April 16, 2004

NRC-04-034
10 CFR 50.55a

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

KEWAUNEE NUCLEAR POWER PLANT
DOCKET 50-305
LICENSE No. DPR-43

IN-SERVICE INSPECTION (ISI) PROGRAM RELIEF REQUEST NO. RR-1-8 REV.1, RR-1-9, RR-1-10, RR-1-11 AND RR-G-6 FOR THIRD TEN-YEAR INTERVAL.
IN-SERVICE INSPECTION (ISI) PROGRAM RELIEF REQUEST NO. RR-1-7 REV.1 AND RR-1-8 REV.1 FOR FOURTH TEN-YEAR INTERVAL

Reference:

1. Letter from Thomas Coutu (NMC) to Document Control Deck (NRC), "In-service Inspection Request For Fourth Inspection Interval", dated December 16, 2003. (ML033580734).

Pursuant to 10 CFR 50.55a(a)(3)(i), Nuclear Management Company, LLC (NMC) requests NRC approval of the enclosed requests for the Third Ten-Year In-service Inspection Interval (5 Total) and Fourth Ten-Year In-service Inspection Interval (2) These requirements are associated with the performance of Reactor Vessel Automated Examinations including compliance with ASME Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Qualification of Nondestructive Examination Personnel For Ultrasonic Examination of ASME Boiler and Pressure Vessel Code, Section XI IWA-2430(d) and Reactor Coolant Pump Flywheel Examinations including compliance with NRC Regulatory Guide 1.14 Rev. 1.

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Relief Requests RR-1-7 Rev.1 for Fourth Ten-Year Interval and RR-1-8 Rev. 1 for Third Ten-Year Interval (Enclosure 1) address the use of 0.189" Root Mean Square Error (RMSE) sizing requirements in lieu of 0.125" RMSE sizing requirements as required per American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Supplement 10, Paragraph 3.2(b). The proposed alternative was approved for the Virgil C. Summer Nuclear Station by NRC letter dated February 3, 2004. (ML040340450)

Relief Request RR-1-8 Rev.1 for Fourth Ten-Year Interval and RR-1-9 for Third Ten-Year Interval (Enclosure 2) address implementation of American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Supplement 2. The proposed alternative was approved for the Virgil C. Summer Nuclear Station by NRC letter dated February 3, 2004. (ML040340450)

Relief Requests RR-1-8 Rev. 1 for Fourth Ten-Year Interval and RR-1-9 for Third Ten-Year Interval (Enclosure 3) address the use of 0.245" RMSE sizing requirements in lieu of 0.125" RMSE sizing requirements as required per American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Supplement 14, Paragraph 3.3(c). The proposed alternative was previously reviewed by the Nuclear Regulatory Commission Staff and Consultants for WESDYNE International qualification test data.

Relief Request RR-1-10 for Third Ten-Year Interval (Enclosure 4) addresses implementation of American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Code Case N-613-1. The proposed alternative was approved for the Virgil C. Summer Nuclear Station by NRC letter dated February 11, 2004. (ML040420386)

Relief Request RR-1-11 for Third Ten-Year Interval (Enclosure 5) addresses use of the root mean square (RMS) value of 10 CFR 50.55a(b)(2)(xv)(C)(1), which modifies the depth sizing criterion of American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Supplement 4, Subparagraph 3.2(a), in lieu of Subparagraph 3.2(c). The proposed alternative was approved for the Prairie Island Nuclear Station by NRC letter dated April 24, 2003. (ML031150063)

Relief Request RR-G-6 for Third Ten-Year Interval (Enclosure 6) will extend the reactor coolant pump (RCP) motor flywheel examination frequency from the currently approved 10-year inspection interval to an interval not to exceed 20 years. The changes are consistent with Industry/Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-421, "Revision to RCP Flywheel Inspection Program (WCAP-15666)." The availability of the Third Ten-Year Augmented In-service Inspection (ISI) Program improvement was announced in the Federal Register on Wednesday, October 22, 2003, as part of the Consolidated Line Item Improvement Process (CLIIP).

The details of the 10 CFR 50.55a(a)(3)(i) requests are enclosed in the attached relief requests for the Kewaunee Nuclear Power Plant.

NMC requests approval of the above listed relief requests by October 1, 2004.

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

I declare under penalty of perjury that the foregoing is true and accurate.
Executed on April 16, 2004.

for

Thomas Coutu
Site Vice-President, Kewaunee Nuclear Power Plant
Nuclear Management Company, LLC

Enclosures (6)

cc: Administrator, Region III, USNRC
Project Manager, Kewaunee Nuclear Power Plant, USNRC
Senior Resident Inspector, Kewaunee Nuclear Power Plant, USNRC
Electric Division, PSCW

ENCLOSURE 1
CODE CASE RELIEF REQUEST

THIRD 10-YEAR INTERVAL JUNE 16, 1994 – JUNE 16, 2004
REQUEST FOR RELIEF No. RR-1-8 Rev. 1 FOR THIRD TEN-YEAR INTERVAL
FOURTH 10-YEAR INTERVAL JUNE 16, 2004 – JUNE 16, 2014
REQUEST FOR RELIEF No. RR-1-7 Rev. 1 FOR FOURTH TEN-YEAR INTERVAL

1. COMPONENTS AFFECTED

Pressure Retaining Dissimilar Pressure Retaining Metal Piping Welds subject to examination using procedures, personnel, and equipment qualified to ASME Section XI, Appendix VIII, Supplement 10 criteria.

Component	Isometric
SI-W112DM	ISIM-938-2Sh1
SI-W54DM	ISIM-939SH1
RC-1DM, RC-W26DM,	ISIM-1703
RC-W30DM, RC-W58DM	ISIM-1704
PS-W61DM	ISIM-874-1
RC-W67DM	ISIM-892
PR-1DM	ISIM-940-1
PR-W16DM, PR-W26DM	ISIM-940-2
RC-W76DM, RC-W77DM	ISIM-1703
RC-W78DM, RC-W79DM	!SIM-1704

2. SECTION XI REQUIREMENTS

A Volumetric examination of Dissimilar Metal Pressure Retaining Piping Welds per 1989 Edition for Third Ten-Year Interval and 1998 Edition 2000 Addenda for Fourth Ten-Year Interval of Section XI, Table IWB-2500-1, Examination Category B-F, Item Nos. B5.10, B5.40 and B5.70. This requires that a volumetric examination of applicable dissimilar metal pressure retaining piping welds use procedures, personnel, and equipment qualified to the criteria of ASME Section XI, 1995 Edition, 1995 Addenda for Third Ten-Year Interval, Appendix VIII, Supplement 10 and ASME Section XI, 1998 Edition, 2000 Addenda, Appendix VIII, Supplement 10, for the Fourth Interval.

3. BASIS FOR REQUESTING RELIEF

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".

4. ALTERNATIVE METHODS OF EXAMINATION

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 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.

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.

Additionally, to address the procedure detection limitation, NMC proposes to apply the following techniques:

1. Ultrasonic Weld Profiling

Ultrasonic Weld Profiling is a tool to assist in the evaluation of poor transducer contact as a result of surface roughness and as a method to provide permanent record of the actual surface condition of the nozzle to pipe dissimilar metal weld joint. The data is taken with focused immersion transducers mounted on the ends of the examination array. The scan stroke is long enough to allow for a surface profile up to 3 inches on either side of the examination volume at approximately one-degree increments around the nozzle bore. When translated through software, the profile data is presented on a section view scale showing the weld joint and geometry such as root protrusion and counter-bore. The most important feature allows the examiner to transpose transducer position along the scan line to evaluate the effect of the geometry on the exam beam.

2. Remote Visual Examinations

To support nozzle to pipe dissimilar metal weld joint examinations and provide a confirmation mechanism for surface conditions, a remote enhanced visual examination (VT-1 using a 1 mil wire as a reference standard) is planned for all four primary nozzles. The ROS PT-10 cameras are positioned near the ultrasonic end-effector. Lighting conditions, focus and zoom are adjustable and the angular/radial position data is transposed on the visual screen for interpretation/correlation with other data. Enhanced visual data will be recorded directly to DVD.

5. IMPLEMENTATION SCHEDULE

Kewaunee Nuclear Power Plant Third Ten-Year Interval, June 16, 1994 – June 16, 2005. The Kewaunee Nuclear Power Plant Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d).

Kewaunee Nuclear Power Plant Fourth Ten-Year Interval, June 16, 2004 – June 16, 2014

ENCLOSURE 2
CODE CASE RELIEF REQUEST

THIRD 10-YEAR INTERVAL JUNE 16, 1994 – JUNE 16, 2004
REQUEST FOR RELIEF No. RR-1-9 FOR THIRD TEN-YEAR INTERVAL
FOURTH 10-YEAR INTERVAL JUNE 16, 2004 – JUNE 16, 2014
REQUEST FOR RELIEF No. RR-1-8 Rev.1 FOR FOURTH TEN-YEAR INTERVAL

1. COMPONENTS AFFECTED

Class 1 Pressure Retaining Piping Welds examined from the inside surface of Pressurized Water Reactors using procedures, personnel, and equipment qualified to ASME Section XI, Appendix VIII, Supplement 2 and 10 criteria.

Component	Isometric
RC-W1DM, RC-W26DM	ISIM-1703
RC-W30DM, RC-W58DM	ISIM-1704
SI-W112DM	ISIM-938-2SH1
SI-W54DM	ISIM-939 SH1

2. SECTION XI REQUIREMENTS

Relief is requested from the qualification requirements for piping welds contained in Table VIII-3110-1 of Appendix VIII to ASME Section XI for:

a. Supplement 2 as applicable for Wrought Austenitic Piping Welds

3. BASIS FOR REQUESTING RELIEF

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 initiate 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 3 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 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 Subcommittee on Nuclear In-service Inspection.

4. ALTERNATIVE METHODS OF EXAMINATION

Pursuant to 10CFR50.55a(a)(3)(i), NMC requests use of the enclosed proposed alternative for implementation of Appendix VIII, Supplement 2, as coordinated with the proposed alternative for the Supplement 10 implementation program as provided for in the approved [NRC letter dated 2/26/04] Nuclear Management Company Fleet Relief Request [TAC Nos. MC0820, MC0821] for Kewaunee Nuclear Power Plant Relief Request RR-1-8 Revision 1 for the Third Ten-Year Interval and additionally for pending Supplement 10, Kewaunee Nuclear Power Plant Relief Request RR-1-7 Revision 1 for the Fourth Ten-Year Interval. The PDI will administer the alternative program as

described in the enclosure. Compliance with the proposed alternatives will provide an adequate level of quality and safety for examination of the affected welds.

5. IMPLEMENTATION SCHEDULE

Kewaunee Nuclear Power Plant Third Ten-Year Interval, June 16, 1994 – June 16, 2005.
The Kewaunee Nuclear Power Plant Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d).

Kewaunee Nuclear Power Plant Fourth Ten-Year Interval, June 16, 2004 – June 16, 2014

SUPPLEMENT 14 - QUALIFICATION REQUIREMENTS FOR COORDINATED IMPLEMENTATION OF SUPPLEMENT 2 AND 10 FOR PIPING EXAMINATIONS PERFORMED FROM THE INSIDE SURFACE	
Proposed Requirements	**Technical Basis**
1.0 SCOPE	
This Supplement is applicable to wrought austenitic and dissimilar metal piping welds examined from the inside surface. This Supplement provides for expansion of Supplement 10 qualifications to permit coordinated qualification for Supplement 2.	There is currently no available Code action allowing for a coordinated implementation of the fundamental qualifications required for the typical examinations performed from the ID of PWR nozzles. Without this change, qualifications would require an excessive amount of flawed and unflawed grading units. This proposed supplement uses the more technically stringent Supplement 10 qualification as a base and then incorporates a limited number of Supplement 2 samples. This proposal is consistent with the philosophy of Supplement 12, the proposed changes to Supplement 10, and the approved changes to Supplement 2 and 11.
2.0 SPECIMEN REQUIREMENTS Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	
2.1 General The specimen set shall conform to the following requirements.	
(a) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	

(b) The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Applicable tolerances are provided in Supplements 2 and 10.	Tolerances are from the applicable Supplements because Supplement 2 dimensions and tolerances are typically based on wrought nominal pipe size that is not appropriate for DM welds that are typically associated with forged and machined safe ends.
(c) The specimen set shall include examples of the following fabrication conditions: (1) geometric and material conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity, and weld repair areas); (2) typical limited scanning surface conditions (e.g., internal tapers, exposed weld roots, and cladding conditions).	
2.2 Supplement 2 Flaws (a) At least 70% of the flaws shall be cracks, the remainder shall be alternative flaws. (b) Specimens with IGSCC shall be used when available. (c) Alternative flaws, if used, shall provide crack-like reflective characteristics and shall comply with the following: (1) Alternative flaws shall be used only when implantation of cracks produces spurious reflectors that are uncharacteristic of service-induced flaws. (2) Alternative flaws shall have a tip width of less than or equal to 0.002 in. (0.05 mm).	
2.3 Distribution The specimen set shall contain a representative distribution of flaws. Flawed and unflawed grading units shall be randomly mixed.	Since the number of flaws will be limited words such as "uniform distribution" could lead to testmanship and are considered inappropriate.

3.0 PERFORMANCE DEMONSTRATION	
Personnel and procedure performance demonstration tests shall be conducted according to the following requirements: (a) The same essential variable values, or, when appropriate, the same criteria for selecting values as demonstrated in Supplement 10 shall be used. (b) The flaw location and specimen identification shall be obscured to maintain a "blind test". (c) All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.	
3.1 Detection Test	
(a) The specimen set for Supplement 2 qualification shall include at least five flawed grading units and ten unflawed grading units in austenitic piping. A maximum of one flaw shall be oriented axially.	
(b) Specimens shall be divided into grading units. (1) Each grading unit shall include at least 3 in. (76 mm) of weld length. (2) The end of each flaw shall be separated from an unflawed grading unit by at least 1 in. (25 mm) of unflawed material. A flaw may be less than 3 in. (76 mm) in length. (3) The segment of weld length used in one grading unit shall not be used in another grading unit. (4) Grading units need not be uniformly spaced around the pipe specimen.	

(c) All grading units shall be correctly identified as being either flawed or unflawed.	
3.2 Length-sizing Test	
(a) The coordinated implementation shall include the following requirements for personnel length sizing qualification.	
(b) The specimen set for Supplement 2 qualification shall include at least four flaws in austenitic material.	Axial flaws are not length sized in Supplement 2.
(c) Each reported circumferential flaw in the detection test shall be length sized. When only length-sizing is being tested, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the length of the flaw in each region.	
(d) Supplement 2 examination procedures, equipment, and personnel are qualified for length-sizing when the flaw lengths estimated by ultrasonics, as compared with the true lengths, do not exceed 0.75 in. (19 mm) RMS, when they are combined with a successful Supplement 10 qualification.	
3.3 Depth-sizing Test	
The coordinated implementation shall include the following requirements for personnel depth-sizing qualification.	
(a) The specimen set for Supplement 2 qualification shall include at least four circumferentially oriented flaws in austenitic material.	Axial flaws are not depth sized in Supplement 2.
(b) For a separate depth-sizing test, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the depth of the flaw in each region.	

(c) Supplement 2 examination procedures, equipment, and personnel are qualified for depth-sizing when the flaw depths estimated by ultrasonics, as compared with the true depths, do not exceed 0.125 in. (3 mm) RMS, when they are combined with a successful Supplement 10 qualification.	
4.0 PROCEDURE QUALIFICATION	
Procedure qualifications shall include the following additional requirements: (a) The specimen set shall include the equivalent of at least three personnel performance demonstration test sets. Successful personnel performance demonstrations may be combined to satisfy these requirements. (b) Detectability of all flaws in the procedure qualification test set that are within the scope of the procedure shall be demonstrated. Length and depth sizing shall meet the requirements of 3.1, 3.2, and 3.3. (c) At least one successful personnel demonstration shall be performed. (d) To qualify new values of essential variables, at least one personnel performance demonstration is required. The acceptance criteria of 4.0(b) shall be met.	

ENCLOSURE 3
CODE CASE RELIEF REQUEST

THIRD 10-YEAR INTERVAL JUNE 16, 1994 – JUNE 16, 2004
REQUEST FOR RELIEF No. RR-1-9 FOR THIRD TEN-YEAR INTERVAL
FOURTH 10-YEAR INTERVAL JUNE 16, 2004 – JUNE 16, 2014
REQUEST FOR RELIEF No. RR-1-8 Rev.1 FOR FOURTH TEN-YEAR INTERVAL
AMENDMENT

1. COMPONENTS AFFECTED

Class 1 Pressure Retaining Piping Welds examined from the inside surface of Pressurized Water Reactors using procedures, personnel, and equipment qualified to ASME Section XI, Appendix VIII, Supplement 2 and 10 criteria.

Component	Isometric
RC-W1DM, RC-W26DM	ISIM-1703
RC-W30DM, RC-W58DM	ISIM-1704
SI-W112DM	ISIM-938-2SH1
SI-W54DM	ISIM-939 SH1

2. SECTION XI REQUIREMENTS

Relief is requested from the qualification requirements for piping welds contained in Table VIII-3110-1 of Appendix VIII to ASME Section XI for:

a. Supplement 2 as applicable for Wrought Austenitic Piping Welds as addressed in Supplement 14-Qualification Requirements For Coordinated Implementation of Supplement 2 and 10 For Piping Examinations Performed From The Inside Surface - Proposed Requirements Depth – sizing Test Section 3.3(c).

3. BASIS FOR REQUESTING RELIEF

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

4. ALTERNATIVE METHODS OF EXAMINATION

Pursuant to 10CFR50.55a(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 test data.

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 between the 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.

5. IMPLEMENTATION SCHEDULE

Kewaunee Nuclear Power Plant Third Ten-Year Interval June 16, 1994 – June 16, 2005. The Kewaunee Nuclear Power Plant Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d).

Kewaunee Nuclear Power Plant Fourth Ten-Year Interval June 16, 2004 – June 16, 2014

SUPPLEMENT 14 - QUALIFICATION REQUIREMENTS FOR COORDINATED IMPLEMENTATION OF SUPPLEMENT 2 AND 10 FOR PIPING EXAMINATIONS PERFORMED FROM THE INSIDE SURFACE	
Proposed Requirements	**Technical Basis**
1.0 SCOPE	
This Supplement is applicable to wrought austenitic and dissimilar metal piping welds examined from the inside surface. This Supplement provides for expansion of Supplement 10 qualifications to permit coordinated qualification for Supplement 2.	There is currently no available Code action allowing for a coordinated implementation of the fundamental qualifications required for the typical examinations performed from the ID of PWR nozzles. Without this change, qualifications would require an excessive amount of flawed and unflawed grading units. This proposed supplement uses the more technically stringent Supplement 10 qualification as a base and then incorporates a limited number of Supplement 2 samples. This proposal is consistent with the philosophy of Supplement 12, the proposed changes to Supplement 10, and the approved changes to Supplement 2 and 11.
2.0 SPECIMEN REQUIREMENTS Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	
2.1 General The specimen set shall conform to the following requirements:	
(a) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	

(b) The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Applicable tolerances are provided in Supplements 2 and 10.	Tolerances are from the applicable Supplements because Supplement 2 dimensions and tolerances are typically based on wrought nominal pipe size that is not appropriate for DM welds that are typically associated with forged and machined safe ends.
(c) The specimen set shall include examples of the following fabrication conditions: (1) geometric and material conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity, and weld repair areas); (2) typical limited scanning surface conditions (e.g., internal tapers, exposed weld roots, and cladding conditions).	
2.2 Supplement 2 Flaws (a) At least 70% of the flaws shall be cracks, the remainder shall be alternative flaws. (b) Specimens with IGSCC shall be used when available. (c) Alternative flaws, if used, shall provide crack-like reflective characteristics and shall comply with the following: (1) Alternative flaws shall be used only when implantation of cracks produces spurious reflectors that are uncharacteristic of service-induced flaws. (2) Alternative flaws shall have a tip width of less than or equal to 0.002 in. (0.05 mm).	

2.3 Distribution The specimen set shall contain a representative distribution of flaws. Flawed and unflawed grading units shall be randomly mixed.	Since the number of flaws will be limited, words such as "uniform distribution" could lead to testmanship and are considered inappropriate.
3.0 PERFORMANCE DEMONSTRATION	
Personnel and procedure performance demonstration tests shall be conducted according to the following requirements: (a) The same essential variable values, or, when appropriate, the same criteria for selecting values as demonstrated in Supplement 10 shall be used. (b) The flaw location and specimen identification shall be obscured to maintain a "blind test". (c) All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.	
3.1 Detection Test	
(a) The specimen set for Supplement 2 qualification shall include at least five flawed grading units and ten unflawed grading units in austenitic piping. A maximum of one flaw shall be oriented axially.	
(b) Specimens shall be divided into grading units. (1) Each grading unit shall include at least 3 in. (76 mm) of weld length. (2) The end of each flaw shall be separated from an unflawed grading unit by at least 1 in. (25 mm) of unflawed material. A flaw may be less than 3 in. (76 mm) in length. (3) The segment of weld length used in one grading unit shall not be used in another grading unit.	

(4) Grading units need not be uniformly spaced around the pipe specimen.	
(c) All grading units shall be correctly identified as being either flawed or unflawed.	
3.2 Length-sizing Test	
(a) The coordinated implementation shall include the following requirements for personnel length sizing qualification.	
(b) The specimen set for Supplement 2 qualification shall include at least four flaws in austenitic material.	Axial flaws are not length sized in Supplement 2.
(c) Each reported circumferential flaw in the detection test shall be length sized. When only length-sizing is being tested, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the length of the flaw in each region.	
(d) Supplement 2 examination procedures, equipment, and personnel are qualified for length-sizing when the flaw lengths estimated by ultrasonics, as compared with the true lengths, do not exceed 0.75 in. (19 mm) RMS, when they are combined with a successful Supplement 10 qualification.	
3.3 Depth-sizing Test	
The coordinated implementation shall include the following requirements for personnel depth-sizing qualification:	
(a) The specimen set for Supplement 2 qualification shall include at least four circumferentially oriented flaws in austenitic material.	Axial flaws are not depth sized in Supplement 2.
(b) For a separate depth-sizing test, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the depth of the flaw in each region.	

(c) Supplement 2 examination procedures, equipment, and personnel are qualified for depth-sizing when the flaw depths estimated by ultrasonics, as compared with the true depths, do not exceed 0.125 in. (3 mm) RMS, when they are combined with a successful Supplement 10 qualification.	
4.0 PROCEDURE QUALIFICATION	
Procedure qualifications shall include the following additional requirements: (a) The specimen set shall include the equivalent of at least three personnel performance demonstration test sets. Successful personnel performance demonstrations may be combined to satisfy these requirements. (b) Detectability of all flaws in the procedure qualification test set that are within the scope of the procedure shall be demonstrated. Length and depth sizing shall meet the requirements of 3.1, 3.2, and 3.3. (c) At least one successful personnel demonstration shall be performed. (d) To qualify new values of essential variables, at least one personnel performance demonstration is required. The acceptance criteria of 4.0(b) shall be met.	

ENCLOSURE 4
CODE CASE RELIEF REQUEST

THIRD 10-YEAR INTERVAL JUNE 16, 1994 – JUNE 16, 2004
REQUEST FOR RELIEF No. RR-1-10 FOR THIRD TEN-YEAR INTERVAL

1. COMPONENTS AFFECTED

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, Addenda Table IWB-2500-1, Examination Category B-D, Item No. B3.90, Class 1 Reactor Vessel Full Penetration Welded Nozzle-to-Vessel Welds.

Component	Isometric
RV-W6	M-1194
RV-W8	M-1194
RV-W9	M-1194
RV-W11	M-1194

2. SECTION XI REQUIREMENTS

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, Examination Category B-D, Item No. B3.90 requires that a minimum volume of material a distance of one half the reactor vessel shell thickness adjacent to the weld (ts/2) be examined as demonstrated in Figures IWB-2500-7 (a), (b) or (c).

3. BASIS FOR REQUESTING RELIEF

The examination volume for the reactor pressure vessel pressure retaining nozzle-to-vessel welds extends far beyond the weld into the base material, and is unnecessarily large. This extends the examination time significantly, and results in no net increase in safety, as the area being examined is a base material region which is not prone to In-service cracking and has been extensively examined during construction, pre-service examination, and during the previous In-service examinations with acceptable results.

Code Case N-613-1 reduces the examination area to one-half (1/2) inch from the weld. NMC intends to use ASME Boiler and Pressure Vessel Code, Section XI, Code Case N-613-1, for the Loop A Reactor Coolant Inlet Nozzle and Loop B Reactor Coolant Inlet Nozzle of the Reactor Vessel as shown in Figure 1, and Safety Injection Nozzles (2) of the Reactor Vessel as shown in Figure 2 of the Code Case. The proposed alternative would re-define and limit the examination volume boundary to one-half (1/2) inch of base material on each side of the widest portion of the weld, removing from the examination the base material that was extensively examined during prior inspections, and is not considered in the high residual stress region associated with the weld. This reduction is applicable to base material examination volume (as indicated in Figure 1 and Figure 2, as applicable).

4. ALTERNATIVE METHODS OF EXAMINATION

Pursuant to 10 CFR 50.55a(a)(3)(i), authorization is requested to use the proposed alternative described in ASME Boiler and Pressure Vessel Code, Section XI, Code Case N-613-1, in lieu of the ASME Section XI, Table IWB-2500-1, Examination Category B3.90 requirements. Compliance with the proposed alternative will provide an acceptable level of quality and safety for examination of the affected welds.

In lieu of the $t_s/2$ volume requirements of ASME Section XI, Figures IWB-2500-7 (a) and (b), NMC proposes to reduce the examination volume next to the widest part of the weld to one-half (1/2) inch from the weld. This refined examination volume is described in detail within Code Case N-613-1. NMC will use Code Case N-613-1 for the Reactor Pressure Vessel (RPV) nozzles as shown in Figures 1 and 2 of the Code Case.

The required examination volume for the reactor vessel pressure retaining nozzle-to-vessel welds extends far beyond the weld into the base material, and is unnecessarily large. This proposed alternative would re-define the examination volume boundary to one-half (1/2) inch of base material on each side of the widest portion of the weld. This reduction in base material examination volume will not affect the flaw detection capabilities in the weld and heat affected zone. The proposed reduction in examination volume is of the base material only.

Crack initiation during plant service in the examination volume excluded from the proposed reduced examination volume is highly unlikely because of the low stresses encountered in the base material outside of the heat affected zone of the weld. The stresses induced by the weld process are concentrated at or directly adjacent to the weld. Cracks, should they initiate, typically occur in the high-stressed areas of the weld. These high stress areas are bounded in the examination volume defined by Code Case N-613-1. During previous examinations, both pre-service and in-service, no indications exceeding the allowable flaw size of IWB-3500 were detected in the reactor vessel nozzle to shell examination volumes including the base material areas proposed for exclusion from examination in this request. The prior thorough examination of the base material and the examination of the high-stressed areas of the weld provide an acceptable level of quality and safety.

The required examinations of the welds shall consist of techniques and procedures qualified in accordance with ASME Code, Section XI, Appendix VIII, Supplements 4, 6 and 7.

From the nozzle bore the weld and surrounding one-half (1/2) inch volume will be interrogated using techniques and procedures qualified in accordance with Appendix VIII, Supplement 7, as administered by the PDI.

In addition, nozzle to shell examination volume is also accessible from the vessel inner diameter (ID) surface and will be examined in four orthogonal directions for the first 15 percent of weld thickness with respect to the vessel ID surface using Appendix VIII, Supplement 4 qualified techniques. The remaining 85 percent of weld volume accessible from the vessel ID surface will be examined in four opposing circumferential scanning directions using Appendix VIII, Supplement 6 qualified techniques to interrogate for transverse defects.

This combination of scans addresses the requirements set forth by the ASME Code, Section XI, 1995 Edition with 1996 Addenda as modified by 10CFR50.55a and assures that current qualified technology will be applied to the re-defined examination volume specified herein to the maximum extent practical. Compliance with these requirements will assure the requisite level of quality and safety is maintained.

Table 1
KNPP Nozzle-to-Vessel Welds Within Scope of Request

Summary Number	Weld Identification and Description	Nozzle Configuration	Full Coverage Exam Previously Completed to Extent Achievable	Nondestructive Examination (NDE) Method
1.	RV-W6 Loop A Inlet Nozzle to Vessel Weld	Code Case N-613-1 Figure 1	Pre-service examination performed, as well as in-service examinations in 1985 and 1995: no indications exceeding ASME acceptance standards found.	Volumetric
2.	RV-W8 Safety Injection Nozzle to Vessel Weld	Code Case N-613-1 Figure 2	Pre-service examination performed, as well as in-service examinations in 1985 and 1995: no indications exceeding ASME acceptance standards found.	Volumetric
3.	RV-W9 Loop B Inlet Nozzle to Vessel Weld	Code Case N-613-1 Figure 1	Pre-service examination performed, as well as in-service examinations in 1985 and 1995: no indications exceeding ASME acceptance standards found.	Volumetric
4.	RV-W11 Safety Injection Nozzle to Vessel Weld	Code Case N-613-1 Figure 2	Pre-service examination performed, as well as in-service examinations in 1985 and 1995: no indications exceeding ASME acceptance standards found.	Volumetric

5. IMPLEMENTATION SCHEDULE

Kewaunee Nuclear Power Plant Third Ten-Year Interval, June 16, 1994 – June 16, 2005. The Kewaunee Nuclear Power Plant Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d).

ENCLOSURE 5
CODE CASE RELIEF REQUEST

NUCLEAR MANAGEMENT COMPANY
KEWUNEE NUCLEAR POWER PLANT
THIRD 10-YEAR INTERVAL JUNE 16, 1994 – JUNE 16, 2004
REQUEST FOR RELIEF No. RR-1-11 FOR THIRD TEN-YEAR INTERVAL

1. COMPONENTS AFFECTED

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, Table IWB-2500-1, Examination Category B-A, Item No.B1.11, Class 1 Reactor Vessel Pressure Retaining Shell Circumferential Welds and Item No. B1.21, Class 1 Reactor Vessel Pressure Retaining Head Circumferential Welds.

Component	Isometric
RV-W2	M-1194
RV-W3	M-1194
RV-W4	M-1194
RV-W5	M-1194

2. SECTION XI REQUIREMENTS

ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 4, Subparagraph 3.2(c), requires that the ultrasonic performance demonstration results be plotted on a two-dimensional plot with the depth estimated by ultrasonics plotted along the ordinate and the true depth plotted along the abscissa. For qualification, the plot must satisfy the following statistical parameters: (1) the slope of the linear regression line is not less than 0.7; (2) the mean deviation of the flaw depth is less than 0.25 in.; and (3) the correlation coefficient is not less than 0.70.

3. BASIS FOR REQUESTING RELIEF

On September 22, 1999, the NRC published a final rule in the Federal Register (64 FR 51378) to amend 10CFR 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 10.55a(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 inappropriate 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 CFR 50.55a(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.

4. ALTERNATIVE METHODS OF EXAMINATION

Pursuant to 10 CFR 50.55a(a)(3)(i), NMC proposes to use the RMS values of 10 CFR 50.55a(b)(2)(xv)(C)(1), which modifies the depth and length sizing criteria of Subparagraphs 3.2(a) and 3.2(b), in lieu of the statistical parameters of ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 4, Subparagraph 3.2(c).

5. IMPLEMENTATION SCHEDULE

Kewaunee Nuclear Power Plant Third Ten-Year Interval, June 16, 1994 – June 16, 2005. The Kewaunee Nuclear Power Plant Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d).

ENCLOSURE 6
CODE CASE RELIEF REQUEST

IN-SERVICE INSPECTION (ISI) PROGRAM RELIEF REQUEST NO. RR-G-6 FOR THIRD TEN-YEAR INTERVAL BASED ON WCAP-15666-A TO EXTEND THE INSPECTION INTERVAL FOR REACTOR COOLANT PUMP FLYWHEELS

1. COMPONENTS AFFECTED

Reactor Coolant Pump Flywheels subject to examination using procedures, personnel, and equipment to meet Nuclear Regulatory Commission Regulatory Guide 1.14, Rev 1, "Reactor Coolant Pump Flywheel Integrity".

Component	Isometric
RCP-1A-FLY	M-1204
RCP-1B-FLY	M-1204

2. SECTION XI EQUIREMENTS

Not Applicable. Examination requirements performed per Nuclear Regulatory Commission Regulatory Guide 1.14, Rev 1, "Reactor Coolant Pump Flywheel Integrity".

3. BASIS FOR REQUESTING RELIEF

Consistent with the NRC-approved TSTF-421, the proposed Third Ten-Year Augmented In-service Inspection (ISI) Program 1994-2004 change includes the following revision and Relief Request RR-G-6:

The examination interval (June 16, 1994-June 16, 2005, Note: Kewaunee Nuclear Power Plant's Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d)) for the Reactor Coolant Pump Flywheels is changed from (approximately 10Year Intervals coinciding with the In-service Inspection schedule as required by ASME Section XI) to 20 Year Intervals. Note: Reactor Coolant Pump A was previously examined on September 29, 2002, and Reactor Coolant Pump B was previously examined August 10, 1992.

4. ALTERNATIVE METHODS OF EXAMINATION

The only change to the Third Ten-Year In-service Augmented Inspection (ISI) Program 1994-2004 Reactor Coolant Pump Inspection Program will be the change to the frequency of performing examinations of the Reactor Coolant Pump Flywheel from once a Ten-Year Interval (10 Years) to a period not to exceed 20 Years.

5. IMPLEMENTATION SCHEDULE

Kewaunee Nuclear Power Plant Third Ten-Year Interval, June 16, 1994 – June 16, 2005. The Kewaunee Nuclear Power Plant Third Ten-Year Interval is being extended as permitted by ASME Boiler and Pressure Vessel Code, Section XI IWA-2430 (d).