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Committed to Nuclear Excellence

Kewaunee Nuclear Power Plant
Operated by Nuclear Management Company, LLC

September 17, 2004

NRC-04-111
10 CFR 50.90

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

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

Response To Request For Additional Information Related To Third and Fourth 10-Year In-Service Inspection Intervals Request for Relief for Nuclear Management Company, LLC

References 1) Letter from Thomas Coutu (NMC) to Document Control Deck (NRC), "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", Dated April 16, 2004.

2) E-mail from Carl F. Lyon (NRC) to Gerald O. Riste - "Request For Additional Information On Third And Fourth 10-Year In-Service Inspection Intervals Requests For Relief", Dated August 31, 2004.

In reference 2, the Nuclear Regulatory Commission (NRC) staff requested additional information concerning the Third and Fourth 10-Year In-service Inspection Interval Request for Relief for Nuclear Management Company, LLC (NMC). This letter is NMC's response to the NRC's request for additional information (RAI).

Enclosure 1 to this letter contains the questions, with the responses, the NRC staff requested.

Also, included in this response is the withdrawal of relief requests RR-1-10 for the third ten-year interval and RR-1-9 for the fourth ten-year interval.

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Summary of Commitments

This letter makes no new commitments but revises an existing commitment.

- KNPP reactor coolant pump flywheel examination will be performed on a 20-year frequency. This supersedes the commitment to perform the inspection on a 10-year frequency.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on September 17, 2004.

for

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

Enclosure (1)

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

REQUEST FOR ADDITIONAL INFORMATION
ON THIRD AND FOURTH 10-YEAR INSERVICE INSPECTION INTERVALS
REQUESTS FOR RELIEF
FOR
NUCLEAR MANAGEMENT COMPANY, LLC
KEWAUNEE NUCLEAR POWER PLANT
DOCKET NUMBER 50-305

1. SCOPE

By letter dated April 16, 2004, the licensee, Nuclear Management Company, LLC, submitted requests for relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for Kewaunee Nuclear Power Plant (Kewaunee). The requests for relief are for the third and fourth 10-year in-service inspection (ISI) intervals, in which Kewaunee adopted the 1989 Edition (third interval), and the 1998 Edition through 2000 Addenda (fourth interval), of ASME Section XI as the Code of record. As required by 10 CFR 50.55a, the licensee must meet the ultrasonic qualification requirements set forth in the 1995 Edition with 1996 Addenda of ASME XI, Appendix VIII for the third interval and the 1998 Edition with 2000 Addenda, Appendix VIII for the fourth interval.

In accordance with 10CFR50.55a(a)(3)(i), the licensee has proposed alternatives for certain requirements contained in ASME Section XI and 10 CFR 50.55a. The licensee's proposed alternatives must provide an acceptable level of quality and safety, as compared with the requirements listed in these regulations.

Pacific Northwest National Laboratory (PNNL) reviewed the licensee's submittal, and based on this review, requires the following information to determine if the licensee's alternatives meet the regulations and to complete the evaluation.

2. REQUEST FOR ADDITIONAL INFORMATION

2.1 General Information:

2.1(a) The licensee states that an extension of the third ISI interval by one-year, as allowed by ASME Section XI, paragraph IWA-2430(d), is being exercised. The start and end dates for the third interval are listed as June 16, 1994 to June 16, 2005. However, the start and end dates for the fourth interval are stated to be June 16, 2004 through June 16, 2014. These dates show that ISI intervals will overlap at Kewaunee.

The intent of ASME Code inspection interval extension criteria is to allow, as a convenience, licensees to schedule inspections based on planned maintenance and/or refueling outages, therefore providing an alternative to requiring a forced outage to complete ISI examinations required to be performed at the end of the affected operating interval. It is unusual for licensees to begin a successive interval ISI program prior to ending the previous interval. Please confirm this third interval schedule change, and state that the current operating license will not exceed 40 years, i.e., the fourth interval shall not be extended to accommodate the extension in the third interval.

<u>Most importantly</u>, confirm that no examinations of components performed during the third interval will be credited to the fourth interval ISI program. It is not permissible to take credit for a single component examination in both intervals, even though a period of overlap may exist in the two intervals.

NMC Response to 2.1(a)

It is the intent of Kewaunee Nuclear Power Plant (KNPP) to overlap intervals for the reactor vessel examinations to permit KNPP to bring the reactor vessel automated remote tool on site once every 10 years and to ensure that required in-service inspection examinations are performed in 40 years, not 44 years (license expiration date is December 21, 2013). Guidance for this is found in ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition IWA-2430(d) which states, "For components inspected under Program B, each of the inspection intervals may be extended or decreased by as much as 1 year. Adjustments shall not cause successive intervals to be altered by more than 1 year from the original pattern of intervals".

This process of overlapping intervals has been in practice at Kewaunee since 1985. A reactor vessel exam was first performed in 1977 at Kewaunee and included the two outlet reactor vessel nozzles and 180° of the flange to seal weld from the seal surface to meet the first period requirements of the first interval, June 16, 1974 through June 16, 1984. To permit bringing the reactor vessel tool to Kewaunee once every interval, it was decided per IWA-2430(d), to use the one year extension and extend the first interval to June 16,1985 but also to commence the second interval June 16, 1984. During the 1985 refueling outage, items completed for the first interval were the two inlet nozzles, two safety injection nozzles, five circumferential welds and the remaining 50% of the flange to seal weld from the seal surface. Since Kewaunee was also in its second interval, first period examinations performed in 1985 and credited to the second interval included the two outlet nozzles and the 50% of the flange to seal weld from the seal surface areas that were initially examined in 1977 and credited for the first interval. The next reactor vessel exams were performed in 1995 following the same format; two inlet nozzles, two safety injection nozzles, five circumferential welds and 50% of the flange to shell weld from the seal surface were examined. These were credited to the second interval which was extended to June 16, 1995. Two outlet nozzles and the remaining 50% of the flange to seal weld from the seal surface were examined and credited to the third interval, which commenced June 16, 1994. This format will now be repeated for the 2004 refueling outage to complete the third interval, which was extended to June 16, 2005 and commence the fourth interval, which started June 16, 2004.

The fourth interval will not be extended cumulatively until 2018. The fourth interval may be extended until no later than June 16, 2015, if life extension is granted. This will permit KNPP to perform one reactor vessel tool exam to finish the fourth ten-year interval and commence the fifth ten-year interval, which starts June 16, 2014.

The benefit of performing 100% reactor vessel examinations during one refueling outage includes cost reduction, reduced critical path time, radiation exposure reduction and reduction in outage length time.

As noted above, no examinations have been credited twice. Exams performed have only been credited to one ten-year interval as referenced in the KNPP third interval; third period, third outage and fourth interval; first period, first outage refueling outage 2004 in-service inspection program.

2.2 *Requests for Relief RR-1-8, Revision 1 (Third Interval) and RR-1-7, Revision 1 (Fourth Interval), Pressure Retaining Welds in Piping Subject to Appendix VIII, Supplement 10, Qualification Requirements for Dissimilar Metal Piping Welds, Change in RMSE Value*

2.2(a) *The licensee lists 15 dissimilar metal piping welds that are included within the scope of this relief request. Identify the configuration, including description, function, materials, geometries, etc. for each of the component welds listed in this request*

NMC Response to 2.2(a)

The 15 dissimilar metal pipes welds include:

6" Pressurizer Relief Safe-End PR-W1DM ISIM-940-1

Nozzle: SA216 Grade WCC attached to Nozzle: 6" SCH 160 0.719"
Nozzle End Weld PR-W1DM: Stainless steel, Actual Thickness: 1.2"
Nozzle to Conical Reducer Weld PR-W2: 308SS
6" x 3" Nozzle Conical Reducer: A403 WP316SS

6" Pressurizer Safety Safe-End PR-W16DM ISIM-940-2

Nozzle: SA216 Grade WCC attached to Nozzle: 6" SCH 160 0.719"
Nozzle End Weld PR-W16DM: Stainless steel, Actual Thickness: 1.2"
Nozzle to Pipe Weld PR-W17: 308SS
Piping: A403 WP316SS

6" Pressurizer Safety Safe-End PR-W26DM ISIM-940-2

Nozzle: SA216 Grade WCC attached to Nozzle: 6" SCH 160 0.719"
Nozzle End Weld PR-W26DM: Stainless steel, Actual Thickness: 1.2"
Nozzle to Pipe Weld PR-W27: 308SS
Piping: A403 WP316SS

4" Pressurizer Spray Safe-End PS-W61DM ISIM-874-1

Nozzle: SA216 Grade WCC attached to Nozzle: 4" SCH 160 0.531"
Nozzle End Weld PS-W61DM: Stainless steel, Actual Thickness: 1.0"
Nozzle to Conical Reducer Weld PS-W60: 308SS
4" x 3" Nozzle Reducer: A403 WP316SS

14" Pressurizer Surge Safe-End RC-W67DM ISIM-892

Nozzle: SA216 Grade WCC attached to Nozzle: 14" SCH 140 1.250"
Nozzle End Weld RC-W67DM: Stainless steel
Nozzle to Reducer Weld RC-W66: 308SS
14" x 10" Conical Nozzle Reducer: A403

Steam Generator 1A Inlet Safe-End 29" I.D. RC-W76DM ISIM-1703

Nozzle: A508 Class 3A
Nozzle End: Alloy 690
Weld: Alloy 600 with Alloy 690 Cladding Actual Thickness: 3.28"
Piping: SA336 CLF 316LN

Steam Generator 1A Outlet Safe-End 31" I.D. RC-W77DM ISIM-1703

Nozzle: A508 Class 3A
Nozzle End: Alloy 690
Weld: Alloy 600 with Alloy 690 Cladding Actual Thickness: 3.28"
Piping: SA336 CLF 316LN

Steam Generator 1B Inlet Safe-End 29" I.D. RC-W78DM ISIM-1704

Nozzle: A508 Class 3A
Nozzle End: Alloy 690
Weld: Alloy 600 with Alloy 690 Cladding Actual Thickness: 3.28"
Piping: SA336 CLF 316LN

Steam Generator 1B Outlet Safe-End 31" I.D. RC-W79DM ISIM-1704

Nozzle: A508 Class 3A
Nozzle End: Alloy 690
Weld: Alloy 600 with Alloy 690 Cladding Actual Thickness: 3.28"
Piping: SA336 CLF 316LN

Reactor Vessel Outlet Safe-End 29" I.D. RC-W1DM ISIM-1703

Nozzle: A508-64 Class 2
Nozzle End: 308SS
Weld RC-W1DM: 308SS Actual Thickness: 3.0"
Piping: A351 Grade CF8M

Reactor Vessel Inlet Safe-End 27.5" I.D. RC-W26DM ISIM-1703

Nozzle: A508-64 Class 2
Nozzle End: 308SS
Weld RC-W26DM: 308SS Actual Thickness: 2.75"
Piping: A351 Grade CF8M

Reactor Vessel Outlet Safe-End 29" I.D. RC-W30DM ISIM-1704

Nozzle: A508-64 Class 2
Nozzle End: 308SS
Weld RC-W30DM: 308SS Actual Thickness: 3.0"
Piping: A351 Grade CF8M

Reactor Vessel Inlet Safe-End 27.5" I.D. RC-W58DM ISIM-1704

Nozzle: A508-64 Class 2
Nozzle End: 308SS
Weld RC-W58DM: 308SS Actual Thickness: 2.75"
Piping: A351 Grade CF8M

Reactor Vessel Safety Injection Safe-End 4" SI-W54DM ISIM-939 Sh.1

Nozzle: A508-64 Class 2
Nozzle End: SA182 F316SS
Cladding and Weld SI-W54DM: Inconnel 600/82 Actual thickness: 0.68"
Piping: A376 TP316SS

Reactor Vessel Safety Injection Safe-End 4" SI-W112DM ISIM-939-2 Sh.1

Nozzle: A508-64 Class 2
Nozzle End: SA182 F316SS
Cladding and Weld SI-W112DM: Inconnel 600/82 Actual thickness: 0.68"
Piping: A376 TP316SS

2.2(b) The licensee has proposed to change the Appendix VIII flaw depth sizing qualification acceptance criteria from 0.125-inch root mean square error (RMSE) to 0.189-inch RMSE. The licensee stated that it's inspection vendor (WESDYNE) was not able to achieve 0.125-inch RMSE during performance demonstration qualifications, and could only measure the depth of flaws to within 0.189-inch RMSE. Please describe in detail what specific conditions, e.g., ID surfaces, geometries, locations of adjacent welds, etc., caused the degradation in sizing performance.

It is reasonable to expect that 0.125-inch RMSE is possible to attain under certain conditions and should be applied to enhance the sizing capabilities when possible. Discuss the conditions that would be necessary in order to use 0.125-inch RMSE as opposed to the degraded value of 0.189-inch RMSE.

Further, the licensee stated the following:

The proposed procedure to address sizing of 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-inch RMSE Appendix VIII, Supplement 10 acceptance criteria. NMC believes the use of 0.189-inch RMSE as an adjustment to the measured flaw will ensure a conservative bounding flaw depth value.

It is unclear from the previous statements, how much additional size is to be added to flaws detected during the examinations of Category B-F dissimilar metal welds. The difference between 0.125-inch and 0.189-inch RMSE (by simple subtraction) is 0.064-inch. However, in the second sentence, the licensee appears to indicate that the entire 0.189-inch value will be added to the size of all detected flaws. Please clarify this procedure for depth-sizing flaws detected during the examinations.

NMC Response to 2.2(b)

The qualifications by WesDyne International were those administered by the Electric Power Research Institute (EPRI) for the Appendix VIII, Supplement 10 Program and were previously docketed by the NRC in safety evaluations for Summer dated 2-3-04 and Prairie Island dated 7-27-04. The RMSE value of 0.189" in lieu of the Appendix VIII flaw depth sizing qualification acceptance criteria of 0.125" was based on the licensee inspection vendor's (WesDyne International) inability to achieve 0.125" RMSE. Some contributing factors included limitations on what can be performed ultrasonically and the WesDyne International equipment capabilities. In an e-mail from EPRI, the 0.189" RMSE was typical and all vendors are within this as a ballpark figure.

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.

The following welds are those that will be affected by WesDyne International's inability to meet the 0.125" RMSE. These welds are performed from the ID utilizing the

WesDyne International remote ultrasonic reactor vessel automated inspection tool and will use the RMSE valve of 0.189".

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM
5. SI-W54DM
6. SI-W112DM

The remaining welds listed below are performed from the O.D. and will be performed to Supplement 10 requirements as listed on relief requests RR-1-8 Rev. 0 for the third ten year interval and relief request RR-1-7 Rev. 0 for the fourth ten-year interval.

1. PS-W61DM
2. RC-W67DM
3. PR-W1DM
4. PR-W16DM
5. PR-W26DM
6. RC-W76DM
7. RC-W77DM
8. RC-W78DM
9. RC-W79DM

2.2(c) *Confirm that volumetric examinations will be performed from the inside surface for all of the subject welds listed in this relief request. Because of inside surface geometries and as-welded conditions typical of these welds, limitations have been identified for many of the EPRI PDI ultrasonic qualifications. Other than the RMSE depth-sizing alternative cited in this request, discuss any other limitations to the UT qualifications that could affect detection and sizing of axial and circumferential cracks in these dissimilar metal welds. Include Kewaunee's proposed solutions to these limitations.*

NMC Response to 2.2(c)

Volumetric examination from the ID will only be performed on the following welds using the remote ultrasonic reactor vessel automated inspection tool:

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM
5. SI-W54DM
6. SI-W112DM

Limitations, other than the 0.189" RMSE, that could occur from the ID include weld configuration, nozzle configuration, geometric conditions, and lift off. The Kewaunee Nuclear Power Plant proposes to address any restrictions to ultrasonic examinations of dissimilar metal welds from the ID by performing ultrasonic profilometry, enhanced visual, and eddy current examinations as described in responses sections 2.2(d), 2.2(e) and 2.2(f).

2.2(d) The submittal lists Ultrasonic Weld Profiling as an additional technique to be used to assist in the evaluation of poor transducer contact, and to provide a permanent record of the inside surface condition of the subject welds. It is stated that this method of characterizing the ID weld geometry will allow examiners to transpose positions of transducers along the scan lines to evaluate geometrical effects on UT beams. Describe in detail how this technique will be used to enhance detection and characterization of axial and circumferential PWSCC, if existing in the subject welds, or explicitly state how the technique is intended to assist these examinations. Also, confirm that Ultrasonic Weld Profiling will be deployed on all 15 dissimilar metal welds listed in this relief request.

NMC Response to 2.2(d)

For the following welds, ultrasonic (UT) profilometry will be performed using the following Wesdyne International technique.

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM
5. SI-W54DM
6. SI-W112DM

<u>Ultrasonic ID Profilometry</u>

WesDyne has developed a process to accurately measure and display the ID geometry of reactor vessel nozzles. This patented process was developed as an integral part of WesDyne's Appendix VIII procedure for the examination of safe end welds and is utilized to assist in the location and sizing of flaws.

Ultrasonic ID profilometry is accomplished by measuring the distance from a transducer fixed in space (a small focused immersion straight beam transducer attached to the sled containing sizing transducers) to the surface of the inspection object.

The profilometry software, part of the PARAGON™ analysis software, allows the use of surface profile data collected simultaneously with the inspection data, during axial scans, to be used to develop a three dimensional solid model of the surface geometry. This model represents the actual surface geometry for the inspected area.

For through-wall sizing, changes in the ID surface profile across the weld and adjacent base metal can create confusion in the proper identification and location of planar flaw boundaries using the B-scan display. The B-scan display images the data assuming the probe is scanned on a flat surface and the beam is propagating into the material at a fixed angle. Reflectors are associated with a depth below the surface value based on the time of flight to the reflector, a fixed material velocity, and a fixed beam angle. The actual reflector depth below the surface is based on the weld. Errors in through-wall sizing may result depending on the location of the probe when a flaw boundary response is observed.

The remaining welds listed below are performed ultrasonically from the O.D. and the ultrasonic profiling will follow the guidelines of MRP-2003-039, "Recommendation for Inspection of Alloy 600/82/182 Pressure Boundary Components" and MRP-2004-05, "Industry Recommended Action for PWR Plants".

1. PR-W1DM
2. PR-W16DM
3. PR-W26DM
4. PS-W61DM
5. RC-W67DM
6. RC-W76DM
7. RC-W77DM
8. RC-W78DM
9. RC-W79DM

2.2(e) The licensee states that a remote enhanced visual examination (VT-1 using a 1-mil diameter wire as a reference standard) will also be used to provide a confirmation mechanism for surface conditions, and that this visual examination will be used for all four reactor coolant system primary nozzles. Confirm that the visual examination is intended solely for the purpose of documenting surface conditions, and not for crack detection. Also, state why this method is only being used on the four primary coolant nozzles and not being used for all 15 dissimilar metal welds included in this request.

NMC Response to 2.2(e)

WesDyne International performs the enhanced visual examination in conjunction with the eddy current to help discriminate between valid indications and indications resulting from surface conditions such as scratches, pitting, and severe geometry. We are not using enhanced visual examination for crack detection. The following welds will be examined by the enhanced visual as needed:

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM

WesDyne International is fully qualified to inspect safety injection nozzle safe-end welds, SI-W54DM and SI-W112DM from the ID with no limitations; therefore, enhanced visual will not be required.

The remaining welds listed below are performed ultrasonically from the O.D. and the ultrasonic profiling will follow the guidelines of MRP-2003-039, "Recommendation for

Inspection of Alloy 600/82/182 Pressure Boundary Components" and MRP-2004-05, "Industry Recommended Action for PWR Plants".

1. PR-W1DM
2. PR-W16DM
3. PR-W26DM
4. PS-W61DM
5. RC-W67DM
6. RC-W76DM
7. RC-W77DM
8. RC-W78DM
9. RC-W79DM

2.2(f) *Recent findings have shown that typical PWSCC cannot be detected by visual examinations. Confirm that the ultrasonic procedures have been qualified to detect axially-oriented cracks. If the procedures to be used are not qualified to detect axial cracks in the subject dissimilar metal welds, discuss whether the use of supplemental surface eddy current testing (ET) could be deployed at Kewaunee to address the UT procedure limitation, as these ET techniques are currently being used at other licensee's facilities. Include in the discussion the value of ET to detect surface-breaking flaws in the presence of irregular surface geometries, and whether ET techniques may be useful to cover areas of the weld not accessible to UT transducers.*

NMC Response to 2.2(f)

Since the submittal of relief requests, KNPP has contracted WesDyne International to perform eddy current examinations on areas of the following welds that are not accessible to ultrasonic transducers utilizing the WesDyne International qualified procedures for ultrasonic detection of axially oriented flaws.

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM

Eddy Current Examination

The WesDyne eddy current technique to interrogate the counter-bore region of the weld uses two ZETEC plus-point coils. The plus-point coil has a coil size of 0.120" with a footprint of 0.25". Each probe is spring loaded and independently gimbaled to give the best information about surface connected defects in a region of complex geometry. Using two coils allows inspection to be completed without changing the scan interval of the required PDI UT. The technique has been demonstrated for SQC (Swedish Qualification Centre) for safe-end examinations at all three Ringhals PWR units and was successfully employed during the WesDyne International 2003 examinations.

An enhanced visual examination is performed in conjunction with the eddy current to help discriminate between valid indications and indications resulting from surface conditions such as scratches, pitting, and severe geometry. The visual inspection can be performed during the UT profiling or during eddy current examination.

1.0 DEFINITION OF EDDY CURRENT DATA DISPLAYS

1.1 The following displays have been incorporated into the PARAGON™ eddy current analysis system:

1.1.1 C-Scan - a 3D display option that shows a developed plan view of the data set with amplitude shown vertically in a color code.

1.1.2 Lissajous - a display that provides amplitude and phase information as a function of test frequency.

2.0 EXAMPLE DATA INTERPRETATION IMAGES

Note: These examples are developed using an illustration (where applicable), a written description of the expected image pattern, and a data display representation. The two types of images created for an eddy current examination are described below.

2.1 Surface-Breaking Planar Flaw Oriented Perpendicular to Scan

2.2 Surface-Breaking Planar Flaw Oriented Parallel to Scan

2.3 *Requests for Relief RR-1-9 (Third Interval) and RR-1-8, Revision 1 (Fourth Interval), Use of Alternative to Appendix VIII, (Proposed) Supplement 14, Combined Qualification Requirements for Piping Welds Examined from the Inner Diameter*

2.3(a) *The licensee has requested to use ASME Code (proposed) Supplement 14, as administered by EPRI PDI, to combine the qualification flaw specimen requirements listed separately under Supplements 2 and 10 into a limited set of flaws as detailed in the proposed Supplement 14. It would appear that RR-1-9 for the third interval is an original request. However, the licensee has previously requested the use of Supplement 14 for the fourth interval in it's program plan submittal dated December 16, 2003. The Staff is unable to identify any significant change between the original RR-1-8 (December 16, 2003) and*

Revision 1, as shown in Enclosure 2 of the licensee's April 16, 2004 submittal. Please explain why there is a need for the Staff to re-evaluate this issue for the fourth interval.

NMC Response to 2.3(a)

The fourth ten-year interval in-service inspection plan submitted by KNPP on December 16, 2003 contained relief request RR-1-8. At the time of submittal, relief request RR-1-8 contained the RMSE value of 0.125". It was subsequently determined that KNPP's vendor, WesDyne International, was unable to obtain the required Appendix VIII flaw depth sizing qualification acceptance criteria of 0.125" for Supplement 14. The submittal for relief requests, submitted on April 16, 2004, RR-1-8 Rev.1 contains the RMSE value of 0.245", which WesDyne International was able to achieve. This was the only change between the December 16, 2003 fourth ten-year interval relief request RR-1-8 and the April 16, 2004 relief request RR-1-8 Rev.1.

2.3(b) *Please indicate whether the alternative (including the comparison enclosure) provided in the licensee's request is the most current Supplement 14 version of the proposed PDI alternative.*

NMC Response to 2.3(b)

A search of the Electric Power Research Institute (EPRI) web wage identified that the Supplement 14 version utilized by KNPP submitted April 16, 2004 is still the latest. KNPP's only utilized EPRI's Supplement 14 format that was applicable to Kewaunee. References to Supplement 3 were removed and use of words "code case" in Section 1.0 Scope Technical Bases was deleted. A follow up phone call with EPRI personnel on September 2, 2004 also confirmed that the Supplement 14 version located on the EPRI web page is the current version.

2.3(c) *The licensee's proposal is aimed at piping welds that are examined from the inner diameter surface using remote automated techniques. The licensee argues that to impose separate qualifications, as currently required by Supplements 2 and 10, is excessive because the ultrasonic essential variables used for dissimilar metal and austenitic welds (when performed from the inner diameter) will be the same. It is expected that inner diameter applications may not be confronted with the same acoustic limitations, i.e., attenuation and beam redirection effects, as methods applied from the outside surface of these piping welds. Please discuss the difference in acoustic problems that are confronted when examining from the ID as opposed to OD examinations, and describe situations that may result in less than two sided examinations. Further, please discuss the following:*

(1) It is unclear how the qualification of far-side examinations will be implemented. Provide a discussion on the implementation of far-side examinations for the different supplements.

(2) It is unclear how the coverage of far-side examinations will be determined. Provide a discussion on coverage of far-side examinations for the different supplements.

NMC Response to 2.3(c)

Supplement 14 relief request was written based on the program developed by Electric Power Research Institute (EPRI) for the Appendix VIII implementation from ASME Boiler and Pressure Vessel Code, Section XI. Qualifications for performance of Appendix VIII examinations by WesDyne International are approved and issued by EPRI and are intended to satisfy ASME Boiler and Pressure Vessel Code, Section XI, Appendix VIII requirements.

The following was received from Electric Power Research Institute on September 8, 2004:

All procedures qualified through the PDI program to date have required two-sided access. Based on all available field data collected to date, access is available from both sides of the weld in all cases. The procedures specifically require that scanning be performed from four directions; essentially perpendicular and parallel to the weld.

For detection and length sizing, the acoustic differences of the weld material are considerably less when examining from the inside surface simply due to the reduced amount of material the ultrasonic beam has to propagate through in order to impinge on the flaw. The use of high angle longitudinal search units (70-80 degrees) have been demonstrated to be very effective in detecting flaws on the near surface. This does not hold true for depth sizing. The currently applied depth sizing techniques require the ultrasonic beam to propagate through much greater amounts of weld in order to reach the tip of the flaws. Naturally the deeper the flaw the more the material has an effect on the beam. This negative effect on the beam, coupled with the irregular surface geometry the search unit is sitting on, is the primary reason for depth sizing errors that are over the acceptable limit of Appendix VIII. The techniques utilized for the Supplement 2 and 10 welds are identical and have the same limitations.

In order to perform detection and length sizing examinations from the outside surface, the ultrasonic beam is required to propagate through the entire thickness of the component in order to reach the flaw so the effect of the material on the beam is most severe. Changes in frequency and focusing of the search units are often required to adapt to the different materials and thickness changes. When depth sizing is required from the outside surface the same material effects exist, but the examination surface is generally flat and the weld conditions ground flush as to allow unimpeded search unit movement over the weld. To date, all qualified depth sizing procedures from the outside surface require that the weld be ground or machined flush. This is not possible for examinations performed from the inside surface.

All qualifications performed to date required dual side access. No far sided qualifications were attempted. Based on all available field data, all configurations to the procedures are intended to be used to examine and allow access from both sides of the weld.

2.4 *Amendment to Requests for Relief RR-1-9 (Third Interval) and RR-1-8, Revision 1 (Fourth Interval), Use of Alternative to Appendix VIII, (Proposed) Supplement 14, Combined Qualification Requirements for Piping Welds Examined from the Inner Diameter*

2.4(a) *Proposed Supplement 14 is a combined qualification that seeks to limit the number of flaws in specimens by integrating flaws required by Supplements 2 and 10 for automated inspections that will be performed from the inside surface of these welds. The licensee has requested that the NRC consider an amendment to the subject relief requests concerning the depth-sizing of flaws. The licensee stated that it's inspection vendor (WESDYNE) was not able to achieve 0.125-inch RMSE during performance demonstration qualifications, and could only measure the depth of flaws to within 0.245-inch RMSE when qualifying to the proposed Supplement 14 requirements. Please describe in detail what specific conditions, e.g., ID surfaces, geometries, locations of adjacent welds, etc., caused the degradation in sizing performance.*

However, in previous requests (RR-1-8, Revision 1 for Third Interval and RR-1-7, Revision 1 for Fourth Interval), the licensee states that their vendor achieved 0.189-inch RMSE for depth-sizing on Supplement 10 dissimilar metal welds. It is expected that the dissimilar metal weld configurations present the most challenging conditions that will be encountered during the examinations performed under proposed Supplement 14 qualifications. In addition, several vendors have qualified under Supplement 2 and have met the depth-sizing criteria of 0.125-inch RMSE. Therefore, it is unclear, if an RMSE of 0.189-inch can be achieved from the inside diameter of the piping during a qualification under Supplement 10, why a comparable, or better, RMSE value cannot be achieved with the addition of flaws included under Supplement 2 for wrought austenitic piping welds. Please discuss this issue and provide a detailed justification for this discrepancy

NMC Response to 2.4(a)

WesDyne International achieved a 0.189" RMSE for depth sizing in lieu of the Supplement 10 required 0.125" RMSE. However, when performing qualifications based on Supplement 14 qualifications, which are a combination of Supplement 2, Supplement 3 and Supplement 10, WesDyne International achieved only a 0.245" RMSE in lieu of the required 0.125" RMSE Appendix VIII Supplement 14 requirements. Specific conditions, for example; ID surfaces, geometries, location, and location of adjacent welds, were utilized for qualification by the EPRI for performance demonstration of Appendix VIII, Supplement 14. Using these specimens supplied by EPRI, WesDyne International was only able to achieve a RMSE Value of 0.245". WesDyne International Qualifications were documented by EPRI in their limitations. WesDyne International limitations in RMSE sizing have been accepted through relief requests at previous utilities ten-year reactor vessel examinations when performing Supplement 14 examinations.

The Supplement 2 qualifications were performed with fewer samples from EPRI than Supplement 10. With fewer samples for grading, this reduced the ability of WesDyne International to possibly reduce the 0.245" RMSE value to closer to 0.125" RMSE. In an e-mail from the EPRI, it was stated the 0.245" RMSE achieved by WesDyne International is typical and that all vendors are within this ballpark figure.

The following was received from Electric Power Research Institute on September 8, 2004:

The test samples contain geometry representative of the actual components in the plant. This geometry includes the following conditions:

1) Counterbore on the inside surface in locations where the search unit had to be placed in order to see the tip signal. When contact could be maintained, the angle of incident is changed relative to the entry surface. Since these systems project the data based on a fixed angle, a significant amount of error can be experienced if the angle changes are not compensated for. The procedures attempt to compensate for this by integrating the profile data obtained with the angle beam data in an attempt to correct for this, however, it is expected that some error will still be experienced in the actual measurements.

2) In many cases the search unit has to be scanned over the adjacent weld in order to examine the full thickness of the component. These adjacent welds in most cases contain inside surface geometry such as root, counterbore and mismatch. When the search units are scanned over

these conditions, several number of things can happen that could significantly affect the procedures capability to accurately depth size:

a. The search unit loses contact, thus does not see the flaw tip.
b. The angle changes relative to the surface, which would cause errors in the measurement if not compensated for.
c. A significant amount of noise would be generated that would be projected into the image, which could mask the true tip signal.
d. The columnar grain structure of the weld can bend the beam thus adding error into the measurements.
e. The geometric conditions associated with the weld could cause the search unit to have a water gap between the surface and the bottom of the search unit. This water gap can significantly add error to the measurements due to the velocity changes between water and the base material.
f. A combination of all or some of the above conditions can also be experienced which makes compensation impossible.

In addition to the above conditions for certain flaws, the search units are required to scan over cast material, which is known to significantly affect the effectiveness of the ultrasonic beam. In addition to the material affects of this configuration the inside surface of this cast material is quite rough, which also has an effect on the effectiveness of examination for this side basically limiting effective measurements to only be obtained from one direction through the weld.

No vendor has obtained a successful qualification for Supplement 2 from the inside surface. The reasons for the inaccuracies in measurements in Supplement 2 are due to the same reasons described above. The Supplement 2 welds that are included in the qualifications are both field welds and contain some of the most difficult geometry. The Supplement 10 welds are a combination of both field and shop weld configurations. In the case of this vendor (WesDyne International) the majority of the error in their RMSE was due to the measurement of a flaw that was significantly compromised by a combination of the above conditions.

2.4(b) The license stated the following regarding their proposed alternative:

> *The proposed procedure to address sizing of 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-inch RMSE and the 0.125-inch RMSE Appendix VIII, Supplement 14 acceptance criteria prior to assessment. NMC believes that adding the difference between the 0.245-inch RMSE and the 0.125-inch RMSE acceptance criteria to the flaw through-wall size prior to assessment is the conservative approach.*

Adding the difference to measured flaw through-wall depths would essentially mean adding the original RMSE criteria (actually 0.120-inch), since the achieved RMSE is nearly twice that in proposed Appendix 14. The achieved 0.245-inch RMSE during qualification is a normalized measure of sizing accuracy. Adding one-half of this measure does not appear to be a conservative approach, i.e., if the vendor can only depth-size flaws to within 0.245-inch RMSE, then flaws could be 0.245-inch greater in through-wall depth than the actually measured size. It would seem reasonable to add the full RMSE to the measured size to account for the sizing error. Explain why a conservative approach would not entail adding a value equal to or greater than the RMSE achieved during qualification to the measured flaw size.

NMC Response to 2.4(b)

The qualifications by WesDyne International were those administered by EPRI for the Appendix VIII, Supplement 14 program. The RMSE value of 0.245" in lieu of the Appendix VIII, Supplement 14 flaw depth sizing qualification acceptance criteria of 0.125" was based on the licensee inspection vendor's (WesDyne International) inability to achieve 0.125" RMSE during Performance Demonstration Initiative (PDI).

KNPP would add the difference (0.120 inch) between the code required RMSE (0.125 inch) and the demonstrated accuracy (0.245 inch) to the measurements acquired from flaw through-wall depth sizing. This type of accuracy adjustment utilized by WesDyne International has been previously docketed at Summer and Prairie Island.

2.4(c) Other than the RMSE depth-sizing alternative cited in this request, discuss any other limitations to the UT qualifications that could affect detection and sizing of axial and circumferential cracks in these welds. Include Kewaunee's proposed solutions to these limitations, including whether Ultrasonic Weld Profiling or enhanced visual examinations will be used as an additional technique to assist in the evaluation of poor transducer contact, and to provide a permanent record of the inside surface condition of the subject welds. Specifically describe whether these additional techniques would improve the flaw-sizing RMSE achieved during the performance of the qualification, and field, examinations.

NMC Response to 2.4(c)

For the following welds, ultrasonic (UT) profilometry will be performed using the following WesDyne International technique:

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM
5. SI-W54DM
6. SI-W112DM

Ultrasonic ID Profilometry

WesDyne has developed a process to accurately measure and display the ID geometry of reactor vessel nozzles. This patented process was developed as an integral part of WesDyne's Appendix VIII procedure for the examination of safe end welds and is utilized to assist in the location and sizing of flaws.

Ultrasonic ID profilometry is accomplished by measuring the distance from a transducer fixed in space (a small focused immersion straight beam transducer attached to the sled containing sizing transducers) to the surface of the inspection object.

The profilometry software, part of the PARAGON™ analysis software, allows the use of surface profile data collected simultaneously with the inspection data, during axial scans, to be used to develop a 3 dimensional solid model of the surface geometry. This model represents the actual surface geometry for the inspected area.

For through wall sizing, changes in the ID surface profile across the weld and adjacent base metal can create confusion in the proper identification and location of planar flaw boundaries using the B-scan display. The B-scan display images the data assuming the probe is scanned on a flat surface and the beam is propagating into the material at a fixed angle. Reflectors are associated with a depth below the surface value based on the time of the flight to the reflector, a fixed material velocity and a fixed beam angle.

The actual reflector depth below the surface is based on the profile of the weld. Errors in through-wall sizing may result depending on the location of the probe when a flaw boundary response is observed.

The enhanced visual examination is performed by WesDyne International, in conjunction with the eddy current to help discriminate between valid indicators and indications resulting from surface conditions such as scratches, pitting and severe geometry. As required, the following welds as required will be examined by the enhanced visual:

1. RC-W1DM
2. RC-W26DM
3. RC-W30DM
4. RC-W58DM

WesDyne International is fully qualified to inspect safety injection nozzle safe end welds SI-W54DM and SI-W112DM from the ID. Therefore, with no limitations, enhanced visual will not be required.

Since the submittal of relief requests Kewaunee Nuclear Power Plant has contracted WesDyne International to perform eddy current examinations on the areas of the following welds, which are not accessible to ultrasonic transducers.

Eddy Current Examination

The WesDyne eddy current technique to interrogate the counter-bore region of the weld uses two ZETEC plus-point coils. The plus-point coil has a coil size of 0.120" with a footprint of 0.25". Each probe is spring loaded and independently gimbaled to give the best information about surface connected defects in a region of complex geometry. Using two coils allows inspection to be completed without changing the scan interval of the required PDI UT. The technique has been demonstrated for SQC (Swedish Qualification Centre) for safe end examinations at all three Ringhals PWR units and was successfully employed during the WesDyne International 2003 examinations.

An enhanced visual examination is performed in conjunction with the eddy current to help discriminate between valid indications and indications resulting from surface conditions such as scratches, pitting and severe geometry. The visual inspection can be performed during the UT profiling or during eddy current examination.

1.0 DEFINITION OF EDDY CURRENT DATA DISPLAYS

1.1 The following displays have been incorporated into the PARAGON™ eddy current analysis system:

1.1.1 C-Scan - a 3D display option that shows a developed plan view of the data set with amplitude shown vertically in a color code.

1.1.2 Lissajous - a display that provides amplitude and phase information as a function of test frequency.

2.0 EXAMPLE DATA INTERPRETATION IMAGES

Note: These examples are developed using an illustration (where applicable), a written description of the expected image pattern and a data display representation. The two types of images created for an eddy current examination are described below.

2.1 Surface-Breaking Planar Flaw Oriented Perpendicular to Scan.

2.2 Surface-Breaking Planar Flaw Oriented Parallel to Scan.

2.5 *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*

2.5(a) *The licensee has proposed to use ASME Code Case N-613-1 in lieu of the ultrasonic volumes described in Figures IWB-2500-7(a) and (b). Code Case N-613-1 has not been approved for general use in Regulatory Guide 1.147. The Code case would reduce the examination volume associated with nozzle-to-vessel welds from 1/2 of the base metal thickness on either side of the weld to 1/2-inch of the base metal beyond the widest portion of the weld on either side of the weld.*

Significant issues are related to as-built weld configurations that may exist at Kewaunee, the interpretation of ultrasonic signals, and assurance of volumetric coverage. Because the examination of the subject nozzles is primarily by remote, automated ultrasonic methods that are implemented from the inner clad surface of the RPV, it is unclear how the licensee will be able to precisely locate the extremities (widest sections) of the as-built nozzle-to-vessel welds. Recent studies have found that most repairs occur along the weld fusion lines causing the weld cross-section to become substantially larger than originally designed. It is unclear how repaired areas (fabrication or in-service) extending beyond the ideal weld cross-sectional area are identified, nor how these areas will be examined.

(1) *Discuss the documentation available of the actual cross-sectional dimensions and precise locations of repaired (pre-service or in-service) areas for all RPV nozzle-to-vessel welds at Kewaunee. Discuss the process for defining new examination volumes that encompass these repaired weld areas.*

(2) *Describe the process for accurately determining the location of ultrasonic reflectors with respect to the proposed new examination volumes.*

(3) *Discuss how the automated ultrasonic equipment accurately locates the as-built weld extremities (the use of design dimensions alone may not be acceptable).*

NMC Response to 2.5(a)

The intent of KNPP was always to examine the ASME Boiler and Pressure Vessel Code, Section XI, Figures IWB-2500-7(a) and (b) required volume for nozzle to vessel welds RV-W6, RV-W7, RV-W8, RV-W9, RV-W10 and RV-W11. This is documented in the WesDyne International examination program scan plan. The intent of requesting the use of code case N-613-1 is as follows:

1. Previous examinations performed in 1995 documented examinations less than the 90% required volume as required by Code of Federal Regulations 10CFR § 50.55 a(g)(6)(ii)(A)(2). Failure to achieve more than a 90% volume coverage would require a relief request.

2. Requesting use of code case N-613-1 could increase the amount of volume examined since the Figure IWB-2500-7(a) and (b) volume identified in code case N-613-1 will be smaller.

3. If WesDyne International did not achieve the 90% code required volume per Figure IWB-2500-7(a) and (b), KNPP would require Wesdyne International to calculate the volume of each individual reactor vessel nozzle to shell weld actually examined as required by code case N-613-1 Figure. If using code case N-613-1 increased the volume examined to greater than 90% a relief request would not be required since code case N-613-1 relief request was granted.

4. KNPP realized that a relief request for required volume coverage of the reactor vessel nozzle to shell weld RV-W6, RV-W7, RV-W8, RV-W9, RV-W10 AND RV-W12 would probably be required, based on the 1995 reactor vessel examinations. Since ASME code case N-613-1 was available, approved at other sites, and could possibly be approved by the Nuclear Regulatory Commission in Revision 14 of Regulatory Guide 1.147, KNPP felt that an upfront relief request to address volume coverage would be preferable to a follow up relief request after examinations were performed.

5. ASME Boiler and Pressure Vessel Code, Section XI, Code Case N-613-1 was listed as an acceptable Section XI code case in the NRC Draft Regulatory Guide, DG-1125 issued April 2004. This is a preliminary draft that is a guideline on code cases that could be acceptable in Revision 14 of USNRC Regulatory Guide 1.147.

The ASME Code Case N-613-1 was to be utilized for meeting the 10CFR § 50.55 a(g)(6)(ii)(A)(2) 90% required volume only. The intent of KNPP is to examine the six nozzle to vessel welds as required by ASME Boilers and Pressure Vessel Code, Section XI, Figures IWB-2500-7(a) and (b); therefore, KNPP wishes to withdraw relief request, RR-1-10 for the third ten-year interval. Limitations to nozzle to vessel welds; RV-W6, RV-W8, RV-W9 and RV-W11, that restrict at least 90% volume coverage will be documented in a separate relief request to be submitted following the KNPP refueling outage in Fall 2004.

2.5(b) *The licensee is requesting to apply the Code Case to two (2) reactor coolant system nozzle-to-vessel welds, and two (2) safety injection nozzle-to-vessel welds. Confirm that the proposed Code Case is only intended for these four (4) nozzles, and that proposed Code Case N-613-1, if authorized, will be applied in it's entirety.*

NMC Response to 2.5(b)

The six reactor vessel nozzle to shell welds are scheduled for examination during the 2004 refueling. The two outlet nozzle welds; RV-W7 and RV-W10, are not listed on relief request, RR-1-10 (third interval) letter dated April 16, 2004 were included in the fourth ten-year interval plan submitted December 16, 2003 as relief request, RR-1-9.

For nozzle to vessel welds; RV-W7 and RV-W10, scheduled for examination in Fall 2004 as listed in the KNPP fourth ten-year interval submittal, code case N-613-1 relief request, RR-1-9 will also be withdrawn. RV-W7 and RV-W10 will be examined as required by ASME Boiler and Pressure Vessel Code, Section XI, Figures IWB-2500-7(a) and (b) and limitations that restrict 90% volume coverage will be documented in a separate relief request.

2.6 *<u>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</u>*

2.6(a) *The licensee has proposed to use the RMSE acceptance criteria for flaw depth and length sizing, as listed in 10 CFR 50.55a(b)(2)(xv)(C)(1), in lieu of the statistical parameters required by ASME Appendix VIII, Supplement 4. Since this has been approved by the Staff in the regulation, it is appropriate for use at Kewaunee. However, the regulation at 10 CFR 50.55a(b)(2)(xv) also states that if licensees elect to use the provisions listed therein, they must apply **<u>all of the provisions in this section</u>** (except for 10 CFR 50.55(a)(b)(2)(xv)(F), which is optional). Confirm that all provisions in 10 CFR 50.55a(b)(2)(xv), except paragraph (F), will be applied at Kewaunee.*

NMC Response to 2.6(a)

During a pre-outage meeting with WesDyne International in February 2004, discussions were held on 10 CFR § 50.55a applicability. WesDyne International confirmed that they will meet the requirements in 10 CFR § 50.55a as they are applicable to Appendix VIII Qualifications except where relief requests are requested. A phone call discussion on September 1, 2004 with WesDyne International reconfirmed this commitment.

In discussion with EPRI, the current edition of 10 CFR § 50.55a does not address ASME Boiler and Pressure Vessel Code, Section XI; Appendix VIII; Supplement 4; Subparagraph 3.2(c), and thus, relief request, RR-1-11 will still be required.

The draft copy of 10 CFR § 50.55a that is currently out for comments, however, does address the Appendix VIII, Supplement 4, Subparagraph 3.2(c) correction, but as of September 7, 2004 has not yet been issued.

A search performed by KNPP of the latest edition of 10 CFR § 50.55a also determined that ASME Boiler and Pressure Vessel Code, Section XI, Appendix VIII, Supplement 4, Subparagraph 3.2(c) was not addressed and relief request, RR-1-11 will still be required.

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

2.7(a) *The licensee stated:*

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 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 10-year 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 Pump B was previously examined on August 10, 1992.

There is no ASME Section XI, nor 10 CFR 50.55a, requirement for Kewaunee to examine the reactor coolant pump flywheels. As stated by the licensee, this appears to be an augmented program, initially developed to meet NRC Regulatory Guide 1.114, Revision 1, Reactor Coolant Pump Flywheel Integrity, *and may be invoked through the Technical Specifications at the plant. Please clarify the basis, and implementing documents, for this augmented examination requirement.*

NMC Response to 2.7(a)

NMC has reviewed the basis for performing the reactor coolant pump flywheel examinations. The commitment to perform reactor coolant pump flywheel examinations was developed to respond to Nuclear Regulatory Commission Regulatory Guide 1.14 Rev. 1, "Reactor Coolant Pump Flywheel Integrity." Although NUREG 1431, "Standard Technical Specification – Westinghouse Plant," contains requirements for performing the reactor coolant pump flywheel examinations, KNPP custom Technical Specification (CTS) do not. Instead Wisconsin Public Service Corporation (WPSC) made a commitment to perform reactor coolant pump flywheel examinations in the Third Ten Year Interval ISI Plan submitted to the NRC. The NRC approved the Third Ten Year Interval ISI Plan in a safety evaluation (SE) dated April 28, 1995. Section 2.2.4 of this SE covers augmented examination commitments that the licensee committed to perform, additional to the requirements specified in section XI of the ASME Code. Section 2.2.4, item (g) of this SE states:

> Ultrasonic examination of Reactor Coolant Pump Flywheels to meet the requirements of the Kewaunee Nuclear Power Plant (KNPP) Updated Safety Analysis Report, Section 4.2.2, Reactor Coolant Pump Flywheels...

Kewaunee Nuclear Power Plant Updated Safety Analysis Report (USAR), section 4.2.2, Reactor Coolant Pump Flywheels, states, "An ultrasonic inspection capable of detecting at least ½ inch deep cracks from the ends of the flywheel will be more than adequate as part of a plant surveillance program".

Therefore, the commitment associated with the KNPP reactor coolant pump flywheel examinations is listed in the KNPP third ten-year in-service interval (ISI) program augmented examination programs. The requirements are:

1. Flywheels on both reactor coolant pumps will be ultrasonically examined during the third inspection interval.

2. Examinations will be performed concurrent with scheduled maintenance.

Therefore, NMC finds that the reactor coolant pump flywheel examinations are an augmented program that is not required by ASME Section XI or 10CFR50.55a, but are a commitment made as a part of the third ten-year interval ISI plan.

On May 5, 2003, the NRC issued, "Safety Evaluation of Topical Report WCAP-15666, "Extension Of Reactor Coolant Pump Motor Flywheel Examination" (TAC NO. MB2819) (Adams Accession NO. ML031250595). The topical report (TR) provided the technical justification to extend the reactor coolant pump (RCP) motor flywheel examination frequency for all domestic Westinghouse plants from the currently approved 10-year inspection interval, to an interval not to exceed 20 years to enable domestic Westinghouse plants to conduct their flywheel examination during a planned RCP refurbishment

In the NRC's SE, the staff stated that the request is a change from the current RG 1.14 guidance. The staff determined that the regulatory positions in RG 1.14 concerning the three critical speeds are satisfied, and that the evaluation indicating that critical crack sizes are not expected to be attained during a 20-year inspection interval is reasonable and acceptable. Additionally, the NRC staff found that the potential for failure of the RCP flywheel is, and will continue to be, negligible during normal and accident conditions. The bounding estimate is below the very small change in LERF guidelines in RG 1.174 and the staff finds that the increase in risk is small and is consistent with the Commission's Safety Goal Policy Statement.

Therefore, the inspections of the RCP flywheels are not required by ASME Section XI or 10CFR50.55a, but are based on RG 1.14, and the NRC staff has approved the extension of the inspection frequency to 20 years, NMC is changing the commitment associated with the RCP flywheel inspection frequency at the KNPP. NMC will now, as approved for all domestic Westinghouse plants, inspect the RCP flywheels on a 20-year inspection frequency.

2.7(b) Based on the response to the previous question above, it may become more clear how the Staff can evaluate the licensee's proposal. If this is an augmented program that is not required by Section XI or 10 CFR 50.55a, it may not be appropriate to make an evaluation under 10 CFR 50.55a(a)(3). On the other hand, if it is determined that 10 CFR 50.55a(a)(3) may be used for the evaluation, the licensee has not (i) provided information to demonstrate that the proposed alternative will provide an acceptable level of quality and safety, or (ii) shown that compliance with the existing requirements result in a hardship or unusual difficulty with no compensating increase in the level of quality and safety.

Since these examinations have been performed approximately every 10 years in previous intervals, it is not expected that the licensee will be able to show a hardship or unusual difficulty. Therefore, provide evidence to demonstrate that, by extending the examination interval from 10 to 20 years provides an acceptable level of quality and safety.

NMC Response to 2.7(b)

As stated in NMC's response to item 2.7(a), NMC has determined that this is an augmented program that is not required by Section XI or 10 CFR 50.55a, thus it is not appropriate to make an evaluation under 10 CFR 50.55a(a)(3).