May 31, 2001

Mr. John H. Mueller
Chief Nuclear Officer
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station
Operations Building, Second Floor
Lycoming, NY 13093

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT NO. 2 - APPROVAL TO USE A RISK-INFORMED INSERVICE INSPECTION PROGRAM FOR THE SECOND 10-YEAR INTERVAL (TAC NO. MB0297)

Dear Mr. Mueller:

The inservice inspection (ISI) program of a nuclear plant is required by 10 CFR 50.55a, "Codes and Standards," to comply with the requirements in the latest edition and addenda of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (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. For Nine Mile Point Nuclear Station, Unit 2, the applicable edition of Section XI of the ASME Code for the second 10-year ISI interval (April 5, 1998 thru April 4, 2008) is the 1989 Edition. By letter dated October 16, 2000, Niagara Mohawk Power Corporation (NMPC) submitted Relief Request RR-RI-ISI-2, proposing to use a risk-informed ISI program as an alternative to the current ISI program for Class 1 and 2 piping. NMPC stated that its RI-ISI program was developed in accordance with the NRC-approved methodology contained in the Electric Power Research Institute Report TR-112657. NMPC provided clarifying information by letters dated March 19, 2001, and April 12, 2001, in response to the staff's requests for additional information.

The NRC staff reviewed the submittals and concludes that NMPC's proposed risk-informed ISI program is an acceptable alternative to the current ISI program for Class 1 and 2 piping welds at NMP-2. Therefore, Relief Request RR-RI-ISI-2 is approved pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that it provides an acceptable level of quality and safety. This approval is for the second 10-year ISI interval (April 5, 1998 through April 4, 2008). Please contact the project manager, Mr. Peter Tam, if you have any questions.

Sincerely,

/RA/

Richard P. Correia, Acting Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-410

cc: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL INSERVICE INSPECTION

RELIEF REQUEST RR-RI-ISI-2, RISK-INFORMED ALTERNATIVE APPROACH

NINE MILE POINT NUCLEAR STATION, UNIT NO. 2

DOCKET NUMBER 50-410

1.0 INTRODUCTION

As required by Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a, "Codes and Standards," the current inservice inspection (ISI) requirements for the Nine Mile Point Nuclear Station, Unit No. 2 (NMP-2) are in accordance with the 1989 Edition of Section XI, Division 1 of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). By letter dated October 16, 2000 (Reference 1), Niagara Mohawk Power Corporation (NMPC, the licensee) submitted a relief request, RR-RI-ISI-2, which proposed to use a risk-informed inservice inspection (RI-ISI) program as an alternative to the current ISI program for Class 1 and 2 piping. The licensee stated that its RI-ISI program was developed in accordance with the methodology contained in the Electric Power Research Institute (EPRI) Report EPRI TR-112657 (Reference 2), which was previously reviewed and approved by the staff (Reference 3). In response to staff's requests for additional information (RAIs), the licensee provided clarifying information by letters dated March 19, 2001 (Reference 4) and April 12, 2001 (Reference 5).

Previously, by a letter dated December 14, 1999 (Reference 6), the staff approved the licensee's Relief Request RR-RI-ISI-1, and authorized NMP-2 not to perform certain examinations required by the ASME Code during Refueling Outage 7, with an acknowledgment that the licensee was planning to submit a RI-ISI program for review. As a result, the licensee submitted this relief request (Reference 1) with the proposed RI-ISI program pursuant to 10 CFR 50.55a(a)(3)(i) for the second 10-year ISI interval.

2.0 BACKGROUND

2.1 Applicable Requirements

Section 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 and the applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulation at 10 CFR 50.55a(a)(3) states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the proposed alternatives would provide an acceptable level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that 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. For NMP-2, the applicable edition of Section XI of the ASME Code for the second 10-year ISI interval, which began on April 5, 1998, and will end on April 4, 2008, is the 1989 Edition.

2.2 Summary of Proposed Approach

Section XI of the ASME Code requires that for each successive 10-year ISI interval, 100% of Category B-F welds and 25 percent of Category B-J welds for ASME Code Class 1 piping greater than 1 inch in nominal diameter be selected for volumetric and/or surface examination based on existing stress analyses and cumulative usage factors. For Category C-F piping welds, 7.5 percent of non-exempt welds shall be selected for volumetric and/or surface examination.

The licensee proposed to use an RI-ISI program for a subset of ASME Class 1 and Class 2 piping (Examination Categories B-F, B-J, and C-F) welds, as an alternative to the ASME Code, Section XI requirements. The licensee stated that existing ISI program requirements of the ASME Code, Section XI for components other than ASME Class 1 piping with Categories B-F and B-J welds, and ASME Class 2 piping with Categories C-F-1 and C-F-2 welds will not be affected by the proposed RI-ISI program. The proposed RI-ISI program follows a previously approved RI-ISI methodology delineated in EPRI TR-112657. The licensee stated that there were no deviations from the process described in this EPRI Report.

The licensee indicated that for the existing augmented ISI program implemented in response to NRC Generic Letter (GL) 88-01, “Intergranular Stress Corrosion Cracking (IGSCC),” Category A welds are integrated into the RI-ISI program. However, portions of the program related to Categories B through G welds will remain unchanged. In addition, the existing augmented ISI program implemented in response to GL 89-08, “Flow Accelerated Corrosion (FAC),” is credited in the RI-ISI program, but is not affected or changed by the RI-ISI program. In addition, all other existing augmented ISI programs are not affected by the proposed RI-ISI program.

The licensee also indicated that three NRC-approved relief requests pertaining to the piping systems within the scope of the proposed RI-ISI program are no longer required. These three relief requests are RR-IBW-6, RR-IWC-2, and RR-IWC-5. All other previously approved relief requests remain applicable as addressed in their respective safety evaluation reports (SERs).

3.0 EVALUATION

Pursuant to 10 CFR 50.55a(a)(3)(i), the 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 for ASME Code Case N-578-1 applications, NRC’s SER to EPRI TR-112657, Regulatory Guides (RGs) 1.174 (Reference 7) and 1.178 (Reference 8), and Standard Review Plan (SRP), Chapter 3.9.8 (Reference 9).

3.1 Proposed Changes to the ISI Program

The scope of the licensee's proposed RI-ISI program is limited to ASME Class 1 and Class 2 piping welds for the following Examination Categories: B-F for pressure retaining dissimilar metal welds in vessel nozzles (Items B5.10, B5.20, B5.130, and B5.150); B-J for pressure retaining welds in piping (Items B9.11, B9.12, B9.21, B9.31, B9.32, and B9.40); C-F-1 for pressure retaining welds in austenitic stainless steel or high alloy piping (Items C5.11 and C5.12); and C-F-2 for pressure retaining welds in carbon or low alloy steel piping (Items C5.51, C5.52, C5.70, and C5.81). The RI-ISI program is proposed as an alternative to the existing ISI requirements of the ASME Code, Section XI. A general description of the proposed changes to the ISI program is provided in Sections 3 and 5 of the licensee's submittal (Reference 1).

In Table 5-1 of Reference 1, a comparison between the current ISI program and the proposed RI-ISI program is provided for the weld inspection locations. A total of 94 Class 1 welds (consisting of 8 Category B-F welds and 86 Category B-J welds) and 31 Class 2 welds (consisting of 4 Category C-F-1 welds and 27 Category C-F-2 welds) are selected for RI-ISI inspection. The 94 selected Class 1 welds include only 19 welds (out of 49) credited from the GL 88-01 IGSCC Category D and E augmented inspection program and 2 welds (out of 34) credited from the FAC augmented inspection program. In accordance with Section 3.6.4.1 of the EPRI TR-112657, no more than half of the inspection locations in the RI-ISI program may be selected from the augmented inspection program. Therefore, the licensee's proposal is in conformance with the guideline stated in the EPRI TR-112657, and the information submitted adequately defines the proposed changes to the existing ISI program.

During the course of its review, the staff verified that the proposed RI-ISI program is consistent with the guidelines contained in EPRI TR-112657, which state in part that industry and plant-specific piping failure information, if any, is utilized to identify piping degradation mechanisms and failure modes, and consequence evaluations are performed using probabilistic risk assessments (PRAs) to establish piping segment safety ranking for selecting new inspection locations.

3.2 Engineering Analysis

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 a 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 and that adequate safety margins will be maintained. The licensee performed an evaluation to determine the 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. The proposed RI-ISI program resulted in a reduction of required examination locations from 282 to 94 for Class 1 and 125 to 31 for Class 2 piping systems. However, 94 out of a total of 942 butt welds in these B-F and B-J categories (10 percent) were selected for volumetric inspection.

The licensee stated that for Class 1 and Class 2 piping at NMP-2, the augmented inspection program implemented during the first inspection interval in response to GL 88-01, IGSCC Category A welds are integrated into the RI-ISI program. However, portions of the program for IGSCC Categories B through G welds remain unchanged. In addition, the existing augmented

ISI program implemented in response to GL 89-08 associated with FAC, is credited in the RI-ISI program, but is not affected or changed by the RI-ISI program. The licensee also stated that the existing augmented ISI programs for the remaining Class 1 and Class 2 piping are unaffected by the proposed RI-ISI program. The approach adopted for the augmented inspection programs is consistent with the EPRI TR-112657 guidelines, and therefore, is considered to be acceptable.

Piping systems within the scope of the RI-ISI program were divided into piping segments. Pipe segments are defined as lengths of pipe whose failure (anywhere within the pipe segment) would lead to the same consequence and which are exposed to the same degradation mechanisms. That is, some lengths of pipe whose failure would lead to the same consequence may be split into two or more segments when two or more regions are exposed to different degradation mechanisms. This is appropriate, and necessary, because the methodology combines separate consequence categories with degradation mechanism categories and therefore, the two characteristics should not be mixed within a segment. The licensee's submittal (Reference1) also states that failure potential estimates, presented in Table 3.3-1 of the submittal, were generated utilizing industry failure history, plant-specific failure history, and other relevant information using the guidance provided in EPRI TR-112657. The staff concludes that the licensee has met the SRP 3.9.8 guidelines to confirm that a systematic process was used to identify the component's (i.e., pipe segments) 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 containment performance (isolation, bypass, and large early release), and that the impact due to both direct and indirect effects was considered using guidance provided in the EPRI TR-112657. The licensee reported no deviations from the consequence evaluation methodology approved by the staff in the EPRI Report. Therefore, the staff considers the consequence evaluation performed by the licensee for this application to be acceptable.

3.3 Probabilistic Risk Assessment

The licensee used its July 1999 Level 2 PRA to evaluate the consequences of pipe rupture for the RI-ISI assessment. In its submittal (Reference 1), the licensee reported a base core damage frequency (CDF) of 5.4E-5/year and a base large early release frequency (LERF) of 1.5E-6/year. The licensee stated in its submittal that the PRA used in its evaluation is a consolidation of the Individual Plant Examination (IPE) and Individual Plant Examination of External Events (IPEEE).

The NMP-2 IPE was submitted in June 1992 and supplemented by a response to a staff RAI in May 1993. The IPE identified a mean CDF of 3.1E-5/year. The SER, dated August 18, 1994, concluded that the NMP-2 IPE satisfied the intent of GL 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities." In its SER, the staff noted that the licensee stated its intent to continue to use and maintain its IPE as a living program. The staff's 1994 SER identified six hardware and procedural enhancements that the licensee planned to implement by the end of the December 1993 refueling outage. The licensee stated in Reference 4 that these

enhancements have been addressed and that the July 1999 PRA reflects the as-built, as-operated plant.

The staff did not review the IPE analysis to assess the accuracy of the quantitative estimates. The staff recognizes that the quantitative results of the IPE are used as order-of-magnitude estimates for several risk and reliability parameters used to support the assignment of segments into three broad consequence categories. Inaccuracies in the models or in assumptions large enough to invalidate the broad categorizations developed to support RI-ISI would have been identified during the staff's review of the IPE and by the licensee's model update control program. Minor errors or inappropriate assumptions will affect only the consequence categorization of a few segments and will not invalidate the general results or conclusions. The staff finds the quality of the licensee's PRA sufficient to support the proposed RI-ISI program.

The degradation category and the consequence category were combined according to the approved methodology described in the EPRI TR-112657 to categorize the risk significance of each segment. The risk significance of each segment is used to determine the number of weld inspections required in each segment.

As required by Section 3.7 of the EPRI-TR, the licensee evaluated the change in risk expected from replacing the current program with the RI-ISI program. The licensee performed both a qualitative and quantitative analysis to evaluate the estimated change in risk. The qualitative analysis estimates the net change in risk due to the positive and negative influence of adding and removing locations for each of the risk categories within each system from the inspection program. For those locations identified by the qualitative evaluation with a potential increase in the change in risk compared to the Section XI program, a quantitative evaluation was performed. The expected change in risk was quantitatively evaluated using the "Simplified Risk Quantification Method" described in Section 3.7.2 of the EPRI TR-112657. Some of the systems had an estimated risk increase while others had an estimated risk reduction. The licensee estimated the aggregate change in CDF to be about 9.7E-10/yr and estimated the aggregate change in LERF to be about 3.3E-10/yr including credit for the new locations selected but excluding credit for any increased probability of detection (POD) due to the use of improved inspection techniques. Including the expected increased POD results in an aggregate estimated change in CDF of 1.0E-9/yr and aggregate estimated change in LERF of 3.0E-10/yr.

The staff finds the licensee's process to evaluate and bound the potential change in risk reasonable because it accounts for the change in the number and location of elements inspected, recognizes the difference in degradation mechanism related to failure likelihood, and considers the effects of enhanced inspection. All system level and aggregate estimates of the changes in CDF and LERF are less than the corresponding guideline values in EPRI TR-112657. The 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. Therefore, the staff concludes that the implementation of the RI-ISI program as described in the licensee's application will have a small impact on risk consistent with the guidelines of RG 1.174.

3.4 Integrated Decisionmaking

As described in the licensee's submittal (Reference1), an integrated approach is used 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 submittal using the results of the risk category ranking and other operational considerations. Table 3.5-1 of the submittal provides the number of locations and inspections by risk category for the NMP-2 systems within the scope of the RI-ISI program. Table 5-1 of the submittal provides a summary table comparing the number of inspections required under the existing ASME Section XI ISI program with the alternative RI-ISI program. Tables 3.8-1A gives a summary of the proposed RI-ISI program versus the current Section XI program on a per system basis by each applicable risk category, taking into account FAC and IGSCC degradation mechanisms. Table 3.8-1B gives a summary of the proposed RI-ISI program versus the current Section XI program on a per system basis by each applicable risk category without the impact of FAC and IGSCC degradation mechanisms. 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. The methodology described in this EPRI TR requires that existing augmented programs be maintained, with the exception of thermal fatigue and IGSCC Category A piping welds, which the RI-ISI program supersedes. Also, the EPRI Report describes targeted examination volumes (typically associated with welds) and methods of examination based on the type(s) of degradation expected. The staff has reviewed these guidelines and has determined that, if implemented as described, the RI-ISI examinations should result in improved detection of service-related degradations over that currently provided by the ASME Code, Section XI.

The objective of inservice inspection 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 is a technically sound "inspection for cause" program. 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 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.

3.5 Implementation and Monitoring

Performance-based implementation and performance monitoring strategies require careful consideration by the licensee and are addressed in Element 3 of RG 1.178 and 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 using 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 adequate level of quality and safety.

The licensee stated 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 confirmed that the applicable portions of the ASME Code, such as inspection methods, acceptance guidelines, pressure testing, corrective measures, documentation requirements, and quality control requirements would be retained.

The licensee stated in Section 4 of the submittal (Reference 1) 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 high safety-significant piping locations. The submittal also states that, at a minimum, risk-ranking of piping segments will be reviewed and adjusted on an ISI 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 proposed periodic reporting requirements meet existing ASME Code requirements and applicable regulations, and therefore, are acceptable. The 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 licensee's proposed process for program updates is acceptable.

An RI-ISI program for piping should be implemented at the start of a plant's next ISI interval, consistent with the requirements of the ASME Code, Section XI Edition and Addenda committed to by a licensee in accordance with 10 CFR 50.55a, or any delays granted by the NRC staff pursuant to 10 CFR 50.55a(g)(6). As noted in EPRI TR-112657, Section 3.6.6, updates and changes to the plant inspection program will occur at the start of each 10-year inspection interval. However, the RI-ISI program can be implemented at any time within an inspection interval as long as the examination schedules are consistent with the interval requirements contained in Article IWA-2000 of the ASME Code, Section XI, as applied to inspection Program B.

The NMP-2 RI-ISI program will be implemented in the second inspection period of the second 10-year inspection interval. The program requires 125 weld inspections over this 10-year interval. A total of 26 of the 63 weld locations examined in the first period (from April 5, 1998 to April 4, 2001) are now part of the RI-ISI program, which equals 20 percent of the 125 required weld inspections. The licensee has scheduled the remaining 99 weld inspections for completion (i.e., a total of 63 to 85 welds representing 50-65 percent during the second period and 125 welds representing 100 percent of RI-ISI weld locations during the third period) by the end of the second 10-year inspection interval. The licensee plans to examine 30-45 percent of

the RI-ISI scope in the second period (from April 5, 2001 to April 5, 2005), which equals 50-65 percent for the interval when adding the 20 percent completed during the first period. The remaining inspections are to be conducted in the third period (from April 5, 2005 to April 4, 2008). The three periods will include 100 percent of the required RI-ISI inspection locations with period percentages in accordance with ASME Code requirements. Therefore, the proposed schedule is acceptable.

4.0 CONCLUSION

10 CFR 50.55a(a)(3)(i) permits alternatives to specified regulatory requirements when authorized by the NRC on the basis that an alternative provides an acceptable level of quality and safety. In this case, the licensee has proposed an alternative which involves using the risk-informed process described in the NRC-approved EPRI TR-112657. As discussed in Section 3.0 above, the licensee's proposed RI-ISI program, as described in Reference 1, 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 decision-making 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 regulatory guides. The EPRI-TR RI-ISI methodology is a process-driven approach, that is, the process identifies high risk-significant pipe segment locations to be inspected. The NMP-2 RI-ISI program demonstrates that unacceptable risk impacts will not occur, and thus implementation of the RI-ISI program satisfies the acceptance criteria of the RG 1.174.

The NMP-2 methodology 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, 2, and 3 systems in accordance with the ASME Code, Section XI program. The RI-ISI program applies the same performance measurement strategies as existing ASME Code requirements and, in addition, increases the inspection volumes at weld locations that are exposed to thermal fatigue.

The RI-ISI program at NMP-2 selected no socket welds associated with Examination Category Items B5.150, B9.40 and C5.70 for inservice inspection. The ASME Code required pressure testing and VT-2 visual examinations to provide the assurance that any leakage through these socket welds will be identified prior to their failure. Similarly, for the RI-ISI program, the licensee selected 11 out of 84 longitudinal welds associated with Examination Category Item B9.12 and selected no longitudinal welds associated with Examination Category Items C5.12 and C5.52. However, the licensee stated that these longitudinal welds are associated with the applicable circumferential weld examination at NMP-2 and are examined in accordance with Code Case N-524. In addition, they are not counted in the total piping welds within the scope of the RI-ISI program.

The NMP-2 methodology included an engineering analysis of the proposed changes using a combination of engineering analysis with supporting insights from a PRA. Defense-in-depth quality is not degraded in that the methodology provides reasonable confidence that any reduction in existing inspections will not lead to degraded piping performance when compared to 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 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 NMP-2, and therefore, Relief Request RR-RI-ISI-2 is approved pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the request provides an acceptable level of quality and safety. This safety evaluation authorizes implementation of the proposed RI-ISI program for the second 10-year ISI interval (April 5, 1998 through April 4, 2008).

5.0 REFERENCES

1. Niagara Mohawk Letter, dated October 16, 2000 (NMP2L 1990), by Richard B. Abbott (Vice President Nuclear Engineering, Nine Mile Point Unit 2), to U.S. Nuclear Regulatory Commission, on *Request for Authorization to Use Risk-Informed Inservice Inspection Alternative.*

2. EPRI TR-112657, Revision B-A, *Revised Risk-Informed Inservice Inspection Evaluation Procedure,* Final Report, December 1999.

3. NRC staff safety evaluation on EPRI TR-122657, Revision B-A, dated October 28, 1999. (ADAMS ML993190477).

4. Niagara Mohawk Letter, dated March 19, 2001, by Richard B. Abbott (Vice President, Nuclear Engineering, Nine Mile Point Unit 2) to U. S. Nuclear Regulatory Commission, on *Response to Request for Additional Information Related to Risk-Informed Inservice Inspection Program Plan - Nine Mile Point Unit 2*.

5. Niagara Mohawk Letter, dated April 12, 2001, by Richard B. Abbott (Vice President Nuclear Engineering, Nine Mile Point Unit 2), to U.S. Nuclear Regulatory Commission, on *Response to Request for Additional Information Related to Request to Use Risk-Informed Inservice Inspection Alternative.*

6. NRC staff safety evaluation regarding relief request RR-RI-ISI-1 for the Second 10-year Interval Inservice Inspection Program Plan for Nine Mile Point Unit 2, December 14, 1999. (ADAMS ML993500351).

7. NRC Regulatory Guide 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,* July 1998.

8. NRC Regulatory Guide 1.178, *An Approach for Plant-Specific Risk-Informed Decisionmaking: Inservice Inspection of Piping,* September 1998.

9. NRC NUREG-0800, Chapter 3.9.8, *Standard Review Plan for Trial Use for the Review of Risk-Informed Inservice Inspection of Piping,* September 1998.

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Date: May 31, 2001

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