactor Vessel and Reactor Vessel Internal Weld Examinations - Calvert Cliffs Nuclear Power Plant, Unit No. 1 (TAC Nos. ME0668 and ME0669)

References

1. ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with the 1996 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