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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

AND REQUESTS FOR RELIEF NOS. RR-4, AND RR-9 FOR

CONSUMERS ENERGY COMPANY

PALISADES PLANT

DOCKET NUMBER: 50-255

1.0 INTRODUCTION

The Technical Specifications (TS) for Palisades Plant state that the inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Palisades Plant third 10-year ISI interval is the 1989 Edition.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving

ENCLOSURE

due consideration to the burden upon the licensee that could result if the requirements were imposed.

By letter dated June 3, 1997, Consumers Energy Company (licensee) submitted alternatives to the ASME, Section XI Code (Code) regarding its third 10-year Interval ISI Program Plan Requests for Relief Nos. RR-4 and RR-9 for Palisades Plant. The licensee provided additional information in its letter dated November 14, 1997.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering and Environmental Laboratory (INEEL), has evaluated the information provided by the licensee in support of its third 10-year Interval ISI Program Plan Requests for Relief Nos. RR-4, and RR-9, for Palisades Plant. Based on the results of the review, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) attached.

Request for Relief No. RR-4: .Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief for the Inlet Nozzle-to-Shell Welds 1-104-251, and 1-102-251A, and Outlet Nozzle-to-Shell Welds 1-102-251B, 2-104-351, 2-102-351A, and 2-102-351B, from meeting the Code requirements of an essentially 100% volumetric examination of the above steam generator nozzle-to-vessel welds The licensee included in its request for relief a copy of an EPRI [Electrical Power Research Institute] letter dated September 16, 1996, to Consumers Power (now known as Consumers Energy Company) describing the coverage calculations performed by the EPRI Center on the Palisades Steam Generator Inlet and Outlet Nozzles. The EPRI report was restricted to calculating where the ultrasound beam interrogated the examination volume.

The Code requires 100% volumetric examination of the subject steam generator nozzle-to-vessel welds. However, examination of these welds is restricted by nozzle geometry and configuration (i.e., blend radius and proximity of nozzle bore), which make the Code coverage requirements impractical. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of this requirement would cause a burden on the licensee.

The licensee has obtained greater than 30% coverage on each of the subject nozzle-to-vessel welds. In addition, the nozzle inner radius sections were examined to the extent required by the Code. The combination of these examinations should detect any significant patterns of degradation. The licensee's proposed alternative to examine the accessible weld volumes, as identified in the above EPRI letter, once per interval in lieu of the ASME Section XI 100% volumetric examination requirements provides a reasonable assurance of the continued structural integrity of the above nozzles. Therefore, Request for Relief No. RR-4 is granted pursuant to 10 CFR 50.55a(g)(6)(i).

Request for Relief No. RR-9: Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee has proposed to use the requirements of Code Case N-521 for the following examination areas:

Nozzle-to-Vessel Welds	Nozzle Inside Radius Sections
5-114A	5-114A-IRS
5-114B	5-114B-IRS
5-114C	5-114C-IRS
5-114D	5-114D-IRS
5-114E	5-114E-IRS
5-114F	5-114F-IRS

The Code requires examination of at least 25%, but not more than 50% (credited), of reactor pressure vessel (RPV) nozzles and associated inside radius (IR) sections and nozzle safe ends during the first inspection interval. The licensee has requested to use Code Case N-521 to defer the examination of these areas until the end of the third 10-year interval.

Code Case N-521 states that the examination of RPV nozzles, IR sections, and nozzle-to safe end welds may be deferred provided (a) no inservice repairs or replacements by welding have ever been performed on any of the subject areas, (b) none of the subject areas contains identified flaws or relevant conditions that currently require successive inspections in accordance with IWB-2420(b), and (c) the unit is not in the first interval. The licensee has confirmed that these conditions have been met. In addition, the licensee examined all the subject areas during the final refueling outage of the second 10-year interval. By examining the nozzle, associated IR sections, and nozzle-to-safe end welds at the end of the previous 10-year interval, the licensee has established a new sequence of examinations and the proposed schedule will not exceed 10 years between examinations.

The licensee has met all the conditions stated in Code Case N-521 and examined all of the affected areas, and at the end of the previous interval, a new sequence of examinations has been established. Furthermore, since the time between examinations will not exceed 10 years, the licensee's proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative contained in Request for Relief No. RR-9 is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3.0 CONCLUSION

The staff has reviewed the licensee's submittal and concludes that the Code examination coverage requirements are impractical in the case of Request for Relief No. RR-4, and that the licensee's proposed alternative provides reasonable assurance of the structural integrity of the Steam Generator Nozzle-to-Vessel Welds listed above. Therefore, Request for Relief No. RR-4 is granted pursuant to 10 CFR 50.55a(g)(6)(i).

For Request for Relief No. RR-9, the staff concludes that the licensee's proposed alternative provides an acceptable level of quality and safety. Therefore, the staff concludes that the licensee's proposed alternative contained in Request for Relief No. RR-9 is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Attachment: INEEL TLR

Principal Contributor: T. McLellan

Dated: March 20, 1998

TECHNICAL LETTER REPORT
ON THE THIRD TEN-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF
CONSUMERS ENERGY COMPANY
PALISADES NUCLEAR PLANT
DOCKET NUMBER 50-255

1.0 INTRODUCTION

By letter dated June 3, 1997, the licensee, Consumers Energy Company, submitted Requests for Relief No. RR-4 and RR-9 from the requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI. In response to a Nuclear Regulatory Commission (NRC) request for additional information, the licensee submitted further information in a letter dated November 14, 1997. The Idaho National Engineering and Environmental Laboratory (INEEL) staff has evaluated the information provided by the licensee in support of these requests for relief in the following section.

2.0 EVALUATION

The Code of record for the Palisades Nuclear Plant, third ten-year inservice inspection (ISI) interval is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

A. Request for Relief No. RR-4, Examination Category B-D, Item B3.130, Steam Generator Nozzle-to-Vessel Welds

Code Requirement: Examination Category B-D, Item B3.130 requires 100% volumetric examination of Class 1 steam generator nozzle-to-vessel welds, as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief for the following steam generator nozzle-to-head welds:

Inlet Nozzle-to-Shell Welds 1-104-251 and 1-102-251A	
Axial scans-shell side	79%
Axial scans-nozzle side	0%
Transverse scans from shell	63%
Transverse scans from nozzle	0%
Cumulative coverage	35.5%

ATTACHMENT

Outlet Nozzle-to-Shell Welds 1-102-251B, 2-104-351, 2-102-351A, and 2-102-351B	
Axial scans-shell side	74%
Axial scans-nozzle side	0%
Transverse scans from shell	47%
Transverse scans from nozzle	0%
Cumulative coverage	30.25%

Licensee's Basis for Requesting Relief (as stated):

"A relief request from the code required examination volumes is necessary as the code required volumes cannot be achieved due to the physical geometries of the nozzles within the steam generator vessel heads.

"For purposes of discussion, Figure IWB-2500-7(a) 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.

"Consumers Energy working with EPRI have developed the attached report. The EPRI report identifies the code required examination volumes, exam volumes within the areas of limitations, exam volumes where no limitations exist and the composite exam volumes which can be examined. The EPRI report was also compared to past field examinations to verify these examination limitations.

"The attached package includes:

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

"In summary, the examination volumes are limited and the maximum achievable volumes within the areas of limitations are accurately identified."

Licensee's Proposed Alternative (as stated):

"The accessible weld volumes, as identified in the EPRI report, will be examined once per interval in lieu of the ASME Section XI 100% volumetric examination requirements."

Evaluation: The Code requires 100% volumetric examination of the subject steam generator nozzle-to-vessel welds. However, examination of these welds is restricted by nozzle geometry and configuration (i.e., blend radius and proximity of nozzle bore), which make the Code coverage requirements impractical. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of this requirement would cause a burden on the licensee.

The licensee has obtained greater than 30% coverage on each of the subject nozzle-to-vessel welds. In addition, the nozzle inner radius sections were examined to the extent required by the Code. The combination of these examinations should detect any significant patterns of degradation and provide reasonable assurance of the continued structural integrity. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

B. Request for Relief No. RR-9, Examination Category B-D, Items B3.90 and B3.100, Reactor Pressure Vessel (RPV) Nozzle-to-Vessel Welds and Inside Radius Sections

Code Requirement: Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination of RPV nozzle-to-vessel welds and nozzle inside radius sections, as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee has proposed to use the requirements of Code Case N-521 for the following examination areas:

Nozzle-to-Vessel Welds	Nozzle Inside Radius Sections
5-114A	5-114A-IRS
5-114B	5-114B-IRS
5-114C	5-114C-IRS
5-114D	5-114D-IRS
5-114E	5-114E-IRS
5-114F	5-114F-IRS

The licensee stated:

"Examination records for the nozzle to vessel and inside radius section welds have been reviewed to verify compliance to the conditions in the code case. No repairs, replacements or flaws or relevant indications have been identified with the plant currently in the beginning of the third inspection interval. Therefore, the twelve welds will be scheduled to be volumetrically examined during the 2005 outage of the third period of the third interval."

Licensee's Basis for Requesting Relief (as stated):

"Pursuant to 10 CFR 50.55a(a)(3) and Footnote 6, the use of the following code case is requested as a relief request.

"Code Case N-521 allows the examination schedule for the identified welds and inside radius sections to be deferred to the end of the inspection interval provided the welds have not been repaired or replaced, the welds do not contain identified flaws or relevant indications that currently require successive inspections in accordance with IWB-2420(b) and the unit is not in the first inspection interval.

"Additionally, all identified welds and inside radius sections were examined during the 1995 refueling outage. This was the second examination of the interval for the outlet nozzles and inside radius sections. The 1995 refueling outage was the last outage of the second inspection interval. Therefore, granting approval of this relief request would not extend any examinations beyond ten year interval."

Evaluation: The Code requires examination of at least 25%, but not more than 50% (credited), of RPV nozzles and associated inside radius (IR) sections and nozzle safe ends during the first inspection interval. The licensee has requested to use Code Case N-521 to defer the examination of these areas until the end of the third ten-year interval.

Code Case N-521 states that the examination of RPV nozzles, IR sections, and nozzle-to safe end welds may be deferred provided (a) no inservice repairs or replacements by welding have ever been performed on any of the subject areas, (b) none of the subject areas contain identified flaws or relevant conditions that currently require successive inspections in accordance with IWB-2420(b), and (c) the unit is not in the first interval. The licensee has confirmed that these conditions have been met. In addition, the licensee examined all the subject areas during the final refueling outage of the second ten-year interval. By examining the nozzle, associated IR sections, and nozzle-to-safe end welds at the end of the previous ten-year interval, the licensee has established a new sequence of examinations and the proposed schedule will not exceed 10 years between examinations.

Considering that the licensee has met all the conditions stated in the Code case and examined all of the affected areas at the end of the previous interval, a new sequence of examinations has been established. Furthermore, since the time between examinations will not exceed 10 years, the licensee's proposed alternative will provide an acceptable level of quality and safety. Therefore, it is recommended

that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3.0 CONCLUSION

The INEEL staff has reviewed the licensee's submittal and concludes that the Code examination coverage requirements are impractical in the case of Request for Relief No. RR-4, and that reasonable assurance of the structural integrity has been provided by the examinations that were completed. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

For Request for Relief No. RR-9, it is concluded that the licensee's proposed alternative provides an acceptable level of quality and safety. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).