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May 12, 2003
NL-03-078

U. S. Nuclear Regulatory Commission
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SUBJECT: Indian Point Nuclear Generating Unit No. 2
Docket No. 50-247
Relief Request RR 63,
Risk-Informed Inservice Inspection (RI-ISI) Program

Reference:

1. EPRI TR-112657, Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure"
2. USNRC letter to Electric Power Research Institute (EPRI), dated October 28, 1999, regarding "Safety Evaluation Report Related to EPRI Risk-Informed Inservice Inspection Evaluation Procedure (EPRI TR-112657, Revision B, July 1999)"
3. USNRC letter from R. Laufer to M. Kansler, dated February 4, 2003, regarding "Relief Request No. RR 3-28 Regarding Risk-Informed Inservice Inspection Program, Indian Point Nuclear Generating Unit No. 3 (TAC No. MB4637)"

Dear Sir:

Entergy Nuclear Operations Inc. (ENO) requests relief to use the proposed Risk-Informed Inservice Inspection Program (RI-ISI, Attachment 1) as an alternative to current ASME Section XI inspection requirements for Indian Point Unit 2 (IP2) Class 1, Item Category B-F and B-J welds pursuant to 10 CFR 50.55a(a)(3)(i). This RI-ISI Program has been developed in accordance with the EPRI methodology contained in EPRI TR-112657, Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure" (Reference 1). EPRI TR-112657 was approved by NRC Safety Evaluation Report, dated October 28, 1999 (Reference 2).

The attached IP2-specific RI-ISI program supports the conclusion that the proposed alternative provides an acceptable level of quality and safety as required by 10 CFR 50.55a(a)(3)(i). Also, the proposed program for IP2 is similar to the program previously approved by the NRC for IP3 (Reference 3). NRC review comments on the IP3 program have been incorporated into the proposed program for IP2.

A047

ENO plans to implement the RI-ISI program during refueling outage 2R16, currently scheduled for October 2004. ENO requests approval by December 2003 to support planning activities in preparation for that outage

There are no new commitments made in this letter. If you have any questions, please contact Mr. Kevin Kingsley at 914-734-5581.

Very truly yours,

Fred R. Dacimo
Vice President, Operations
Indian Point Energy Center

Attachment: 1. Indian Point Nuclear Generating Unit No. 2 Risk-Informed Inservice Inspection Program Plan, Rev. 0

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ATTACHMENT I TO NL-03-078

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

RISK INFORMED INSERVICE INSPECTION PROGRAM, Rev. 0

(Relief Request RR 63)

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

RISK-INFORMED INSERVICE INSPECTION PROGRAM PLAN

INDIAN POINT UNIT 2 (REVISION 0)

Table of Contents

1. INTRODUCTION

Indian Point Unit 2 is currently in the third inservice inspection (ISI) interval as defined by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Section XI Code for Program B. Pursuant to 10 CFR 50.55a(g)(4)(ii), the applicable ASME Section XI Code for Indian Point Unit 2 is the 1989 Edition, No Addenda.

The objective of this submittal is to request the use of a risk-informed inservice inspection (RI-ISI) process for Class 1 piping. The RI-ISI process used in this submittal is described in Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Rev. B-A "Revised Risk-Informed Inservice Inspection Evaluation Procedure." The RI-ISI application was also conducted in a manner consistent with ASME Code Case N-578 "Risk-Informed Requirements for Class 1, 2, and 3 Piping, Method B."

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" and Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping." Further information is provided in Section 3.6.2 relative to defense-in-depth.

1.2 PRA Quality

The Indian Point 2 Individual Plant Examination (IPE) model (August 1992) was used as the initial basis to evaluate the consequences of pipe ruptures during power operation. The base core damage frequency (CDF) from internal events from the IPE is 3.13 E-5/yr. The additional contribution from internal flooding, developed during the IPE external events, was 6.66 E-6/yr.

Significant changes have been made to the IPE model. These changes were made to reflect new data, calculations, and modifications to the plant design and procedures. Updated results based on the model update completed in 2002 were used to confirm that the consequence evaluations were current. The base CDF from the model including internal flooding is 2.27 E-5/yr.

The NRC review of the IPE concluded that the IPE process is capable of identifying the most likely severe accidents and severe accident vulnerabilities. The review did not identify any weaknesses or necessary improvements to the IPE model.

The updated model has undergone a Westinghouse Owners Group (WOG) PRA certification review and there were no significant findings identified that would impact the RI-ISI consequence evaluation.

Based on the results of past NRC staff reviews and the WOG certification peer review, Entergy Nuclear Northeast is confident that the level of detail and quality of the IP-2 IPE fully supports this risk informed regulation application.

2. PROPOSED ALTERNATIVE TO CURRENT ISI PROGRAM REQUIREMENTS

2.1 ASME Section XI

ASME Section XI Examination Categories B-F and B-J currently contain the requirements for the nondestructive examination (NDE) of Class 1 piping components. The alternative RI-ISI program for piping is described in EPRI TR-112657. The RI-ISI program will be substituted for the currently approved program for Class 1 piping (Examination Categories B-F and B-J) in accordance with 10 CFR 50.55a(a)(3)(i) by alternatively providing an acceptable level of quality and safety. Other non-related portions of the ASME Section XI Code will be unaffected. EPRI TR-112657 provides the requirements for defining the relationship between the RI-ISI program and the remaining unaffected portions of ASME Section XI.

2.2 Augmented Programs

No augmented programs were affected by the RI-ISI application on Class 1 piping at Indian Point Unit 2.

3. RISK-INFORMED ISI PROCESS

The process used to develop the RI-ISI program conformed to the methodology described in EPRI TR-112657 and consisted of the following steps:

- Scope Definition
- Consequence Evaluation
- Failure Potential Assessment
- Risk Characterization
- Element and NDE Selection
- Risk Impact Assessment
- Implementation Program
- Feedback Loop

3.1 Scope of Program

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

3.2 Consequence Evaluation

The consequence(s) of pressure boundary failures were evaluated and ranked based on their impact on core damage and containment performance (isolation, bypass and large, early release). The consequence evaluation included an assessment of shutdown and external events. The impact on these measures due to both direct and indirect effects was considered using the guidance provided in EPRI TR-112657.

3.3 Failure Potential 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-112657.

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

3.4 Risk Characterization

In the preceding steps, each run of piping within the scope of the 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, piping segments are then defined as continuous runs of 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-112657. The results of these calculations are presented in Table 3.4-1.

The large, early release frequency (LERF) from the Indian Point 2 (IP2) probabilistic risk assessment is 1.0279E-06/yr. The accident types and their contribution to internal large, early release frequencies are identified in the table below.

Accident Types and Their Contribution to Internal Large Early Release Frequencies

Accident Type	Point Estimate Large Early Release Frequency (/yr)	% Contribution to Point Estimate Large Early Release Frequency
Steam Generator Tube Ruptures, SGTR	7.8263E-07	76.14
Loss of Offsite Power / Station Blackout, LOSP	6.4817E-08	6.31
Interfacing Systems Loss of Coolant Accidents, ISLOCA	6.4167E-08	6.24
Internal Flooding Events	4.9091E-08	4.78
Anticipated Transients Without Scram, ATWS	4.9229E-08	4.79
Transients	1.6686E-08	1.62
Loss of Coolant Accidents, LOCA	1.2318E-09	0.12
Reactor Vessel Rupture	8.4193E-11	0.01

The IP2 RI-ISI evaluations were done consistent with the requirements of EPRI TR-112657 including an assessment of the impact of postulated piping failure on LERF. In assessing the change in risk, the proposed RI-ISI program was shown to be risk neutral from a core damage frequency as well as LERF perspective. That is, in the high

and medium risk regions the number of inspections were increased or remained the same as compared to the existing Section XI program. In addition, the IP2 RI-ISI application only applies to Class 1 piping which is located inside containment. Implementing the RI-ISI program only affects LOCA and based on the low contribution of LOCA to LERF, as shown in the Table, the change in LERF due to implementing the RI-ISI program is small.

3.5 Element and NDE Selection

In general, EPRI TR-112657 requires that 25% of the locations in the high-risk region and 10% of the locations in the medium risk region be selected for inspection using appropriate NDE methods tailored to the applicable degradation mechanism. In addition, per Section 3.6.4.2 of EPRI TR-112657, if the percentage of Class 1 piping locations selected for examination falls substantially below 10%, then the basis for selection needs to be investigated. For the Indian Point Unit 2 Station, the percentage of Class 1 welds selected for examination per the RI-ISI process is 7.4%. Investigation reveals that the percentage is less than 10% due to the high number of Class 1 welds in the Chemical and Volume Control System (CH) assigned to the low risk region. Indian Point 2 has 265 CH system low risk welds located primarily outboard of the regenerative heat exchanger in the charging and letdown piping. Since most of this piping is small bore piping with a low consequence of failure and thus low risk, the deviation from 10% is considered acceptable.

One additional factor that was considered during the evaluation was that the overall percentage of Class 1 selections included both socket and non-socket welds. The percentage of Class 1 selections was 7.4% when both socket and non-socket piping welds were considered. This percentage increases to 11.0% when considering only those piping welds that are non-socket welded.

A brief summary is provided below, and the results of the selection process are presented in Table 3.5-1.

Totals	Description
826[1]	Class 1 Piping Welds
61	RI-ISI Program Selections

Notes

1. Includes all non-exempt Examination Category B-F and B-J locations. All in-scope piping components, regardless of risk classification, will continue to receive Code required pressure testing, as part of the current ASME Section XI program. VT-2 visual examinations are scheduled in accordance with the station's pressure test program that remains unaffected by the RI-ISI program.

3.5.1 Additional Examinations

The RI-ISI program in all cases will determine through an engineering evaluation the root cause of any unacceptable flaw 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 or replaced.

The evaluation will include whether other elements in the segment or segments are subject to the same root cause conditions. Additional examinations will be performed on those elements with the same root cause conditions or degradation mechanisms as the identified flaw or relevant condition. The additional examinations will include high risk significant elements and medium risk significant elements, if needed, up to a number equivalent to the number of elements required to be inspected on the segment or segments during the current outage. If unacceptable flaws or relevant conditions are again found similar to the initial problem, the remaining elements identified as susceptible will be examined. An evaluation of the root cause and degradation mechanism shall be performed to determine the size of the second expansion sample to be examined in the current outage. No additional examinations will be performed if there are no additional elements identified as being susceptible to the same root cause conditions.

3.5.2 Program Relief Requests

An attempt has been made to select RI-ISI locations for examination such that a minimum of >90% coverage (i.e., Code Case N-460 criteria) is attainable. 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.

At this time, the RI-ISI examination locations that have been selected provide >90% coverage. In instances where locations may be found at the time of the examination that do not meet the >90% coverage requirement, the process outlined in EPRI TR-112657 will be followed.

No existing Indian Point Unit 2 relief requests are being withdrawn due to the RI-ISI application.

3.6 Risk Impact Assessment

The RI-ISI program evaluation has been conducted in accordance with Regulatory Guide 1.174 and the requirements of EPRI TR-112657, and the risk from implementation of this program is expected to remain neutral or decrease 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-112657 and ASME Code Case N-578 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 changing 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. For example, for locations subject to thermal fatigue, examinations will be conducted on an expanded volume and will be focused to enhance the probability of detection (POD) during the inspection process.

3.6.1 Qualitative Analysis

Table 3.6-1 presents a summary of the proposed RI-ISI program versus the current Section XI program.

Table 3.6-1 identifies 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 program,
- the number of locations proposed for the RI-ISI program, crediting where appropriate, inspections from the augmented inspection programs,
- the increase, decrease or no 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 program, and
- the risk impact (change in risk) of the RI-ISI program as compared to the Section XI program.

The final column (change in risk) of Table 3.6-1 provides a conclusion as to the impact on risk for the RI-ISI program as compared to the Section XI program. The following discussion explains the terms used in this column:

For locations identified as risk category 6 or 7:
Negligible: As discussed in TR-112657 (section 3.7.1) 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 RI-ISI inspection calls for a larger inspection volume with its accompanying increase in probability of detection.

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," "Negligible" or "No Change" do not adversely impact the change in risk assessment, the following discussion is focused on those locations identified as "Increase."

As identified in Table 3.6-1, there is an overall increase of 14 inspection locations in the high-risk region (i.e. Risk Categories 1, 2, and 3). Also, as identified in this table, there is an overall decrease of 2 locations in the medium risk region (i.e. Risk Categories 4 and 5). Overall, there is a net increase of 12 inspection locations in the high and medium risk regions. This shows an overall decrease in the risk associated with implementing the RI-ISI program, which meets the requirements of TR-112657 and Reg. Guide 1.174. In addition, a separate quantitative evaluation was conducted consistent with TR-112657, section 3.7 and as expected, met TR-112657 and Reg Guide 1.174 quantitative criteria.

3.6.2 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 depicted in ASME White Paper 92-01-01 Rev. 1, "Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds," this method has been ineffective in identifying leaks or failures. EPRI TR-112657 and Code Case N-578 provide a more robust selection process founded on actual service experience with nuclear plant piping failure data.

This process has two key independent ingredients, that is, a determination of each location's susceptibility to degradation and secondly, an independent assessment of the consequence of the piping failure. These two ingredients assure 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 leaks or ruptures is increased. Secondly, 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.

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 the Code regardless of its risk classification.

4. IMPLEMENTATION AND MONITORING PROGRAM

Upon approval of the RI-ISI program, procedures that comply with the guidelines described in EPRI TR-112657 will be prepared to implement and monitor the program. The new program will be integrated into the Third In-service inspection interval. No changes to the Updated Final Safety Analysis Report are necessary for program implementation.

The applicable aspects of the ASME Code not affected by this change will be retained, such as inspection methods, acceptance guidelines, pressure testing, corrective measures, documentation requirements, and quality control requirements. Existing ASME Section XI program implementing procedures will be retained and modified to address the RI-ISI process, as appropriate.

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

A. Identify
B. Characterize
C. (1) Evaluate, determine the cause and extent of the condition identified
   (2) Evaluate, 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 high safety significant piping locations. EPRI is currently working within the industry to develop guidelines for reviewing and updating risk-informed programs that have been generated per EPRI TR-112657. Once these guidelines are available, ENO will review them and implement applicable criteria. In addition, significant changes may

require program adjustments as directed by NRC Bulletin or Generic Letter requirements, or by industry and plant specific feedback.

ENO will review the RI-ISI program on an ASME interval basis consistent with industry guidance. In accordance with the Operating Experience Program, ENO will review and assess the significance of plant-specific and industry events (e.g. generic letters, bulletins, INPO notices) and update the RI-ISI program, as necessary, on a more frequent basis.

5. PROPOSED ISI PROGRAM PLAN CHANGE

A comparison between the RI-ISI program and ASME Section XI Code 1989 Edition, No Addenda program requirements for in-scope piping is provided in Tables 5-1 and 5-2. Table 5-1 provides a summary comparison by risk region. Table 5-2 provides the same comparison information, but in a more detailed manner by risk category, similar to the format used in Table 3.6-1.

Indian Point Unit 2 is currently in the third in-service inspection interval. Examinations shall be performed during the interval such that the period examination percentage requirements of ASME Section XI, paragraph IWB-2412 are met.

6. REFERENCES/DOCUMENTATION

6.1 Reference

6.1.1 EPRI TR-112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure", Rev. B-A

6.1.2 ASME Code Case N-578, "Risk-Informed Requirements for Class 1, 2, and 3 Piping, Method B, Section XI, Division 1"

6.1.3 Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis"

6.1.4 Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping"

6.2 Supporting Onsite Documentation

6.2.1 Report No. 17184-03, "RI-ISI Degradation Analysis for Indian Point Units 2 and 3.

6.2.2 Report No. 17184-02, "Consequence Evaluation of Class 1 Piping in Support of ASME Code Case N-578, Indian Point 3 Nuclear Power Plant"

6.2.3 Report No. 17184-06, "Segment Risk Ranking and Element Selection Results of Class 1 Piping In Support of ASME Code Case N-578, Indian Point 3 Nuclear Power Plant"

6.2.4 Report No. 17184-08, "RI-ISI Risk Impact Analysis for Indian Point Unit 3"

6.2.5 Memo to file, "Resolution of final IP2 RI-ISI comments"

Enclosure A - Tables

- Table 3.1-1 (1 page)
- Table 3.3-1 (1 page)
- Table 3.4-1 (1 page)
- Table 3.5-1 (1 page)
- Table 3.6-1 (2 pages)
- Table 5-1 (1 page)
- Table 5-2 (2 pages)

Table 3.1-1 System Selection and Segment / Element Definition			
System Description	**ASME Code Class**	**Number of Segments**	**Number of Elements**
RC – Reactor Coolant System	Class 1	66	253
CH – Chemical and Volume Control System	Class 1	27	369
SI – Safety Injection System	Class 1	38	183
AC – Auxiliary Cooling System (Residual Heat Removal)	Class 1	3	21
Totals		**134**	**826**

Table 3.3-1

Failure Potential Assessment Summary

System[1]	Thermal Fatigue		Stress Corrosion Cracking				Localized Corrosion			Flow Sensitive	
	TASCS	TT	IGSCC	TGSCC	ECSCC	PWSCC	MIC	PIT	CC	E-C	FAC
RC	X	X									
CH	X										
SI	X		X								
AC	X										

Note

1. Systems are described in Table 3.1-1.

Table 3.4-1

Number of Segments by Risk Category With and Without Impact of FAC[1]

System[2]	High Risk Region						Medium Risk Region				Low Risk Region			
	Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7	
	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without
RC			10	10			50	50	1	1			5	5
CH			2	2			7	7	3	3	15	15		
SI			16	16			2	2	8	8	12	12		
AC			1	1			1	1			1	1		
Total			**29**	**29**			**60**	**60**	**12**	**12**	**28**	**28**	**5**	**5**

Notes

1. The Flow Assisted Corrosion (FAC) Program is not applicable for Class 1 piping at the Indian Point Unit 2 Station. As such, the FAC Program has no impact on the figures shown in the table. The table format and reference to the FAC Program has been retained solely for uniformity purpose with other RI-ISI application template submittals.
2. Systems are described in Table 3.1-1.

Table 3.5-1

Number of Elements Selected for Inspection by Risk Category Excluding Impact of FAC[1]

System[2]	High Risk Region						Medium Risk Region				Low Risk Region			
	Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7	
	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected
RC			27	7			182	19	32	4			12	0
CH			5	2			49	5	50	5	265	0		
SI			48	12			6	1	27	3	102	0		
AC			6	2			2	1			13	0		
Total			86	23			239	26	109	12	380	0	12	0

Notes

1. The Flow Assisted Corrosion (FAC) Program is not applicable for Class 1 piping at the Indian Point Unit 2 Station. As such, the FAC Program has no impact on the figures shown in the table. The reference to the FAC Program has been retained solely for uniformity purpose with other RI-ISI application template submittals.
2. Systems are described in Table 3.1-1.

Table 3.6-1

Risk Impact Analysis Results

System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[3]		LERF Impact[3]	
			DMs	Rank	Section XI[2]	RI-ISI	Delta	w/ POD	W/o POD	w/ POD	w/o POD
RC	2	High	TASCS, TT	Medium	1	2	+1		Improvement		Improvement
RC	2	High	TASCS	Medium	2	5	+3		Improvement		Improvement
RC	4	High	None	Low	38	19	-19		Increase		Increase
RC	5	Medium	TASCS	Medium	0	4	+4		Improvement		Improvement
RC	7	Low	None	Low	0	0	0		No change		No change
RC Total					41	30	-11				
CH	2	High	TASCS	Medium	0	2	+2		Improvement		Improvement
CH	4	High	None	Low	0	5	+5		Improvement		Improvement
CH	5	Medium	TASCS	Medium	0	5	+5		Improvement		Improvement
CH	6	Medium	None	Low	0	0	0		No change		No change
CH Total					0	12	+12				
SI	2	High	TASCS, IGSCC	Medium	0	4	+4		Improvement		Improvement
SI	2	High	IGSCC	Medium	4	8	+4		Improvement		Improvement
SI	4	High	None	Low	0	1	+1		Improvement		Improvement
SI	5	Medium	IGSCC	Medium	1	3	+2		Improvement		Improvement
SI	6	Medium	None	Low	3	0	-3		negligible		negligible
SI Total					8	16	+8				

Table 3.6-1

Risk Impact Analysis Results

System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[3]		LERF Impact[3]	
			DMs	Rank	Section XI[2]	RI-ISI	Delta	w/ POD	W/o POD	w/ POD	w/o POD
AC	2	High	TASCS	Medium	2	2	0		no change		No change
AC	4	High	None	Low	1	1	0		No change		No change
AC	6	Medium	None	Low	2	0	-2		Negligible		Negligible
AC Total					5	3	-2				
Grand Total					54	61	+7				

Notes

1. Systems are described in Table 3.1-1.
2. Only those ASME Section XI Code inspection locations that received a volumetric examination in addition to a surface examination are included in this count. Inspection locations previously subjected to a surface examination only are not considered in accordance with Section 3.7.1 of EPRI TR-112657.
3. Per Section 3.7.1 of EPRI TR-112657, the contribution of low risk categories 6 and 7 need not be considered in assessing the change in risk. Hence, the word "negligible" is given in these cases in lieu of values for CDF and LERF Impact. In those cases where no inspections were being performed previously via Section XI, and none are planned for RI-ISI purposes, "no change" is listed instead of "negligible".

Table 5-1

Inspection Location Selection Comparison Between ASME Section XI Code, 1989, No Addenda and EPRI TR-112657 by Risk Region

System[1]	Code Category[2]	High Risk Region					Medium Risk Region					Low Risk Region				
		Weld Count	ASME Section XI		EPRI TR-112657		Weld Count	ASME Section XI		EPRI TR-112657		Weld Count	ASME Section XI		EPRI TR-112657	
			Vol/Sur	Sur Only	RI-ISI	Other[3]		Vol/Sur	Sur Only	RI-ISI	Other[3]		Vol/Sur	Sur Only	RI-ISI	Other[3]
RC	B-F	2	2	0	1		20	20	0	8						
	B-J	25	1	7	6		194	18	30	15		12	0	6	0	
CH	B-J	5	0	2	2		99	0	27	10		265	0	58	0	
SI	B-J	48	4	13	12		33	1	6	4		102	3	20	0	
AC	B-J	6	2	0	2		2	1	0	1		13	2	0	0	
Total	B-F	2	2	0	1		20	20	0	8						
	B-J	84	7	22	22		328	20	63	30		392	5	78	0	

Notes

1. Systems are described in Table 3.1-1.
2. The ASME Code Category is based on the 1989 Edition, No Addenda of the ASME Section XI Code.
3. The column labeled "Other" is generally used to identify augmented inspection program locations that are credited beyond those locations selected per the RI-ISI process, as addressed in Section 3.6.5 of EPRI TR-112657. This option was not applicable for the Indian Point Unit 2 RI-ISI application. The "Other" column has been retained in this table solely for uniformity purposes with other RI-ISI application template submittals.

Table 5-2

Inspection Location Selection Comparison Between ASME Section XI Code, 1989 Edition, No Addenda and EPRI TR-112657 by Risk Category

System[1]	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	ASME Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other[2]
RC	2	High	High	TASCS	Medium	B-F	1	1	0	0	
						B-J	20	1	7	5	
RC	2	High	High	TASCS, TT	Medium	B-F	1	1	0	1	
						B-J	5	0	0	1	
RC	4	Medium	High	None	Low	B-F	20	20	0	8	
						B-J	162	18	15	11	
RC	5	Medium	Medium	TASCS	Medium	B-J	32	0	14	4	
RC	7	Low	Low	None	Low	B-J	12	0	5	0	
CH	2	High	High	TASCS	Medium	B-J	5	0	2	2	
CH	4	Medium	High	None	Low	B-J	49	0	18	5	
CH	5	Medium	Medium	TASCS	Medium	B-J	50	0	8	5	
CH	6	Low	Low	None	Medium	B-J	265	0	58	0	
SI	2	High	High	TASCS. IGSCC	Medium	B-J	17	0	7	4	
SI	2	High	High	IGSCC	MEDIUM	B-J	31	4	6	8	
SI	4	Medium	High	None	Low	B-J	6	0	0	1	
SI	5	Medium	Medium	IGSCC	Medium	B-J	27	1	5	3	
SI	6	Low	Medium	None	Low	B-J	102	3	14	0	

Table 5-2

Inspection Location Selection Comparison Between ASME Section XI Code, 1989 Edition, No Addenda and EPRI TR-112657 by Risk Category

System	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	ASME Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other[2]
AC	2	High	High	TASCS	Medium	B-J	6	2	0	2	
AC	4	Medium	High	None	Low	B-J	2	1	0	1	
AC	6	Low	Medium	None	Low	B-J	13	2	0	0	

Notes

1. Systems are described in Table 3.1-1.
2. The column labeled "Other" is generally used to identify augmented inspection program locations that are credited beyond those locations selected per the RI-ISI process, as addressed in Section 3.6.5 of EPRI TR-112657. This option was not applicable for the Indian Point Unit 2 RI-ISI application. The "Other" column has been retained in this table solely for uniformity purposes with other RI-ISI application template submittals.