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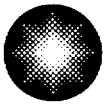

Constellation
Nuclear

Nine Mile Point
Nuclear Station

A Member of the
Constellation Energy Group

February 22, 2002
NMP1L 1644

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

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject : ***Request for Authorization to Use Risk-Informed Inservice Inspection Alternative (TAC No. MB4085)***

Gentlemen:

By letters dated September 21, 2000, and November 30, 2000, Niagara Mohawk Power Corporation (NMPC), then operating licensee for Nine Mile Point Unit 1 (NMP1), submitted inservice inspection (ISI) relief request ISI-13 and Revision 1 to ISI-13, respectively. Pursuant to 10CFR50.55a(a)(3)(i), relief request ISI-13 proposed an alternative to meeting the first period (December 26, 1999 to December 25, 2002) minimum percentage of examination required by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI. This alternative was implemented during Refueling Outage Number Sixteen, which occurred in March-April 2001. Relief request ISI-13 also proposed to submit no later than February 2002 a risk-informed ISI (RI-ISI) program for NMP1, which was to be implemented during the second period (December 26, 2002, to December 25, 2006), starting with Refueling Outage Number Seventeen (RFO-17), which is scheduled to occur in March-April 2003. By letter dated February 9, 2001, the NRC authorized use of the alternative requested in ISI-13 and acknowledged NMPC's plan to submit its RI-ISI program by February 2002.

Enclosure 1 to this letter contains the RI-ISI program. Enclosure 1 consists of relief request ISI-22 and Attachment 1 to this relief request, titled "Alternate Risk-Informed Inservice Inspection in Lieu of ASME Section XI Inservice Inspection." This RI-ISI program has been developed in accordance with the methodology contained in the NRC-approved Electric Power Research Institute (EPRI) Topical Report (TR) 112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure." Attachment 1 uses the Nuclear Energy Institute template submittal format, dated March 21, 2000.

A047

Pursuant to 10 CFR50.55a(a)(3)(i), Nine Mile Point Nuclear Station, LLC requests NRC authorization on or before November 30, 2002, to use the enclosed RI-ISI program as an acceptable alternative, to support planning efforts for RFO-17. A similar request for Nine Mile Point Unit 2 was previously authorized by the NRC by letter dated May 31, 2001.

Sincerely,

Bruce S. Montgomery
General Manager Nuclear Engineering

BSM/cld
Enclosure

xc: Mr. H. J. Miller, NRC Regional Administrator, Region 1
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Mr. P. S. Tam, Senior Project Manager, NRR (2 copies)
Records Management

Enclosure 1

(Enclosure 1 consists of Relief Request ISI-22 and Attachment 1 to Relief Request ISI-22, titled "Alternate Risk-Informed Inservice Inspection in Lieu of ASME Section XI Inservice Inspection")

NINE MILE POINT UNIT 1
THIRD INSERVICE INSPECTION INTERVAL
RELIEF REQUEST ISI-22

A. COMPONENT IDENTIFICATION

System: Various Systems

Class: Quality Groups A, and B, (ASME Code Class 1, and 2)

Component Description: Piping Circumferential Welds

B. EXAMINATION REQUIREMENTS

Pursuant to 10 CFR 50.55a(g), American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PVC), Section XI, 1989 Edition with No Addenda, Examination Tables IWB-2500-1 and IWC-2500-1, Examination Categories B-F, B-J, C-F-1, C-F-2 must receive inservice inspection during each successive 120-month (ten-year) interval.

The Nuclear Regulatory Commission (NRC) Generic Letter (GL) 88-01 requires Intergranular Stress Corrosion Cracking (IGSCC) Category A welds to be examined over the 10-year interval in accordance with the staff positions on schedule, methods, personnel and sample expansion.

The required examinations in each Examination Category shall be completed during each successive inspection interval in accordance with Inspection Program "B", Tables IWB-2412-1 and IWC-2412-1 and GL 88-01 guidelines, as defined in Table 1 below.

Table 1
ASME Section XI and GL 88-01 Examination Requirements

ASME Code Class	Examination Category	Types of Welds	Examination Methods	Percentage Requirements
1	B-F	Dissimilar Metal Welds	Volumetric and Surface or Surface	100% Required*
1	B-J	Piping Welds	Volumetric and Surface or Surface	25% Required
1	GL-A	Resistant Material	Volumetric	25% Required
2	C-F-1	Piping Welds	Volumetric and Surface or Surface	7.5% Required
2	C-F-2	Piping Welds	Volumetric and Surface or Surface	7.5% Required

* Weld 33-WD-014 is inaccessible and is addressed in Request for Relief ISI-12, which was approved by the NRC on May 31, 2001 (TAC No. MA9662).

C. RELIEF REQUESTED

Pursuant to 10 CFR 50.55a(a)(3)(i), Nine Mile Point Nuclear Station, LLC (NMPNS) requests relief from the ASME B&PVC, 1989 Edition with No Addenda of Section XI, Division 1, Tables IWB-2500-1 and IWC-2500-1 Examination Categories B-F, B-J, C-F-1 and C-F-2 requirements.

NMPNS also requests relief from GL 88-01 staff positions on schedule, methods, personnel and sample expansion on IGSCC Category "A" weld examinations.

D. **BASIS FOR RELIEF**

Niagara Mohawk Power Corporation (NMPC), the former operating licensee for Nine Mile Point Unit 1 (NMP1), by Letters NMP1L 1540, dated September 21, 2000 and NMP1L 1551, dated November 30, 2000 submitted request for relief ISI-13. RR-ISI-13 requested relief from the minimum percentage requirements specified in Table IWB-2412-1 and IWC-2412-1 of the ASME B&PV Code, Section XI for the first inspection period, (December 26, 1999 to December 25, 2002). RR-ISI-13 also requested a delay of two years from December 26, 1999 through refueling outage sixteen (RFO-16), as allowed by NRC Information Notice 98-44, Ten-Year Inservice Inspection (ISI) Program Update for Licensees That Intend To Implement Risk-Informed ISI for Piping, dated December 10, 1998. The NRC granted approval per Safety Evaluation (TAC No. MB0175), dated February 9, 2001.

The objective of the ISI program is to identify service-induced degradation that might lead to pipe leaks and ruptures, thereby meeting, in part, the requirements set forth in the General Design Criteria and 10 CFR 50.55a. ISI programs are intended to address all piping locations that are subject to degradation. Incorporating risk insights into ISI programs can focus examinations on the more important locations and reduce personnel exposure, while at the same time maintaining or improving the public health and safety.

The NRC staff review of the Electric Power Research Institute (EPRI), Topical Report (TR), hereafter referred to as EPRI-TR, document EPRI-TR-112657, Revision B-A, was submitted by letter dated July 29, 1999, and Titled "Revised Risk-Informed Inservice Inspection Evaluation Procedure", concluded in a Safety Evaluation Report, dated October 28, 1999, that the EPRI-TR was acceptable for referencing in licensing applications to the extent specified and under the limitations delineated in the EPRI TR and the associated NRC safety evaluation.

In addition, the NRC staff concluded that the proposed risk-informed inservice inspection program (RI-ISI) as described in the EPRI-TR, is a sound technical approach and will provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a for the proposed alternative to the piping ISI requirements with regard to the number of locations, locations of inspections, and methods of inspection.

NMPNS has contracted with EPRI to develop a RI-ISI program in accordance with the methodology described in EPRI-TR.

As stated within the EPRI-TR, no changes to the augmented inspection programs for Flow Accelerated Corrosion (FAC) or Intergranular Stress Corrosion Cracking (IGSCC) Categories B through G welds are being made in the proposed RI-ISI program. The proposed RI-ISI program will supersede augmented inspection programs for IGSCC Category A welds.

In addition to development of the Proposed RI-ISI program utilizing the EPRI methodology, NMPNS will implement ASME Code Case N-578-1, Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B, Section XI, Division 1, which was approved by ASME on March 28, 2000.

As a result of the above insights, more efficient and technically sound means for selecting and scheduling inservice examinations of piping can be achieved and will provide an acceptable level of quality and safety, as required by 10 CFR 50.55a(a)(3)(i).

E. ALTERNATIVE EXAMINATIONS

In accordance with 10 CFR 50.55a(a)(3)(i), the proposed Risk-Informed Inspection Program change is an alternative to the ASME Code Section XI inservice inspections requirements for piping with regard to the number of inspections, locations of inspections, and methods of inspections as summarized in Attachment 1 of this request.

NMPNS proposes to implement the alternative RI-ISI inspection plan and schedule in accordance with ASME Code Case N-578-1, utilizing the EPRI methodology applied to plant specific ASME Code Class 1, and 2 piping in accordance with the EPRI-TR and Regulatory Guide 1.178.

All examinations required by the alternative risk-informed methodology will be accomplished by the end of the Third Ten-Year Inservice Inspection Interval that is currently scheduled for completion on December 25, 2009.

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 current ASME Section XI pressure testing program.

F. IMPLEMENTATION SCHEDULE

During the Third Inspection Interval (December 26, 1999 to December 25, 2009), NMPNS plans to implement the alternative RI-ISI program at the start of the second inspection period, refueling outage seventeen (RFO-17), in March-April of 2003.

G. ATTACHMENTS

Attachment 1 Summary Submittal (EPRI Template) for implementation of the Proposed Alternative Risk-Informed Inservice Inspection Program.

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THIRD INSERVICE INSPECTION INTERVAL

ATTACHMENT 1

ALTERNATE RISK-INFORMED INSERVICE INSPECTION PROGRAM

IN LIEU OF

ASME SECTION XI INSERVICE PIPING EXAMINATIONS

Prepared For

Nine Mile Point Nuclear Station, Unit 1
P.O. Box 63
Lycoming, New York 13093

Commercial Service Date:		December 26, 1969
NRC Docket Number:		50-220
Document Number:		RR-ISI-22
Revision Number:	0	Date: February 19, 2002

Table of Contents

1 Introduction

Inservice examinations are currently being performed on piping in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 1989 Edition, No Addenda, as required by Title 10, Code of Federal Regulations (CFR), Part 50, Section 50.55a. Nine Mile Point Nuclear Station, Unit 1 (NMP1) is currently in the Third Inservice Inspection interval as defined by ASME Section XI, Inspection Program "B", which is scheduled to end on December 25, 2009.

The objective of this submittal is to provide the information required to support the NMPNS request to use an alternative to the current ASME Section XI, Quality Group A and B, (Code Class 1 and 2) piping examinations through the development of an alternative risk-informed inspection process. The alternative risk-informed process summarized in this template submittal was developed based on the Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Revision B-A , titled "Revised Risk-Informed Inservice Inspection Evaluation Procedure" (Reference 1), hereafter referred to as the EPRI-TR and ASME Code Case N-578-1, titled "Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B, Section XI, Division 1, which was approved by ASME on March 28, 2000.

1.1 Relation to NRC Regulatory Guides 1.174 and 1.178

As a risk-informed application, this submittal meets the intent and principles of Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (Reference 2), and Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decision making Inservice Inspection of Piping" (Reference 3).

1.2 Probabilistic Risk Assessment Quality

The NMP1 Level II Probabilistic Risk Assessment (PRA) model (Reference 4) was used to evaluate the consequences of pipe ruptures during operation. The base core damage frequency (CDF) and base large early release frequency (LERF) from this version of the PRA model are 2.7E-5/yr and 2.3E-6/yr, respectively. The PRA is a consolidation of the Individual Plant Examination (IPE) and Individual Plant Examination External Events (IPEEE) conducted at NMP1. Both of these evaluations received independent and peer reviews per Generic Letter 88-20 (Reference 11) and its supporting guidance.

The IPE has undergone the Boiling Water Reactor Owners Group certification process. The certification review results were documented and considered during the PRA update. The items identified from this review were associated with improving guidance, documentation, models, and capturing plant changes. Overall, the certification provided high technical marks on the PRA and there were no comments that significantly impacted the PRA results.

NRC reviews provided another level of assessment, as documented in the NRC Staff Evaluations on IPE dated April 2, 1996 (TAC No. M 74436) and IPEEE dated July 18, 2000 (TAC No. M 83645). The NRC concluded that the NMP1 process is capable of identifying the most likely severe accidents and no significant impacts on the PRA were identified.

2 Proposed Alternative to Current Inservice Inspection Programs

2.1 ASME Section XI

ASME Section XI, Tables IWB-2500-1 and IWC-2500-1, Examination Categories B-F, B-J, C-F-1, and C-F-2 currently provide the requirements for inservice examination of piping welds, utilizing nondestructive examination (NDE) methods. The proposed alternative RI-ISI program for piping was developed in accordance with the EPRI-TR and ASME Code Case N-578-1. The proposed RI-ISI

program will be used as an alternative to the current ASME Section XI examination requirements on piping in accordance with 10 CFR 50.55a(a)(3)(i) by providing an acceptable level of quality and safety. Non-related portions of the ASME Section XI Code, (inspection intervals, acceptance criteria for evaluation of flaws, expansion criteria for flaws discovered, and qualification of examination techniques and personnel are essentially unaffected by the proposed RI-ISI program. The EPRI-TR provides the relationship between the proposed risk-informed examination program and the remaining unaffected portions of ASME Section XI.

2.2 Augmented Programs

Nine Mile Point Nuclear Station, LLC, together with the Boiling Water Reactor (BWR) Vessel & Internals Project and EPRI, is investigating operating experience and material performances with respect to the BWR fleet and intergranular stress corrosion cracking (IGSCC) issues. Consistent with the EPRI-TR, Category A, Generic Letter 88-01(Reference 12) and NUREG-0313, Rev 2 (Reference 13) welds are integrated into the proposed alternative RI-ISI program. As such, our response to Generic Letter 88-01 and its supplement remains unchanged for IGSCC Categories B through G at this time. Another augmented inspection program, Generic Letter 89-08 – Flow Accelerated Corrosion Program (FAC), is credited in the proposed RI-ISI program but is not affected or changed by the proposed RI-ISI program. Any other existing augmented inspection programs are unaffected by this submittal.

3 Risk-Informed ISI Process

The process used for the development of the proposed alternative RI-ISI program is consistent with the methodology described in the EPRI-TR. The process applied involves the following steps:

- Scope Definition
- Consequence Evaluation
- Failure Assessment
- Risk Evaluation
- NDE Selection
- Program Implementation
- Feedback Loop

There were no deviations to the process described in the EPRI-TR.

3.1 Scope of Program

The systems included in the proposed RI-ISI program are provided in Table 3.1-1. Piping and instrumentation diagrams and additional plant information were used to define the system boundaries.

3.2 Consequence Evaluation

The consequences of pressure boundary failures were evaluated and ranked based on the impact on core damage and containment performance (isolation, bypass, and large, early release). The impact on these measures due to both direct and indirect effects was considered using the guidance provided in EPRI-TR.

3.3 Failure Assessment

Failure potential estimates were generated utilizing industry failure history, plant specific failure history, and other relevant information. These failure estimates were determined using the guidance provided in EPRI-TR.

Table 3.3-1 summarizes the failure potential assessment by system for each degradation mechanism that was identified as potentially operative.

3.4 Risk Evaluation

In the preceding steps, each run of piping within the scope of the proposed program was evaluated to determine its impact on core damage and containment performance (isolation, bypass, and large, early release), as well as its potential for failure. Given the results of these steps, risk segments are then defined as piping potentially susceptible to the same type(s) of degradation and whose failure will result in similar consequence(s). Segments are then ranked based upon their risk significance as defined in EPRI-TR.

The results of these calculations are presented in Table 3.4-1.

3.5 Element and NDE Selection

In general, the EPRI-TR requires 25 percent of the locations in the high risk regions (i.e., risk categories 1, 2 & 3) and 10 percent of the locations in the medium risk regions (i.e., risk categories 4 & 5) be selected for examination, utilizing the appropriate non-destructive (NDE) examination methods. Each of the locations is tailored to the applicable degradation mechanism defined by ASME Code Case N-578-1 (Reference 10). In accordance with Section 3.6.4.2 of the EPRI-TR, a review of ASME Code Class 1 RI-ISI selections was made to ensure that the percentage was not significantly reduced below 10 percent of the ASME Code Class 1 piping population. The results of this review indicate that NMP1's RI-ISI program will inspect greater than 10 percent of the ASME Code Class 1 piping systems. The results of the selection process are presented in Table 3.5-1.

Section 4 of the EPRI-TR was used as guidance in determining the NDE examination requirements for these locations. In addition, all in-scope piping components, regardless of risk classification will continue to receive ASME Code, Section XI, visual VT-2 examinations during performance of required pressure tests scheduled in accordance with the NMP1 pressure test program, which remains unaffected by the proposed alternative RI-ISI program.

3.6 Additional Examinations

The proposed RI-ISI program will determine, through an engineering evaluation, the root cause of any unacceptable flaw determined to be service- related (e.g., fatigue, wall loss, IGSCC, etc.) or relevant condition found during examination. The evaluation will include the applicable service conditions and degradation mechanisms to establish that the element(s) will still perform their intended safety function during subsequent operation. Elements not meeting this requirement will be repaired, replaced, or analyzed in accordance with the applicable ASME Code Edition and Addenda as identified in the ISI Program.

The evaluation will include whether other elements on the segment or segments are subject to the same root cause and degradation mechanism. Additional examinations will be performed on these elements up to a number equivalent to the number of elements requiring examinations on the segment or segments initially. If unacceptable flaws determined to be service related or relevant conditions are again found similar to the initial problem, the remaining elements identified as susceptible will be examined. No additional examinations will be performed if there are no additional elements identified as being susceptible to the same service related root cause conditions or degradation mechanism.

3.7 Program Relief Requests

Alternate methods are specified to ensure structural integrity in cases where examination methods cannot be applied due to limitations such as inaccessibility or radiation exposure hazard.

An attempt has been made to provide a minimum of >90 percent coverage (per ASME Code Case N-460) when performing the risk-informed examinations. However, some limitations will not be known until the examination is performed, since some locations may be examined for the first time by the specified techniques and the implementation of Appendix VIII and/or the EPRI Performance Demonstration Initiative (PDI) program.

At this time, all the risk-informed examination locations that have been selected are estimated to provide >90 percent coverage, with the exception of the following:

Weld 38-WD-007, located on the Shutdown Cooling System, is inaccessible due to its location inside a containment penetration. No other selection can be made as all four (4) items from which a selection may be made are inaccessible. Structural integrity of these welds is addressed in request for relief ISI-12, and requires a visual VT-2 examination each refueling outage. Request for relief ISI-12 was approved per NRC Safety Evaluation, dated May 31, 2001, (TAC No. MA9662).

In instances where a location may be found at the time of the examination that does not meet >90 percent coverage, the process outlined in the EPRI-TR will be followed.

All other requests for relief remain applicable for the current inspection interval.

3.8 Change in Risk

Regulatory Guide 1.174 was applied to the proposed RI-ISI program and the risk from implementation of this program is neutral or decreases when compared to that estimated from current requirements.

This evaluation identified the allocation of segments into High, Medium, and Low risk regions of the EPRI-TR and ASME Code Case N-578-1 risk ranking matrix, and then determined for each of these risk classes what inspection changes are proposed for each of the locations in each segment. The changes include modification of the number and location of inspections within the segment and, in many cases, improving the effectiveness of the inspection to account for the findings of the RI-ISI degradation mechanism assessment. As an example, for locations subject to thermal fatigue, inspection locations have an expanded volume and the examination is focused to enhance the probability of detection during the inspection process.

Two types of evaluations have been conducted to support the conclusion that the NMP1 proposed RI-ISI program results in a risk decrease or is risk neutral. Section 3.8.1 provides the qualitative evaluation while section 3.8.2 provides a quantitative evaluation.

3.8.1 Qualitative Evaluation

Table 3.8-1A presents a summary of the proposed RI-ISI program versus the current Section XI inservice inspection program taking into account FAC and IGSCC degradation mechanisms. The risk ranking provided in this table includes the impact of degradation mechanisms associated with and managed by these augmented inspection programs. These augmented programs have been defined in the EPRI-TR as the process for effectively managing the risk associated with these piping segments, unless there is the potential for other degradation mechanism (e.g., thermal fatigue) that would not be

appropriately managed by these augmented inspections, they are not modified. Table 3.8-1B presents similar information, after performing the risk ranking without the impact of the FAC and IGSCC degradation mechanisms. The final inspection location selection is based upon Table 3.8-1B.

Tables 3.8-1A and 3.8-1B identify on a per system basis:

- The applicable risk category.
- The number of locations.
- The consequence rank and degradation mechanism which supports the risk category.
- The number of locations inspected by the current Section XI inspection program.
- The number of locations proposed for the RI-ISI program, crediting where appropriate, inspections from the augmented inspection programs.
- The increase, decrease or lack of change in the number of locations inspected. This assessment does not credit inspections required by augmented inspection programs unless these inspections are also credited in the Section XI inspection program.
- The number of locations addressed (currently being evaluated) by Augmented Programs (Table 3.8-1A only).
- The number of locations currently being inspected by Augmented Programs.
- The number of locations from Augmented Programs credited in the RI-ISI program (Table 3.8-1B only).
- The risk impact (change in risk) of the RI-ISI program as compared to the Section XI inspection program.

The final column (change in risk) of Table 3.8-1B provides a conclusion as to the impact on the overall risk for the proposed RI-ISI program as compared to the current Section XI, inspection program. The following discussion explains the terms used in this column.

For locations identified as risk category 6 or 7:

Negligible - As discussed in section 2.7.1 of the EPRI-TR the impact on risk of removing inspections from risk category 6 and 7 locations is negligible. Thus, the risk impact will be "Negligible" for category 6 and 7 locations, whenever there is a reduction in the number of locations inspected.

No Change - When there is no change in the number of locations inspected (i.e., the same before, as after), the risk impact will be "No Change."

For locations identified as risk category 1, 2, 3, 4 or 5.

No Change - As with risk category 6 and 7 locations, when there is no change in the number of locations inspected (i.e., the same before, as after), the risk impact is classified as "No Change." This will be conservative when the proposed RI-ISI program calls for a larger inspection volume with its accompanying increase in probability of detection.

Acceptable - This applies to locations that are identified as potentially susceptible to degradation mechanisms that are being addressed by other (non-Section XI) augmented inspection programs. Per the EPRI-TR, the number, location and frequency of inspection is to be the same as the augmented program. These augmented inspection programs are specifically geared towards finding the mechanism of interest and are the only relevant means of managing the risk associated with these

mechanisms. Random Section XI inspections are not geared toward the mechanism of interest and most likely would not identify the mechanism of interest. As such, reductions in the number of the Section XI inspections for these locations do not impact risk and thus the change in risk is acceptable.

There may be occurrences when the risk ranking shown in Table 3.8-1B requires additional inspection locations beyond the augmented inspection program (e.g., risk category 4). These inspection locations provide an additional level of defense in depth beyond the augmented inspection program.

Improvement - When there is an increase in the number of locations being inspected, there is a resultant decrease in the risk associated with piping failure. Thus, whenever the number of RI-ISI locations exceeds the number of Section XI locations inspected, "Improvement" will be found in the Risk Impact column. This conservatively does not credit the added benefit of increased inspection volumes for applicable degradation mechanisms (e.g., thermal fatigue).

Increase - When there is a decrease in the number of locations being inspected, there is the potential for a resultant increase in the risk associated with piping failure. Thus, for locations not managed by an augmented inspection program, when the number of Section XI locations exceeds the number of RI-ISI locations inspected, "Increase" will be found in the Risk Impact column.

Because locations that are identified as "Improvement," "Acceptable," "Negligible" or "No Change" do not adversely impact the change in risk assessment, only those systems in Table 3.8-1B with a potential "Increase" need to be evaluated quantitatively. The quantitative results of these evaluations are provided in the next section.

3.8.2 Quantitative Evaluation

As discussed above, the proposed RI-ISI program at NMP1 has been developed in accordance with Regulatory Guide 1.174 and the EPRI-TR methodology requirements. The risk from implementation of this program has remained risk neutral or decreased when compared to that estimated for current requirements.

Limits are imposed by the EPRI-TR methodology to ensure that the change in risk of implementing the RI-ISI program meets the requirements of Regulatory Guide 1.174. The quantitative criteria established in the EPRI-TR require that the cumulative change in core damage frequency (CDF) and Large early release frequency (LERF) be less than 1E-7 and 1E-8 per year per system, respectively, or 1E-6 and 1E-7 per year total for all systems (complete RI-ISI Program), respectively.

NMPNS conducted a risk impact analysis per the requirements of Section 3.7 of the EPRI-TR. The analysis estimates the net change in risk due to the positive and negative influence of adding and removing locations from the inspection program. A risk quantification was conducted using the "Simplified Risk Quantification Method" described in Section 3.7.2 of the EPRI-TR. The conditional core damage probability and conditional large, early release probability used is based on the consequence analysis results (Reference 6). The likelihood of pressure boundary failure (PBF) is determined by the presence of different degradation mechanisms. The basic likelihood of PBF for a piping location with no degradation mechanism present is noted as x_0, and is expected to have a value lower than 1E-8. Piping locations identified as medium failure potential (i.e., potentially susceptible to thermal fatigue, erosion corrosion, or cavitation corrosion) have a likelihood of $20x_0$. The likelihood of these failures is consistent with References

9 and 14 of the EPRI-TR.

The analysis results are summarized in Tables 3.8-2A and 3.8-2B.

3.8.3 Defense-In-Depth

The intent of the inspections mandated by ASME Section XI for piping welds is to identify conditions such as flaws or indications that may be precursors to leaks or ruptures in a system's pressure boundary. Currently, the process for picking inspection locations is based upon structural discontinuity and stress analysis results. As referenced in Section 2.3 of the EPRI-TR and depicted in the Summary of the ASME White Paper 92-01-01 Rev. 1, "Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds" (Reference 9), this method has been ineffective in identifying leaks or failures. The EPRI-TR and Code Case N-578-1 provide a more robust selection process founded on actual service experience with nuclear plant piping failure data.

This process has two key independent ingredients; a determination of each location's susceptibility to degradation and an independent assessment of the consequence of the piping failure. These two ingredients assure that defense-in-depth is maintained. First, by evaluating a location's susceptibility to degradation, the likelihood of finding flaws or indications that may be precursors to leak or ruptures is increased. Second, the consequence assessment effort has a single failure criterion. As such, no matter how unlikely a failure scenario is, it is ranked High in the consequence assessment, and at worst Medium in the risk assessment (i.e., Risk Category 4), if as a result of the failure there is no mitigative equipment available to respond to the event. In addition, the consequence assessment takes into account equipment reliability, and less credit is given to less reliable equipment.

As a result of the above process, the main reduction in the number of inspections occurs in low risk categories. All locations within the reactor coolant pressure boundary will continue to receive a system pressure test and visual VT-2 examination as currently required by ASME Section XI, regardless of their risk classification.

3.8.4 Summary

In summary, the NMP1 proposed RI-ISI application credits, where appropriate, existing augmented inspection programs while defining new, additional inspections for those locations potentially susceptible to degradation that are not currently being addressed by the ASME Section XI Inservice Inspection Program.

The impact on risk of the NMP1 proposed RI-ISI application has been assessed qualitatively and quantitatively. In each case, the above evaluations demonstrate that unacceptable risk impacts will not occur, and thus implementation of the RI-ISI program satisfies the acceptance criteria of Regulatory Guide 1.174 and the EPRI methodology requirements.

4 Implementation and Monitoring Program

Upon approval of the proposed RI-ISI program, appropriate procedures and/or revisions to the existing inspection program that implement the guidelines described in the EPRI-TR and/or ASME Code Case N-578-1 will be prepared. The new risk-informed program will be integrated into the existing and subsequent ASME Section XI inservice inspection intervals.

No changes to the Updated Final Safety Analysis Report are necessary for the alternative RI-ISI program implementation.

The NMP1 Plant Technical Specifications 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, personnel and sample expansion included in this generic letter". Therefore, a change to the NMP1 Technical Specifications will be required in order for the IGSCC Category A weldments to be incorporated into the RI-ISI program. A Technical Specification change was submitted by letter NMP1L 1628, dated November 26, 2001 (TAC No. MB3208) to remove the requirements of Generic Letter 88-01 from the Plant Technical Specifications and leave them in the current ISI Program. NMPNS is awaiting NRC approval.

Non-related portions of the ASME Section XI Code, (inspection intervals, acceptance criteria for evaluation of flaws, expansion criteria for flaws discovered, and qualification on examination techniques and personnel) are essentially unaffected by the proposed RI-ISI program. The EPRI-TR provides the relationship between the proposed risk-informed examination program and the remaining unaffected portions of ASME Section XI.

The NMPNS deviation monitoring and corrective action program will contain the following elements:

A. Identification of the condition
B. Characterization of the condition
C. Evaluation of the condition, to include
    1. determination of the cause and extent of the condition identified
    2. develop a corrective action plan or plans
D. Decide
E. Implement
F. Monitor
G. Trend

The RI-ISI program is a living program requiring feedback of new relevant information to ensure the appropriate identification of safety significant piping locations. As a minimum, risk ranking of piping segments will be reviewed and adjusted on an ASME period basis. In addition, significant changes may require more frequent adjustment as identified by NRC Bulletins, Generic Letters , or by industry and plant specific feedback. Changes will be reflected, as appropriate, in the future 10-Year inspection plan and schedule submittals as required by IWA-1400(c).

In addition, the industry is currently developing the requirements for implementing a living program for RI-ISI. NMPNS will review the completed document and, where applicable, revise or update the alternate RI-ISI program, procedures or instructions to incorporate the appropriate steps necessary to assure that the RI-ISI program remains current.

5 Proposed Inservice Inspection Program Plan Change

A comparison between the proposed RI-ISI program and the current ASME Section XI inspection program requirements for in-scope piping is given in Table 5-1. An identification of piping segments that are part of current plant augmented programs is also included in Table 5-1.

The proposed alternative Risk-Informed Program will be implemented starting at refueling outage seventeen (second inspection period), contingent on NRC approval of Relief Request ISI-22. The proposed RI-ISI program requires sixty three (63) element examinations to be completed over the third ten year inspection interval. The first inspection period of the 3rd interval ended on December 25, 2002. Therefore, all (63) required RI-ISI examinations will be completed in the remaining inspection periods. However, one of the (63) elements selected on the Shutdown Cooling System (SDC) in risk category 2 is

inaccessible. Additional details on this element (weld 38-WD-007) are provided in section 3.7, Program Relief Requests.

Intersecting longitudinal seam welds of RI-ISI selected elements will continue to be examined in accordance with ASME Code Case N-524 (Reference Regulatory Guide 1.147, Revision 12).

INSPECTION PROGRAM "B"						
Inspection Periods	**Period Start and End Dates**	**Inspection Period Calendar Years of Plant Service Within the Interval**	**Minimum Examinations Completed, %**	**Maximum Examination Credited, %**	**RI-ISI Exams Scheduled**	**Notes**
1	12/26/99 to 12/25/02	3	16%	34%	RR-ISI-13	Note 1
2	12/26/02 to 12/25/06	7	50%	67%	31.5	
3	12/26/06 to 12/25/09	10	100%	100%	31.5	
Note 1: Due to a crud burst during RFO-16, the First Inspection Period was extended till RFO-17 as allowed by IWB-2412(a). It is the intent of NMPNS to perform RI-ISI examinations in RFO-17 and utilize the results of the examinations to satisfy the first and second period percentage requirements, as appropriate. Request for Relief ISI-13 provided relief from the first period percentage requirements. Relief Request ISI-13 approved per NRC Safety Evaluation, dated February 9, 2001 (TAC No. MB0175).						

5.1 Applicable ASME Code Case

NMPNS has determined that the applicable ASME Code Case to be used for the Alternative Risk-Informed Inspection Program of Class 1 and 2 piping examinations is ASME Code Case N-578-1, Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B, Section XI, Division 1, approved by ASME March 28, 2000. The requirements of the Code Case were applied to the EPRI-TR process identified above. By this process NMPNS is preparing an Alternative Risk-Informed Inspection plan and scheduling for the implementation of RI-ISI program.

5.2 Exceptions to the EPRI Methodology

The following exception is being taken from the EPRI methodology:

Section 2.3, page 2-17 of the EPRI-TR, NMPNS takes exception to the statement "For flaws not exceeding acceptance criteria, items shall be examined for the next three inspection periods". In accordance with Section XI, "flaws not exceeding the acceptance criteria shall be considered acceptable for continued service". This statement is considered to be an inadvertent typographical error in the EPRI-TR.

5.3 Implementation of RI-ISI Program

Implementation of the alternative RI-ISI program will be in accordance with inspection plans and schedules, prepared in accordance with the applicable ASME Section XI Code Edition and Addenda, ASME Code Case N-578-1 and the EPRI-TR. The alternative RI-ISI program will be integrated into the existing and subsequent ASME Section XI Inservice Inspection Intervals.

6 References/Documentation

1. Electric Power Research Institute Topical Report-112657 Rev. B-A titled, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," dated December 1999.

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

3. Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decision making Inservice Inspection of Piping," dated July 1998.

4. NMP1 PRA, (Model U1PRA01), dated July 1999

5. NER-1A-020, Rev. 0 "NMP1 RI-ISI Degradation Evaluation," dated November 20, 2001.

6. NER-1A-019, Rev. 0 "NMP1 RI-ISI Consequence Evaluation," dated November 20, 2001.

7. "NMP1-RI-ISI-01-003-SE, Rev. 1 "Risk-Informed Inservice Inspection Program Service Experience," dated October 23, 2001

8. NER-1A-021, Rev. 0 "NMP1 RI-ISI Risk Ranking, Element Selection & Delta Risk," dated January 24, 2001.

9. Summary of the ASME White Paper 92-01-01 Rev. 1, "Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds," dated July 1995.

10. ASME Code Case N-578-1, "Risk-Informed Requirements for Class 1, 2, or 3 Piping," Method B, Section XI, Division 1, approved by ASME March 28, 2000

11. Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR 50.54(f)"., dated November 23, 1988.

12. Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," dated January 1988

13. NUREG 0313, Revision 2, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," dated January 1988.

14. Generic Letter 89-08, "Erosion/Corrosion-Induced Pipe Wall Thinning," dated May 1989.

15. ASME Code Case N-524, "Alternative Examination Requirements for Longitudinal Welds in Class 1 and Class 2 Piping," Section XI, Division 1, approved by ASME on August 8, 1993, and approved by Regulatory Guide 1.147, Revision 12, dated May 1999.

16. ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," Section XI, Division 1, approved by ASME on July 27, 1988, and approved by Regulatory Guide 1.147, Revision 12, dated May 1999.

Table 3.1-1 Scope and Number of Welds				
System	**System Identification**	**System Description**	**Number of Welds**	**ASME Class**
MS	01	Main Steam	66	1
FW	31	Feedwater	50	1
RR	32	Reactor Recirculation	187	1
RWCU	33	Reactor Water Cleanup	33	1
INST	36	Reactor Instrumentation	22	1
RPV	RV	Reactor Vessel Nozzles	17	1
RHV	37	Reactor Head Vent	30	1
RD	37 & 37.1	Reactor Drain	22	1
SDC	38	Shutdown Cooling	16	1
EC	39	Emergency Condenser	125	1, 2
CS	40, 40.1, 81 & 81.1	Core Spray	336	1, 2
LP	42.1	Liquid Poison	21	1
CRD	44.1, 44.2 & 44.3	Control Rod Drive	81	1, 2
CTN	80, 93 & 93.1	Containment Spray	363	2
-	-	Total	1369	-

Table 3.3-1 Failure Potential Assessment Summary

System[1]	Thermal Fatigue		Stress Corrosion Cracking				Local Corrosion			Flow Sensitive	
	TT	TASCS	IGSCC	TGSCC	ECSCC	PWSCC	MIC	Pitting	CC	EC	FAC
MS		X									
FW									X		X
RR		X	X								
RWCU		X	X								
INST											
RPV											
RHV			X								
RD											
SDC		X	X								
EC		X	X								
CS			X						X		
LP		X							X		
CRD											
CTN											

Notes: 1 - Systems are described in Table 3.1-1

TT – Thermal Transient
TASCS – Thermal Stripping, Cycling and Stratification
IGSCC – Intergranular Stress Corrosion Cracking
TGSCC – Transgranular Stress Corrosion Cracking
ECSCC – External Chloride Stress Corrosion Cracking
PWSCC – Primary Water Stress Corrosion Cracking
MIC – Microbiologically Influenced Corrosion
Pitting – Pitting
CC – Crevice Corrosion Cracking
EC – Cavitation
FAC – Flow Accelerated Corrosion

Table 3.4-1 Number of Segments by Risk Category Including FAC and IGSCC

System[1]	Risk Category 1[2]	Risk Category 2	Risk Category 3[2]	Risk Category 4	Risk Category 5	Risk Category 6	Risk Category 7
MS	0	0	0	0	1	4	1
FW	2	1	0	2	0	0	0
RR	0	2	0	2	0	0	0
RWCU	0	5	0	4	1	2	0
INST	0	0	0	1	0	1	0
RPV	0	0	0	0	0	1	0
RHV	0	0	0	0	1	1	1
RD	0	0	0	1	0	0	1
SDC	0	1	0	0	2	0	0
EC	0	3	0	3	4	3	0
CS	0	8	0	4	2	8	1
LP	0	0	0	2	2	1	0
CRD	0	0	0	2	0	1	1
CTN	0	0	0	7	0	31	1
TOTAL	2	20	0	28	13	53	6

Notes: 1 – Systems are described in Table 3.1-1
2 – The welds in these segments are adjusted for element selection into other risk categories consistent with methodology.

Table 3.5-1 Number of Locations/Inspections by Risk Category Without FAC and IGSCC

System[1]	Risk Category 1		Risk Category 2		Risk Category 3		Risk Category 4		Risk Category 5		Risk Category 6		Risk Category 7	
	Pop	Insp	Pop	Insp.	Pop	Insp.	Pop	Insp.	Pop	Insp.	Pop	Insp.	Pop	Insp
MS	0	0	0	0	0	0	0	0	10	1	54	0	2	0
FW	0	0	6	2	0	0	44	5	0	0	0	0	0	0
RR	0	0	15	5	0	0	172	17	0	0	0	0	0	0
RWCU	0	0	15	4	0	0	14	2	0	0	4	0	0	0
INST	0	0	0	0	0	0	5	1	0	0	17	0	0	0
RPV	0	0	0	0	0	0	0	0	0	0	17	0	0	0
RHV	0	0	0	0	0	0	0	0	0	0	18	0	12	0
RD	0	0	0	0	0	0	20	2	0	0	0	0	2	0
SDC	0	0	4*	1*	0	0	0	0	5	1	7	0	0	0
EC	0	0	8	2	0	0	10	1	24	3	83	0	0	0
CS	0	0	2	1	0	0	80	8	0	0	250	0	4	0
LP	0	0	0	0	0	0	9	1	11	2	1	0	0	0
CRD	0	0	0	0	0	0	20	2	0	0	60	0	1	0
CTN	0	0	0	0	0	0	20	2	0	0	339	0	4	0

Note: 1 – Systems are described in Table 3.1-1

Pop. – Population, the number of welds in a particular risk category after augmented program adjustments.
Insp. – Inspected, the number of welds selected for inspection.
* All four welds in the population are inaccessible, thus the selected weld cannot be inspected.

Table 3.8-1A Risk Categories With FAC and IGSCC										
System[1]	Risk Category[2]	Consequence Rank	Degradation Mechanism	Number of Locations	Locations Inspected[3]		Delta Inspections	Augmented Locations[4]	Augmented Inspections[5]	Change in Risk
					SXI	RI-ISI				
CRD	4	High	None	20	0	2	+2			Improvement
	6	Medium	None	60	6	0	-6			Negligible
	7	Low	None	1	0	0	0			No Change
CS	2	High	IGSCC	48	6	4	-2	48 IGSCC	4 IGSCC	Acceptable
			IGSCC,CC	2	2	1	-1	2 IGSCC	1 IGSCC	Acceptable
	4	High	None	32	1	4	+3			Improvement
	5	Medium	IGSCC	24	0	0	0	24 IGSCC		No Change
	6	Medium	None	226	20	0	-20			Negligible
	7	Low	None	4	0	0	0			No Change
CTN	4	High	None	20	1	2	+1			Improvement
	6	Medium	None	339	27	0	-27			Negligible
	7	Low	None	4	0	0	0			No Change
EC	2	High	IGSCC	2	0	0	0	2 IGSCC		No Change
			IGSCC,TASCS	4	0	0	0	4 IGSCC		No Change
			TASCS	4	0	2	+2			Improvement
	4	High	None	8	1	1	0			No Change
	5	Medium	IGSCC	32	11	0	-11			Acceptable
			IGSCC,TASCS	22	0	3	+3	22 IGSCC	3 IGSCC	Improvement
			TASCS	2	0	0	0			No Change
	6	Medium	None	51	23	0	-23			Negligible
FW	1	High	FAC	6	1	1	0	6 FAC	1 FAC	No Change
			FAC,CC	1	0	0	0	1 FAC		No Change
	2	High	CC	5	4	2	-2			Increase
	4	High	None	38	7	4	-3			Increase
INST	4	High	None	5	0	1	+1			Improvement
	6	Medium	None	17	1	0	-1			Negligible
LP	4	High	None	9	0	1	+1			Improvement
	5	Medium	CC	3	0	1	+1			Improvement
			TASCS	8	0	1	+1			Improvement
	6	Medium	None	1	0	0	0			No Change
MS	5	Medium	TASCS	10	0	1	+1			Improvement
	6	Medium	None	54	11	0	-11			Negligible
	7	Low	None	2	2	0	-2			Negligible
RD	4	High	None	20	0	2	+2			Improvement
	7	Low	None	2	0	0	0			No Change
RHV	5	Medium	IGSCC	1	0	0	0	1 IGSCC		No Change
	6	Medium	None	17	1	0	-1			Negligible
	7	Low	None	12	0	0	0			No Change
RPV	6	Medium	None	17	17	0	-17			Negligible
RR	2	High	IGSCC	5	5	5	0	5 IGSCC	5 IGSCC	No Change

Table 3.8-1A Risk Categories With FAC and IGSCC										
System[1]	Risk Category[2]	Consequence Rank	Degradation Mechanism	Number of Locations	Locations Inspected[3]		Delta Inspections	Augmented Locations[4]	Augmented Inspections[5]	Change in Risk
					SXI	RI-ISI				
			TASCS	15	2	5	+3			Improvement
	4	High	None	167	42	12	-30			Increase
RWCU	2	High	IGSCC	3	1	1	0	3 IGSCC	1 IGSCC	No Change
			IGSCC,TASCS	1	1	1	0	1 IGSCC	1 IGSCC	No Change
			TASCS	14	5	3	-2			Increase
	4	High	None	11	3	1	-2			Increase
	5	Medium	IGSCC	1	1	0	-1	1 IGSCC		Acceptable
	6	Medium	None	3	1	0	-1			Negligible
SDC	2	High	IGSCC,TASCS	4	0	0	0	4 IGSCC		No Change
	5	Medium	IGSCC	7	2	0	-2	7 IGSCC		Acceptable
			IGSCC,TASCS	5	1	1	0	5 IGSCC	1 IGSCC	No Change

1. Systems are described in Table 3.1-1
2. Risk ranking includes impact of all degradation mechanism (e.g. FAC and IGSCC)
3. Excludes surface examinations
4. Included in programs to address FAC and IGSCC, as appropriate.
5. The IGSCC program requirements have been: 100% of category "D" and "E" every 2 refueling cycles. The FAC programs locations are evaluated to determine susceptibility and inspection locations, frequency is based on wear predictions and previous inspection results.

Table 3.8-1B Risk Categories Without FAC and IGSCC

System[1]	Risk Category[2]	Consequence Rank	Degradation Mechanism	Number of Locations Inspected[3]			Delta Inspections	Augmented Locations[4]	Augmented Inspections[5]	Change in Risk
				Locations	SXI	RI-ISI				
CRD	4	High	None	20	0	2	+2			Improvement
	6	Medium	None	60	6	0	-6			Negligible
	7	Low	None	1	0	0	0			No Change
CS	2	High	IGSCC,CC	2	2	1	-1	2 IGSCC	1 IGSCC	Acceptable
	4	High	None	32	1	4	+3			Improvement
			IGSCC	48	6	4	-2	48 IGSCC	4 IGSCC	Acceptable
	6	Medium	None	226	20	0	-20			Negligible
			IGSCC	24	0	0	0	24 IGSCC		No Change
	7	Low	None	4	0	0	0			No Change
CTN	4	High	None	20	1	2	+1			Improvement
	6	Medium	None	339	27	0	-27			Negligible
	7	Low	None	4	0	0	0			No Change
EC	2	High	IGSCC,TASC	4	0	0	0	4 IGSCC		No Change
			TASCS	4	0	2	+2			Improvement
	4	High	None	8	1	1	0			No Change
			IGSCC	2	0	0	0	2 IGSCC		No Change
	5	Medium	IGSCC,TASC	22	0	3	+3	22 IGSCC	3 IGSCC	Improvement
			TASCS	2	0	0	0			No Change
	6	Medium	None	51	23	0	-23			Negligible
			IGSCC	32	11	0	-11			Negligible
FW	2	High	CC	5	4	2	-2			Increase
			FAC,CC	1	0	0	0	1 FAC		No Change
	4	High	None	38	7	4	-3			Increase
			FAC	6	1	0	-1	6 FAC	1 FAC	Acceptable
INST	4	High	None	5	0	1	+1			Improvement
	6	Medium	None	17	1	0	-1			Negligible
LP	4	High	None	9	0	1	+1			Improvement
	5	Medium	CC	3	0	1	+1			Improvement
			TASCS	8	0	1	+1			Improvement
	6	Medium	None	1	0	0	0			No Change
MS	5	Medium	TASCS	10	0	1	+1			Improvement
	6	Medium	None	54	11	0	-11			Negligible
	7	Low	None	2	2	0	-2			Negligible
RD	4	High	None	20	0	2	+2			Improvement
	7	Low	None	2	0	0	0			No Change
RHV	6	Medium	None	17	1	0	-1			Negligible
			IGSCC	1	0	0	0	1 IGSCC		No Change
	7	Low	None	12	0	0	0			No Change
RPV	6	Medium	None	17	17	0	-17			Negligible
RR	2	High	TASCS	15	2	5	+3			Improvement

Table 3.8-1B Risk Categories Without FAC and IGSCC										
System[1]	Risk Category[2]	Consequence Rank	Degradation Mechanism	Number of Locations Inspected[3]			Delta Inspections	Augmented Locations[4]	Augmented Inspections[5]	Change in Risk
				Locations	SXI	RI-ISI				
	4	High	None	167	42	12	-30			Increase
			IGSCC	5	5	5	0	5 IGSCC	5 IGSCC	No Change
RWCU	2	High	IGSCC,TASC	1	1	1	0	1 IGSCC	1 IGSCC	No Change
			TASCS	14	5	3	-2			Increase
	4	High	None	11	3	1	-2			Increase
			IGSCC	3	1	1	0	3 IGSCC	1 IGSCC	No Change
	6	Medium	None	3	1	0	-1			Negligible
			IGSCC	1	1	0	-1	1 IGSCC		Negligible
SDC	2	High	IGSCC,TASC	4	0	0	0	4 IGSCC		No Change
	5	Medium	IGSCC,TASC	5	1	1	0	5 IGSCC	1 IGSCC	No Change
	6	Medium	IGSCC	7	2	0	-2	7 IGSCC		Negligible

1. Systems are described in Table 3.1-1
2. Risk ranking includes impact of all degradation mechanism (e.g. FAC and IGSCC)
3. Excludes surface examinations.
4. Included in programs to address FAC and IGSCC, as appropriate.
5. The IGSCC program requirements have been: 100% of category "D" and "E" every 2 refueling cycles. The FAC programs locations are evaluated to determine susceptibility and inspection locations, frequency is based on wear predictions and previous inspection results.

Table 3.8-2A – Risk Impact Results with POD[2] Credit							
System[1]	Risk Category	Consequence	Degradation Mechanisms	Inspected		Delta Risk (1/yr)	
				Section XI	RI-ISI	CDF	LERF
CRD (Control Rod Drive)	4	High	None	0	2	**-7.5E-12**	**-5.4E-12**
CS (core spray)	2	High	CC, IGSCC	2	1	3.0E-10	4.0E-11
	4	High	None	1	4	-1.5E-12	-3.0E-14
			IGSCC	6	4	5.0E-11	-2.8E-11
Total						**3.5E-10**	**1.2E-11**
CTN (containment spray)	4	High	None	1	2	**-2.0E-12**	**-2.8E-14**
EC (emergency condenser)	2	High	TASCS	0	2	-1.8E-10	-2.5E-11
			TASCS, IGSCC	0	0	0.0	0.0
	4	High	None	1	1	0.0	0.0
			IGSCC	0	0	0.0	0.0
	5	Medium	TASCS	0	0	0.0	0.0
			TASCS, IGSCC	0	3	0.0 (a)	0.0 (a)
Total						**-1.8E-10**	**-2.5E-11**
FW (feedwater)	2	High	CC	4	2	1.0E-10	1.4E-11
			CC, FAC	0	0	0.0	0.0
	4	High	None	7	4	1.0E-10	1.0E-10
			FAC	1	1	2.5E-12	3.5E-13
Total						**2.1E010**	**1.1E-10**
INST (instrumentation)	4	High	None	0	1	**-2.5E-12**	**-3.5E-12**
LP (liquid Poison)	4	High	None	0	1	-1.5E-13	-1.0E-13
	5	Medium	TASCS	0	1	-1.6E-11	-1.6E-12
			CC	0	1	-9.0E-12	-9.0E-13
Total						**-2.5E-11**	**-2.6E-12**
MS (main steam)	5	Medium	TASCS	0	1	**-1.1E-12**	**-3.6E-14**
RD (reactor drain)	4	High	None	0	2	**-5.0E-12**	**-7.0E-13**
RR (reactor Recirculation)	2	High	TASCS	2	5	-3.9E-10	-5.5E-11
	4	High	None	42	12	7.5E-11	1.1E-11
			IGSCC	5	5	0.0	0.0
Total						**-3.2E-10**	**-4.4E-11**
RWCU (reactor cleanup)	2	High	TASCS	5	3	-1.2E-10	-1.7E-11
			TASCS, IGSCC	1	1	0.0	0.0
	4	High	None	3	1	5.0E-12	7.0E-13
			IGSCC	1	1	0.0	0.0
Total						**-1.2E-10**	**-1.6E-11**
SDC (shutdown cooling)	2	High	TASCS, IGSCC	0	0	0.0	0.0
	5	Medium	TASCS, IGSCC	1	1	0.0	0.0
Total						**0.0**	**0.0**
Overall Change in Risk						-1.0E-10	3.25E-11

1 - Systems are described in Table 3.1-1
2 - POD = Probability of Detection
(a) Since the IGSCC program includes all these welds, there is no change in risk.

Table 3.8-2B – Risk Impact Results without POD[2] Credit							
System[1]	Risk Category	Consequence	Degradation Mechanisms	Inspected		Delta Risk (1/yr)	
				Section XI	RI-ISI	CDF	LERF
CRD (Control Rod Drive)	4	High	None	0	2	**-7.5E-12**	**-5.4E-12**
CS (core spray)	2	High	CC, IGSCC	2	1	3.0E-10	4.0E-11
	4	High	None	1	4	-1.5E-11	-3.0E-11
			IGSCC	6	4	5.0E-11	-2.8E-11
Total						**3.5E-10**	**-1.2E-11**
CTN (containment spray)	4	High	None	1	2	**-2.0E-12**	**-2.0E-14**
EC (emergency condenser)	2	High	TASCS	0	2	-1.0E-10	-1.4E-11
			TASCS, IGSCC	0	0	0.0	0.0
	4	High	None	1	1	0.0	0.0
			IGSCC	0	0	0.0	0.0
	5	Medium	TASCS	0	0	0.0	0.0
			TASCS, IGSCC	0	3	0.0 (a)	0.0 (a)
Total						**-1.0E-10**	**-1.4E-11**
FW (feedwater)	2	High	CC	4	2	1.0E-10	1.4E-11
			CC, FAC	0	0	0.0	0.0
	4	High	None	7	4	1.0E-10	1.0E-10
			FAC	1	0	2.5E-12	3.5E-13
Total						**2.1E-10**	**1.1E-10**
INST (instrumentation)	4	High	None	0	1	**-2.5E-12**	**-3.5E-12**
LP (liquid Poison)	4	High	None	0	1	-1.5E-13	-1.0E-13
	5	Medium	TASCS	0	1	-9.0E-12	-9.0E-13
			CC	0	1	-9.0E-12	-9.0E-13
Total						**-1.8E-11**	**-1.9E-12**
MS (main steam)	5	Medium	TASCS	0	1	**-6.0E-13**	**-2.0E-14**
RD (reactor drain)	4	High	None	0	2	**-5.0E-12**	**-7.0E-13**
RR (reactor Recirculation)	2	High	TASCS	2	5	-1.5E-10	-2.1E-11
	4	High	None	42	12	7.5E-11	1.1E-11
			IGSCC	5	5	0.0	0.0
Total						**-7.5E-11**	**-1.1E-12**
RWCU (reactor cleanup)	2	High	TASCS	5	3	1.0E-10	1.4E-11
			TASCS, IGSCC	1	1	0.0	0.0
	4	High	None	3	1	5.0E-12	7.0E-13
			IGSCC	1	1	0.0	0.0
Total						**1.1E-10**	**1.5E-11**
SDC (shutdown cooling)	2	High	TASCS, IGSCC	0	0	0.0	0.0
	5	Medium	TASCS, IGSCC	1	1	0.0	0.0
Total						**0.0**	**0.0**
Overall Change in Risk						4.5E-10	1.1E-10

1 - Systems are described in Table 3.1-1
2 - POD = Probability of Detection
(a) Since the IGSCC program includes all these welds, there is no change in risk.

Table 5-1 Comparison of ASME XI Requirements

System[1]	Number of High/Medium Risk Region Segments[2]	RI-ISI Inspection Locations				ASME Section XI 1989 Edition Examination Requirements				Number of High/Medium Segments Credited in Augmented Programs[3]
		Class 1	Class 2	Class 3	NNS[4]	B-F	B-J	C-F-1	C-F-2	
MS	0/1	66	0	0	0	0	66	0	0	0/0
FW	3/2	50	0	0	0	0	50	0	0	2/0
RR	2/2	187	0	0	0	10	177	0	0	1/0
RWCU	5/5	33	0	0	0	2	31	0	0	1/1
INST	0/1	22	0	0	0	10	12	0	0	0/0
RPV	0/0	17	0	0	0	17	0	0	0	0/0
RHV	0/1	30	0	0	0	1	29	0	0	0/1
RD	0/1	22	0	0	0	0	22	0	0	0/0
SDC	1 / 2	16	0	0	0	0	16	0	0	0/1
EC	3/7	50	75	0	0	2	48	75	0	1 / 2
CS	8/6	94	242	0	0	2	92	0	242	6/2
LP	0/4	21	0	0	0	1	20	0	0	0/0
CRD	0/2	21	60	0	0	1	20	0	60	0/0
CTN	0/7	0	363	0	0	0	0	0	363	0/0
TOTAL	22/41	629	740	0	0	46	583	75	665	11/7

1. Systems are described in Table 3.1-1
2. High Risk = Categories 1, 2 and 3
   Medium Risk = Categories 4 and 5
   Ranking includes impact of all degradation mechanisms (e.g., FAC, IGSCC, TASCS, etc.)
3. Includes programs to address Generic Letter 89-08 (FAC) and Generic Letter 88-01 (IGSCC in BWRs)
4. NNS - Non-Nuclear Safety