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10 CFR 50.55a

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

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Request for Authorization to Extend the Third 10-Year Inservice Inspection Interval for Reactor Vessel Weld Examination

References:

1) Letter from Nuclear Regulatory Commission (NRC) to Nuclear Management Company, LLC (NMC), "Palisades Nuclear Plant – Request for Authorization to Extend the Third Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MC6547)," dated November 29, 2005 (ADAMS Accession number ML053200296)

2) Letter from NRC to NMC "Palisades Nuclear Plant – Corrected Page for Request for Authorization to Extend the Third Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MC6547)," dated December 14, 2005 (ADAMS Accession number ML053460170)

3) Letter from NRC to Entergy Nuclear Operations, Inc. "Palisades Nuclear Plant – Request for Authorization to Extend the Third Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MD3059)," dated September 4, 2007 (ADAMS Accession number ML071770387)

4) Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated November 2002 (ADAMS Accession number ML023240437)

5) Letter from NRC to Mr. Gordon Bischoff, Manager Owners Group Program Management Office, "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 (ADAMS Accession numbers ML081060051 and ML081060045)

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy Nuclear Operations, Inc. (ENO) is requesting Nuclear Regulatory Commission (NRC) approval for the use of an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, paragraph IWB-2412, Inspection Program B, for the Palisades Nuclear Plant (PNP).

The third inspection interval for PNP started on May 12, 1995, and considering the ASME Code-allowed extensions, was originally scheduled to end on December 12, 2006. The examination of the reactor vessel (RV) welds (Category B-A), the nozzle-to-vessel welds and inner radius sections (Category B-D), for the third interval would need to be completed by the end of the spring 2009 refueling outage, as allowed by two previously approved relief requests (References 1, 2, and 3).

NRC approval is requested to extend the third inspection interval, for RV pressure retaining welds, examination category B-A and B-D until December 12, 2015, for the subject examinations. The technical justification for this request is consistent with the guidance provided in Regulatory Guide 1.174, dated November 2002 (Reference 4). Additionally, NRC-approved topical report WCAP-16168-NP-A, Revision 2 (Reference 5) includes an evaluation of risk based on PNP site-specific information. The extension of the inspection interval for these examinations would result in an acceptable level of quality and safety, as described in the enclosed request.

In accordance with Reference 5, a proposed license amendment request is being submitted separately and concurrent with this proposed alternative.

ENO requests approval by March 2, 2009. However, ENO would like approval sooner to accommodate outage planning.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

Christopher J. Schwarz
Site Vice President
Palisades Nuclear Plant

Enclosure

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE
REQUEST FOR AUTHORIZATION TO EXTEND THE THIRD 10-YEAR INSERVICE INSPECTION INTERVAL FOR REACTOR VESSEL WELD EXAMINATION PALISADES NUCLEAR PLANT

1.0 ASME Code Component(s) Affected

The affected component is the Palisades Nuclear Plant (PNP) reactor vessel (RV), specifically, the following American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI examination categories and item numbers covering examinations of the 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 Head 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

(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.")

2.0 Applicable Code Edition and Addenda

The PNP third interval Inservice Inspection (ISI) program plan was prepared to the 1989 edition of the Code.

3.0 Applicable Code Requirement

IWB-2412, Inspection Program B, requires volumetric examination of essentially 100% of RV pressure retaining welds identified in Table IWB-2500-1, once each ten-year interval. In accordance with IWA-2430(d) and IWA-2430(e), PNP's third inspection interval was scheduled to conclude on December 12, 2006. However, the third interval has been extended until the spring 2009 refueling outage for the subject examinations as allowed by two previously approved relief requests (References 1, 2, and 3).

4.0 Reason for Request

An alternative is requested from the requirement of IWB-2412, Inspection Program B, that volumetric examination of essentially 100% of RV pressure retaining welds,

examination categories B-A and B-D be performed once each ten-year interval. Further extension of the third inspection interval, for RV pressure retaining welds examination category B-A and B-D until December 12, 2015, is requested for the subject examinations.

The intent of the requested extension is to allow for the subject examinations to be performed in accordance with the date provided in the industry plan for implementation of a 20-year ISI interval. This plan was provided to the Nuclear Regulatory Commission (NRC) on October 31, 2006, in Pressurized Water Reactor Owners Group (PWROG) letter 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" (Reference 4). While this letter provided an implementation plan based on planned implementation of Revision 1 of WCAP-16168-NP it is still applicable per the final safety evaluation for WCAP-16168-NP, Revision 2 (Reference 5).

5.0 Proposed Alternative and Basis for Use

The third inspection interval for PNP started on May 12, 1995, and was originally scheduled to end on December 12, 2006. This inspection interval included credit for the IWA-2430(d) allowed one-year extension and the IWA-2430(e) allowed 215-day extension, due to the 2001 extended maintenance outage. The subject examinations would need to be completed by the end of the spring 2009 refueling outage as allowed by the previous relief requests that were approved by letters dated November 29, 2005, December 14, 2005, and September 4, 2007 (References 1, 2, and 3). The date proposed in this request is ten years beyond the Code-allowed inspection interval. In accordance with 10 CFR 50.55a(a)(3)(i), this interval extension is requested on the basis that the current inspection interval can be extended, while providing an acceptable level of quality and safety.

The technical justification for the extension in ISI interval is presented for the ASME Category B-A and B-D welds. These welds were addressed in the recent NRC effort to re-evaluate the risk of pressurized thermal shock (References 7, 8, and 9) and in WCAP-16168-NP-A, Revision 2 (Reference 5). The technical justification for the proposed interval extension for the Category B-A and B-D welds is discussed in the following sections.

5.1 Risk of Palisades Vessel Failure due to Pressurized Thermal Shock

PNP was one of three pilot plants evaluated in the recent NRC effort to re-evaluate the risk of pressurized thermal shock. These efforts are summarized in NUREG-1806, "Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening Limit in the PTS Rule (10 CFR 50.61): Summary Report" (Reference 7) and NUREG-1874, "Recommended Screening Limits for Pressurized Thermal Shock (PTS)" (Reference 8). These NUREG reports form the basis for the proposed voluntary pressurized thermal shock rule, 10 CFR 50.61a, described in SECY-07-0104, "Proposed Rulemaking –

Alternate Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events (RIN 3150-AI01)" (Reference 9).

The above mentioned reports describe detailed and thorough analyses of three pilot plants including PNP. The goal of these pilot plant analyses was to use state of the art techniques to evaluate the likelihood of through-wall cracking in pressurized water RVs. The three main steps of the analysis included a probabilistic risk assessment (PRA) event sequence analysis, thermal hydraulic analysis, and a probabilistic fracture mechanics (PFM) analysis. The PRA event sequence analysis determined the potential scenarios for which PTS may occur and the likelihood for each scenario to occur in terms of a frequency distribution. The thermal hydraulic response of the plant was determined for each of the postulated PTS scenarios. The thermal hydraulic response, in terms of pressure and temperature of the primary coolant system (PCS) inventory versus time, was then input into the PFM analysis along with plant-specific material and fluence properties for the RV beltline region. The beltline region is defined as that portion of the RV adjacent to the reactor core. This is the region of the RV that is of greatest concern for maintaining RV structural integrity. One other input to the PFM analysis, which is addressed in Section 5.3, was a distribution of flaw sizes for the RV beltline materials, including the Category B-A welds.

The PFM analysis, performed using the FAVOR Code, determined a probability of through-wall cracking distribution for each potential PTS scenario. The frequency distribution for each scenario was then combined with the probability of through wall cracking distribution to get a total plant through-wall cracking frequency (TWCF). The analysis described above took no credit for ISI, and fatigue crack growth was not considered. The resulting mean TWCF calculated for PNP at 60 effective full power years, as reported in NUREG-1874, is 7.85E-08 events per year. Given this low TWCF and the fact that the NRC PTS risk re-evaluation effort did not credit ISI or consider fatigue crack growth, it can be expected that the change-in-risk associated with extending ISI interval for the RV beltline would be extremely small. This is confirmed in Section 5.2.

5.2 Change-in-Risk Assessment for Palisades Category B-A and B-D Welds

The PWROG has performed an evaluation of the change in risk of extending the ISI interval for the RV Category B-A and B-D welds from 10 to 20 years. This evaluation is documented in topical report WCAP-16168-NP-A, Revision 2 (Reference 5) and has been approved by the NRC.

The analyses in the WCAP used PFM tools and inputs from the work described in Section 5.1 for the PTS risk re-evaluation. PNP was the pilot plant representing the Combustion Engineering (CE) nuclear steam supply system (NSSS) design. Therefore, this report is applicable to PNP. The PWROG analyses, however, incorporated the effects of fatigue crack growth and inservice inspection. Design basis transient data was used as input to the fatigue crack growth evaluation. PNP has operated within its design basis and is not expected to exceed the design basis number of transients

before the end of the PNP renewed operating license. The effects of ISI were modeled consistently with the previously-approved PFM codes, SRRA and PC-Praise, developed for evaluating the probability of failure in piping in risk-informed ISI programs (References 10 and 11). These effects were input into evaluations performed with the FAVOR PFM code. All other inputs were identical to those used in the PTS risk re-evaluation.

Two cases were evaluated with the FAVOR code. The base case, "10-year ISI interval," represented the current ASME Section XI 10-year ISI interval. The extended ISI interval case, "10-year ISI only," represented performing the first ten-year ISI and then eliminating ISI for the remainder of the plant life. The difference between these cases was taken to conservatively estimate the change-in-risk associated with extending the ten-year ISI interval to 20 years. To account for any uncertainties, a bounding change-in-risk was taken between a lower and upper bound. The lower bound was determined by subtracting two times the standard error output by FAVOR from the mean through wall cracking frequency for the 10-year ISI interval case. The upper bound was determined by adding two times the standard error to the mean through wall cracking frequency for the 10-year ISI only case. The results of this change-in-risk assessment are shown in Table 1.

Table 1: Palisades Reactor Vessel Failure Frequency Results	
10-Year ISI Only (Mean Value / Standard Error)	7.62E-08 / 4.08E-09
Upper Bound Value	8.44E-08
ISI Every 10 Years (Mean Value / Standard Error)	7.39E-08 / 3.80E-09
Lower Bound Value	6.63E-08
Bounding Change in Failure Frequency	1.81E-08

As shown in Table 1 the bounding change in RV failure frequency for PNP is 1.81E-08. As discussed in WCAP-16168-NP-A, if it is assumed that a though-wall crack in the RV results in a large early release, the change in large early release frequency (LERF) associated with the proposed extension of the ISI interval for the Category B-A and B-D welds at PNP can be estimated as 1.81E-08 events per year. This is less than the Regulatory Guide 1.174 (Reference 12) criterion of 1.0E-7 events per year for an acceptably small change in LERF.

5.3 Palisades ISI History for the Category B-A and B-D Welds

PNP is in its third ISI interval for the subject RV welds. Two ISIs have been performed on the Category B-A and B-D welds to date. These inspections have been performed in accordance with Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," (Reference 6). A summary of the inspections was provided to the NRC in previous relief requests (References 1 and 3) and is included in Attachment 1 to this request. These results indicate that no reportable indications have been found in any of the reactor vessel welds. Inspection

coverage has been greater than 90% for all welds in the RV beltline region. There are a total of four recordable indications in the RV beltline region. All of these indications are in the plate material and are acceptable per ASME Section XI Table IWB-3510-1. The four indications meet the "Allowable Number of Flaws" criterion in the proposed voluntary PTS Rule, 10 CFR 50.61a (Reference 9). An assessment of the PNP beltline indications to these criteria is provided in Table 2.

Table 2: Assessment of Palisades Plate Flaws to 10 CFR 50.61a Allowable Flaw Criteria

ASME Section XI Flaw Size per IWA-3200	Range of Through-Wall Extent (TWE) of Flaw (in.)	Allowable Number of Cumulative Flaws per 1000 Square Inches of Inside Diameter Surface Area in Forgings or Plates in the ASME Section XI Inspection Volume	Allowable Number of Cumulative Flaws for PNP (Based on 7682 square inches of Inside Diameter Surface Area in the ASME Section XI Inspection Volume)	Number of PNP Plate Flaws
0.05	$0.025 \leq TWE < 0.075$	Unlimited	Unlimited	0
0.10	$0.075 \leq TWE < 0.125$	8.049	61.83	0
0.15	$0.125 \leq TWE < 0.175$	3.146	24.17	2
0.20	$0.175 \leq TWE < 0.225$	0.853	6.55	1
0.25	$0.225 \leq TWE < 0.275$	0.293	2.25	1
0.30	$0.275 \leq TWE < 0.325$	0.0756	0.58	0
0.35	$0.325 \leq TWE < 0.375$	0.0144	0.11	0

Based on the assessment in Table 2, it can be concluded that the flaw distributions used in the PTS risk re-evaluation discussed in Section 5.1 and the ISI interval proposed extension evaluation discussed in Section 5.2 are bounding of the flaw conditions in the PNP RV beltline. Therefore, the numerical risk results from the PTS risk re-evaluation and the PWROG ISI interval extension effort are directly applicable for PNP.

5.4 Defense in Depth

While the results presented in WCAP-16168-NP-A demonstrate that eliminating future inspections after the initial 10-year ISI meets the Regulatory Guide 1.174 criterion for assessing risk, the proposed course of action is to extend the inspection interval requirements from 10 to 20 years while not eliminating any portion of the current inspection requirements. This provides additional margin for defense-in-depth and contributes directly toward maintaining plant safety. Further, as discussed in the WCAP:

Defense-in-depth philosophy is not expected to change unless:

- A significant increase in the existing challenges to the integrity of the barriers occurs.
- The probability of failure of each barrier changes significantly.
- New or additional failure dependencies are introduced that increase the likelihood of failure compared to the existing conditions.
- The overall redundancy and diversity in the barriers changes.

The proposed alternative to IWB-2412, Inspection Program B, would extend the interval for ISI of certain welds. It would not result in any of the changes identified above. It would not exempt the same components from other programs that may require inspections during the extended interval. Therefore, it can be expected that the defense-in-depth currently existing at Palisades would remain unchanged.

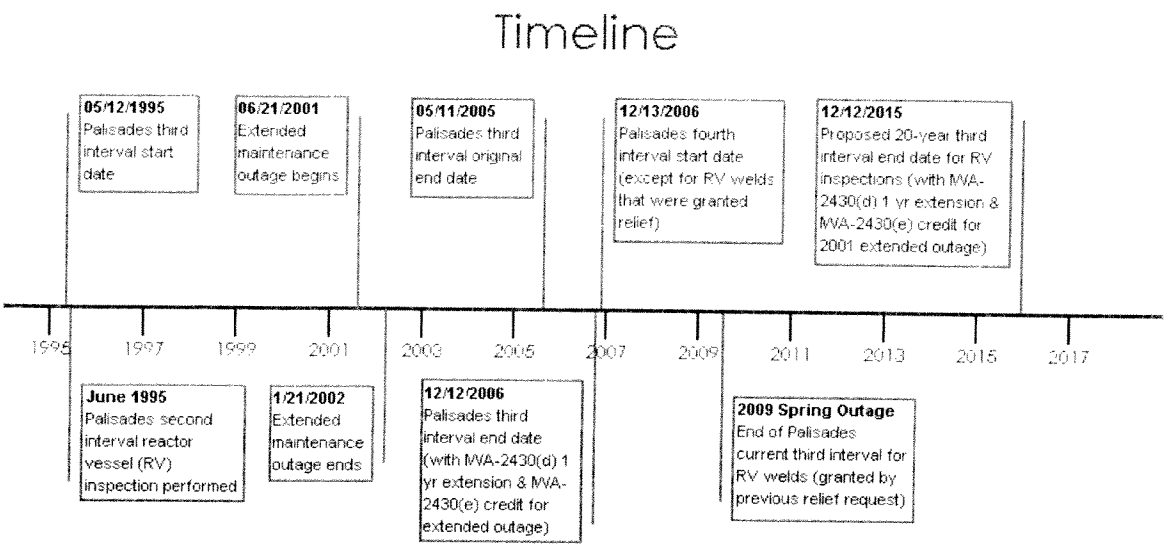
5.5 Summary

The technical basis presented in Sections 5.1 through 5.4 provides assurance that the proposed extension in ISI interval for the PNP RV pressure retaining welds Category B-A and B-D welds provides an acceptable level of quality and safety. Furthermore, the proposed extension in interval meets the regulatory criteria in Regulatory Guide 1.174, including requirements for maintaining defense-in-depth. The plant-specific information requested in section 3.4 of the final safety evaluation for WCAP-16168-NP, Revision 2, is included in Attachment 2.

6.0 Duration of Proposed Alternative

The proposed alternative is requested to extend the third ISI interval 10 years beyond the ASME Code required 10-year inspection interval and the Code-allowed 215-day extension for the subject examinations. This request is applicable to the third 10-year inspection interval only. If this relief request is approved, the third ISI interval for the subject examinations would end on December 12, 2015. Pending approval of this proposed alternative, future inspection for the subject examinations would be performed in, or before, 2015. Entergy Nuclear Operations, Inc. (ENO) is submitting a license amendment request concurrent with this proposed alternative per the requirements of the final safety evaluation for WCAP-16168-NP, Revision 2 (Reference 5).

A graphical presentation of the Palisades Reactor Vessel ASME Section XI code interval dates and inspections is provided below:



7.0 References

1. Letter from NRC to Nuclear Management Company (NMC) "Palisades Nuclear Plant – Request for Authorization to Extend the Third Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MC6547)" dated November 29, 2005 (ADAMS Accession number ML053200296)
2. Letter from NRC to NMC "Palisades Nuclear Plant – Corrected Page for Request for Authorization to Extend the Third Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MC6547)" dated December 14, 2005 (ADAMS Accession number ML053460170)
3. Letter from NRC to ENO "Palisades Nuclear Plant – Request for Authorization to Extend the Third Inservice Inspection Interval for Reactor Vessel Weld Examination (TAC NO. MD3059)" dated September 4, 2007 (ADAMS Accession number ML071770387)
4. PWROG Letter 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

5. Letter from NRC to Mr. Gordon Bischoff, Manager Owners Group Program Management Office, "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 (ADAMS Accession numbers ML081060051 and ML081060045)

6. Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," dated February 1983

7. NUREG-1806, "Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening Limit in the PTS Rule (10 CFR 50.61): Summary Report," August 2007, (ADAMS Accession numbers ML072830076 and ML072830081)

8. NUREG-1874, "Recommended Screening Limits for Pressurized Thermal Shock (PTS)," 2007, (ADAMS Accession number ML070860156)

9. SECY-07-0104, "Proposed Rulemaking — Alternate Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," June 25, 2007, Enclosure 1 (ADAMS Accession number ML070570525)

10. WCAP-14572-NP-A, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report," Revision 1, February 1999 (ADAMS Accession numbers ML012630327, ML012630349, and ML012630313)

11. NUREG/CR-5864, Theoretical and Users Manual for PC-PRAISE, July 1992

12. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," November 2002 (ADAMS Accession number ML023240437)

Attachment 1
Palisades Inservice Inspection Results

Weld ID	ASME Weld Category	ASME Code Item	Date Last Inspected	Percent Coverage Obtained	Number of Reportable Indications*	Number of Indications Currently Being Monitored*	Growth of Indications Currently Being Monitored*(in)
RPV Circumferential Weld 8-112	B-A	B1.11	June 1995	90.37	0	0	N/A
RPV Circumferential Weld 9-112	B-A	B1.11	June 1995	90.37	0	0	N/A
RPV Circumferential Weld 10-112	B-A	B1.11	June 1995	100	0	0	N/A
RPV Longitudinal Weld 1-112A	B-A	B1.12	June 1995	93.8	0	0	N/A
RPV Longitudinal Weld 1-112B	B-A	B1.12	June 1995	93	0	0	N/A
RPV Longitudinal Weld 1-112C	B-A	B1.12	June 1995	93	0	0	N/A
RPV Longitudinal Weld 2-112A	B-A	B1.12	June 1995	97.86	0	0	N/A
RPV Longitudinal Weld 2-112B	B-A	B1.12	June 1995	100	0	0	N/A
RPV Longitudinal Weld 2-112C	B-A	B1.12	June 1995	100	0	0	N/A
RPV Longitudinal Weld 3-112A	B-A	B1.12	June 1995	100	0	0	N/A
RPV Longitudinal Weld 3-112B	B-A	B1.12	June 1995	100	0	0	N/A
RPV Longitudinal Weld 3-112C	B-A	B1.12	June 1995	100	0	0	N/A
RPV Circumferential Weld 4-113	B-A	B1.21	June 1995	59.45	0	0	N/A
RPV Closure Head Weld 1-118A	B-A	B1.22	Sept 1983	100	0	0	N/A
RPV Closure Head Weld 1-118B	B-A	B1.22	Sept 1983	100	0	0	N/A
RPV Closure Head Weld 1-118C	B-A	B1.22	Sept 1983	100	0	0	N/A
RPV Closure Head Weld 1-118D	B-A	B1.22	Sept 1983	100	0	0	N/A
RPV Closure Head Weld 1-118E	B-A	B1.22	Sept 1983	100	0	0	N/A
RPV Closure Head Weld 1-118F	B-A	B1.22	June 1995	100	0	0	N/A
RPV Meridional Weld 1-113A	B-A	B1.22	June 1995	47	0	0	N/A
RPV Meridional Weld 1-113B	B-A	B1.22	June 1995	53	0	0	N/A
RPV Meridional Weld 1-113C	B-A	B1.22	June 1995	53	0	0	N/A

Attachment 1
Palisades Inservice Inspection Results

Weld ID	ASME Weld Category	ASME Code Item	Date Last Inspected	Percent Coverage Obtained	Number of Reportable Indications*	Number of Indications Currently Being Monitored*	Growth of Indications Currently Being Monitored*(in)
RPV Meridional Weld 1-113D	B-A	B1.22	June 1995	47	0	0	N/A
RPV Meridional Weld 1-113E	B-A	B1.22	June 1995	53	0	0	N/A
RPV Meridional Weld 1-113F	B-A	B1.22	June 1995	53	0	0	N/A
RPV Circumferential Weld 7-112	B-A	B1.30	June 1995	100	0	0	N/A
RPV Closure Head to Flange Weld 6-118A	B-A	B1.40	1999/2001	67	0	0	N/A
RPV Nozzle Inside Radius Weld 5-114A-IRS	B-D	B3.100	June 1995	100	0	0	N/A
RPV Nozzle Inside Radius Weld 5-114B-IRS	B-D	B3.100	June 1995	100	0	0	N/A
RPV Nozzle Inside Radius Weld 5-114C-IRS	B-D	B3.100	June 1995	100	0	0	N/A
RPV Nozzle Inside Radius Weld 5-114D-IRS	B-D	B3.100	June 1995	100	0	0	N/A
RPV Nozzle Inside Radius Weld 5-114E-IRS	B-D	B3.100	June 1995	100	0	0	N/A
RPV Nozzle Inside Radius Weld 5-114F-IRS	B-D	B3.100	June 1995	100	0	0	N/A
RPV Nozzle to Shell Weld 5-114A	B-D	B3.90	June 1995	100	0	0	N/A
RPV Nozzle to Shell Weld 5-114B	B-D	B3.90	June 1995	100	0	0	N/A
RPV Nozzle to Shell Weld 5-114C	B-D	B3.90	June 1995	100	0	0	N/A
RPV Nozzle to Shell Weld 5-114D	B-D	B3.90	June 1995	100	0	0	N/A
RPV Nozzle to Shell Weld 5-114E	B-D	B3.90	June 1995	100	0	0	N/A
RPV Nozzle to Shell Weld 5-114F	B-D	B3.90	June 1995	100	0	0	N/A

Note: Due to improvements in inspection technology, the most recent inspection is considered to be of the greatest quality of the inspections performed. In some instances, indications were found during inspections and then, in later inspections with improved equipment, were determined to be reflections rather than indications. Therefore, the inspection data provided in this table are for the most recent inservice inspection.

Attachment 2
WCAP-16168-NP Revision 2 NRC Safety Evaluation
Section 3.4 Information

Plant specific information for the Palisades Nuclear Plant (PNP) is provided in bold for each of the following five items denoted in section 3.4 of the final safety evaluation for topical report (TR) WCAP-16168-NP, Revision 2, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval," dated May 8, 2008.

1) Licensees must demonstrate that the embrittlement of their [reactor vessel] RV is within the envelope used in the supporting analyses. Licensees must provide the 95th percentile [through wall cracking frequency] $TWCF_{TOTAL}$ and its supporting material properties at the end of the period in which the relief is requested to extend the inspection interval from 10 to 20 years. The 95th percentile $TWCF_{TOTAL}$ must be calculated using the methodology in NUREG-1874. The RT_{MAX-X} and the shift in the Charpy transition temperature produced by irradiation defined at the 30 ft-lb energy level, ΔT_{30}, must be calculated using the latest approved methodology documented in Regulatory Guide 1.99, "Radiation Embrittlement of Reactor Vessel Materials," or other NRC-approved methodology. The [Pressurized Water Reactor Owners Group] PWROG response to [request for additional information] RAI 3 from Reference 3 and Appendix A in the TR identifies the information that is to be submitted.

   PNP was one of the pilot plants for WCAP-16168-NP-A. PNP's $TWCF_{95\text{-}TOTAL}$ at 60 effective full-power years using the correlations from NUREG-1874 is 3.16E-7 events per year (reference page N-29 in WCAP-16168-NP-A, revision 2). The methodology used to calculate ΔT_{30} was NUREG-1874 section 3.5.2 (reference page A-4 in WCAP-16168-NP-A, revision 2).

2) Licensees must report whether the frequency of the limiting design basis transients during prior plant operation are less than the frequency of the design basis transients identified in the PWROG fatigue analysis that are considered to significantly contribute to fatigue crack growth.

   PNP was one of the pilot plants for WCAP-16168-NP-A. The frequency of the limiting design basis transients during prior plant operation for PNP is 13 heat-up and cool-down cycles per year (reference page 3-7 in WCAP-16168-NP-A, revision 2). On average PNP has operated with fewer than 13 cycles per year.

3) Licensees must report the results of prior inservice inspection ISI of RV welds and the proposed schedule for the next 20 year ISI interval. The 20 year inspection interval is a maximum interval. 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, "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," dated October 31, 2006 (Reference 10).

Results of prior ISI of RV examination categories B-A and B-D welds are included in Attachment 1 of this submittal. Future inspection scheduling is discussed in section 6.0 of the Enclosure to this submittal.

4) Licensees with B&W plants must (a) verify that the fatigue crack growth of 12 heat-up/cool-down transients per year that was used in the PWROG fatigue analysis bound the fatigue crack growth for all of its design basis transients and (b) identify the design bases transients that contribute to significant fatigue crack growth.

Not applicable since PNP is a Combustion Engineering plant.

5) Licensees with RVs having forgings that are susceptible to underclad cracking and with RT_{MAX-FO} values exceeding 240 °F must submit a plant-specific evaluation to extend the inspection interval for ASME Code, Section XI, Category B-A and B-D RV welds from 10 to a maximum of 20 years because the analyses performed in the TR are not be applicable.

Not applicable since PNP RT_{MAX-FO} value is 0°F (reference page N-29 in WCAP-16168-NP-A, revision 2).