

February 12, 2007

10 CFR 50.55a

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

Palisades Nuclear Power Plant
Dockets 50-255
License No. DPR-20

Response to Request for Additional Information Related to 4th Interval Inservice
Inspection Plan Relief Requests 4-1 through 4-12 (TAC Nos. MD2404 – MD2415)

By letter dated June 12, 2006, pursuant to 10 CFR 50.55a, Nuclear Management Company, LLC (NMC) submitted the 4th Interval Inservice Inspection (ISI) plan for the Palisades Nuclear Plant (PNP). The relief requests included in the plan were submitted for Nuclear Regulatory Commission (NRC) review and approval.

Enclosure 1 submits the additional information requested by email dated November 17, 2006. Also, by this letter, NMC is withdrawing relief request 4-4 and relief request 4-8. Relief request 4-4 is being withdrawn because of the publication of Code Case N-706, "Alternative Examination Requirements of Table IWB-2500-1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchangers Section XI, Division 1." Code Case N-706 allows VT-2 examinations in lieu of volumetric examinations, as long as a volumetric exam has been performed previously. NMC plans to resubmit a relief request on Code Case N-706 in the near future, as PNP has performed the volumetric exams required for Code Case N-706 use. Relief request 4-8 is being withdrawn because after subsequent evaluation of the nozzle configuration, NMC has determined that an acceptable ultrasonic examination may be performed.

Summary of Commitments

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

 For Paul A. HARDEN

Paul A. Harden
Site Vice President, Palisades Nuclear Plant
Nuclear Management Company, LLC

Enclosure (1)
Attachment (1)

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE 1
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
4TH INTERVAL INSERVICE INSPECTION PLAN
PALISADES NUCLEAR PLANT

NRC Request

Request for Relief Nos. 4-2, 4-3, 4-4, 4-6 and 4-7

Nuclear Management Company, LLC (NMC) letter of June 12, 2006, provided the volumetric coverage for each scan. However, it did not provide the aggregate coverage for each welded component examined. Please provide the aggregate coverage not including 0-degree scan for each welded component examined in these requests for relief. If required by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), provide the results of any surface exams that NMC performed on the subject components.

NMC Response

1. The aggregate coverage is not applicable to the subject relief requests based on the requirements below.

ASME XI, 2001/2003 Mandatory Appendix I, Article I-2000, Paragraph I-2210 requires vessel welds not greater than 2 inch in thickness to be conducted in accordance with Appendix III supplemented by Table I-2000-1

- a. ASME XI, 2001/2003 Appendix III, Paragraph III-4420 states for reflectors parallel to the weld seam, "The examination shall be performed using sufficiently long examination beam path to provide coverage of the required examination volume in two-beam path directions. The examination shall be performed from two sides of the weld, where practical, or from one side of the weld, as a minimum."
- b. ASME XI, 2001/2003 Appendix III, Paragraph III-4430 states for reflectors transverse to the weld seam, "The angle beam examination for reflectors transverse to the weld shall be performed on the weld crown on a single scan path to examine the weld root by one-half V path in two directions along the weld."

ASME XI, 2001/2003 Mandatory Appendix I, Article I-2000, Paragraph I-2120 requires other vessel welds greater than 2 inch in thickness to be conducted in accordance with ASME Section V, Article 4

- a. ASME V, 2001/2003 Article 4, Paragraph T-472.1.2 states for reflectors parallel to the weld seam, "The beam angle shall be directed at approximate right angles to the weld axis from both sides of the weld (i.e., from two directions) on the same surface when possible. The search unit shall be manipulated so that the ultrasonic energy passes through the required volume of the weld and adjacent base material."

- b. ASME V, 2001/2003 Article 4, Paragraph T-472.1.3 states for reflectors transverse to the weld seam, “The angle beam shall be directed essentially parallel to the weld axis. The search unit shall be manipulated so that the ultrasonic energy passes through the required volume of the weld and adjacent base material. The search unit shall be rotated 180 degree and the examination repeated.”

Below is a summary of the weld volume coverage that can be obtained, not including 0-degree.

Relief Request 4-2

Welds	Axial Scans	Transverse Scans	Surface Exams
5-988	68% of required volume	92% or required volume	None required per ASME Section XI
3-982	68% of required volume	92% of required volume	None required per ASME Section XI
2-984	0% of the required volume	0% of the required volume	None required per ASME Section XI
1-984A	25% of accessible length	25% of accessible length	None required per ASME Section XI
1-984B	25% of accessible length	25% of accessible length	None required per ASME Section XI
1-984C	25% of accessible length	25% of accessible length	None required per ASME Section XI
1-984D	25% of accessible length	25% of accessible length	None required per ASME Section XI
1-986	84% of required volume*	81% of required volume	None required per ASME Section XI
3-985	5% of required volume	84% of required volume	None required per ASME Section XI
8-986	10% of required volume	81% of required volume	None required per ASME Section XI
8-986A	10% of required volume	81% of required volume	None required per ASME Section XI
8-986B	10% of required volume	81% of required volume	None required per ASME Section XI
8-986C	10% of required volume	81% of required volume	None required per ASME Section XI

*from head side only with no beam angles crossing based on material being carbon steel with stainless steel inside diameter cladding which does not allow a full V examination

Relief Request 4-3

Welds	Axial Scans	Transverse Scans	Surface Exams
1-104-251	79% of the required volume*	42% of the required volume	None required per ASME Section XI
2-104-351	79% of the required volume*	42% of the required volume	None required per ASME Section XI
1-102-251A	74% of the required volume*	22% of the required volume	None required per ASME Section XI
1-102-251B	74% of the required volume*	22% of the required volume	None required per ASME Section XI
2-102-351A	74% of the required volume*	22% of the required volume	None required per ASME Section XI
2-102-351B	74% of the required volume*	22% of the required volume	None required per ASME Section XI

*from head side only with no beam angles crossing based on material being carbon steel with stainless steel inside diameter cladding which does not allow a full V examination

Relief Request 4-6

Welds	Axial Scans	Transverse Scans	Surface Exams
1-101-221	75% of required volume	100% required volume	None required per ASME Section XI
2-101-221	75% of required volume	100% required volume	None required per ASME Section XI

Relief Request 4-7

Welds	Axial Scans	Transverse Scans	Surface Exams
E-60B-01	43% of required volume	94% of required volume	None required per ASME Section XI
E-60B-02	32% of required volume	92% of required volume	None required per ASME Section XI
E-60B-03	98% of required volume*	60% of required volume	No indications
E-60B-04	98% of required volume*	60% of required volume	One 1/8-inch rounded indication

*from head side only with no beam angles crossing based on material being carbon steel with stainless steel inside diameter cladding which does not allow a full V examination

NRC Request

Request for Relief 4-3

The 2001 Edition, through the 2003 Addenda, of the ASME Code, Section XI, is the ASME Code of record for the fourth 10-year inservice inspection (ISI) interval at Palisades Nuclear Plant (Palisades). In accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.55a(a)(3)(ii), NMC's letter of June 12, 2006, submitted Request for Relief 4-3 for this inspection interval. This relief request seeks Nuclear Regulatory Commission approval for NMC to examine the accessible volumes of the following steam generator nozzle-to-shell welds at Palisades to the extent possible in lieu of the 100 percent volume examination required by the ASME Code:

- 1-104-251

- 1-102-251A
- 1-102-251B
- 2-104-351
- 2-102-351A
- 2-102-351B

The amount of coverage expected for these welds was specified in Electric Power Research Institute (EPRI) report Palisades Inlet and Out Let Nozzle Coverage Calculations dated September 5, 1996, which NMC submitted as Attachment 2 of its Request for Relief 4-3.

Title 10, Part 50.55a(a)(3)(ii) states that licensees may propose an alternative to ASME Code requirements if a hardship or unusual difficulty would be incurred by performing the requirement. NMC must adequately state the hardship or unusual difficulty, and demonstrate that no compensating level of quality or safety would be realized by performing the inspection or testing required by the ASME Code. NMC must also justify why the proposed alternative provides reasonable assurance of structural integrity of the subject component.

NMC did not justify why the ASME Code requirements are a hardship or unusual difficulty when performing the required examinations. It did provide an alternative to use the EPRI report regarding the subject steam generator nozzle-to-shell weld examination coverages. However, NMC did not justify why the proposed alternative provides reasonable assurance of structural integrity of the subject components. Please supplement your request for relief to provide this information to us.

NMC Response

After subsequent evaluation, NMC requests that relief request 4-3 be reviewed in accordance with 10 CFR 50.55a(g)(5)(iii), instead of 10 CFR 50.55a(a)(3)(ii). Attachment 1 provides a revision to relief request 4-3, to reflect this change.

NRC Request

Request for Relief 4-4

Provide the material type for nozzle-to-shell welds 05 and 07 on regenerative heat exchangers E-56A and E-56B.

NMC Response

NMC is withdrawing relief request 4-4. This relief request is being withdrawn because of the publication of Code Case N-706, "Alternative Examination Requirements of Table IWB-2500-1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchangers Section XI, Division 1." Code Case N-706 allows VT-2 examinations in lieu of volumetric examinations, as long as a volumetric exam has been performed previously. NMC plans to resubmit a relief request on Code Case N-706 in the near future, as PNP has performed the volumetric exams required for Code Case N-706 use.

NRC Request

Request for Relief 4-8

1. *What are the base materials, weld materials, and surface conditions of the weld joints associated with this relief request?*
2. *If the weld material is Alloy 82/182, please describe the actions NMC has taken to mitigate the primary water stress corrosion cracking (PWSCC) degradation mechanism (see similar question in Request for Relief 4-10).*
3. *Please provide a history of the non-destructive examinations previously performed on the affected piping segments. Have previous volumetric examinations identified any mid-wall indications which could provide stress concentration areas that could present locations for flaw initiation? Have these welds been ultrasonically examined previously using ASME Code, Section XI, Appendix VIII/Performance Demonstration Initiative techniques? What are the recorded examination coverages for previous volumetric examinations?*
4. *Provide cross-sectional drawings showing the interferences with the ultrasonic testing (UT) transducer(s) and the expected UT examination coverage.*
5. *This relief request references NRC Revised Order EA-03-009 as a basis for performing the dye-penetrant testing (PT) examination in lieu of the UT examination. The Revised Order requires PT examination of the entire wetted surface of the J-groove weld and the high stressed portions of the wetted surface of the reactor pressure vessel head penetration nozzle-base material. The Revised order also requires that high-susceptibility materials be examined every refueling outage. Accordingly, what is the proposed examination surface coverage on the inner and outer-diameters of the piping segments? Also, what is the proposed frequency for the PT examination of the inner and outer-diameters of the piping segments?*

NMC Response

NMC is withdrawing relief request 4-8. After subsequent evaluation of the nozzle configuration, NMC has determined that an acceptable ultrasonic examination may be performed.

NRC Request

Request for Relief 4-10

1. *Section 3.8 of NMC's March 1, 2002, RI-ISI submittal addresses Additional Examinations. The submittal states in part that, "the program in all cases will require an engineering evaluation determining the cause of any unacceptable flaw or relevant condition found during examination." The submittal goes on to state, "The evaluation will include whether other elements on the segment or segments are subject to the same root cause and degradation mechanism.*

Additional examinations will be performed on these elements up to a number equivalent to the number of elements required to be inspected on the segment or segments initially.”

Please describe the term “initially,” and confirm the additional examinations described in the submittal will be completed during the current next? outage as required by IWB/C-2430(a) and (b) of ASME Code, Section XI, 2001 Edition with 2003 Addenda.

2. *Table IWB-2500-1 of the ASME Code, Section XI, 2001 Edition with 2003 Addenda, requires volumetric and/or surface examination of all Category B-F or B-J pressure retaining, dissimilar-metal welds greater than NPS 1. Based on recent findings of PWSCC in Alloy 82/182 dissimilar-metal welds, supply more information on your inspection plan for these welds in the 4th Interval ISI Plan for PNP. Please describe the inspection plan for Alloy 82/182 dissimilar metal welds greater than NPS 1 in the 4th Interval ISI Plan for Palisades (e.g., are they included in the RI-ISI program, how many are selected for examination, what examination method(s) are being employed, what is the frequency of examination, etc.).*

NMC Response

1. Initially indicates the number of elements within the segment scheduled for examination during the applicable outage. If the additional examination identifies an unacceptable flaw or relevant condition, the remaining elements within the segment would be examined during the same outage.

In addition, if other segments are determined to be subject to the same root cause during the engineering evaluation, examination would be extended to include elements on these segments during the same outage.

2. The following is a listing of the PNP Alloy 600 Program welds that are greater than 1-inch and the inspection requirements for the fourth inspection interval

(1) 4-inch PORV nozzle – this penetration was mitigated in 1995 and replaced with alloy 690 material. This location is required to be volumetrically inspected once each inspection interval per the risk-informed program and per MRP-139A requirements. (RI-ISI Segment Number PZR-009)

(1) 4-inch pressurizer spray line penetration – these welds are required to be volumetrically inspected once each inspection interval by the risk-informed ISI program. Additionally, a volumetric inspection is required every other refueling outage per MRP-139D requirements, and a bare metal visual inspection is required during refueling outages when a volumetric examination is not performed. (RI-ISI Segment Number PZR-015)

(1) 12-inch pressurizer surge line penetration- these welds are required to be volumetrically inspected once each inspection interval by the risk-informed ISI program. Additionally, a volumetric inspection is required every other refueling

outage per MRP-139C/D requirements, and a bare metal visual inspection is required during refueling outages when a volumetric examination is not performed. (RI-ISI Segment Number PZR-001)

(3) 3-inch pressurizer safety relief valve nozzle to flange welds- these welds are required to be volumetrically inspected once each inspection interval by the risk-informed ISI program and will additionally receive a bare metal visual inspection during refueling outages when a volumetric examination is not performed. (RI-ISI Segment Numbers PZR-006, PZR-007 and PZR-008)

(1) 12-inch hot leg surge line penetration - these welds are required to be volumetrically inspected once each inspection interval by the risk-informed ISI program and are additionally required to be volumetrically inspected every other refueling outage per MRP-139C/D requirements and a bare metal visual inspection during refueling outages when a volumetric examination is not performed. (RI-ISI Segment Number PZR-001)

(1) 12-inch hot leg shutdown cooling line penetration - these welds are required to be volumetrically inspected once each inspection interval by the risk-informed ISI program and are additionally required to be volumetrically inspected every other refueling outage per MRP-139C/D requirements and a bare metal visual inspection during refueling outages when a volumetric examination is not performed. (RI-ISI Segment Number PCS-039)

(1) 2-inch hot leg drain line penetration – the welds associated with this penetration receive a bare metal visual inspection every refueling outage in accordance with MRP-139J requirements (RI-ISI Segment Number PCS-023)

(2) 2-inch cold leg charging penetrations – the welds associated with this penetration receive a bare metal visual inspection every third refueling outage in accordance with MRP-139K requirements (RI-ISI Segment Numbers PCS-040 and PCS-041)

(2) 3-inch cold leg spray – the welds associated with this penetration receive a bare metal visual inspection every third refueling outage in accordance with MRP-139K requirements (RI-ISI Segment Numbers PCS-028 and PCS-029)

(4) 2-inch cold leg drain penetrations – the welds associated with this penetration receive a bare metal visual inspection every third refueling outage in accordance with MRP-139K requirements (RI-ISI Segment Numbers PCS-015, PCS-016, PCS-017 and PCS-018)

(4) 12-inch cold leg safety injection penetrations- - these welds are required to be volumetrically inspected once each inspection interval by the risk-informed ISI program and are additionally required to be volumetrically inspected every third refueling outage per MRP-139E requirements. (RI-ISI Segment Numbers PCS-035, PCS-036, PCS-037 and PCS-038)

ATTACHMENT 1
PALISADES NUCLEAR PLANT
4TH INTERVAL INSERVICE INSPECTION PLAN

RELIEF REQUEST NUMBER – RR 4-3, Revision 1

COMPONENT IDENTIFICATION

Code Class	1
Code Reference	IWB-2500 Table IWB-2500-1
Examination Category	B-D
Item Number	B3.130
Component Description	Steam Generator Nozzle to Shell Welds, 1-104-251, 1-102-251A, 1-102-251B, 2-104-351 2-102-351A, 2-102-351B
Reference Drawings	M1-FAA Sh. 44 and M1-F-AA Sh. 40 Figure IWB-2500-7(A) (See Attachment 1)

In accordance with 10 CFR 50.55a(g)(5)(iii), Nuclear Management Company, LLC (NMC) requests approval to implement examination on the accessible volumes as identified below in lieu of the 100% volumetric requirements at Palisades Nuclear Plant. The impracticality of compliance is that in order to obtain the required examination volume, the components would require modification or replacement.

CODE REQUIREMENT

Section XI, Table IWB-2500-1 requires all nozzle to vessel welds to be volumetrically examined once during each inspection interval.

BASIS FOR RELIEF

For purposes of discussion, Figure 1WB-2500-7(a) (attached) will be used to describe the 4 required weld volumes. With the exception of the nozzle inner radius section, this figure is the closest configuration to our actual nozzles.

Palisades working with EPRI have developed the attached package (See Attachment 2). The attached information is an excerpt from the EPRI report and is intended to identify the exam volumes within the areas of limitations. The final EPRI report will identify exam volumes within the area of limitations (attached information), exam volumes where no limitations exist and the composite exam volumes. The final composite exam volumes will be slightly higher since this will include the areas where no limitations exist. However, the code required exam volume will not be achieved and this relief request is necessary.

ATTACHMENT 1
PALISADES NUCLEAR PLANT
4TH INTERVAL INSERVICE INSPECTION PLAN

The attached package includes:

- 1) Figure defining exam volumes.
- 2) Inlet nozzle inner radius coverage table followed by supporting figure.
- 3) Inlet nozzle-to-shell weld exam volume.
- 4) Axial scan coverage table for inlet nozzle-to-shell weld followed by supporting figures.
- 5) Transverse scan (no probe skewing) coverage table for inlet nozzle-to-shell weld followed by supporting figures.
- 6) Transverse scan (+/-20° probe skewing) coverage table for inlet nozzle-to-shell weld followed by supporting figures.
- 7) Outlet nozzle inner radius coverage table followed by supporting figure.
- 8) Outlet nozzle-to-shell weld exam volume.
- 9) Axial scan coverage table for outlet nozzle-to-shell weld followed by supporting figures.
- 10) Transverse scan (no probe skewing) coverage table for outlet nozzle-to-shell weld followed by supporting figures.
- 11) Transverse scan (+/-20° probe skewing) coverage table for outlet nozzle-to-shell weld followed by supporting figures.

There are 2 acronyms used in the EPRI report for identification, they are Consumers Power - Steam Generator Project Inlet Nozzle (CP-SGPIN) and Consumers Power - Steam Generator Project Outlet Nozzles (CP-SGPON).

The computer based modeling was performed on one steam generator and this is intended to address all primary head nozzle welds in both steam generators. The steam generators are identical in design.

The probe skew angle for the axial exams are identified as 0° and 180° within the coverage tables. The probe skew angle for the transverse exams were modeled using a 90° and then offset using a 70° and 110° skew to increase exam volume coverages.

ATTACHMENT 1
PALISADES NUCLEAR PLANT
4TH INTERVAL INSERVICE INSPECTION PLAN

In summary, the examination volumes are limited and the maximum achievable volumes within the areas of limitations are accurately identified. A relief request from the code required examination volumes is necessary. The final EPRI report is on file at Palisades. The alternative of using the EPRI report exam volumes, regarding the subject steam generator nozzle-to-shell weld examination coverage, should detect significant patterns of degradation and provide reasonable assurance of continued structural integrity.

PROPOSED ALTERNATIVE EXAMINATION

All accessible weld volumes will be examined once per interval in lieu of the 100% volumetric examination requirements.

IMPLEMENTATION SCHEDULE

The proposed alternative is requested for the 4th ten year interval of the Inservice Inspection Program for Palisades Nuclear Plant.

REFERENCE

By letter dated March 20, 1998, the NRC Staff previously authorized this relief to Palisades, Docket No 50-255 [TAC NO. M98925] for the 3rd ten year inspection interval (Previously RR-4).