May 27, 2005

Mr. Craig W. Lambert
Site Vice President
Kewaunee Nuclear Power Plant
Nuclear Management Company, LLC
N490 Highway 42
Kewaunee, WI 54216-9511

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - THIRD AND FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL PROGRAM REQUESTS FOR RELIEF (TAC NOS. MC2727, MC2728, MC2729, MC2730, MC2731, AND MC2732)

Dear Mr. Lambert:

By letter dated April 16, 2004 (ML041180580), as supplemented by letter dated September 17, 2004 (ML042720366), Nuclear Management Company, LLC (the licensee) submitted requests for relief from certain requirements of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code), Section XI, for the third and fourth 10-year interval inservice inspection (ISI) programs at Kewaunee Nuclear Power Plant (KNPP). The ASME Code Section XI of record for KNPP for the third 10-year ISI interval is the 1989 Edition and for the fourth 10-year ISI interval is the 1998 Edition with 2000 Addenda. The third 10-year ISI interval at Kewaunee was extended by 1 year as allowed by the ASME Code and ends on June 16, 2005. The fourth 10-year ISI interval at Kewaunee ends on June 16, 2014.

Based on the information provided in the relief requests, the U. S. Nuclear Regulatory Commission (NRC) staff, with technical assistance from its contractor, the Pacific Northwest National Laboratory (PNNL), concluded that the following requests for relief were acceptable:

Third Interval	Fourth Interval
RR-1-8, Rev.1	RR-1-7, Rev.1
RR-1-9	RR-1-8, Rev.1, Amendment
RR-1-9, Amendment	
RR-1-11	

Relief Request RR-1-8, Rev.1 (fourth interval) is the same as RR-1-8 (fourth interval), which was approved by letter from L. Raghavan (NRC) to C. Lambert (NMC) dated February 18, 2005 (ML050350225). The licensee withdrew Relief Requests RR-1-10 and RR-G-6 by supplemental letter dated September 17, 2004.

Relief Requests RR-1-8, Rev.1 (third interval), and RR-1-9, Amendment (third interval) and RR 1-7, Rev.1 (fourth interval), and RR-1-8, Rev.1, Amendment (fourth interval) may be granted on the basis that the NRC staff concludes that it is impractical for the licensee to comply with the subject ASME Code requirements, the proposed inspections provide reasonable assurance of structural integrity, and that granting relief pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i) is authorized by law and will not

endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the subject reliefs are granted for the third and fourth 10-year ISI intervals, as noted, at Kewaunee.

Relief Requests RR-1-9 (third interval) and RR-1-11 (third interval) may be granted on the basis that the NRC staff concludes that the alternative proposed by the licensee provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative is authorized for the third 10-year ISI interval at Kewaunee.

All other requirements of the ASME Code Section XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

The detailed results of the NRC staff's review are provided in the safety evaluation in Enclosure 1. Enclosure 2 is the PNNL Technical Letter Report. Enclosure 3 is a table that provides a summary and the status of approval for the relief requests. If you have any questions concerning this matter, please call Mr. F. Lyon of my staff at (301) 415-2296.

Sincerely,

/RA/

L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures:
1. Safety Evaluation
2. PNNL Technical Letter Report
3. Summary Table

cc w/encl: See next page

Regulations (10 CFR) Section 50.55a(g)(6)(i) is authorized by law and will not endanger life or life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the subject reliefs are granted for the third and fourth 10-year ISI intervals, as noted, at Kewaunee.

Relief Requests RR-1-9 (third interval) and RR-1-11 (third interval) may be granted on the basis that the NRC staff concludes that the alternative proposed by the licensee provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative is authorized for the third 10-year ISI interval at Kewaunee.

All other requirements of the ASME Code Section XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

The detailed results of the NRC staff's review are provided in the safety evaluation in Enclosure 1. Enclosure 2 is the PNNL Technical Letter Report. Enclosure 3 is a table that provides a summary and the status of approval for the relief requests. If you have any questions concerning this matter, please call Mr. F. Lyon of my staff at (301) 415-2296.

Sincerely,

/RA/

L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures:
1. Safety Evaluation
2. PNNL Technical Letter Report
3. Summary Table

cc w/encl: See next page

DISTRIBUTION:

PUBLIC	PD3-1 Reading	AMohseni	LRaghavan
FLyon	THarris	AKeim	TChan
DWeaver	ACRS	OGC	TKozak, RIII
DLPM DPR			

Accession Number: ML051080379 *previously concurred **SE dated 4/12/05

OFFICE	PM:PDIII-1	LA:PDIII-1	SC:EMCB	OGC	SC:PDIII-1
NAME	FLyon	THarris*	TChan**	SUttal	JStang for LRaghavan
DATE	05/17/05	4/21/05	04/12/05	05/25/05	05/27/05

OFFICIAL RECORD COPY

Kewaunee Nuclear Power Plant

cc:

John Paul Cowan
Executive Vice President &
Chief Nuclear Officer
Nuclear Management Company, LLC
700 First Street
Hudson, MI 54016

Plant Manager
Kewaunee Nuclear Power Plant
N490 Highway 42
Kewaunee, WI 54216-9511

Manager, Regulatory Affairs
Kewaunee Nuclear Power Plant
N490 Highway 42
Kewaunee, WI 54216-9511

David Molzahn
Nuclear Asset Manager
Wisconsin Public Service Corporation
600 N. Adams Street
Green Bay, WI 54307-9002

Resident Inspectors Office
U. S. Nuclear Regulatory Commission
N490 Hwy 42
Kewaunee, WI 54216-9511

Regional Administrator, Region III
U. S. Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Jonathan Rogoff
Vice President, Counsel & Secretary
Nuclear Management Company, LLC
700 First Street
Hudson, WI 54016

Larry L. Weyers
Chairman, President and CEO
Wisconsin Public Service Corporation
600 North Adams Street
Green Bay, WI 54307-9002

David Zellner
Chairman - Town of Carlton
N2164 County B
Kewaunee, WI 54216

Mr. Jeffery Kitsembel
Electric Division
Public Service Commission of Wisconsin
PO Box 7854
Madison, WI 53707-7854

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD AND FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUESTS FOR RELIEF

NUCLEAR MANAGEMENT COMPANY, LLC

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

1.0 INTRODUCTION

The U. S. Nuclear Regulatory Commission (NRC) staff, with technical assistance from its contractor, the Pacific Northwest National Laboratory (PNNL), has reviewed and evaluated the information provided by the Nuclear Management Company, LLC (the licensee) in its letter dated April 16, 2004, as supplemented by letter dated September 17, 2004, requesting relief from certain requirements of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code) for the Kewaunee Nuclear Power Plant (KNPP). The requests for relief for the third inservice inspection (ISI) interval are identified as follows: RR-1-8, Rev.1; RR-1-9; RR-1-9, Amendment; and RR-1-11. The requests for relief for the fourth ISI interval are identified as follows: RR-1-7, Rev.1; RR-1-8, Rev.1; and RR-1-8, Rev.1, Amendment. By its supplemental letter dated September 17, 2004, the licensee withdrew RR-1-10 and RR-G-6.

2.0 REGULATORY REQUIREMENTS

ISI of ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). In addition, 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 alternative 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 preservice 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 ASME Code of record for the third 10-year ISI interval for KNPP is the 1989 Edition of Section XI, and the fourth 10-year ISI interval for KNPP is the 1998 Edition of Section XI, through the 2000 Addenda. The third 10-year ISI interval at KNPP was extended by 1 year as allowed by the ASME Code and ends on June 16, 2005. The fourth 10-year ISI interval at KNPP ends on June 16, 2014.

3.0 TECHNICAL EVALUATION

The NRC staff adopts the evaluations and recommendations for granting or authorizing reliefs as contained in the Technical Letter Report (TLR) prepared by PNNL, included as Enclosure 2. Enclosure 3 is a summary table listing each relief request by ASME Code examination category and the status of approval.

For Relief Requests RR-1-8, Rev.1 (third interval) and RR-1-7, Rev.1 (fourth interval), the licensee requested to use a root-mean-squared (RMS) error value of 0.189-inch in lieu of the 0.125-inch RMS error value imposed by Appendix VIII, Supplement 10 and included in Paragraph 3.2(b) of the Electric Power Research Institute Performance Demonstration Initiative (EPRI PDI) alternative. The proposed inspection applies to through-wall sizing of flaws identified during examinations of dissimilar metal welds from the inside surface. Currently, no vendor has been able to comply with the Code-required RMS error of 0.125 inches. The performance of the licensee's vendor, Wesdyne, with an RMS error of 0.189 inches, represents the current achievable state-of practice for through-wall sizing from the inside surface of reactor pressure vessel nozzle safe-end dissimilar metal welds. The licensee is proposing to use a depth sizing criterion of 0.189 inch to size any detected flaw during the examination of the subject dissimilar metal welds. The licensee proposes to add the difference of 0.064 inches between the Code-required RMS error (0.125 inches) and the demonstrated accuracy (0.189 inches) to the measurements acquired from flaw sizing. For this reason, the staff finds that compliance with the Code-required RMS error value is currently impractical and that, by adding the difference between the Code-required RMS error and the demonstrated accuracy to the measurements acquired from flaw sizing, in addition to the use of the acceptance standards specified in Section IWB-3500 of the Code, the proposed inspection provides reasonable assurance of continued structural integrity for the subject dissimilar metal welds. Therefore, relief is granted on the basis that the NRC staff concludes that it is impractical for the licensee to comply with the subject ASME Code requirements and that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Requests for relief RR-1-8, Rev.1, and RR-1-7, Rev.1, are granted for the third and fourth intervals, respectively.

For Relief Request RR-1-9 (third interval), the licensee proposed using a Supplement 2 add-on to a Supplement 10 qualification, as administrated by the EPRI PDI program. The NRC staff determined that the licensee’s proposed alternative use of the EPRI PDI administrated program in lieu of the selected requirements of ASME Section XI will provide a comparatively challenging process for qualification in the sizing and detection of flaws in the subject components. Therefore, the NRC staff finds that the licensee’s proposed alternative provides an acceptable

level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval at KNPP.

For Relief Request RR-1-9, Amendment (third interval) and RR-1-8, Rev.1, Amendment (fourth interval), the licensee proposes to use an RMS error value of 0.245 inch in lieu of the Code-required value of 0.125 inch value in Appendix, VIII, Supplements 2 and 10, and included in paragraph 3.3(c) of the EPRI PDI alternative implementation of Supplements 2 and 10. The proposed RMS error value applies to flaws identified during examinations of the reactor coolant system safe end-to-piping welds inspected from the inside surface. Supplements 2 and 10 require that examination procedures, equipment, and personnel used for examination of dissimilar metal piping welds shall meet specific criteria for flaw depth sizing accuracy. The Code requires that the maximum error for flaw depth measurements, when compared with the true flaw depths, must be less than or equal to an RMS error value of 0.125 inch. The nuclear industry is in the process of qualifying personnel in accordance with Supplements 2 and 10 requirements, as implemented through the PDI program. However, personnel have been unsuccessful at achieving the Code-required RMS error value for flaw depth sizing demonstrations performed from the inside surface of a pipe weldment. At this time, achieving an RMS error value of 0.125 inch is impractical since no vendor has been able to comply with the Code-required RMS error of 0.125 inches. The performance of the licensee's vendor, Wesdyne, with an RMS error of 0.245 inches, represents the current achievable state-of practice for through-wall sizing from the inside surface of the reactor vessel nozzle. As a result, the licensee is proposing to use a depth sizing criterion of 0.245 inches to size any detected flaw during the examination of the subject safe end-to-pipe welds. The licensee also proposes to add the difference (0.120 inches) between the Code-required RMS error (0.125 inches) and the demonstrated accuracy (0.245 inches) to the measurements acquired from flaw sizing.

The NRC staff finds that compliance with the Code-required RMS error value is currently impractical and that by adding the difference between the Code-required RMS error and the demonstrated accuracy to the measurements acquired from flaw sizing, in addition to the use of the acceptance standards specified in Section IWB-3500 of the Section XI Code, the proposed inspection provides reasonable assurance of continued structural integrity for the subject safe end-to-pipe welds. Therefore, relief is granted on the basis that the NRC staff concludes that it is impractical for the licensee to comply with the subject ASME Code requirements and that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Requests for relief RR-1-9, Amendment, and RR-1-8, Rev.1, Amendment, are granted for the third and fourth intervals, respectively.

Relief Request RR-1-8, Rev.1 (fourth interval) is the same as RR-1-8 (fourth interval), which was approved by letter from L. Raghavan (NRC) to C. Lambert (NMC) dated February 18, 2005 (ML050350225). Relief Requests RR-1-10 (third interval) and RR-G-6 (third interval) were withdrawn by the licensee in a letter dated September 17, 2004.

For Relief Request RR-1-11 (third interval), the licensee proposed to use the root-mean-square (RMS) values of 10 CFR 50.55a(b)(2)(xv)(C)(*1*), in lieu of the depth and length sizing criteria of ASME Code Section XI, Appendix VIII, Supplement 4, Subparagraphs 3.2(a), 3.2(b) and 3.2(c). The recent amendment of 10 CFR 50.55a as noticed in the *Federal Register* on October 1, 2004 (69 FR 58804), which became effective on November 1, 2004, states in paragraph

50.55a(b)(2)(xv)(C)(*1*):

> A depth sizing requirement of 0.15 inch RMS must be used in lieu of the requirements in Subparagraphs 3.2(a) and 3.2(c), and a length sizing requirement of 0.75 inch RMS must be used in lieu of the requirement in Subparagraph 3.2(b).

The licensee's proposed alternative is the same as the requirement in 10 CFR 50.55a(b)(2)(xv)(C)(*1*). Therefore, the NRC staff finds that the licensee's proposed alternative provides an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval at KNPP.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in these relief requests remain applicable, including third party review by the Authorized Nuclear Inspector.

4.0 CONCLUSION

The NRC staff adopts the evaluations and recommendations for granting or authorizing reliefs as contained in the TLR prepared by PNNL, included as Enclosure 2. Enclosure 3 is a summary table listing each relief request by ASME Code examination category and the status of approval.

For Relief Requests RR-1-8, Rev.1 (third interval), RR-1-9, Amendment (third interval), RR-1-7, Rev.1 (fourth interval), and RR-1-8, Rev.1, Amendment (fourth interval), the staff concludes that it is impractical for the licensee to comply with the subject ASME Code requirements and that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the subject reliefs are granted for the third or fourth 10-year ISI interval at KNPP, as stated above.

For Relief Requests RR-1-9 (third interval) and RR-1-11 (third interval), the staff concludes that the alternatives proposed provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i) the licensee's proposed alternatives are authorized for the third 10-year ISI interval at KNPP.

Relief Request RR-1-8, Rev.1 (fourth interval) is the same as RR-1-8 (fourth interval), which was approved by letter from L. Raghavan (NRC) to C. Lambert (NMC) dated February 18, 2005 (ML050350225). Relief Requests RR-1-10 (third interval) and RR-G-6 (third interval) were withdrawn by letter dated September 17, 2004.

All other requirements of the ASME Code Section XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: A. Keim

Date:

TECHNICAL LETTER REPORT

THIRD AND FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL

REQUESTS FOR RELIEF

NUCLEAR MANAGEMENT COMPANY, LLC

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NUMBER 50-305

1.0 INTRODUCTION

By letter dated April 16, 2004, the licensee, Nuclear Management Company, submitted several requests for relief from requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*. In response to an NRC Request for Additional Information (RAI), the licensee provided further information in a letter dated September 17, 2004. These requests are for the third and fourth 10-year inservice inspection (ISI) intervals at Kewaunee Nuclear Power Plant (Kewaunee). The Pacific Northwest National Laboratory (PNNL) has evaluated the requests for relief in the following section.

2.0 REGULATORY REQUIREMENTS

Inservice inspection of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME *Boiler and Pressure Vessel Code* (B&PV Code), and applicable addenda, as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulation at 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the licensee demonstrates that (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 preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) 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, which was 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 Code of Record for the Kewaunee third 10-year interval inservice inspection program, which began on June 16, 1994, is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code, with no addenda. The Code of Record for the Kewaunee fourth 10-year interval inservice inspection

program, which will begin on June 16, 2005, is the 1998 Edition of Section XI, through the 2000 Addenda. It is noted that the licensee is extending the third interval by a full year as allowed by ASME Code Section XI, Paragraph IWA-2430(d).

3.0 EVALUATION

The information provided by Nuclear Management Company in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. Please note that the same relief requests are designated differently by the licensee for the third and fourth 10-year inspection intervals. Also, the same designation was used for differing requests in each of these intervals, which complicates the administration and review of these requests.

3.1 Requests for Relief RR-1-8, Revision 1 (Third Interval) and RR-1-7, Revision 1 (Fourth Interval), Flaw-Sizing Error Limitations for Pressure Retaining Dissimilar Metal Welds in Reactor Pressure Vessel (RPV) Nozzles Examined from the Inside Surface Subject to Appendix VIII, Supplement 10, Qualification Requirements for Dissimilar Metal Piping Welds

Code Requirement: Performance demonstration requirements for qualifying procedures, personnel and equipment to inspect dissimilar metal piping welds are listed in the 1995 Edition/1996 Addenda of ASME Section XI, Appendix VIII, Supplement 10. Licensees may 1) elect to use the requirements of Supplement 10 as listed, 2) seek NRC approval for new ASME code cases currently being reviewed by Code Committees, or 3) propose an alternative to Code requirements. The licensee was previously authorized to use the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) alternative for satisfying Appendix VIII, Supplement 10 requirements via Safety Evaluation Reports (SERs) dated February 26, 2004 for the third interval and February 18, 2005 for the fourth interval. Paragraph 3.2(b) of the EPRI PDI alternative states that personnel, equipment, and procedures are qualified for depth-sizing when the flaw depths estimated by ultrasonics, as compared to true flaw depths, do not exceed 0.125-inch root-mean-squared error (RMSE).

Licensee's Proposed Alternative: Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee proposed to use the RMSE value of 0.189-inch, in lieu of the 0.125-inch RMSE required by Paragraph 3.2(b) of the EPRI PDI alternative to Supplement 10. This request for relief is applicable only to the following dissimilar metal welds examined from the inside surface on Kewaunee RPV primary outlet and inlet nozzles:

RC-W1DM	RC-W26DM
RC-W58DM	RC-W30DM

All other dissimilar metal welds (e.g., on the pressurizer and steam generator nozzles), which are examined from the outside surface, and the two safety injection nozzles which are examined from the inside surface, will be performed using personnel, procedures and equipment qualified in accordance with the EPRI PDI alternative to Supplement 10 with no deviations, as previously authorized. The licensee stated the following:

On September 17, 2003, Kewaunee Nuclear Power Plant, as part of the Nuclear Management Company, submitted Relief Request for Alternative to ASME Section XI, Appendix VIII, Supplement 10. The Nuclear Regulatory Commission, on February 26, 2004, approved the Request for Relief for Appendix VIII, Supplement 10, for the Kewaunee Nuclear Power Plant Third Ten-Year Interval. The Relief Request for the Fourth Ten-Year Interval was submitted on December 16, 2003, as part of the Fourth Ten-Year In-service Inspection (ISI) Program 2004-2014. However, since the approval of the Request for Relief for the Third Ten-Year Interval was granted and the Fourth Ten-Year Interval is pending, a Revision to ASME Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Supplement 10, Relief Requests are required.

The 1995 Edition with 1996 Addenda of the ASME Code, Section XI, Appendix VIII, Supplement 10 and the 1998 Edition with 2000 Addenda of Section XI, Appendix VIII, Supplement 10, Paragraph 3.2(b), states that the examination procedures, equipment, and personnel are qualified for depth sizing when the RMS (root mean square) error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125". The vendor (WESDYNE International) employed by NMC for the remote automated Reactor Vessel examinations did not achieve the 0.125" RMSE Appendix VIII, Supplement 10 acceptance tolerance during procedure qualification. NMC proposes using the WESDYNE International achieved sizing error of 0.189" RMSE. This value represents a combination of measurements in shop weld and field weld qualification specimens. The Nuclear Regulatory Commission Staff and consultants have previously reviewed WESDYNE International qualification test data.

Licensee' Bases for Alternative (as stated):

The proposed procedure to address sizing of the flaws that may be found during the examination is to add to the measured flaw size the difference between the achieved sizing error and the 0.125" RMSE Appendix VIII, Supplement 10 acceptance criteria. NMC believes the use of 0.189" RMSE as an adjustment to the measured flaw will ensure a conservative bounding flaw depth value.

Response to Request for Additional Information (as stated):

Kewaunee Nuclear Power Plant would add the difference (0.064-inch) between the Code-required RMSE (0.125-inch) and the demonstrated accuracy (0.189-inch RMSE) to the measurements acquired from flaw sizing.

Evaluation: 10 CFR 50.55a(g)(6)(ii)(C)(2) requires, in part, implementation of Appendix VIII, Supplement 10 in 1995 Edition, 1996 Addenda of the ASME Code, Section XI for qualification purposes. The licensee was previously approved to use the EPRI PDI alternative to Supplement 10 in SERs dated February 26, 2004 (third interval) and February 18, 2005 (fourth interval). In the current revision to the previously approved requests, the licensee proposes to use an RMS error value of 0.189 inch in lieu of the Code-required value of 0.125 inch imposed by Appendix VIII, Supplement 10 and included in paragraph 3.2(b) of the EPRI PDI alternative. The proposed alternative applies to through-wall sizing of flaws identified during examinations of dissimilar metal welds from the inside surface.

Supplement 10 requires that examination procedures, equipment, and personnel used for examination of dissimilar metal piping welds shall meet specific criteria for flaw depth sizing accuracy. The Code requires that the maximum error for flaw depth measurements, when compared with the true flaw depths, must be less than or equal to an RMS error value of 0.125 inch. The nuclear industry is in the process of qualifying personnel in accordance with Supplement 10 requirements, as implemented through the PDI program. However, personnel have been unsuccessful at achieving the Code-required RMS error value for flaw depth sizing demonstrations performed from the inside surface of a pipe weldment. At this time, achieving an RMS error value of 0.125 inch is impractical. The licensee has stated that its vendor, Wesdyne, has only been able to achieve an RMS error value of 0.189 inch. As a result, the licensee is proposing to use a depth sizing criterion of 0.189 inch to size any detected flaw during the examination of the subject dissimilar metal welds. The licensee also proposes to add the difference (0.064 inches) between the Code-required RMS error (0.125 inches) and the demonstrated accuracy (0.189 inches) to the measurements acquired from flaw sizing.

Currently, no vendor has been able to comply with the Code-required RMS error of 0.125 inches. The performance of the vendor Wesdyne (with an RMS error of 0.189 inches, represents the current achievable state-of practice for through-wall sizing from the inside surface of reactor pressure vessel nozzle safe-end dissimilar metal welds. For this reason, the staff finds that compliance with the Code-required RMS error value is currently impractical and that by adding the difference between the Code-required RMS error and the demonstrated accuracy to the measurements acquired from flaw sizing, in addition to the use of the acceptance standards specified in Section IWB-3500 of the Code, provides reasonable assurance of continued structural integrity for the subject dissimilar metal welds. Therefore, it is recommended that, pursuant to 10 CFR 50.55a(g)(6)(i), Requests for Relief RR-1-8, Revision 1 and RR-1-7, Revision 1, be granted for the third and fourth intervals, respectively. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

3.2 Request for Relief RR-1-9, (Third Interval), Pressure Retaining Welds in Piping Examined from the Inside Surface of Pressurized Water Reactors (PWR) Subject to Appendix VIII, Supplements 2 and 10

Code Requirement: Performance demonstration requirements for qualifying procedures, personnel and equipment to inspect piping welds are listed in the 1995 Edition/1996 Addenda of ASME Section XI, Appendix VIII, Supplements 2, 3, and 10. Licensees may 1) elect to use the requirements of these supplements as listed, 2) seek NRC approval for new ASME Code cases currently being reviewed by Code Committees, or 3) propose an alternative to Code requirements.

Licensee's Proposed Alternative: Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee proposed to use a modification of the industry's Performance Demonstration Initiative (PDI) program as an alternative to the requirements listed in ASME XI, Appendix VIII, Table VIII-3110-1 for Supplement 2 Wrought Austenitic Piping Welds, as coordinated with the proposed alternative for the Supplement 10 Dissimilar Metal Piping Welds implementation program. The Electric Power Research Institute (EPRI) PDI program is

described in the submittal as supplemented. This alternative applies to examinations performed from the inside surface of PWR piping using automated inspection systems. (For reference, this PDI alternative is being routed through the Code approval process as proposed Supplement 14).

Licensee's Bases for Alternative (as stated):

The Kewaunee Nuclear Power Plant reactor vessel inlet nozzles (2) to main coolant piping, reactor vessel outlet nozzles (2) to main coolant piping, and reactor vessel nozzles (2) to safety injection piping are fabricated using ferritic components and assembled using austenitic or dissimilar metal welds. Additionally, differing combinations of these assemblies may be in close proximity, which typically means the same ultrasonic essential variables are used for each weld and the most challenging ultrasonic examination process is employed (e.g., the ultrasonic examination process associated with a dissimilar metal weld would be applied to an austenitic weld.

Separate qualifications to Supplements 2 and 10 are redundant when done in accordance with the PDI Program. For example, during a personnel qualification to the PDI Program, the candidate would be exposed to a minimum of 10 flawed grading units for each individual supplement. Personnel qualification to Supplements 2 and 10 would therefore require a total of 20 flawed grading units. Test sets this large and tests of this duration are impractical. Additionally, a full procedure qualification (i.e. 2 personnel qualifications) to the PDI Program requirements would require 60 flawed grading units. This is particularly burdensome for a procedure that will use the same essential variables or the same criteria for selecting essential variables for the 2 supplements.

To resolve these issues, the PDI Program recognizes the Supplement 10 qualification as the most stringent and technically challenging ultrasonic application. The essential variables used for the examination of Supplements 2 and 10 are the same. A coordinated add-on implementation would be sufficiently stringent to qualify Supplement 2 if the requirements used to qualify Supplement 10 are satisfied as a prerequisite. The basis for this conclusion is the fact that the majority of the flaws in Supplement 10 are located wholly in austenitic weld material. This configuration is known to be challenging for ultrasonic techniques due to the variable dendritic structure of the weld material. Conversely, flaws in Supplement 2 are located in fine-grained base materials.

Additionally, the proposed alternative is more stringent than current Code requirements for a detection and length sizing qualification. For example, the current Code would allow a detection procedure, personnel, and equipment to be qualified to Supplement 10 with 5 flaws and Supplement 2 with 5 flaws, a total of only 10 flaws. The proposed alternative of qualifying Supplement 10 using 10 flaws and adding on Supplement 2 with 5 flaws results in a total of 15 flaws which will be multiplied by a factor of three for the procedure qualification.

Based on the above, the use of a limited number of Supplement 2 flaws is sufficient to access the capabilities of procedures and personnel who have already satisfied Supplement 10 requirements. The statistical basis used for screening personnel and procedures is still maintained at the same level with competent personnel being successful and less skilled personnel being unsuccessful. The proposed alternative is

consistent with other coordinated qualifications currently contained in Appendix VIII.

The proposed alternate program is attached[1] and is identified as Supplement 14. It has been submitted to the ASME Code for consideration as new Supplement 14 to Appendix VIII and as of February 2002 has been approved by the Subcommittee on Nuclear In-service Inspection.

Evaluation: The licensee requests relief from the qualification requirements of ASME Section XI, Appendix VIII, Supplement 2 criteria. The Code currently requires separate qualifications for Supplements 2 (austenitic piping welds), 3 (ferritic piping welds), and 10 (dissimilar metal piping welds). Qualifications for each supplement would entail a minimum of 10 flaws each for a total of 30 flaws minimum. The minimum number of flaws per supplement established a statistical-based pass\fail objective. The process of a single qualification for each supplement would greatly expand the minimum number of ferritic and austenitic flaws required to be identified which would also raise the pass\fail acceptance criteria.

The Code recognized that flaws in austenitic materials are more difficult to detect and size than flaws in ferritic material. In addition, the prevailing reasoning concluded that a Supplement 3 qualification following a Supplement 2 qualification had diminishing returns on measuring personnel skills and procedure effectiveness. Therefore, in lieu of separate Supplements 2 and 3 qualifications, the ASME Code developed proposed Supplement 12 which provides for a Supplement 2 add-on to a Supplement 3 qualification. The add-on consists of a minimum of 5 flaws in austenitic material. A statistical evaluation of Supplement 12 acceptance criteria satisfied the pass\fail objective established for Appendix VIII performance demonstration acceptance criteria.

The licensee's proposed alternative builds upon the experiences of Supplement 12 by starting with the most challenging Supplement 10 qualifications, as implemented by the PDI program (PDI Supplement 10), and adding a sufficient number of flaws to demonstrate the personnel skills and procedure effectiveness to satisfy Supplement 2 qualifications. A PDI Supplement 10 performance demonstration has at least 1 flaw with a maximum of 10 percent of the total number of flaws being in the ferritic material. The rest of the flaws are in the more challenging austenitic material. When expanding the PDI Supplement 10 qualification to include Supplement 2, the proposed alternative would add a minimum of 5 flaws in austenitic material to the performance demonstration. The performance demonstration results added to the appropriate PDI Supplement 10 results must satisfy the acceptance criteria of the PDI Supplement 10. A statistical evaluation performed by the Pacific Northwest National Laboratories, an NRC contractor, showed that the proposed alternative acceptance criteria satisfied the pass\fail objective established for Appendix VIII for an acceptable performance demonstration.

It has been determined that use of a limited number of flaws to qualify Supplement 2 as coordinated with the PDI developed alternative to Supplement 10, will provide equivalent flaw detection performance to that of the Code-required qualification for piping welds. As such, the licensee's proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the licensee's proposed alternative contained in Request for Relief RR-1-9, be authorized

[1] The attachment submitted by the licensee, identified as Supplement 14, is not included in this report.

for the third interval at Kewaunee.

3.3 Amendment to Requests for Relief RR-1-9 (Third Interval) and RR-1-8, Revision 1 (Fourth Interval), Flaw-Sizing Error Limitations for Pressure Retaining Welds in Piping Examined from the Inside Surface of Pressurized Water Reactors (PWR) Subject to Appendix VIII, Supplements 2 and 10, Qualification Requirements for Wrought Austenitic and Dissimilar Metal Piping Welds

Code Requirement: Performance demonstration requirements for qualifying procedures, personnel and equipment to inspect austenitic stainless steel and dissimilar metal piping welds are listed in the 1995 Edition/1996 Addenda of ASME Section XI, Appendix VIII, Supplements 2 and 10. Licensees may 1) elect to use the requirements of Supplement 2 as listed, 2) seek NRC approval for new ASME code cases currently being reviewed by Code Committees, or 3) propose an alternative to Code requirements. The licensee was previously authorized to use the EPRI PDI alternative for satisfying Appendix VIII, Supplements 2 and 10 requirements in Section 3.2 of this report for the third interval, and in an SER dated February 18, 2005 for the fourth interval. Paragraph 3.3(c) of the EPRI PDI alternative states that personnel, equipment, and procedures are qualified for depth-sizing when the flaw depths estimated by ultrasonics, as compared to true flaw depths, do not exceed 0.125-inch root-mean-squared error (RMSE).

Licensee's Proposed Alternative: Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee proposed to amend previously approved Requests for Relief RR-1-9 and RR-1-8 by using an RMSE value of 0.245-inch, in lieu of the 0.125-inch RMSE required by Paragraph 3.3(c) of the EPRI PDI alternative (proposed Supplement 14) for flaw depth-sizing qualification. This request for relief is applicable only to safe end-to-piping welds on the Kewaunee primary reactor coolant system examined from the inside surface.

All other austenitic stainless steel piping welds, which are examined from the outside surface, will be performed using personnel, procedures and equipment qualified in accordance with the EPRI PDI alternative (proposed Supplement 14) with no deviations, as previously authorized. The licensee stated the following:

The vendor (WESDYNE International) employed by the NMC for the remote automated Reactor Vessel examinations did not achieve the 0.125" RMSE ASME Boiler Pressure Vessel Code, Section XI, Appendix VIII, Supplement 14 acceptance tolerance during procedure qualification.

Pursuant to 10 CFR 50.55a(a)(3)(i), NMC proposes using the vendor achieved through-wall sizing value of 0.245" RMSE in the examination of Supplement 2 piping welds. This value represents a combination of Supplement 10 and Supplement 2 through-wall sizing results in accordance with the criteria set forth in Supplement 14. The Nuclear Regulatory Commission staff and consultants have previously reviewed WESDYNE International qualification data.

Licensee's Basis for Alternative: (as stated):

The proposed procedure to address sizing of the flaws that may be found during the

examination is to add to the measured flaw size the difference between the achieved sizing error of 0.245" RMSE and the 0.125" RMSE Appendix VIII, Supplement 14

acceptance criteria prior to assessment. NMC believes that adding the difference [0.120 inch] between 0.245" RMSE vendor value and the 0.125" RMSE acceptance criteria to the flaw through-wall size prior to assessment is the conservative approach.

Compliance with the proposed alternative will provide an adequate level of quality and safety for the examination of the affected welds.

Evaluation: 10 CFR 50.55a(g)(6)(ii)(C)(2) requires, in part, implementation of Appendix VIII, Supplement 10 in 1995 Edition, 1996 Addenda of the ASME Code, Section XI for qualification purposes. The licensee was previously approved to use the EPRI PDI alternative to Supplements 2 and 10 (proposed Supplement 14) in Section 3.2 of this report (third interval) and in SER dated February 18, 2005, relief request number RR-1-8 (fourth interval). In the current revision to the previously approved requests, the licensee proposes to use an RMS error value of 0.245 inch in lieu of the Code-required value of 0.125 inch imposed by Appendix VIII, Supplements 2 and 10, and included in paragraph 3.3(c) of the EPRI PDI alternative. The proposed alternative applies to through-wall sizing of flaws identified during examinations of reactor coolant system safe end-to-piping welds applied from the inside surface.

Supplements 2 and 10 require that examination procedures, equipment, and personnel used for examination of dissimilar metal piping welds shall meet specific criteria for flaw depth sizing accuracy. The Code requires that the maximum error for flaw depth measurements, when compared with the true flaw depths, must be less than or equal to an RMS error value of 0.125 inch. The nuclear industry is in the process of qualifying personnel in accordance with Supplements 2 and 10 requirements, as implemented through the PDI program. However, personnel have been unsuccessful at achieving the Code-required RMS error value for flaw depth sizing demonstrations performed from the inside surface of a pipe weldment. At this time, achieving an RMS error value of 0.125 inch is impractical since no vendor has been able to comply with the Code-required RMS error of 0.125 inches. The performance of the vendor Wesdyne (with an RMS error of 0.245 inches, represents the current achievable state-of practice for through-wall sizing from the inside surface of the reactor vessel nozzle. As a result, the licensee is proposing to use a depth sizing criterion of 0.245 inches to size any detected flaw during the examination of the subject safe end-to-pipe welds. The licensee also proposes to add the difference (0.120 inches) between the Code-required RMS error (0.125 inches) and the demonstrated accuracy (0.245 inches) to the measurements acquired from flaw sizing.

The staff finds that compliance with the Code-required RMS error value is currently impractical and that by adding the difference between the Code-required RMS error and the demonstrated accuracy to the measurements acquired from flaw sizing, in addition to the use of the acceptance standards specified in Section IWB-3500 of the Code, provides reasonable assurance of continued structural integrity for the subject safe end-to-pipe welds. Therefore, it is recommended that, pursuant to 10 CFR 50.55a(g)(6)(i),

Requests for Relief RR-1-9 and RR-1-8, Revision 1, be granted for the third and fourth intervals, respectively. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

3.4 Request for Relief RR-1-10 (Third Interval), Examination Category B-D, Item B3.90, Reactor Pressure Vessel (RPV) Full Penetration Nozzle-to-Vessel Welds, Use of Code Case N-613-1

Note: In response to the NRC Request for Additional Information, the licensee has elected to withdraw RR-1-10 for the third interval, and must therefore meet the examination volume requirements listed in the Code, or propose an alternative in accordance with 10 CFR 50.55a(a)(3)(i) or (ii).

3.5 Request for Relief RR-1-11 (Third Interval), Examination Category B-A, Pressure Retaining Welds in the RPV Shell and Head, Application of Appendix VIII, Supplement 4, Statistical Parameters for Flaw Sizing Acceptance Criteria

Code Requirement: ASME Code, Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 4, subparagraph 3.2(c) requires performance demonstration results reported by the candidate when plotted on a two-dimensional plot (Figure VIII-S4-1) with the depth estimated by ultrasonics plotted along the ordinate and the true depth plotted along the abscissa, satisfy the following statistical parameters: (1) slope of the linear regression line is not less that 0.7; (2) the mean deviation of the flaw depth is less than 0.25 inch; (3) correlation coefficient is not less than 0.70.

Licensee's Proposed Alternative to Code (as stated):

In accordance with 10 CFR 50.55a(a)(3)(i), the licensee proposed an alternative to the requirements listed in Supplement 4, Subparagraph 3.2(c), for determining a successful qualification for flaw depth sizing. The alternative consists of two parts:

1) Use the flaw-sizing acceptance criteria of 0.15-inch Root Mean Square (RMS) Error (depth) and 0.75-inch (length) as listed in 10 CFR 50.55a(b)(2) (xv)(C)(*1*), which modifies Code Sub-paragraphs 3.2(a) and 3.2)b), and

2) Perform the qualification analysis for flaw-sizing capability by determining RMS error in lieu of the statistical parameters of ASME Boiler and Pressure Vessel Code Section XI 1998 Edition 2000 Addenda Appendix VIII, Supplement 4, Subparagraph 3.2(c).

The licensee will implement this alternative for the inspection of RPV shell and head Welds RV-W2, RV-W3, RV-W4, and RV-W5.

Licensee's Basis for Alternative: (as stated):

On September 22, 1999, the NRC published a final rule in the Federal Register (64 FR

51378) to amend 10 CFR 50.55a(b)(2), to incorporate by reference the 1995 Edition and Addenda through the 1996 Addenda, of Section XI of the ASME Code. The change included the provisions of Subparagraph 3.2(a), 3.2(b) and 3.2(c) of Section XI of the ASME Code, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 4.

Additionally, the September 22, 1999, Federal Register amended

10 CFR 50.55a(b)(2)(xv)(C)(*1*). The amended 10 CFR 50.55a(b)(2)(xv)(c)(1) requires a depth sizing acceptance criterion of 0.15 inch RMS to be used in lieu of the requirements of Subparagraph 3.2 (a) and 3.2(b) of Section XI of the ASME Code, Appendix VIII, Supplement 4.

On March 26, 2001, the NRC published a correction to the September 22, 1999, final rule in the Federal Register (66 FR 16390). The NRC identified that an error had occurred in the published wording of 10 CFR 50.55a(b)(2)(xv)(c)(1). The corrected 10 CFR 50.55a(b)(2)(xv)(C)(*1*) requires a depth sizing acceptance criterion of 0.15 inch RMS be used in lieu of the requirements of Subparagraph 3.2(a) and a length sizing requirement of 0.75 inch RMS to be used in lieu of the requirements of 3.2(b) of Section XI of the ASME Code, Appendix VIII, Supplement 4.

The U.S. nuclear utilities created the PDI to implement performance demonstration requirements contained in Appendix VIII of Section XI of the ASME Code. To this end, PDI has developed a performance demonstration program for qualifying UT equipment, procedures, and personnel. During the development of the performance demonstration for Supplement 4, the PDI determined that the Code criteria for flaw sizing was unworkable.

NMC proposes to eliminate the use of the requirement in Supplement 4, Subparagraph 3.2(c), which imposes three statistical parameters for depth sizing. The first parameter, 3.2(c)(1), pertains to the slope of a linear regression line. The linear regression line is the difference between actual versus true value plotted along a through-wall thickness. For Supplement 4 performance demonstrations, a linear regression line of the data is not applicable because the performance demonstrations are performed on test specimens with flaws located in the inner 15 percent through-wall. The differences between actual versus true value produce a tight grouping of results which resemble a shotgun pattern. The slope of a regression line from such data is extremely sensitive to small variations, thus making the parameter of Subparagraph 3.2(c)(1) a poor and inappropriate acceptance criterion. The second parameter, 3.2(c)(2), pertains to the mean deviation of flaw depth. The value used in the code is too lax with respect to evaluating flaw depths within the inner 15 percent of wall thickness. The third parameter, 3.2 (c)(3), pertains to correlation coefficient. The value of the correlation coefficient in Subparagraph 3.2(c)(3) is in appropriate for this application since it is based on the linear regression from Subparagraph 3.2(c)(1). Therefore, NMC proposes to use the more appropriate acceptance criteria of 0.15 inch RMS (depth) and 0.75 inch RMS (length) from 10 CFR50.55a(b)(2)(xv)(C)(*1*), which modifies Subparagraph 3.2(a) and 3.2(b).

PDI was aware of the inappropriateness of Subparagraph 3.2(c) early in the development of their program. They brought the issue before the appropriate ASME committee, which formalized Code Case N-622, eliminating the use of Supplement 4, Subparagraph 3.2(c). The NRC staff representatives participated in the discussions and consensus process of the code case.

Evaluation: Supplement 4, Subparagraph 3.2(c) imposes three statistical parameters for depth sizing. The first parameter, 3.2(c)(1), pertains to the slope of a linear regression

line. The linear regression line is a best fit line obtained by the least-square method using data points of UT measured flaw depth versus actual flaw depth. For Supplement 4 performance demonstrations, a best fit line acquired by the linear regression method would be calculated from data points that come from the inner 15% of the wall thickness. Plotting the data, UT measured flaw depth versus true flaw depth, produce closely grouped data points that resemble a shotgun pattern. The slope of a line calculated by linear regression from data points that are so close together would not produce meaningful results because the line would be extremely sensitive to small variations in depth measurements. The second parameter, 3.2(c)(2), pertains to the mean deviation of flaw depth. The Code currently requires a mean deviation flaw depth of less than 0.25-inch versus the licensee proposed 0.15 RMS value. The licensee's proposal to use the more restrictive criterion of 0.15 RMS of 10 CFR 50.55a(b)(2)(xv)(C)(*1*), which modifies Subparagraph 3.2(a), as the acceptance criterion is more conservative than Code and follows the PDI protocol. The third parameter, 3.2(c)(3), pertains to a correlation coefficient. The value of the correlation coefficient in Subparagraph 3.2(c)(3) is inappropriate for this application since it is based on the linear regression from Subparagraph 3.2(c)(1). In addition, the licensee's use of 0.75-inch RMS for flaw length-sizing acceptance is consistent with the requirements stated in 10 CFR 50.55a(b)(2)(xv)(C)(*1*).

It has been determined that the proposed alternative to Supplement 4, as administered by the PDI program will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that Request for Relief RR-1-11 be authorized for the third interval at Kewaunee.

3.6 Request for Relief RR-G-6 (Third Interval), Inspection Interval for Reactor Coolant Pump Flywheels

Note: In response to the NRC Request for Additional Information, the licensee has elected to withdraw RR-G-6 for the third interval, and will perform the reactor coolant pump flywheel examination as part of an augmented inspection program developed in accordance with Regulatory Guide 1.14.

4.0 CONCLUSION

Pacific Northwest National Laboratory has reviewed the licensee's submittal and concludes that the Code requirement of 0.125-inch root mean square (RMS) for acceptable flaw depth-sizing

error is currently impractical, when performing examinations of nozzle-to-safe end dissimilar metal welds and safe end-to-piping similar metal welds from the inside surfaces of the components using automated equipment. The demonstrated accuracies for these welds during performance qualifications was 0.189-inch and 0.245-inch, respectively. The licensee's practice of adding the difference between the Code-required RMS error and the demonstrated accuracy to the measurements acquired from sizing any detected flaws, in addition to the use of the acceptance standards specified in Section IWB-3500 of the Code, provides reasonable assurance of continued structural integrity for the subject welds. Therefore, it is recommended that, pursuant to 10 CFR 50.55a(g)(6)(i), Requests for Relief RR-1-8, Revision 1 and RR-1-7, Revision 1, be granted for the third and fourth intervals at Kewaunee, respectively. Similarly, it is also recommended that amended Requests for Relief RR-1-9 and RR-1-8, Revision 1, be granted for the third and fourth intervals, respectively.

Further, based on the information provided in the licensee's submittal, it has been concluded that the alternatives proposed in Requests for Relief RR-1-9 and RR-1-11 provide an acceptable level of quality and safety. Therefore, it is recommended that these requests be authorized, pursuant to 10 CFR 50.55a(a)(3)(i), for the third 10-year inspection interval at Kewaunee.

As a result of the NRC Request for Additional Information, Requests for Relief RR-1-10, and RR-G-6 were withdrawn by the licensee in their response dated September 17, 2004.

KEWAUNEE NUCLEAR POWER PLANT Page 1 of 1
Third and Fourth 10-Year ISI IntervalsTABLE 1
SUMMARY OF RELIEF REQUESTS

Relief Request Number	ISI Interval	PNNL TLR Sec.	System or Component	Exam. Category	Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Disposition
RR-1-8, Rev.1 RR-1-7, Rev.1	Third Fourth	3.1	RPV Nozzles	B-F	B5.10 B5.20	100% of dissimilar metal nozzle welds in RPV	Volumetric	Use PDI alternative to Appendix VIII, Supplement 10 for ultrasonic qualifications with 0.189-inch RMSE for flaw depth-sizing	Granted 10 CFR 50.55a (g)(6)(i)
RR-1-9	Third	3.2	Piping	B-F B-J	Multiple	Pressure retaining circumferential piping welds at RPV nozzle safe-ends	Volumetric and Surface	Use PDI alternative to Appendix VIII, Supplements 2 and 10 for ultrasonic qualifications	Authorized 10 CFR 50.55a (a)(3)(i)
RR-1-9, Amd RR-1-8, Rev.1, Amd	Third Fourth	3.3	Piping	B-J	B9.11	Pressure retaining circumferential piping welds at RPV nozzle safe-ends	Volumetric and Surface	Use PDI alternative to Appendix VIII, Supplements 2 and 10 for ultrasonic qualifications with 0.245-inch RMSE for flaw depth-sizing	Granted 10 CFR 50.55a (g)(6)(i)
RR-1-10	Third	3.4	RPV Nozzle Welds	B-D	B3.90	100% of pressure-retaining RPV nozzle-to-shell welds	Volumetric	Use alternative in Code Case N-613-1 for examination volume	Withdrawn by licensee September 17, 2004
RR-1-11	Third	3.5	RPV Shell Welds	B-A	Multiple	100% of RPV pressure-retaining shell and head welds	Volumetric	Use RMSE for flaw-sizing qualification in lieu of statistical regression	Authorized 10 CFR 50.55a (a)(3)(i)
RR-G-6	Third	3.6	RCP Flywheels	N/A	N/A	Augmented inspection of RCP flywheels	Volumetric	Extend inspection interval to 20 years	Withdrawn by licensee September 17, 2004