July 2, 2003

Mr. Alfred J. Cayia
Site Vice President
Point Beach Nuclear Plant
Nuclear Management Company, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR POWER PLANT, UNITS 1 AND 2 - EVALUATION OF RISK-INFORMED INSERVICE INSPECTION PROGRAM (TAC NOS. MB5553 AND MB5554)

Dear Mr. Cayia:

By letter dated July 3, 2002, as supplemented March 27, 2003, the Nuclear Management Company, LLC (the licensee), submitted Relief Request No. 3 requesting approval of an alternative risk-informed inservice inspection (RI-ISI) program for the Point Beach Nuclear Power Plant, Units 1 and 2, for the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code) Class 1 and 2 piping welds (Categories B-F, B-J, C-F-1, and C-F-2 only).

The Point Beach, Units 1 and 2, RI-ISI program was developed in accordance with Electric Power Research Institute Topical Report TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure, Final Report," dated December 1999, using the Nuclear Energy Institute's template methodology. The Nuclear Regulatory Commission (NRC) staff has evaluated the licensee's proposed alternative RI-ISI program and finds it to be an acceptable alternative to the requirements of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The NRC staff concludes that the proposed alternative provides an acceptable level of quality and safety, and therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i). The proposed alternative is authorized for the remainder of the fourth 10-year ISI interval at Point Beach, Units 1 and 2, which began July 1, 2002. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

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

Docket Nos. 50-266 and 50-301

Enclosure: Safety Evaluation

cc w/encl: See next page

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Point Beach Nuclear Plant, Units 1 and 2

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF REGARDING

FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

BASED ON RISK-INFORMED ALTERNATIVE APPROACH

POINT BEACH NUCLEAR POWER PLANT, UNITS 1 AND 2

NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NOS. 50-266 AND 50-301

1.0 INTRODUCTION

By letter dated July 3, 2002, as supplemented March 27, 2003, the Nuclear Management Company, LLC (the licensee), submitted Relief Request No. 3 (RR-3) requesting approval of an alternative risk-informed inservice inspection (RI-ISI) program for the Point Beach Nuclear Power Plant, Units 1 and 2, for the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code) Class 1 and 2 piping welds (Categories B-F, B-J, C-F-1, and C-F-2 only).

In RR-3, the licensee requested a change to the ISI program for Class 1 and 2 piping using the RI-ISI process described in Electric Power Research Institute (EPRI) Topical Report (TR) EPRI TR-112657, Revision B-A, “Revised Risk-Informed Inservice Inspection Evaluation Procedure,” dated December 1999, and ASME Code Case N-578, "Risk-informed Requirements for Class 1, 2, or 3 Piping, Method B Section XI, Division 1," dated September 1997. The RI-ISI program has been developed in accordance with the methodology contained in EPRI TR-112657, which was previously reviewed and approved by the Nuclear Regulatory Commission (NRC) staff in a letter dated October 28, 1999.

Pursuant to 10 CFR 50.55(a)(3)(i), the licensee proposed to implement the RI-ISI program as an alternative to the existing ISI requirements of the ASME Code, Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components.” The scope of the licensee’s proposed RI-ISI program is limited to ASME Code Class 1 and Class 2 piping welds for the following Examination Categories:

- B-F for pressure-retaining dissimilar metal welds in vessel nozzles
- B-J for pressure-retaining welds in piping
- C-F-1 for pressure-retaining welds in austenitic stainless steel or high alloy piping
- C-F-2 for pressure-retaining welds in carbon or low alloy steel piping.

ENCLOSURE

The licensee indicated that the existing augmented ISI program implemented in response to Generic Letter (GL) 89-08, “Erosion/Corrosion-Induced Pipe Wall Thinning,” is credited in the RI-ISI program development, but is not affected or changed by the RI-ISI program. The existing augmented Inspection for high-energy break exclusion piping is also not affected by the proposed RI-ISI program.

2.0 REGULATORY EVALUATION

2.1 Applicable Requirements

The regulation at 10 CFR 50.55a(g) requires that ISI of the ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements set forth in the Code to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

The regulation at 10 CFR 50.55a(a)(3) states, in part, that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.2 Specific Applicable Regulatory Criteria

Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis," defines the following safety principles that should be met in an acceptable RI-ISI program:

(1) The proposed change meets current regulations unless it is explicitly related to a requested exemption.
(2) The proposed change is consistent with the defense-in-depth philosophy.
(3) The proposed change maintains sufficient safety margins.
(4) When proposed changes result in an increase in risk, the increases should be small and consistent with the intent of the Commission’s Safety Goal Policy Statement.
(5) The impact of the proposed change should be monitored using performance measurement strategies.

Regulatory Guide 1.178, “An Approach For Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping,” describes methods acceptable to the NRC staff for integrating insights from PRA techniques with traditional engineering analyses into ISI programs for piping, and addresses risk-informed approaches that are consistent with the basic elements identified in Regulatory Guide 1.174.

The licensee has proposed to use an RI-ISI program for ASME Class 1 and Class 2 piping (Examination Categories B-F, B-J, and C-F-1 and C-F-2) welds, as an alternative to the ASME Code, Section XI requirements. The proposed RI-ISI program follows the RI-ISI methodology described in EPRI TR-112657. In its letter dated October 28, 1999, approving the methodology described in EPRI TR-112657, the NRC staff also concluded that an RI-ISI program as described in EPRI TR-112657 utilizes a sound technical approach and will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a, any RI-ISI program meeting the requirements of EPRI TR-112657 provides an acceptable alternative to the piping ISI requirements with regard to (1) the number of locations, (2) the locations of inspections, and (3) the methods of inspection. The proposed program maintains the fundamental requirements of ASME Code, Section XI, such as the examination technique, examination frequency, and acceptance criteria. However, the proposed program significantly reduces the number of required examination locations and is able to demonstrate that an acceptable level of quality and safety is maintained. Thus, the proposed alternative approach is based on the conclusion that it provides an acceptable level of quality and safety and, therefore, is in conformance with 10 CFR 50.55a(a)(3)(i).

2.3 Current Requirements

The regulation at 10 CFR 50.55a(g) requires that ISI of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). In a letter dated January 8, 2001, the licensee requested relief from ASME Code, Section XI, requirements stated in paragraphs IWA-2430(b), IWA-2432, IWB-2412, IWC-2412, and IWD-2412, as delineated in Tables IWB-2412-1, IWC-2412-1, and IWD-2412-1. The request sought to align the inspection interval start dates so that applicable Section XI rules for both units are the same and implemented at the same time. In the January 8, 2001, letter, the licensee stated its intention to complete the required third interval examinations for both units, and that there would be no reduction in the number of examinations for either unit as a result of the date change. By letter dated June 18, 2001, the NRC staff authorized a start date for the fourth ISI interval of July 1, 2002 at Point Beach Units 1 and 2.

Pursuant to 10 CFR 50.55a(g)(4)(ii), the applicable ASME Code, Section XI for the third ISI interval was the 1986 edition. However, by letter dated June 4, 2001, the licensee submitted a request for updating ISI program plans to the 1998 edition of the ASME Code, Section XI, with all addenda through 2000 for the fourth 10-year ISI interval. By letter dated November 6, 2001, the NRC staff approved NMC's request to use the 1998 edition of the ASME Code with all addenda through 2000 with the provision that the licensee must implement the requirements when the proposed rule for 10 CFR 50.55a dated August 3, 2001, is finalized. The proposed rule was subsequently made final and published. The licensee is required to update their ISI program to follow those rules.

The licensee is currently utilizing the 1998 edition of the ASME Code with all addenda through 2000, as specified in the NRC staff's safety evaluation dated November 6, 2001. The 1998 edition of the ASME Code, Section XI, requires that, for Class 1 and 2 piping, a minimum percentage of examinations in each category of welds be completed during each successive inspection period and inspection interval in accordance with Program B, Tables IWB-2412-1 and IWC-2412-1, respectively.

Pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff has reviewed and evaluated the licensee's proposed RI-ISI program based on guidance and acceptance criteria provided in the following documents:

- EPRI TR-112657
- NRC safety evaluation report for EPRI TR-112657
- RGs 1.174 and 1.178
- Standard Review Plan (SRP) Chapter 3.9.8, "Standard Review Plan for Trial Use for the Review of Risk-Informed Inservice Inspection of Piping"

3.0 TECHNICAL EVALUATION

In accordance with the guidance provided in RGs 1.174 and 1.178, the licensee provided the results of an engineering analysis of the proposed changes using a combination of traditional engineering analysis and supporting insights from the probabilistic risk assessment (PRA). The licensee stated that the results of the engineering analysis demonstrate that the proposed changes are consistent with the principles of defense-in-depth. The licensee performed an evaluation to determine susceptibility of components (i.e., a weld on a pipe) to a particular degradation mechanism that may be a precursor to leak or rupture, and then performed an independent assessment of the consequence of a failure at that location.

3.1 Description of Change

The number and locations of inspections based on ASME guidelines will be replaced by the number and locations of inspections based on the RI-ISI guidelines. The ASME Code, Section XI, specifies that for each successive 10-year ISI interval, 100 percent of Category B-F welds and 25 percent of Examination Category B-J welds in Class 1 piping greater than 1 inch in nominal diameter must be selected for nondestructive examinations (NDE) such as volumetric and/or surface examination based on existing stress analyses and cumulative usage factors. For Examination Category C-F piping welds in Class 2 piping, 7.5 percent of nonexempt welds shall be selected for volumetric and/or surface examination. As illustrated in Section 3.5 of the licensee's July 3, 2002, letter, the proposed RI-ISI program for Unit 1 selects 70 of 754 Class 1 piping welds, and 58 of 1068 Class 2 piping welds for NDE. The proposed program for Unit 2 selects 63 of 621 Class 1 piping welds, and 69 of 1152 Class 2 piping welds for NDE. The surface exams required by the ASME Code will be discontinued while system pressure tests and VT-2 visual exams shall continue. These results are consistent with the concept that, by focusing inspections on the most safety significant welds, the number of inspections can be reduced while at the same time maintaining protection of public health and safety.

3.2 Key Information

During the course of its review, the NRC staff determined that the proposed RI-ISI program is consistent with the guidelines contained in EPRI TR-112657. The report states, in part, that industry and plant-specific piping failure information, if any, is to be utilized to identify piping degradation mechanisms and failure modes, and consequence evaluations are to be performed using PRAs to establish safety ranking of piping segments for selecting new inspection locations.

Piping systems defined by the scope of the RI-ISI program were divided into piping segments. Pipe segments are defined as lengths of pipe whose failure leads to similar consequences and are exposed to the same degradation mechanisms. That is, some lengths of pipe whose failure would lead to the same consequences may be split into two or more segments when two or more regions are exposed to different degradation mechanisms.

Augmented programs for flow-accelerated corrosion (FAC) (GL 89-08), and high-energy break exclusion piping (NRC Branch Technical Position MEB 3-1) are not subsumed into the RI-ISI program and remain unaffected. Elements in Point Beach that are covered by these augmented programs were included in the consequence assessment, degradation assessment, and risk categorization evaluations to determine whether the affected piping was subject to damage mechanisms other than those addressed by the augmented program.

Tables 3.1-1 and 3.1-2 of the licensee's July 3, 2002, letter summarize the results of the segmentation scheme for Units 1 and 2, respectively. The licensee's submittal states that the failure potential assessment presented in Tables 3.3-1 (for Unit 1) and Table 3.3-2 (for Unit 2) of the July 3, 2002, letter, were generated utilizing industry failure history, plant-specific failure history, and other relevant information using the guidance provided in EPRI TR-112657. The degradation mechanisms identified in the submittal include: thermal fatigue (including thermal stratification, cycling and striping (TASCS), thermal transients (TT)), intergranular stress-corrosion cracking (IGSCC), primary water stress-corrosion cracking (PWSCC), and FAC. The licensee stated in Section 2.2 of its July 3, 2002, letter that the augmented inspection program for FAC is relied upon to manage this mechanism and is not changed by the RI-ISI program.

The NRC staff concludes that the licensee has met the SRP 3.9.8 guidelines, and confirms that a systematic process was used to identify the component's (i.e., pipe segment's) susceptibility to common degradation mechanisms, and to categorize these degradation mechanisms into the appropriate degradation categories with respect to their potential to result in a postulated leak or rupture.

Additionally, the licensee stated that the consequences of pressure boundary failures were evaluated and ranked based on their impact on core damage and large early release, and that the impact due to both direct and indirect effects was considered using guidance provided in EPRI TR-112657.

3.2.1 Probabilistic Risk Assessment

In its March 27, 2003, supplemental letter, the licensee stated that it used Revision 3.00 of the Point Beach PRA model dated October 12, 2001, to support the development of the RI-ISI program. In its July 3, 2002, letter, the licensee stated that the base core damage frequency (CDF) and base large early release frequency (LERF) from the 2001 PRA model is 4.4E-5 per year and 1.2E-5 per year, respectively for each Point Beach unit.

The individual plant examination (IPE) for Point Beach was submitted to the NRC on June 30, 1993. The NRC staff evaluation report dated January 26, 1995, identified shortcomings in the treatment of pre-accident human errors. In 2001, the PRA was reviewed by a Westinghouse Owners Group (WOG) PRA Peer Review Team. The peer review team identified shortcomings in pre-accident human errors such as instrument miscalibration errors and valve restoration errors. In its March 27, 2003, supplemental letter, the licensee discusses the miscalibration

errors and indicates that there are numerous instrumentation available to identify and respond to loss-of-coolant accidents (LOCAs), which are the dominate source of risk for RI-ISI. Therefore, while improved estimates for these errors may be needed for issues addressing instrumentation issues, they are negligible contributors for RI-ISI risk scenarios and any changes are not expected to impact the results. Similarly, the contribution to LOCA risk from valve restoration errors is also minor and replacing the current bounding values will not significantly affect the consequence evaluation results.

In addition, the WOG PRA peer review group identified concerns regarding the values assigned to some of the common cause failure (CCF) probabilities. The licensee reported in its March 27, 2003, supplemental letter that post-accident human error probabilities are at least two orders of magnitude higher than the CCF probabilities in sequences that dominate the RI-ISI results. A human failure to align redundant components has the same effect as a CCF. Other sequences where the CCF probabilities may have a dominate impact. such as loss-of-station power sequences, have a very small impact on the RI-ISI results. Consequently, potentially inappropriate CCF values should have no significant impact on the consequence evaluation results used in the RI-ISI submittal.

The NRC staff did not review the PRA model to assess the accuracy of the quantitative estimates reported by the licensee in its RI-ISI submittal. The NRC staff recognizes that the quantitative results of the PRA model are used as order of magnitude estimates to support the assignment of segments into three broad consequence categories. Inaccuracies in the models or in assumptions that are large enough to invalidate the broad categorizations developed to support the RI-ISI should have been identified during the NRC staff's review of the IPE, and by the licensee's model update control program that included a peer review of the PRA model by a peer review team. Minor errors or inappropriate assumptions will affect only the consequence categorization of a few segments and will not invalidate the general results or conclusions of the proposed RI-ISI program.

The licensee used the "Simplified Risk Quantification Method," described in Section 3.7.2 of EPRI TR-112657 to quantitatively estimate expected change in risk. For high consequence category segments, the licensee used the conditional core damage probability (CCDP) and the conditional large early release probability (CLERP) based on the highest estimated CCDP (2.8E-2) and highest estimated CLERP (1.1E-3). For medium consequence category segments, bounding estimates of CCDP (1E-4) and CLERP (1E-5) were used. The licensee assessed the change in risk with and without taking credit for an increased probability of detection (POD). In its July 3, 2002, letter, the licensee reported the aggregate change in CDF and LERF for both units. These estimates are shown in the table below. A negative aggregate change in CDF and LERF indicates a reduction in risk as a result of transitioning from ASME Code, Section XI based ISI program to the RI-ISI program.

Estimated Change in Risk Associated with Replacing the Section XI ISI Program with a Risk-Informed ISI Program

	ΔCDF		ΔLERF	
	With POD	Without POD	With POD	Without POD
Unit 1	-5.39E-08	-1.25E-09	-2.12E-09	-4.85E-11
Unit 2	-4.86E-08	-6.05E-09	-1.91E-09	-2.40E-10

The NRC staff finds the licensee's process to evaluate and bound the potential change in risk reasonable because it (1) accounts for the change in the number and location of elements inspected, (2) recognizes the difference in degradation mechanism related to failure likelihood, and (3) considers the effects of enhanced inspection. System level and aggregate estimates of the changes in CDF and LERF are less than the corresponding guideline values in EPRI TR-112657. The NRC staff finds that redistributing the welds to be inspected with consideration of the safety significance of the segments provides assurance that segments whose failure have a significant impact on plant risk receive an acceptable and often improved level of inspection.

3.2.2 Integrated Decisionmaking

The licensee used an integrated approach in defining the proposed RI-ISI program by considering in concert the traditional engineering analysis, the risk evaluation, the implementation of the RI-ISI program, and performance monitoring of piping degradation. This is consistent with the guidelines given in RG 1.178.

The selection of pipe segments to be inspected is described in Section 3.5 of the licensee's March 27, 2003, supplemental letter. The licensee used the results of the risk category ranking and other operational considerations in selecting the pipe segments. The licensee provided additional detailed information on the results of the evaluation in the following tables included in the March 27, 2003, supplemental letter:

- Tables 3.3-1 and 3.3-2 provide the failure potential assessment summary for Units 1 and 2, respectively
- Tables 3.4-1 and 3.4-2 identify on a per system basis, the number of segments and number of elements (welds) by risk category for Units 1 and 2, respectively.
- Tables 3.6-1 and 3.6-2 provide the risk impact analysis results for each system for Units 1 and 2 respectively.
- Tables 5.1-1 and 5.1-2 provides a summary table for each unit comparing the number of inspections required under the 1986 ASME Code, Section XI, ISI program with the alternative RI-ISI program.

The licensee states that the failure estimates and the selection of examination elements with high and medium risk-ranked piping segments were determined using the guidance provided in EPRI TR-112657. Based on the information provided by the licensee in its July 3, 2002, letter, EPRI's requirements of performing NDE methods on at lease 25 percent of the locations in the high-risk region and 10 percent of the locations in the medium-risk region are met. According to the licensee in its March 27, 2003, letter, when accounting for both socket and non-socket piping welds, the percentage of Class 1 welds selected for examination is 9.3 percent and 10.1 percent for Units 1 and 2, respectively.

The licensee states that any examination location where greater than 90 percent volumetric coverage cannot be obtained, the process outlined in the EPRI TR-112657 will be followed. As required by Section 6.4 of EPRI TR-112657, the licensee has completed an evaluation of existing relief requests to determine if any should be withdrawn or modified due to changes that occur from implementing the RI-ISI program. In its submittal, the licensee has stated that none of the existing PBNP relief requests are being withdrawn.

The objective of ISI required by ASME Code, Section XI, is to identify conditions (i.e., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. The RI-ISI program is judged to meet this objective. Further, the risk-informed selection process utilizes a technically sound "inspection for cause" program. In this way, the process not only identifies the risk-important areas of the piping systems, but also defines the appropriate examination methods, examination volumes, procedures, and evaluation standards necessary to address the degradation mechanism(s) of concern and the ones most likely to occur at each location to be inspected. Thus, the location selection process is acceptable since it is consistent with the process described in EPRI TR-112657, which takes into account defense-in-depth and includes coverage of systems subjected to degradation mechanisms in addition to those covered by augmented inspection programs.

Chapter 4 of EPRI TR-112657 provides guidelines for the areas and/or volumes to be inspected, as well as examination methods, acceptable standards, and evaluation standards for each degradation mechanism. Based on the review of the cited portion of the EPRI report, the NRC staff concludes that the examination methods for the proposed RI-ISI program are acceptable since they are selected based on specific degradation mechanisms, pipe sizes, and materials of concern.

3.2.3 Implementation and Monitoring

Implementation and performance monitoring strategies require careful consideration by the licensee and are addressed in Element 3 of RG 1.178 and in SRP 3.9.8. The objective of Element 3 is to assess performance of the affected piping systems under the proposed RI-ISI program by utilizing monitoring strategies that confirm the assumptions and analyses used in the development of the RI-ISI program. Pursuant to 10 CFR 50.55a(a)(3)(i), a proposed alternative (in this case the implementation of the RI-ISI program, including inspection scope, examination methods, and methods of evaluation of examination results) must provide an acceptable level of quality and safety.

The licensee states that upon approval of the RI-ISI program, procedures that comply with the EPRI TR-112657 guidelines will be prepared to implement and monitor the RI-ISI program. The licensee confirms that the applicable aspects of the ASME Code not affected by the proposed RI-ISI program would be retained.

The licensee states in Section 4 of its July 3, 2002, letter that the RI-ISI program is a living program and its implementation will require feedback of new relevant information to ensure the appropriate identification of safety-significant piping locations. The licensee also states that, as a minimum, risk-ranking of piping segments will be reviewed and adjusted on an ASME-period basis and that significant changes may require more frequent adjustment as directed by NRC bulletin or generic letter requirements, or by industry and plant-specific feedback.

The NRC staff finds that the proposed process for RI-ISI program updates meets the guidelines of RG 1.174, which provide that risk-informed applications should include performance monitoring and feedback provisions. Therefore, the NRC staff finds the licensee's proposed process for program updates acceptable.

3.3 Comparison of Change to Regulatory Criteria

The licensee proposed to implement the NRC staff-approved RI-ISI methodology delineated in EPRI TR-112657 with one deviation related to assessing the potential for TASCS. In Section 3 of its July 3, 2002, letter, the licensee described the deviation to the EPRI RI-ISI methodology that was implemented for Point Beach Units 1 and 2. Specifically, the licensee has incorporated in its methodology considerations for determining the potential for thermal fatigue as a result of the effects of TASCS. Those considerations involved the following TASCS areas: turbulent penetration, low flow, valve leakage, and convection heating. The licensee also stated that the criteria it plans to use for assessing TASCS potential are the same as those previously submitted to the NRC by EPRI for generic approval in a letter dated February 28, 2001. The licensee's description of its deviation is identical to other licensee submittals that have been reviewed and accepted by the NRC staff. Specifically, the NRC staff has reviewed the guidance for evaluating TASCS, as described in Materials Reliability Project (MRP) methodology in EPRI Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)."

3.4 Summary

Pursuant to 10 CFR 50.55a(a)(3)(i), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that the proposed alternatives will provide an acceptable level of quality and safety. In this case, the licensee has proposed an alternative to use the risk-informed process described in the NRC-approved EPRI TR-112657 with one deviation regarding the methodology used for assessing the potential for TASCS. As discussed above, the NRC staff concludes that the licensee's proposed RI-ISI program, which is consistent with the methodology described in EPRI TR-112657, will provide an acceptable level of quality and safety with regard to the number of inspections, location of inspections, and method of inspections.

In accordance with RGs 1.174 and 1.178 guidelines, the elements of traditional engineering analysis and PRA of an RI-ISI program are part of an integrated decisionmaking process that assesses the acceptability of the program. The primary objective of this process is to confirm that the proposed program change will not compromise defense-in-depth, safety margins, and other key principles described in these RGs. The EPRI TR-112657 RI-ISI methodology is a process-driven approach; that is, the process identifies high, risk-significant pipe segment locations to be inspected. The PBNP RI-ISI program demonstrates that unacceptable risk impacts will not occur, and thus, implementation of the RI-ISI program satisfies the acceptance guideline of RG 1.174.

The methodology used by the licensee also considers implementation and performance monitoring strategies. Inspection strategies ensure that failure mechanisms of concern have been addressed and there is adequate assurance of detecting damage before structural integrity is affected. The risk significance of piping segments is taken into account in defining the inspection scope for the RI-ISI program.

System pressure tests and visual examination of piping structural elements will continue to be performed on all Class 1 and 2 systems in accordance with the ASME Code, Section XI. The RI-ISI program applies the same performance measurement strategies as the existing ASME Code requirements and, in addition, increases the inspection volumes at weld locations that are susceptible to thermal fatigue.

Point Beach's methodology includes an engineering analysis of the proposed changes using a combination of engineering analysis with supporting insights from a PRA. Defense-in-depth and quality is not degraded in that the methodology provides reasonable assurance that any reduction in inspections will not lead to degraded piping performance when compared to the existing performance levels. Inspections are focused on locations with active degradation mechanisms as well as selected locations that monitor the performance of system piping.

As discussed above, the NRC staff concludes that the licensee's proposed RI-ISI program is an acceptable alternative to the current ISI program for Class 1 and 2 piping welds at Point Beach Units 1 and 2, and therefore, the proposed alternative of RR-3 is authorized for the remaining periods of the fourth 10-year ISI interval pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative would provide an acceptable level of quality and safety.

4.0 CONCLUSION

Based on the information provided in the licensee's letter dated July 3, 2002, as supplemented March 27, 2003, the NRC staff has determined that the proposed alternative, as described above, provides an acceptable level of quality and safety, and therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the remainder of the fourth 10-year ISI interval at Point Beach Units 1 and 2, which began July 1, 2002. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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