September 4, 2002

Mr. John T. Conway
Site Vice President
Nine Mile Point Nuclear Station, LLC
P.O. Box 63
Lycoming, NY 13093

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT NO. 1 - RISK-INFORMED INSERVICE INSPECTION PROGRAM (TAC NO. MB4085)

Dear Mr. Conway:

By letters dated February 22, 2002, and August 14, 2002, Nine Mile Point Nuclear Station, LLC (NMPNS) submitted inservice inspection (ISI) Relief Request ISI-22, "Alternate Risk-Informed Inservice Inspection in lieu of ASME [American Society of Mechanical Engineers] Section XI Inservice Inspection." NMPNS requested Nuclear Regulatory Commission (NRC) approval of a risk-informed ISI (RI-ISI) program for Class 1 and 2 piping welds as an alternative to the current ISI program at Nine Mile Point Nuclear Station, Unit No 1. The proposed RI-ISI program was developed in accordance with the methodology contained in the NRC-approved Electric Power Research Institute Topical Report EPRI-TR-112657, Revision B-A.

As delineated in the enclosed safety evaluation, the NRC staff concludes that the RI-ISI program proposed by NMPNS is an acceptable alternative to the ASME Boiler and Pressure Vessel Code, Section XI, for ISI of Class 1 and 2 piping welds specified in the application (i.e., Relief Request ISI-22). Therefore, the proposed alternative is authorized for the third 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. If you need clarification of this approval, please contact the project manager, Mr. Peter Tam at (301)415-1451.

Sincerely,

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-220

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST ISI-22

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

BOILER AND PRESSURE VESSEL CODE

NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

NINE MILE POINT NUCLEAR STATION, LLC

DOCKET NO. 50-220

1.0 INTRODUCTION

The current inservice inspection (ISI) requirements for Nine Mile Point Nuclear Station, Unit No.1 (NMP1) are in accordance with the 1989 edition of Section XI, Division 1 of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, "Rules for Inservice Inspection of Nuclear Power Plant Components" (hereinafter called ASME Code). By letters dated February 22, 2002 (Ref. 1), and August 14, 2002, (Ref. 2), Nine Mile Point Nuclear Station, LLC (NMPNS, the licensee), submitted Relief Request ISI-22, and Revision 1, proposing 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 is developed in accordance with the methodology contained in the Electric Power Research Institute (EPRI) Report EPRI TR-112657 (Ref. 3), which has been previously reviewed and approved by the Nuclear Regulatory Commission (NRC) staff (Ref. 4).

Previously, by letter dated February 9, 2001 (Ref. 5), the NRC staff authorized the licensee's proposed alternative in Relief Request ISI-13 to defer inservice examinations of piping by 2 years from December 26, 1999 (start of the first inspection period of the third 10-year interval) or through refueling outage-16 (RFO-16), whichever is later since the licensee proposed to submit an RI-ISI program no later than February 2002 for implementation in the second period of the third 10-year ISI interval beginning on December 26, 2002. As a result, the licensee submitted the subject Relief Request ISI-22, to be implemented during the 2nd inspection period starting with RFO-17.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 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 applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if an 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.

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. For NMP1, and as stated in Section 1.0 above, the applicable edition of Section XI of the ASME Code for the third 10-year ISI interval, which began on December 26, 1999, and ends on December 25, 2009, is the 1989 edition. The licensee's relief request ISI-13 approved by the NRC states that the initial RI-ISI program will be implemented during the second period (December 26, 2002 to December 25, 2005) of the third 10-year ISI interval, starting with the seventeenth RFO of NMP1.

3.0 TECHNICAL EVALUATION

3.1 Summary of Proposed Approach

The licensee is required to perform ISI in accordance with the ASME Code, Section XI, which specifies that for each successive 10-year ISI interval, 100% of Category B-F welds and 25% of Examination Category B-J welds in 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 Examination Category C-F piping welds in Class 2 piping, 7.5% 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 proposed RI-ISI program follows a previously approved RI-ISI methodology delineated in EPRI TR-112657 (Ref. 3).

The licensee stated in its revised August 14, 2002, letter that its Risk-Informed Inspection Program did not deviate from the EPRI methodology. In the original submittal (Ref. 1), the licensee identified a potential exception to the EPRI Methodology based on an ambiguity in the EPRI-TR. In Section 5.2 of its original submittal, the licensee stated that a typographical error exists on page 2-17, Section 2.3, of the EPRI-TR. The text of the EPRI-TR discussed by the licensee is shown below:

> For Flaws exceeding acceptance criteria (IWX-3500),
>
> - Increase the sample population to include those items scheduled for this and the next scheduled period,
> - If additional flaws are found in the expanded sample population, inspect all items of similar design, size, and function,
> - Remove, repair, replace or analytically evaluate,

- For flaws not exceeding acceptance criteria, items shall be examined for the next three inspection periods.

The NRC staff believes that the last bullet of the above text, although not in error, could have more clearly specified the requirements of the ASME Code, Section XI, subsections IWB-3132.4 and IWC-3122.4 which state "here the acceptance criteria of IWX-3600 (Analytical Evaluation of Flaws) are satisfied, the area containing the flaw shall be subsequently reexamined in accordance with IWX-2420(b) and (c)." The licensee's revised submittal (Ref. 2) states that there are no exceptions to the EPRI-TR in the licensee's RI-ISI program and it complies with the requirements of the ASME Code, Section XI with regard to the inspection program and schedule, personnel qualification, flaw evaluation and acceptance criteria, repair/replacement of component containing flaw, and system pressure test.

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. All other existing augmented ISI programs are not affected by the proposed RI-ISI program.

3.2 NRC Staff Evaluation

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's Safety Evaluation of EPRI TR-112657, Regulatory Guides (RGs) 1.174 (Ref. 6) and 1.178 (Ref. 7), and Standard Review Plan (SRP), Chapter 3.9.8 (Ref. 8).

3.2.1 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, B-J for pressure retaining welds in piping, C-F-1 for pressure retaining welds in austenitic stainless steel or high alloy piping, and C-F-2 for pressure retaining welds in carbon or low alloy steel piping. 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 (Ref. 1).

During the course of its review, the NRC 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 to be utilized to identify piping degradation mechanisms and failure modes, and consequence evaluations are performed using probabilistic risk assessments to establish safety ranking of piping segments for selecting new inspection locations.

3.2.2 Engineering Analysis

In accordance with the guidance provided in RGs 1.174 and 1.178 (Refs. 6 and 7), 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.

The licensee stated that for Class 1 and Class 2 piping at NMP1, the augmented inspection program implemented in response to GL 88-01, IGSCC, Category A 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 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. The licensee also stated that failure potential assessment, presented in Table 3.3-1 of the licensee's submittal, were generated utilizing industry failure history, plant-specific failure history, and other relevant information using the guidance provided in EPRI TR-112657. The NRC 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 NRC staff in the EPRI report. Therefore, the NRC staff considers the consequence evaluation performed by the licensee for this application acceptable.

3.2.3 Probabilistic Risk Assessment

The licensee used its July 1999 Level 2 PRA, model U1PRA01, to evaluate the consequences of pipe rupture for the RI-ISI assessment. In its submittal, the licensee reported a base core

damage frequency (CDF) of 2.7E-5 /year and a base large early release frequency (LERF) of 2.3E-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 for External Events (IPEEE),

The NMP1 IPE was submitted in July 1993 and supplemented by a response to an NRC staff request for additional information (RAI) in July 1995. The IPE identified a mean CDF of 5.5E-6/year. The NRC staff evaluation report, dated April 2, 1996, concluded that the NMP1 IPE satisfied the intent of GL 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities" and no deficiencies or weaknesses were identified. The NRC staff did not review the IPE analysis to assess the accuracy of the quantitative estimates. The NRC 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 should have been identified during the NRC 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 NRC 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 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. 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 4.5E-10/yr and estimated the aggregate change in LERF to be about 1.1E-10/year, 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 1E-10/year and aggregate estimated change in LERF of 3.25E-11/year.

The NRC 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 the EPRI-TR. The NRC staff finds that re-distributing 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 NRC 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, and thus, will not cause the NRC safety goals to be exceeded.

3.2.4 Integrated Decision Making

As described in the licensee's submittal, an integrated approach is utilized 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 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 stated 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 licensee stated that all risk-informed examination locations that have been selected are estimated to provide >90 percent coverage with the exception of weld 38-WD-007, located on the shutdown cooling system. On May 31, 2001, the NRC staff granted relief requested in Relief Request ISI-12 exempting augmented volumetric examination under GL 88-01 of certain inaccessible welds (Ref. 9). The EPRI-TR requires that 25% of all high safety significance (HSS) welds in each system be selected. The licensee further states that weld 38-WD-007 is inaccessible due to its location inside a containment penetration and that no other selection can be made as all four HSS welds in this system are also inaccessible. The NRC staff notes that the licensee has selected 25% of the total population of welds for inspection in the HSS category, and that the shutdown cooling system contains no other HSS welds. The NRC staff considers the relief granted previously to be valid and applicable to the RI-ISI program in exempting inservice examination of the four HSS welds in the shutdown cooling system due to inaccessibility.

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-TR describes targeted examination volumes (typically associated with welds) and methods of examination based on the type(s) of degradation expected. The NRC staff reviewed these guidelines and determined that, if implemented as described, the RI-ISI examinations should result in improved detection of service-related degradations over that currently required by the ASME Code, Section XI.

The objective of ISI required by ASME 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. 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.

3.2.5 Implementation and Monitoring

As addressed in Element 3 of RG 1.178 and SRP 3.9.8, licensees are to carefully consider performance-based implementation and performance monitoring strategies. 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 stated that the NMP1 plant Technical Specifications (TSs) currently state that "the Inservice Inspection Program for piping identified in NRC Generic Letter 88-01 shall be performed in accordance with the staff positions on schedule, methods, and personnel and sample expansion included in this generic letter." The licensee further stated that a proposed change to the TSs was submitted by letter NMP1L 1628, dated November 26, 2001, to remove the requirements of GL 88-01 from plant TSs and leave them in the current ISI program. This proposed change was approved on August 5, 2002 (Amendment No. 173).

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 EPRI-TR provides the relationship between the proposed risk-informed examination program and the remaining portions of the ASME Code, Section XI that are unaffected by the proposed RI-ISI program.

The licensee stated in Section 4 of the submittal that the RI-ISI program is a living program and its implementation will require feedback of new and relevant information to ensure the appropriate identification of safety-significant piping locations. The licensee also stated 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 GL 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 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 licensee's proposed process for program updates is acceptable.

It is desirable that a RI-ISI program for piping 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(a)(3). 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 ASME Code, Section XI, as applied to inspection Program B.

The NMP1 RI-ISI program will be implemented in the second inspection period of the third 10-year inspection interval. The program requires 63 weld inspections over this 10-year interval. The licensee stated that in Relief Request ISI-13, Niagara Mohawk Power Corporation (NMPC, the former licensee) has requested relief from meeting the first period minimum percentage of examination required by the ASME Code. By letter dated February 9, 2001 (Ref. 5), the NRC staff authorized a delay of 2 years for conforming to the piping weld examination requirements of the 1989 Edition of the ASME Code, Section XI, for the third 10-year ISI interval of NMP1. The licensee plans to examine 50% of the RI-ISI scope in the second period (from December 26, 2002 to December 25, 2006) and the remaining inspections are to be conducted in the third period (from December 26, 2006 to December 25, 2009). Hence, the three periods within the current interval will cover all examinations of the required RI-ISI locations. Since the NRC has authorized the proposed alternative of Relief Request ISI-13 to defer inservice examinations of piping by 2 years from December 26, 1999, or through RFO-16, whichever is later, the proposed schedule is acceptable.

4.0 CONCLUSION

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 proposed an alternative to use 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 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 RGs. 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 NMP1 RI-ISI program demonstrates that unacceptable risk impacts will not occur, and thus, implementation of the RI-ISI program satisfies the acceptance guideline of the RG 1.174.

The NMP1 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. 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.

The NMP1 methodology includes 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 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.

The NRC staff concludes that the RI-ISI program proposed by NMP1 is an acceptable alternative to the ASME Code, Section XI, for ISI of Class 1 and 2 piping welds specified in the application (i.e., Relief Request ISI-22). Therefore, the proposed alternative is authorized for the third 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.

5.0 REFERENCES

1. Letter, B. S. Montgomery (General Manager Nuclear Engineering, Nine Mile Point Unit 1) to U.S. NRC, “Request for Authorization to Use Risk-Informed Inservice Inspection Alternative,” February 22, 2002.

2. Letter, B. S. Montgomery to U.S. NRC, “Request for Authorization to Use Risk-Informed Inservice Inspection Alternative,” August 14, 2002.

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

4. NRC Staff Safety Evaluation on EPRI TR-122657, Revision B-A, dated October 28, 1999. (ADAMS ML993190477).

5. NRC Staff Safety Evaluation regarding Relief Request RR-RI-ISI-13 for the Third 10-year Interval Inservice Inspection Program Plan for Nine Mile Point Unit 1, dated February 9, 2001. (ADAMS ML010180160).

6. 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.

7. Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decision Making: Inservice Inspection of Piping," September 1998.

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

9. NRC Staff Safety Evaluation regarding Relief Request RR-RI-ISI-12 for the Third 10-year Interval Inservice Inspection Program Plan for Nine Mile Point Unit 1, dated May 31, 2001. (ADAMS ML011290479).

Principal Contributors: P. Patnaik
S. Malik

Date: September 4, 2002

Nine Mile Point Nuclear Station
Unit No. 1

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 126
Lycoming, NY 13093

Charles Donaldson, Esquire
Assistant Attorney General
New York Department of Law
120 Broadway
New York, NY 10271

Mr. Paul D. Eddy
Electric Division
NYS Department of Public Service
Agency Building 3
Empire State Plaza
Albany, NY 12223

Mr. William M. Flynn, President
New York State Energy, Research,
and Development Authority
17 Columbia Circle
Albany, NY 12203-6399

Mark J. Wetterhahn, Esquire
Winston & Strawn
1400 L Street, NW
Washington, DC 20005-3502

Supervisor
Town of Scriba
Route 8, Box 382
Oswego, NY 13126

Mr. Michael J. Wallace
President
Nine Mile Point Nuclear Station, LLC
c/o Constellation Energy Group
250 W. Pratt Street - 24th Floor
Baltimore, MD 21201-2437

Mr. Raymond L. Wenderlich
Senior Constellation Officer
Responsible for Nine Mile Point
Nine Mile Point Nuclear Station, LLC
P.O. Box 63
Lycoming, NY 13093

Mr. James M. Petro, Jr., Esquire
Counsel
Constellation Power Source, Inc.
111 Market Place
Suite 500
Baltimore, MD 21202