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James Knubel
Senior Vice President and
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May 8, 2000
JPN-00-014

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

Subject: James A. FitzPatrick Nuclear Power Plant
Docket 50-333
Revised Risk-Informed Inservice Inspection (RI-ISI) Program

References: 1. NYPA letter, J. Knubel to USNRC dated October 13, 1999 (JPN-99-034) regarding "Risk-Informed Inservice Inspection (RI-ISI) Program."

Dear Sir:

In Reference 1, the Authority submitted a proposed risk-informed Inservice Inspection Program as an alternative to current ASME Section XI inspection requirements for Class 1 and 2 piping for review and approval by the NRC pursuant to 10 CFR 50.55a(a)(3). In subsequent discussions, the NRC staff suggested changes that would clarify our application.

The Authority has incorporated these clarifications into the proposed alternate program. Attachment I details the changes. Attachment II is the amended Section 3.8 and five revised tables reflecting these changes. The material in Attachment II supersedes and replaces the corresponding portions of Reference 1.

Augmented Inspection Programs

The Authority revised the program to detail how augmented inspection programs (i.e. Flow Accelerated Corrosion (FAC), Intergranular Stress Corrosion Cracking (IGSCC) and Microbiologically Influenced Corrosion (MIC)) will be coordinated with the risk-informed ISI program. In summary, under the revised program, the Authority will:

- continue with the FAC, IGSCC and MIC augmented inspection programs;
- select additional RI-ISI inspection locations, (if warranted for the risk category as dictated by the EPRI Topical Report) when the risk category is determined without the impact of FAC, IGSCC or MIC; and

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- take credit for the FAC, IGSCC and MIC examinations in the RI-ISI program.

Risk Impact Evaluation

In addition, the Authority performed a quantitative evaluation of the program to better understand the affect of RI-ISI on overall plant risk. This evaluation showed that implementation of this program will result in a decrease in the total core damage frequency at FitzPatrick. Details of this evaluation are in Section 3.8 of Attachment II.

This letter contains no new commitments. If you have any questions, please contact Ms. C. D. Faison.

Very truly yours,

J. Knubel
Senior Vice President and
Chief Nuclear Officer

Attachment: As stated

cc: Regional Administrator
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Attachment I to JPN-00-014

NEW YORK POWER AUTHORITY
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

RISK INFORMED INSERVICE INSPECTION PROGRAM
(Relief Request #20)

Section	Description of Change
Section 3.8	This section (entitled "Change is Risk") was replaced in its entirety to better describe the analysis that was performed and the results of the quantitative evaluation.
Table 3.4-1	The title of this table was changed from "Number of Segments by Risk Category" to "Number of Segments by Risk Category Including FAC, IGSCC and MIC."
Table 3.5-1	This table was changed to reflect segment risk ranking without the impact of the FAC, IGSCC and MIC degradation mechanisms.
Table 3.8-1	This was replaced with Tables 3.8-1A and 3.8-1B: • Table 3.8-1A shows the risk ranking results with the impact of the FAC, IGSCC and MIC degradation mechanisms. • Table 3.8-1B shows the risk ranking results without the impact of the FAC, IGSCC and MIC degradation mechanisms.
Table 3.8-2	This table was deleted.
Table 5-1	This was changed to reflect inspection locations as presented in Table 3.8-1B.

Attachment II to JPN-00-014

RISK INFORMED INSERVICE INSPECTION PROGRAM

(Relief Request #20)

NEW YORK POWER AUTHORITY
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
DOCKET NO. 50-333
DPR-59

3.8 Change in Risk

The risk-informed ISI program at Fitzpatrick has been conducted in accordance with Regulatory Guide 1.174, 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 N578 risk ranking matrix, and then determined for each of these risk regions 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, 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 Fitzpatrick 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 program taking into account degradation mechanisms FAC, IGSCC and MIC into the risk ranking process. The risk ranking provided in this table includes the impact of degradation mechanisms associated with and managed by augmented inspection programs (e.g. FAC). These other augmented programs have been defined in TR-112657 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 (e.g. FAC). Table 3.8-1B presents similar information, after performing the risk ranking without the impact of the FAC, IGSCC and MIC 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 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

- 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 Program 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 program.

The final column (change in risk) of Table 3.8-1B 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.

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 TR-112657, 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, the following discussion is focused on those locations identified as "Increase."

As identified in Table 3.8-1B, there is an overall increase of six 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 increase of one location in the medium risk region (i.e. Risk Categories 4 and 5). Not crediting the benefit of increased inspections in the high risk region, there is a net increase of seven inspection locations in the high and medium risk regions.

3.8-2 Quantitative Evaluation

As discussed above, the RI-ISI program at Fitzpatrick has been conducted in accordance with Regulatory Guide 1.174 and the EPRI methodology requirements, and the risk from implementation of this program is expected to remain neutral or decrease when compared to that estimated for current requirements.

Limits are imposed by the EPRI methodology (TR-112657) 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 TR-112657 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.

The Authority conducted a risk impact analysis per the requirements of Section 3.7 of EPRI TR-112657. The analysis estimates the net change in risk due to the positive and negative influence of adding and removing locations from the inspection program.

Of the 14 systems analyzed, eight systems passed the qualitative screen. The Authority conducted a risk quantification on the remaining six systems using the "Simplified Risk Quantification Method" described in Section 3.7.2. The analysis conducted is consistent with References 9 and 14 of TR-112657.

The conditional core damage probability (CCDP) used for high consequence category segments was based on the highest evaluated CCDP (1E-02), whereas, for the medium consequence category segments, bounding estimates of CCDP were used (i.e. 1E-04).

The likelihood of pressure boundary failure (PBF) is determined by the presence of different degradation mechanisms and the rank is based on the relative failure probability (instead of an absolute number). 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 IGSCC, TS, TT or CC) have a likelihood of 20 x_o and piping locations noted as high failure potential have a likelihood of 200 x_o.

In addition, the analysis was performed both with and without taking credit for the benefit of enhanced inspection effectiveness due to an increased probability of detection (POD) from application of the RI-ISI approach. The results of this evaluation are as follows:

System	Passed Qualitative Screen	$\Delta Risk_{CDF}$ Improved POD	$\Delta Risk_{CDF}$ No Improved POD
CRD	Yes	N/R	N/R
CS	No	4.0E-12	2.0E-11
ESW	Yes	N/R	N/R
FW	No	-4.4E-09	4.2E10
FPC	Yes	N/R	N/R
HPCI	Yes	N/R	N/R
MS	No	-3.4E-09	-1.8E-09
INST	Yes	N/R	N/R
RCIC	No	-8.5E-10	-8.5E-10
RWCU	No	1.5E-10	1.5E-10
RWR	No	9.0E-11	9.0E-11
RHR	Yes	N/R	N/R
RHRSW	Yes	N/R	N/R
SLC	Yes	N/R	N/R
Total Quantified Risk		-8.4E-09	-1.9E-09

The results show that implementation of the RI-ISI program at Fitzpatrick, lead to a decrease in the total core damage frequency (with or without crediting an improved POD) and are consistent with the TR-112657 CDF and LERF acceptance criteria.

3.8-3 Summary

In summary, the Fitzpatrick RI-ISI application credits, where appropriate, augmented inspection programs while defining new, additional inspections for those locations potentially susceptible to degradation that are not currently being addressed by the Section XI inspection program. There is an overall increase in the number of inspection locations in higher risk pipe segments and decrease in the number of locations in lower risk pipe segments.

The impact on risk of the Fitzpatrick 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 at Fitzpatrick, satisfies the acceptance criteria of Regulatory Guide 1.174 and the EPRI RI-ISI methodology requirements.

Table 3.4-1

Number of Segments by Risk Category Including FAC, IGSCC and MIC

System	***Risk Category 1***	***Risk Category 2***	***Risk Category 3***	***Risk Category 4***	***Risk Category 5***	***Risk Category 6***	***Risk Category 7***
CRD						1	3
CS				4	11	4	6
ESW		4			20		
FW	11		8				
FPC							1
HPCI		1	1	5	6	12	
MS	14		10	1	4	3	
INST					1	3	2
RCIC		1		4	3	6	1
RWCU	1		3	1	3	1	
RWR					40	20	
RHR		4		6	24	34	26
RHRSW		6				9	
SLC				1	1	2	
TOTAL	26	16	22	22	113	95	39

Table 3.5-1

Number of Locations/Inspections by Risk Category w/o FAC, IGSCC and MIC

System	***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.
CRD											3	0	51	0
CS							8	0	10	2	36	0	164	0
ESW (+)			1	1			3	0	15	2*	23	0		
FW			15	4			33	1+1*	11	3	22	0		
FPC (+)													30	0
HPCI			1	1			21	3	13	2	177	0		
MS			5	2			45	4	5	1	85	0	4	0
INST (+)									1	1	4	0	20	0
RCIC			8	2			25	3			72	0	9	0
RWCU							14	2			13	0	9	
RWR									10	1	132	0		
RHR			8	2			48	5	2	1	304	0	525	0
RHRSW (+)			4	1*			7	1*			2	0	24	0
SLC							1	0	2	1	18	0		

Pop. – Population, the number of welds in a particular risk category.
Insp. – Inspected, the number of welds selected for inspection.
(*) Inspections credited from augmented inspection programs.
(+) locations are defined as piping runs versus welds for these systems

TABLE 3.8-1A

(Risk Categories with FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2) Current Sect. XI	Locations Inspected (2) Proposed RI-ISI	Change in # of Inspec-tions	Number of Locations Addressed by Augmented Programs (3)	Number of Locations Currently Being Inspected in Augmented Programs (4)	Change in Risk
CRD	6	3	Medium	None	0	0	0			Change in risk is discussed in Table 3.8-1B
	7	50	Low	None	5	0	-5			
	7	1	None	IGSCC	0	0	0	1 / IGSCC	1 / IGSCC (D)	
CS	4	8	High	None	0	0	0			
	5	2	Medium	TS	0	0	0			
	5	6	Medium	TS, IGSCC	2	1	-1	6 / IGSCC	2 / IGSCC (A)	(6)
	5	2	Medium	CC, IGSCC	2	1	-1	2 / IGSCC	2 / IGSCC (1A/1D)	(6)
	5	7	Medium	IGSCC	5	0	-5	7 / IGSCC	5 / IGSCC (A)	
	6	29	Medium	None	2	0	-2			
	5	16	Low	FAC	5	0	-5	16 / FAC		
	7	148	Low	None	11	0	-11			
ESW	2	1	High	E-Cav, MIC	0	1	1	1 / MIC		
	2	3	High	MIC	0	0	0	3 / MIC	1/MIC	
	5	15	Medium	E-Cav, MIC	0	2*	0	15 / MIC	2/MIC	
	5	23	Medium	MIC	0	0	0	23 / MIC	2/MIC	
FW	1	1	High	CC, TS, FAC	0	1	1	1 / FAC		
	1	2	High	CC, TT, FAC	1	2	1	2 / FAC		

TABLE 3.8-1A

(Risk Categories with FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Addressed by Augmented Programs (3)	Number of Locations Currently Being Inspected in Augmented Programs (4)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
	1	3	High	CC, FAC	0	0	0	3 / FAC		Change in risk is discussed in Table 3.8-1B
	1	3	High	TS, FAC	1	1	0	3 / FAC		
	1	6	High	TT, FAC	2	0	-2	6 / FAC		
	1	33	High	FAC	9	1+1*	-8	33 / FAC	1/FAC (5)	
	3	2	Medium	CC, TT, FAC	1	1	0	2 / FAC		
	3	3	Medium	TS, FAC	2	2	0	3 / FAC		
	3	6	Medium	TT, FAC	2	0	-2	6 / FAC		
	3	22	Medium	FAC	9	0	-9	22 / FAC		
FPC										
	7	30	Low	None	0	0	0			
HPCI										
	2	1	High	TS	0	1	1			
	4	21	High	None	3	3	0			
	5	13	Medium	TS	0	2	2			
	5	4	Medium	MIC	0	0	0	4 / MIC		
	6	171	Medium	None	13	0	-13			
	3	2	Medium	FAC	0	0	0	2 / FAC		
MS										
	1	5	High	TS, FAC	0	2	2	5 / FAC		
	1	39	High	FAC	7	3	-4	39 / FAC		
	4	6	High	None	2	1	-1			
	3	5	Medium	TS, FAC	0	1	1	5 / FAC		
	3	69	Medium	FAC	17	0	-17	69 / FAC	1/FAC (5)	

TABLE 3.8-1A

(Risk Categories with FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2) Current Sect. XI	Locations Inspected (2) Proposed RI-ISI	Change in # of Inspec-tions	Number of Locations Addressed by Augmented Programs (3)	Number of Locations Currently Being Inspected in Augmented Programs (4)	Change in Risk
	6	16	Medium	None	4	0	-4			Change in risk is discussed in Table 3.8-1B
	5	4	Low	FAC	4	0	-4	4 / FAC		
INST										
	5	1	Medium	TS	0	1	1			
	6	2	Medium	None	0	0	0			
	6	2	Low	TS	0	0	0			
	7	20	Low	None	0	0	0			
RCIC										
	2	8	High	CC	1	2	1			
	4	25	High	None	6	3	-3			
	6	66	Medium	None	0	0	0			
	5	6	Medium	MIC	0	0	0	6 / MIC		
	7	9	Low	None	0	0	0			
RWCU	1	2	High	FAC	2	0	-2	2 / FAC		
	4	12	High	None	3	2	-1			
	3	8	Medium	FAC	1	0	-1	8 / FAC		
	5	4	Low	TS, FAC	0	0	0	4/ FAC	1/FAC(5)	
	6	1	Medium	None	0	0	0			
	5	9	Low	FAC	2	0	-2	9/ FAC		
RWR	5	10	Medium	CC, IGSCC	10	1	-10	10 / IGSCC	10/IGSCC (D)	(6)
	5	103	Medium	IGSCC	33	0	-33	103 / IGSCC	70/IGSCC (5A/42C/2D/21E)	

TABLE 3.8-1A

(Risk Categories with FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Addressed by Augmented Programs (3)	Number of Locations Currently Being Inspected in Augmented Programs (4)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
	6	29	Medium	None	0	0	0			Change in risk is discussed in Table 3.8-1B
RHR	2	5	High	E-Cav	1	1	0			
	2	3	High	TS	0	1	1			
	4	48	High	None	3	5	2			
	5	2	Medium	TS	0	1	1			
	5	5	Medium	IGSCC	5	0	-5	5 / IGSCC	5/IGSCC (1A/4D)	
	5	9	Low	E-Cav, TS, FAC	1	0	-1	9 / FAC		
	5	8	Low	E-Cav, TT, FAC	0	0	0	8 / FAC		
	5	2	Low	E-CAV, FAC	1	0	-1	2 / FAC		
	5	1	Low	TS, FAC	0	0	0	1 / FAC		
	5	2	Low	TT, FAC	0	0	0	2 / FAC		
	6	36	Medium	None	2	0	-2			
	6	34	Low	E-Cav, TT	0	0	0			
	6	7	Low	E-Cav	1	0	-1			
	6	173	Low	TT	16	0	-16			
	6	27	Low	TS	2	0	-2			
	5	103	Low	FAC	2	0	-2	103 / FAC	1/FAC(5)	
	6	2	Low	IGSCC	2	0	-2	2 / IGSCC	2/IGSCC (D)	
	7	420	Low	None	30	0	-30			
RHRSW	2	4	High	E-Cav, MIC	0	1*	0	4 / MIC	1/MIC	
	2	7	High	MIC	0	1*	0	7 / MIC	1/MIC	
	6	2	Low	E-Cav, MIC	0	0	0	2 / MIC	1/MIC	

TABLE 3.8-1A

(Risk Categories with FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Addressed by Augmented Programs (3)	Number of Locations Currently Being Inspected in Augmented Programs (4)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
	6	24	Low	MIC	0	0	0	24 / MIC	4/MIC	Change in risk is discussed in Table 3.8-1B
SLC	4	1	High	None	0	0	0			
	5	2	Medium	TS	0	1	1			
	6	18	Medium	None	0	0	0			

Notes:

(*) Inspections credited from augmented programs

(1) Risk ranking includes impact of all degradation mechanism (e.g. FAC, IGSCC, MIC)

(2) Excludes surface examinations

(3) Included in programs to address FAC, IGSCC and MIC, as appropriate.

(4) For the IGSCC program the current inspection requirements are: 25% of category "A" welds every 10 years, 100% of category "C" every 10 years, and 100% of category "D" and "E" every 2 refueling cycles. For the FAC and MIC programs locations are evaluated to determine susceptibility and inspection locations and frequency are based on wear predictions and pervious inspection results.

(5) The FAC program includes the portions of FW and MS systems that are outside of the scope of the RI ISI program (i.e. non-code piping). The FW and MS systems (code and non-code piping) are modeled in the Checworks program, which is updated as additional exams are completed.

(6) For these locations, the augmented inspection location and the Section XI inspection location are one in the same. The RI-ISI program requires an additional examination (e.g. increased inspection volume) to capture the identified degradation mechanism (e.g. thermal fatigue).

TABLE 3.8-1B

(Risk Categories without FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Currently Being Inspected in Augmented Programs (3)	Number of Locations from Augmented Programs Credited in RI ISI (4) (5)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
CRD	6	3	Medium	None	0	0	0			No Change
	7	50	Low	None	5	0	-5			Negligible
	7	1	None	(IGSCC)	0	0	0	1 / IGSCC (D)		No Change
CS	4	8	High	None	0	0	0			No Change
	5	2	Medium	TS	0	0	0			No Change
	5	6	Medium	TS (IGSCC)	2	1	-1	2 / IGSCC (A)		Acceptable (6)
	5	2	Medium	CC (IGSCC)	2	1	-1	2 / IGSCC (1A/1D)		Acceptable (6)
	6	7	Medium	(IGSCC)	5	0	-5	5 / IGSCC (A)		Negligible
	6	29	Medium	None	2	0	-2			Negligible
	7	16	Low	(FAC)	5	0	-5			Negligible
	7	148	Low	None	11	0	-11			Negligible
ESW	2	1	High	E-Cav (MIC)	0	1	1			Improvement
	4	3	High	(MIC)	0	0	0	1/MIC		No Change
	5	15	Medium	E-Cav (MIC)	0	2*	0	2/MIC	2	No Change
	6	23	Medium	(MIC)	0	0	0	2/MIC		No Change
FW	2	1	High	CC, TS (FAC)	0	1	1			Improvement
	2	2	High	CC, TT (FAC)	1	2	1			Improvement
	2	3	High	CC (FAC)	0	0	0			No Change

TABLE 3.8-1B

(Risk Categories without FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Currently Being Inspected in Augmented Programs (3)	Number of Locations from Augmented Programs Credited in RI ISI (4) (5)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
	2	3	High	TS (FAC)	1	1	0			No Change
	2	6	High	TT (FAC)	2	0	-2			Increase
	4	33	High	(FAC)	9	1+1*	-8	1/FAC	1	Acceptable
	5	2	Medium	CC, TT (FAC)	1	1	0			No Change
	5	3	Medium	TS (FAC)	2	2	0			No Change
	5	6	Medium	TT (FAC)	2	0	-2			Increase
	6	22	Medium	(FAC)	9	0	-9			Negligible
FPC										
	7	30	Low	None	0	0	0			No Change
HPCI										
	2	1	High	TS	0	1	1			Improvement
	4	21	High	None	3	3	0			No Change
	5	13	Medium	TS	0	2	2			Improvement
	6	4	Medium	(MIC)	0	0	0			No Change
	6	171	Medium	None	13	0	-13			Negligible
	6	2	Medium	(FAC)	0	0	0			No Change
MS										
	2	5	High	TS (FAC)	0	2	2			Improvement
	4	39	High	(FAC)	7	3	-4			Acceptable
	4	6	High	None	2	1	-1			Increase
	5	5	Medium	TS (FAC)	0	1	1			Improvement
	6	69	Medium	(FAC)	17	0	-17	1/FAC		Negligible
	6	16	Medium	None	4	0	-4			Negligible
	7	4	Low	(FAC)	4	0	-4			Negligible

TABLE 3.8-1B

(Risk Categories without FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Currently Being Inspected in Augmented Programs (3)	Number of Locations from Augmented Programs Credited in RI ISI (4) (5)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
INST										
	5	1	Medium	TS	0	1	1			Improvement
	6	2	Medium	None	0	0	0			No Change
	6	2	Low	TS	0	0	0			No Change
	7	20	Low	None	0	0	0			No Change
RCIC										
	2	8	High	CC	1	2	1			Improvement
	4	25	High	None	6	3	-3			Increase
	6	66	Medium	None	0	0	0			No Change
	6	6	Medium	(MIC)	0	0	0			No Change
	7	9	Low	None	0	0	0			No Change
RWCU	4	2	High	(FAC)	2	0	-2			Acceptable
	4	12	High	None	3	2	-1			Increase
	6	8	Medium	(FAC)	1	0	-1			Negligible
	6	4	Low	TS (FAC)	0	0	0	1/FAC		No Change
	6	1	Medium	None	0	0	0			No Change
	7	9	Low	(FAC)	2	0	-2			Negligible
RWR	5	10	Medium	CC (IGSCC)	10	1	-10	10/IGSCC (D)		Acceptable (6)
	6	103	Medium	(IGSCC)	33	0	-33	70/IGSCC (5A/42C/2D/21E)		Negligible
	6	29	Medium	None	0	0	0			No Change

TABLE 3.8-1B

(Risk Categories without FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Currently Being Inspected in Augmented Programs (3)	Number of Locations from Augmented Programs Credited in RI ISI (4) (5)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
RHR	2	5	High	E-Cav	1	1	0			No Change
	2	3	High	TS	0	1	1			Improvement
	4	48	High	None	3	5	2			Improvement
	5	2	Medium	TS	0	1	1			Improvement
	6	5	Medium	(IGSCC)	5	0	-5	5/IGSCC (1A/4D)		Negligible
	6	9	Low	E-Cav, TS (FAC)	1	0	-1			Negligible
	6	8	Low	E-Cav, TT (FAC)	0	0	0			No Change
	6	2	Low	E-CAV (FAC)	1	0	-1			Negligible
	6	1	Low	TS (FAC)	0	0	0			No Change
	6	2	Low	TT (FAC)	0	0	0			No Change
	6	36	Medium	None	2	0	-2			Negligible
	6	34	Low	E-Cav, TT	0	0	0			No Change
	6	7	Low	E-Cav	1	0	-1			Negligible
	6	173	Low	TT	16	0	-16			Negligible
	6	27	Low	TS	2	0	-2			Negligible
	7	103	Low	(FAC)	2	0	-2	1/FAC		Negligible
	7	2	Low	(IGSCC)	2	0	-2	2/IGSCC (D)		Negligible
	7	420	Low	None	30	0	-30			Negligible
RHRSW	2	4	High	E-Cav (MIC)	0	1*	0	1/MIC	1	No Change
	4	7	High	(MIC)	0	1*	0	1/MIC	1	No Change
	6	2	Low	E-Cav (MIC)	0	0	0	1/MIC		No Change
	7	24	Low	(MIC)	0	0	0	4/MIC		No Change

TABLE 3.8-1B

(Risk Categories without FAC, IGSCC, and MIC)

SYSTEM	Risk Category (1)	Number of Locations in Risk Category	Consequence Rank	Degradation Mechanism	Locations Inspected (2)		Change in # of Inspec-tions	Number of Locations Currently Being Inspected in Augmented Programs (3)	Number of Locations from Augmented Programs Credited in RI ISI (4) (5)	Change in Risk
					Current Sect. XI	Proposed RI-ISI				
SLC	4	1	High	None	0	0	0			No Change
	5	2	Medium	TS	0	1	1			Improvement
	6	18	Medium	None	0	0	0			No Change

Notes:

(*) Inspections credited from augmented programs

(1) Risk ranking excludes impact of degradation mechanism inspected in augmented programs (e.g. FAC, IGSCC, MIC)

(2) Excludes surface examinations

(3) Included in programs to address FAC, IGSCC and MIC, as appropriate.

(4) For the IGSCC program the current inspection requirements are: 25% of category "A" welds every 10 years, 100% of category "C" every 10 years, and 100% of category "D" and "E" every 2 refueling cycles. For the FAC and MIC programs locations are evaluated to determine susceptibility and inspection locations and frequency are based on wear predictions and pervious inspection results.

(5) The FAC program includes the portions of FW and MS systems that are outside of the scope of the RI ISI program (i.e. non-code piping). The FW and MS systems (code and non-code piping) are modeled in the Checworks program, which is updated as additional exams are completed.

(6) For these locations, the augmented inspection location and the Section XI inspection location are one in the same. The RI-ISI program requires an additional examination (e.g. increased inspection volume) to capture the identified degradation mechanism (e.g. thermal fatigue).

Table 5-1
Inspection Location Selections
Comparison to ASME Section XI 1989 Edition Requirements

System	Number of High/ Medium Risk Region Segments (1)	RI-ISI Inspection Locations (2)				ASME Section XI 1989 Edition Examination Requirements				Number of H/M Segments Credited in Augmented Programs (3)
		Class 1	Class 2	Class 3	NNS	B-F	B-J	C-F-1	C-F-2	
CRD	0/0								5	
CS	0/15	1	1			4	12		11	7
ESW	4/20			1 + 2*						24
FW	19/0	8+1*					27			19
FPC	0/0									
HPCI	2/11	4	2				7		9	1
MS	24/5	7					34			28
INST	0/1	1								
RCIC	1/7	5					7			
RWCU	4/4	2					8			7
RWR	0/40	1				12	31			40
RHR	4/30	3	5			7	11		48	23
RHRSW	6/0			2*						6
SLC	0/2	1								
TOTAL		33 + 1*	8	1 + 4*		23	137		73	

(1) - 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).

(2) - * = inspections credited from augmented inspection programs.

(3) - Includes programs to address Generic Letter 89-08 (FAC), Generic Letter 88-01 (IGSCC in BWRs) and service water reliability (Generic Letter 89-13).