CP&L
A Progress Energy Company

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10 CFR 50.55a(a)(3)(i)

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U. S. Nuclear Regulatory Commission
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BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
THIRD 10-YEAR INSERVICE INSPECTION PROGRAM – REQUEST FOR APPROVAL OF RISK-INFORMED INSERVICE INSPECTION PROGRAM

Gentlemen:

In accordance with 10 CFR 50.55a(a)(3)(i), Carolina Power & Light (CP&L) Company is requesting NRC approval of an alternative to the requirements of the 1989 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. Approval of the proposed alternative is needed to implement a Risk-Informed Inservice Inspection (RI-ISI) Program for Class 1 Code Category B-J and B-F piping welds at BSEP, Units 1 and 2.

By letter dated April 23, 1998 (Serial: BSEP 98-0087), CP&L submitted the third 10-year inservice inspection program for BSEP, Units 1 and 2. The code of record for the third 10-year inservice inspection program is the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no addenda. The third 10-year inservice inspection interval began on May 11, 1998.

Subsequently, by letter dated August 8, 2000 (Serial: BSEP 00-0111), CP&L requested approval of an alternative to the minimum examination percentages associated with ASME Code Categories B-J and B-F for the first inspection period of the current inspection interval for BSEP, Unit 2. Approval of the alternative was requested to allow delay of certain Class 1 piping weld examinations that might no longer be required once a RI-ISI Program is established. This alternative was granted by the NRC in a letter dated November 29, 2000.

The purpose of this letter is to request relief, in accordance with 10 CFR 50.55a(a)(3)(i), from the requirements of the 1989 Edition of the ASME Code, Section XI, for BSEP, Units 1 and 2, in order to implement a RI-ISI Program for Class 1 Code Category B-J and B-F piping welds. The enclosed RI-ISI Program for BSEP, Units 1 and 2 has been developed in accordance with the Electric Power Research Institute (EPRI) methodology contained in EPRI Topical Report TR-112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," Revision B-A. EPRI Report TR-112657 was approved by the NRC's Safety

Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461

A047

Evaluation Report dated October 28, 1999. This RI-ISI Program supports CP&L's conclusion that the proposed alternative provides an acceptable level of quality and safety, as required by 10 CFR 50.55a(a)(3)(i).

The NRC has previously approved RI-ISI Programs, based on EPRI Topical Report TR-112657, for Vermont Yankee Nuclear Power Corporation (NRC TAC No. M99389) and James A. Fitzpatrick Plant (TAC No. MA6926).

CP&L plans to implement the RI-ISI Program for BSEP, Units 1 and 2, during the second period of the third 10-year inservice inspection interval. In order to support planning activities associated with the next BSEP, Unit 1 refueling outage, CP&L requests NRC approval of the proposed alternative by August 1, 2001. The next BSEP, Unit 1 refueling outage (i.e., B114R1) is currently scheduled to begin March 2, 2002.

Please refer any questions regarding this submittal to Mr. Leonard R. Beller, Supervisor - Licensing, at (910) 457-2073.

Sincerely,

Leonard R. Beller
For

David C. DiCello
Manager - Regulatory Affairs
Brunswick Steam Electric Plant

WRM/wrm

Enclosure: Risk-Informed Inservice Inspection Program Plan, Brunswick Steam Electric Plant, Units 1 and 2 (Revision 0)

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Luis A. Reyes, Regional Administrator
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Theodore A. Easlick, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission
ATTN: Mr. Donnie J. Ashley (Mail Stop OWFN 8G9)
11555 Rockville Pike
Rockville, MD 20852-2738

Ms. Jo A. Sanford
Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Division of Boiler and Pressure Vessel
North Carolina Department of Labor
ATTN: Mr. Jack Given, Assistant Director of Boiler & Pressure Vessels
4 West Edenton Street
Raleigh, NC 27601-1092

ENCLOSURE

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DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
THIRD 10-YEAR INSERVICE INSPECTION PROGRAM – REQUEST FOR APPROVAL OF
RISK-INFORMED INSERVICE INSPECTION PROGRAM

Risk-Informed Inservice Inspection Program Plan,
Brunswick Steam Electric Plant, Units 1 and 2 (Revision 0)

RISK-INFORMED INSERVICE INSPECTION PROGRAM PLAN

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

(REVISION 0)

Table of Contents

1. INTRODUCTION

The Brunswick Steam Electric Plant (BSEP) Units 1 and 2 are 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 Inspection Program B. The third ISI interval for BSEP Units 1 and 2 commenced on May 11, 1998. Pursuant to 10 CFR 50.55a(g)(4)(ii), the applicable ASME Section XI Code for the third ISI interval is the 1989 Edition, no Addenda.

The objective of this submittal is to request a change to the ISI Program for Class 1 piping through the use of a risk-informed inservice inspection (RI-ISI) program. 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 PSA Quality

The BSEP Individual Plant Examination (IPE) addressing the internal events analysis was submitted to NRC in August 1992. The base core damage frequency (CDF) for the Level 1 IPE was 2.7E-5 per year. The NRC Staff completed a review of the IPE submittal and issued a Staff Evaluation Report (SER) dated January 21, 2000. In the SER, the NRC concluded that the Brunswick IPE submittal and associated documentation fully met the intent of Generic Letter 88-20. The criteria in NUMARC 91-04, "Severe Accident Issue Closure Guidelines" were used to screen for plant-specific vulnerabilities and none were identified. However, based upon insights established by the IPE, a number of procedural improvements and hardware modifications have been implemented to enhance the capability of recovering from a station blackout event, recovering offsite power, and extending battery life if the station battery chargers were lost. Also, licensed operator training has been enhanced with respect to loss of decay heat removal.

The BSEP Probabilistic Risk Assessment (PRA) has been subjected to a number of internal and independent reviews as cited in Section 5.2 of the IPE submittal documentation. These included reviews by NRC and their independent contractor INEL, reviews of specific elements of the PRA developed by Carolina Power and Light (CP&L) by various site organizations and consultants such as NUS Corporation, CP&L technical reviews of tasks performed by consultants, a multi-disciplined CP&L severe accident issues project team review of results and insights, and an external review of the methodology and assumptions by experts in Boiling Water Reactor (BWR) PRAs from ERIN Engineering and SAIC. All comments and insights resulting from these reviews were resolved prior to the IPE submittal.

The IPE has been maintained as a "living model". The original IPE model was subsequently updated, with changes documented in September 1993, August 1994, and January 1996. A major upgrade, referred to as Model-of-Record 1998 (MOR 98), was conducted for the IPE model during 1998-2000 to incorporate additional system modeling details and to enhance the treatment of common cause failures, circular logic, Loss of Offsite Power recovery, and human reliability analysis. The upgrade also provided for a complete update of the associated failure database. The system fidelity is current through October 1998 and the plant-specific database is current through November 1999. However, it should be noted that Nuclear Condition Report No. 20277 identified potentially non-conservative assumptions involving the treatment of DC chargers in the model. A sensitivity study was performed and it does not impact the conclusions of the Risk-Informed ISI consequence analysis.

ERIN Engineering independently reviewed the Level 1 results of the upgraded the model in April 2000. The review included observations related to the Probabilistic Safety Assessment (PSA) technical elements specified in the Boiling Water Reactor Owners' Group Probabilistic Safety Assessment Peer Review Certification Process. This review recognized the upgraded Brunswick model as containing excellent structure, level of detail, and documentation. All significant comments and insights from this review were resolved during MOR 98 development. Results generated with MOR 98 were provided by CP&L for the Risk-Informed ISI consequence analysis. The base core damage frequency for MOR 98 at the time of the RI-ISI analysis was 2.5E-5 per year when a truncation of 2E-9/yr was used. The baseline CDF for either unit at BSEP is approximately 2.7E-5/yr when a truncation of 1E-9/yr is used. The Large Early Release Frequency (LERF) value is assumed to be approximately 12% of CDF based on the IPE results. It should be noted that the Level 2 model is in the process of being updated, but results are not yet available.

Periodic updates of the PSA model are controlled by procedure ADM-NGGC-0004, "Periodic Updates of PSA Models". In addition, procedure EGR-NGGC-0005, "Engineering Service Requests" requires that plant engineers screen proposed modifications for impact to the Maintenance Rule or PSA programs. If either of these programs is impacted, then an affected organization review is performed by the appropriate program engineer.

The BSEP Individual Plant Examination of External Events (IPEEE) addressing external events analysis was submitted to NRC in June 1995. This submittal included the external events analysis performed with respect to seismic events, internal fires, high winds and tornadoes, external flooding, and transportation and nearby facility accidents. The NRC completed a review of the IPEEE submittal and issued an SER dated November 18, 1998. In the SER, the NRC indicated that the IPEEE process utilized by CP&L in evaluating Brunswick was capable of identifying the most likely severe accidents and severe accident vulnerabilities. The NRC identified no potential vulnerabilities during the review and concluded that the Brunswick IPEEE met the intent of Supplement 4 to Generic Letter 88-20. There have been no subsequent updates by CP&L to the IPEEE. The results of the IPEEE were available for reference during preparation of the RI-ISI consequence analysis.

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 current 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

The following augmented inspection programs were considered during the RI-ISI application:

- In a letter to the NRC dated February 19, 2001, CP&L notified the NRC that the Brunswick Plant was adopting the guidance contained in BWR Vessel and Internals Project Report No. BWRVIP-75. BWRVIP-75 provides alternative criteria to NRC Generic Letter 88-01 for the examination of welds subject to intergranular stress corrosion cracking (IGSCC). Both Generic Letter 88-01 and BWRVIP-75 specify examination extent and frequency requirements for austenitic stainless steel welds that are classified as Categories "A" through "G", depending on their susceptibility to IGSCC. In accordance with EPRI TR-112657, piping welds identified as Category "A" are considered resistant to IGSCC, and, as such are assigned a low failure potential provided no other damage mechanisms are present. The existing augmented inspection program for the other piping welds subject to IGSCC at BSEP (e.g., Categories "B" through "G") remains unaffected by the RI-ISI submittal.
- The augmented inspection program for flow accelerated corrosion (FAC) per Generic Letter 89-08 is relied upon to manage this damage mechanism but is not otherwise affected or changed by the RI-ISI program.

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

A deviation to the EPRI RI-ISI methodology has been implemented in the failure potential assessment for BSEP. Table 3-16 of EPRI TR-112657 contains criteria for assessing the potential for thermal stratification, cycling and striping (TASCS). Key attributes for horizontal or slightly sloped piping greater than 1" nominal pipe size (NPS) include:

1. Potential exists for low flow in a pipe section connected to a component allowing mixing of hot and cold fluids, or
2. Potential exists for leakage flow past a valve, including in-leakage, out-leakage and cross-leakage allowing mixing of hot and cold fluids, or
3. Potential exists for convective heating in dead-ended pipe sections connected to a source of hot fluid, or
4. Potential exists for two phase (steam/water) flow, or
5. Potential exists for turbulent penetration into a relatively colder branch pipe connected to header piping containing hot fluid with turbulent flow,

AND

$\Delta T > 50°F$,

AND

Richardson Number > 4 (*this value predicts the potential buoyancy of a stratified flow)*

These criteria, based on meeting a high cycle fatigue endurance limit with the actual ΔT assumed equal to the greatest potential ΔT for the transient, will identify all locations where stratification is likely to occur, but allows for no assessment of severity. As such, many locations will be identified as subject to TASCS where no significant potential for thermal fatigue exists. The critical attribute missing from the existing methodology that would allow consideration of fatigue severity is a criterion that addresses the potential for fluid cycling. The impact of this additional consideration on the existing TASCS susceptibility criteria is presented below.

- **Turbulent penetration TASCS**

  Turbulent penetration typically occurs in lines connected to piping containing hot flowing fluid. In the case of downward sloping lines that then turn horizontal, significant top-to-bottom cyclic ΔTs can develop in the horizontal sections if the horizontal section is less than about 25 pipe diameters from the reactor coolant piping. Therefore, TASCS is considered for this configuration.

  For upward sloping branch lines connected to the hot fluid source that turn horizontal or in horizontal branch lines, natural convective effects combined with effects of turbulence penetration will keep the line filled with hot water. If there is no potential for in-leakage towards the hot fluid source from the outboard end of the line, this will result in a well-mixed fluid condition where significant top-to-bottom ΔTs will not occur. Therefore TASCS is not considered for these configurations. Even in fairly long lines, where some

heat loss from the outside of the piping will tend to occur and some fluid stratification may be present, there is no significant potential for cycling as has been observed for the in-leakage case. The effect of TASCS will not be significant under these conditions and can be neglected.

- **Low flow TASCS**

  In some situations, the transient startup of a system (e.g., RHR suction piping) creates the potential for fluid stratification as flow is established. In cases where no cold fluid source exists, the hot flowing fluid will fairly rapidly displace the cold fluid in stagnant lines, while fluid mixing will occur in the piping further removed from the hot source and stratified conditions will exist only briefly as the line fills with hot fluid. As such, since the situation is transient in nature, it can be assumed that the criteria for thermal transients (TT) will govern.

- **Valve leakage TASCS**

  Sometimes a very small leakage flow of hot water can occur outward past a valve into a line that is relatively colder, creating a significant temperature difference. However, since this is a generally a "steady-state" phenomenon with no potential for cyclic temperature changes, the effect of TASCS is not significant and can be neglected.

- **Convection heating TASCS**

  Similarly, there sometimes exists the potential for heat transfer across a valve to an isolated section beyond the valve, resulting in fluid stratification due to natural convection. However, since there is no potential for cyclic temperature changes in this case, the effect of TASCS is not significant and can be neglected.

In summary, these additional considerations for determining the potential for thermal fatigue as a result of the effects of TASCS provide an allowance for the consideration of cycle severity in assessing the potential for TASCS effects. The above criteria has previously been submitted by EPRI for generic approval (Letter dated February 28, 2001, P.J. O'Regan (EPRI) to Dr. B. Sheron (USNRC), "Extension of Risk-Informed Inservice Inspection Methodology").

3.1 Scope of Program

The systems included in the RI-ISI program are provided in Tables 3.1-1 and 3.1-2 for Units 1 and 2, respectively. 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 (i.e., 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-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, with the exception of the previously stated deviation.

Tables 3.3-1 and 3.3-2 summarize the failure potential assessment by system for each degradation mechanism that was identified as potentially operative for Units 1 and 2, respectively.

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 (i.e., 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 Tables 3.4-1 and 3.4-2 for Units 1 and 2, respectively.

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. As depicted below, the percentage of Class 1 welds selected for examination per the RI-ISI process is greater than 10% for both BSEP units. It should be noted that the 10% figure was achieved for both units based on welds that are subject to volumetric examination rather than just a VT-2 visual examination. In addition, as stated in TR-112657, the existing FAC and IGSCC augmented inspection programs provide the means to effectively manage these mechanisms. No additional credit was taken for any FAC or IGSCC augmented inspection program locations beyond those selected by the RI-ISI process to meet the sampling percentage requirements.

A brief summary is provided on the following page, and the results of the selection are presented in Tables 3.5-1 and 3.5-2 for Units 1 and 2, respectively. Section 4 of EPRI TR-112657 was used as guidance in determining the examination requirements for these locations.

Unit	Class 1 Piping Welds[1]	
	Total Number of Welds	RI-ISI Program Selections
1	515	67
2	503	61

Notes

1. Includes all 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 additional segments are subject to the same root cause conditions. Additional examinations will be performed on these elements up to a number equivalent to the number of elements required to be inspected on the segment or segments initially. If unacceptable flaws 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 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.

In instances where locations are 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.

None of the existing BSEP relief requests are being withdrawn due to the RI-ISI application.

3.6 Risk Impact Assessment

The RI-ISI program 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 have a negligible increase 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 Quantitative Analysis

Limits are imposed by the EPRI methodology to ensure that the change in risk of implementing the RI-ISI program meets the requirements of Regulatory Guides 1.174 and 1.178. The EPRI criterion requires that the cumulative change in core damage frequency (CDF) and large early release frequency (LERF) be less than 1E-07 and 1E-08 per year per system, respectively.

Brunswick 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. A risk quantification was performed using the "Simplified Risk Quantification Method" described in Section 3.7 of EPRI TR-112657. The conditional core damage probability (CCDP) and conditional large early release probability (CLERP) used for high consequence category segments was based on the highest evaluated CCDP (1E-02) and CLERP (3E-03), whereas, for medium consequence category segments, bounding estimates of CCDP (1E-04) and CLERP (1E-05) were used. 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. The basic likelihood of PBF for a piping location with no degradation mechanism present is given as x_o and is expected to have a value less than 1E-08. Piping locations identified as medium failure potential have a likelihood of $20x_o$. In addition, the analysis was performed both with and without taking credit for enhanced inspection effectiveness due to an increased POD from application of the RI-ISI approach. The PBF likelihoods and POD values used in the analysis are consistent with those used in the approved RI-ISI pilot applications at Arkansas Nuclear One, Unit 2, and Vermont Yankee, as documented in References 9 and 14 of EPRI TR-112657.

Tables 3.6-1 and 3.6-2 present summaries of the RI-ISI program versus 1989 ASME Section XI Code Edition program requirements and identify on a per system basis, each applicable risk category for Units 1 and 2, respectively. The presence of FAC and IGSCC were adjusted for in the performance of the

quantitative analysis by excluding their impact on the risk ranking. However, in an effort to be as informative as possible, for those systems where FAC and/or IGSCC are present, Tables 3.6-1 and 3.6-2 present the information in such a manner as to depict what the resultant risk categorization is both with and without consideration of FAC and/or IGSCC. This is accomplished by enclosing the FAC and/or IGSCC damage mechanisms, as well as all other resultant corresponding changes (i.e., failure potential rank, risk category and risk rank), in parenthesis. Again, this has only been done for information purposes, and has no impact on the assessment itself. The use of this approach to depict the impact of degradation mechanisms managed by augmented inspection programs on the risk categorization is consistent with that used in the delta risk assessment for the Arkansas Nuclear One, Unit 2 pilot application. An example is provided below.

System	Risk		Consequence Rank	Failure Potential	
	Category	Rank[(1)]		DMs	Rank
FW	5 (3)	Medium (High)	Medium	TASCS, TT, (FAC)	Medium (High)

In this example if FAC is not considered, the failure potential rank is "medium" instead of "high" based on the TASCS and TT damage mechanisms. When a "medium" failure potential rank is combined with a "medium" consequence rank, it results in risk category 5 ("medium" risk) being assigned instead of risk category 3 ("high" risk).

In this example if FAC were considered, the failure potential rank would be "high" instead of "medium". If a "high" failure potential rank were combined with a "medium" consequence rank, it would result in risk category 3 ("high" risk) being assigned instead of risk category 5 ("medium" risk).

Note

1. The risk rank is not included in Tables 3.6-1 or 3.6-2 but it is included in Tables 5-2-1 and 5-2-2.

As indicated in the following tables, this evaluation has demonstrated that unacceptable risk impacts will not occur from implementation of the RI-ISI program, and satisfies the acceptance criteria of Regulatory Guide 1.174 and EPRI TR-112657.

Unit 1 Risk Impact Results

System[1]	ΔRisk$_{CDF}$		ΔRisk$_{LERF}$	
	w/ POD	w/o POD	w/ POD	w/o POD
RPV	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
RCR	8.25E-09	8.25E-09	2.48E-09	2.48E-09
RWCU	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RCIC	no change	no change	no change	no change
RHR	1.00E-10	1.00E-10	3.00E-11	3.00E-11
CS	1.25E-09	1.25E-09	3.75E-10	3.75E-10
HPCI	1.00E-10	1.00E-10	3.00E-11	3.00E-11
MS	7.50E-10	7.50E-10	2.25E-10	2.25E-10
FW	-5.22E-09	1.59E-09	-1.56E-09	4.79E-10
CRD	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
JPI	no change	no change	no change	no change
Total	**5.11E-09**	**1.19E-08**	**1.54E-09**	**3.58E-09**

Note
1. Systems are described in Table 3.1-1.

Unit 2 Risk Impact Results

System[1]	ΔRisk$_{CDF}$		ΔRisk$_{LERF}$	
	w/ POD	w/o POD	w/ POD	w/o POD
RPV	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
RCR	8.10E-09	8.10E-09	2.43E-09	2.43E-09
RWCU	1.50E-10	1.50E-10	4.50E-11	4.50E-11
RCIC	no change	no change	no change	no change
RHR	5.00E-11	5.00E-11	1.50E-11	1.50E-11
CS	1.25E-09	1.25E-09	3.75E-10	3.75E-10
HPCI	1.00E-10	1.00E-10	3.00E-11	3.00E-11
MS	7.50E-10	7.50E-10	2.25E-10	2.25E-10
FW	-3.07E-09	5.40E-10	-9.17E-10	1.64E-10
CRD	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
JPI	no change	no change	no change	no change
Total	**7.26E-09**	**1.09E-08**	**2.19E-09**	**3.27E-09**

Note
1. Systems are described in Table 3.1-2.

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 extent of examination is determined in accordance with the criteria of 10CFR50.55a(b)(2)(ii). 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 leak 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 Class 1 pressure boundaries 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 inservice 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. 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 directed by NRC Bulletin or Generic Letter requirements, or by industry and plant specific feedback.

5. PROPOSED ISI PROGRAM PLAN CHANGE

A comparison between the RI-ISI program and ASME Section XI Code program requirements for in-scope piping is provided in Tables 5-1-1 and 5-2-1 for Unit 1 and Tables 5-1-2 and 5-2-2 for Unit 2. Tables 5-1-1 and 5-1-2 provide summary comparisons by risk region. Tables 5-2-1 and 5-2-2 provide the same comparison information, but in a more detailed manner by risk category, similar to the format used in Tables 3.6-1 and 3.6-2.

Unit 1 is currently at the end of the first period of its third inspection interval. Up until this point, 27.7% of the examinations required by ASME Section XI have been completed for Examination Category B-F and B-J piping welds. Beginning in the second period of the third interval (i.e., May 11, 2001), the examinations determined by the RI-ISI process will replace those formerly selected per ASME Section XI criteria. Since 27.7% of the examinations have been completed during the first period of the third interval, 72.3% of the RI-ISI examinations will be performed during the second and third periods.

Unit 2 is currently at the end of the first period of its third inspection interval. Up until this point, 9.0% of the examinations required by ASME Section XI have been completed for Examination Category B-F and B-J piping welds. Beginning in the second period of the third interval (i.e., May 11, 2001), the examinations determined by the RI-ISI process will replace those formerly selected per ASME Section XI criteria. Since 9.0% of the examinations have been completed during the first period of the third interval, 91.0% of the RI-ISI examinations will be performed during the second and third periods.

During the final outage of the first period in the third interval, BSEP postponed the examination of Class 1 welds in Unit 2 on the basis that the RI-ISI Program would subsequently supersede the examinations selected per ASME Section XI. As a result, the examination of Class 1 piping welds in Unit 2 did not meet the period examination percentage requirements of ASME Section XI, paragraph IWB-2412. This issue is addressed in BSEP Relief Request No. RR-27. During the second and third periods of the third interval, Class 1 piping weld examinations in both units that were selected by the RI-ISI process will be distributed between periods such that the period percentage requirements of ASME Section XI, paragraph IWB-2412 are met. Subsequent ISI intervals will implement 100% of the examination locations selected per the RI-ISI program.

6. REFERENCES/DOCUMENTATION

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

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

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

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

Supporting Onsite Documentation

Calculation/File No. CPL-53Q-301, "Degradation Mechanism Evaluation for Brunswick Units 1 and 2", Revision 2

Calculation/File No. CPL-53Q-302, "Risk-Informed Inservice Inspection Consequence Evaluation of Class 1 Piping for Brunswick Nuclear Power Plant Units 1 and 2", Revision 0

Calculation/File No. CPL-53Q-303, "Brunswick Units 1 and 2 Service History and Susceptibility Review", Revision 0

Calculation/File No. CPL-53Q-304, "Risk Ranking for the Brunswick Plant Units 1 and 2", Revision 0

Calculation/File No. CPL-53Q-305, "Risk Impact Analysis for the Brunswick Plant Units 1 and 2", Revision 0

File No. CPL-53Q-103, Record of Conversation No. ROC-001, "Minutes of the Element Selection Meeting for the Risk-Informed ISI Project at the Brunswick Steam Electric Plant", Revision 0, dated January 18, 2001

Calculation BNP-PSA-043, Revision 1, "PSA Input to the Risk Informed ISI Consequence Analysis"

Table 3.1-1 Unit 1 - System Selection and Segment / Element Definition		
System Description	**Number of Segments**	**Number of Elements**
RPV – Reactor Pressure Vessel	12	13
RCR – Reactor Coolant Recirculation	48	111
RWCU – Reactor Water Clean-Up	7	24
RCIC – Reactor Core Isolation Cooling	6	37
RHR – Residual Heat Removal	12	39
CS – Core Spray	8	49
HPCI – High Pressure Coolant Injection	6	35
MS – Main Steam	23	113
FW – Feedwater	27	91
CRD – Control Rod Drive	1	1
JPI – Jet Pump Instrumentation	2	2
Totals	**152**	**515**

Table 3.1-2

Unit 2 - System Selection and Segment / Element Definition

System Description	Number of Segments	Number of Elements
RPV – Reactor Pressure Vessel	12	13
RCR – Reactor Coolant Recirculation	48	118
RWCU – Reactor Water Clean-Up	7	24
RCIC – Reactor Core Isolation Cooling	6	38
RHR – Residual Heat Removal	12	38
CS – Core Spray	10	49
HPCI – High Pressure Coolant Injection	6	34
MS – Main Steam	24	116
FW – Feedwater	15	70
CRD – Control Rod Drive	1	1
JPI – Jet Pump Instrumentation	2	2
Totals	**143**	**503**

Table 3.3-1

Unit 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
RPV	X		X								
RCR			X						X		
RWCU			X								X
RCIC											X
RHR			X								
CS									X		
HPCI											
MS											
FW	X		X						X		X
CRD											
JPI			X								

Note

1. Systems are described in Table 3.1-1.

Table 3.3-2

Unit 2 - 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
RPV	X		X								
RCR			X						X		
RWCU			X								X
RCIC											X
RHR			X								
CS			X						X		
HPCI											
MS											
FW	X								X		X
CRD											
JPI			X								

Note

1. Systems are described in Table 3.1-2.

Table 3.4-1

Unit 1 - Number of Segments by Risk Category With and Without Impact of FAC and IGSCC

System[1]	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
RPV			2[2]	0			3	5	2	2	5	5		
RCR			32[3]	10			16	38						
RWCU	2[4]	0	1[5]	0			2	5			2	2		
RCIC	2[6]	0			1[7]	0	1	3			2	3		
RHR			3[8]	0			6	9					3	3
CS			2	2			4	4					2	2
HPCI							4	4			2	2		
MS							19	19			4	4		
FW	21[9]	0	4[10]	15	2[11]	0	0	10	0	1	0	1		
CRD							1	1						
JPI			2[12]	0			0	2						
Total	**25**	**0**	**46**	**27**	**3**	**0**	**56**	**100**	**2**	**3**	**15**	**17**	**5**	**5**

Notes

1. Systems are described in Table 3.1-1.
2. These two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
3. Of these thirty-two segments, twenty-two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
4. These two segments become Category 4 after FAC and IGSCC are removed from consideration due to no other damage mechanisms being present.
5. This one segment becomes Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
6. These two segments become Category 4 after FAC is removed from consideration due to no other damage mechanisms being present.
7. This one segment becomes Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.
8. These three segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
9. Of these twenty-one segments, thirteen segments become Category 2 after FAC and IGSCC are removed from consideration due to the presence of other "medium" failure potential damage mechanisms, and eight segments become Category 4 after FAC and IGSCC are removed from consideration due to no other damage mechanisms being present.

Notes for Table 3.4-1 (con't)

10. Of these four segments, two segments remain Category 2 after IGSCC is removed from consideration due to the presence of another "medium" failure potential damage mechanism, and two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
11. Of these two segments, one segment becomes Category 5 after FAC is removed from consideration due to the presence of another "medium" failure potential damage mechanism, and one segment becomes Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.
12. These two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.

Table 3.4-2

Unit 2 - Number of Segments by Risk Category With and Without Impact of FAC and IGSCC

System[1]	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
RPV			2[2]	0			3	5	2	2	5	5		
RCR			32[3]	10			16	38						
RWCU	1[4]	0	1[5]	0			2	4	1[6]	0	2	3		
RCIC	2[7]	0			1[8]	0	1	3			2	3		
RHR			3[9]	0			6	9					3	3
CS			4[10]	2			4	6					2	2
HPCI							4	4			2	2		
MS							20	20			4	4		
FW	13[11]	0	0	7	2[12]	0	0	6	0	1	0	1		
CRD							1	1						
JPI			2[13]	0			0	2						
Total	**16**	**0**	**44**	**19**	**3**	**0**	**57**	**98**	**3**	**3**	**15**	**18**	**5**	**5**

Notes

1. Systems are described in Table 3.1-2.
2. These two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
3. Of these thirty-two segments, twenty-two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
4. This one segment becomes Category 4 after FAC is removed from consideration due to no other damage mechanisms being present.
5. This one segment becomes Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
6. This one segment becomes Category 6 after IGSCC is removed from consideration due to no other damage mechanisms being present.
7. These two segments become Category 4 after FAC is removed from consideration due to no other damage mechanisms being present.
8. This one segment becomes Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.
9. These three segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.
10. Of these four segments, two segments remain Category 2 after IGSCC is removed from consideration due the presence of another "medium" failure potential damage mechanism, and two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanism being present.

Notes for Table 3.4-2 (con't)

11. Of these thirteen segments, seven segments become Category 2 after FAC is removed from consideration due to the presence of other "medium" failure potential damage mechanisms, and six segments become Category 4 after FAC is removed from consideration due to no other damage mechanisms being present.
12. Of these two segments, one segment becomes Category 5 after FAC is removed from consideration due to the presence of another "medium" failure potential damage mechanism, and one segment becomes Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.
13. These two segments become Category 4 after IGSCC is removed from consideration due to no other damage mechanisms being present.

Table 3.5-1

Unit 1 - Number of Elements Selected for Inspection by Risk Category Excluding Impact of FAC and IGSCC

System[1]	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
RPV							5	2[2]	2	1	6	0		
RCR			10	3			101	11[3]						
RWCU							18	5[4]			6	0		
RCIC							14	2			23	0		
RHR							16	3[5]					23	0
CS			2	1			41	5					6	0
HPCI							28	3			7	0		
MS							109	11			4	0		
FW			22	7[6]			67	9[7]	1	1	1	0		
CRD							1	1						
JPI							2	1[8]						
Total			**34**	**11**			**402**	**53**	**3**	**2**	**47**	**0**	**29**	**0**

Notes

1. Systems are described in Table 3.1-1.
2. One of these two welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
3. Seven of these eleven welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
4. Two of these five welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
5. One of these three welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Notes for Table 3.5-1 (con't)

6. Three of these seven welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Crevice corrosion was identified along with IGSCC as a potential damage mechanism for one of these welds, and TASCS was identified along with IGSCC as a potential damage mechanism for the other two welds. In order to be credited toward both the IGSCC Program and the RI-ISI Program, the examinations will include the requirements identified in EPRI TR-112657 for crevice corrosion examinations and TASCS examinations, for the respective welds.
7. Two of these nine welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
8. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Table 3.5-2

Unit 2 - Number of Elements Selected for Inspection by Risk Category Excluding Impact of FAC and IGSCC

System[1]	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
RPV							5	2[2]	2	1	6	0		
RCR			10	3			108	12[3]						
RWCU							17	4[4]			7	0		
RCIC							15	3			23	0		
RHR							16	3[5]					22	0
CS			2	1[6]			41	5[7]					6	0
HPCI							26	3			8	0		
MS							112	12			4	0		
FW			12	3			56	6	1	1	1	0		
CRD							1	1						
JPI							2	1[8]						
Total			**24**	**7**			**399**	**52**	**3**	**2**	**49**	**0**	**28**	**0**

Notes

1. Systems are described in Table 3.1-2.
2. One of these two welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
3. Seven of these twelve welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
4. One of these four welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
5. One of these three welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
6. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since crevice corrosion was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for crevice corrosion examinations in order to be credited toward both the IGSCC and RI-ISI Programs.

Notes for Table 3.5-2 (con't)

7. One of these five welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
8. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Table 3.6-1

Unit 1 - Risk Impact Analysis Results

System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[4]		LERF Impact[4]	
			DMs	Rank	Section XI[2]	RI-ISI[3]	Delta	w/ POD	w/o POD	w/ POD	w/o POD
RPV	4 (2)	High	None (IGSCC)	Low (Medium)	2	1[5]	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
RPV	4	High	None	Low	0	1	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RPV	5	Medium	TASCS	Medium	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
RPV	6	Medium	None	Low	0	0	0	no change	no change	no change	no change
RPV Total								**-1.80E-11**	**-1.00E-11**	**-1.80E-12**	**-1.00E-12**
RCR	2	High	CC	Medium	10	3	-7	7.00E-09	7.00E-09	2.10E-09	2.10E-09
RCR	4 (2)	High	None (IGSCC)	Low (Medium)	21	2[6]	-19	9.50E-10	9.50E-10	2.85E-10	2.85E-10
RCR	4	High	None	Low	10	4	-6	3.00E-10	3.00E-10	9.00E-11	9.00E-11
RCR Total								**8.25E-09**	**8.25E-09**	**2.48E-09**	**2.48E-09**
RWCU	4 (1)	High	None (FAC, IGSCC)	Low (High)	1	1[7]	0	no change	no change	no change	no change
RWCU	4 (1)	High	None (FAC)	Low (High)	1	1	0	no change	no change	no change	no change
RWCU	4 (2)	High	None (IGSCC)	Low (Medium)	0	0[8]	0	no change	no change	no change	no change
RWCU	4	High	None	Low	1	2	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RWCU	6	Medium	None	Low	2	0	-2	negligible	negligible	negligible	negligible
RWCU Total								**-5.00E-11**	**-5.00E-11**	**-1.50E-11**	**-1.50E-11**
RCIC	4 (1)	High	None (FAC)	Low (High)	3	2	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
RCIC	4	High	None	Low	0	1	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RCIC	6 (3)	Medium	None (FAC)	Low (High)	0	0	0	no change	no change	no change	no change
RCIC	6	Medium	None	Low	0	0	0	no change	no change	no change	no change
RCIC Total								**no change**	**no change**	**no change**	**no change**
RHR	4 (2)	High	None (IGSCC)	Low (Medium)	3	0[9]	-3	1.50E-10	1.50E-10	4.50E-11	4.50E-11
RHR	4	High	None	Low	1	2	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RHR	7	Low	None	Low	6	0	-6	negligible	negligible	negligible	negligible
RHR Total								**1.00E-10**	**1.00E-10**	**3.00E-11**	**3.00E-11**

Table 3.6-1

Unit 1 - Risk Impact Analysis Results

System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[4]		LERF Impact[4]	
			DMs	Rank	Section XI[2]	RI-ISI[3]	Delta	w/ POD	w/o POD	w/ POD	w/o POD
CS	2	High	CC	Medium	2	1	-1	1.00E-09	1.00E-09	3.00E-10	3.00E-10
CS	4	High	None	Low	10	5	-5	2.50E-10	2.50E-10	7.50E-11	7.50E-11
CS	7	Low	None	Low	2	0	-2	negligible	negligible	negligible	negligible
CS Total								**1.25E-09**	**1.25E-09**	**3.75E-10**	**3.75E-10**
HPCI	4	High	None	Low	5	3	-2	1.00E-10	1.00E-10	3.00E-11	3.00E-11
HPCI	6	Medium	None	Low	3	0	-3	negligible	negligible	negligible	negligible
HPCI Total								**1.00E-10**	**1.00E-10**	**3.00E-11**	**3.00E-11**
MS	4	High	None	Low	26	11	-15	7.50E-10	7.50E-10	2.25E-10	2.25E-10
MS	6	Medium	None	Low	1	0	-1	negligible	negligible	negligible	negligible
MS Total								**7.50E-10**	**7.50E-10**	**2.25E-10**	**2.25E-10**
FW	2 (1)	High	TASCS, CC, (FAC, IGSCC)	Medium (High)	2	0	-2	1.20E-09	2.00E-09	3.60E-10	6.00E-10
FW	2 (1)	High	TASCS, (FAC, IGSCC)	Medium (High)	2	1	-1	-6.00E-10	1.00E-09	-1.80E-10	3.00E-10
FW	2 (1)	High	CC, (FAC, IGSCC)	Medium (High)	2	1	-1	1.00E-09	1.00E-09	3.00E-10	3.00E-10
FW	2 (1)	High	TASCS, CC, (FAC)	Medium (High)	0	2	2	-3.60E-09	-2.00E-09	-1.08E-09	-6.00E-10
FW	2 (1)	High	TASCS, (FAC)	Medium (High)	1	2	1	-3.00E-09	-1.00E-09	-9.00E-10	-3.00E-10
FW	2 (1)	High	CC, (FAC)	Medium (High)	1	0	-1	1.00E-09	1.00E-09	3.00E-10	3.00E-10
FW	2 (2)	High	TASCS, (IGSCC)	Medium (Medium)	0	1	1	-1.80E-09	-1.00E-09	-5.40E-10	-3.00E-10
FW	4 (1)	High	None (FAC, IGSCC)	Low (High)	2	1[10]	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
FW	4 (1)	High	None (FAC)	Low (High)	17	7	-10	5.00E-10	5.00E-10	1.50E-10	1.50E-10
FW	4 (2)	High	None (IGSCC)	Low (Medium)	2	1[11]	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
FW	5 (3)	Medium	TASCS, (FAC)	Medium (High)	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
FW	6 (3)	Medium	None (FAC)	Low (High)	1	0	-1	negligible	negligible	negligible	negligible
FW Total								**-5.22E-09**	**1.59E-09**	**-1.56E-09**	**4.79E-10**

Table 3.6-1 Unit 1 - Risk Impact Analysis Results											
System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[4]		LERF Impact[4]	
			DMs	Rank	Section XI[2]	RI-ISI[3]	Delta	w/ POD	w/o POD	w/ POD	w/o POD
CRD	4	High	None	Low	0	1	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
CRD Total								**-5.00E-11**	**-5.00E-11**	**-1.50E-11**	**-1.50E-11**
JPI	4 (2)	High	None (IGSCC)	Low (Medium)	0	0[12]	0	no change	no change	no change	no change
JPI Total								**no change**	**no change**	**no change**	**no change**
Grand Total								**5.11E-09**	**1.19E-08**	**1.54E-09**	**3.58E-09**

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 were included in the count. Inspection locations previously subjected to a surface examination only were not considered in accordance with Section 3.7.1 of EPRI TR-112657.
3. Risk Category 4 (1) inspection locations selected for examination by both the FAC and RI-ISI Programs should not be included in the count since they do not represent additional examinations. This consideration was not applicable to the Brunswick RI-ISI application. Conversely, Risk Category 4 (2) inspection locations selected for examination by both the IGSCC Program and the RI-ISI Program should be included in both counts, but only those locations that were previously credited in the Section XI Program and are now being credited in the RI-ISI Program. This consideration was applicable to the Brunswick RI-ISI application.
4. 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".
5. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
6. Two of the seven IGSCC Program and RI-ISI Program inspection locations selected for examination were previously credited in the Section XI Program.
7. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
8. The IGSCC Program and RI-ISI Program inspection location selected for examination was not previously credited in the Section XI Program.
9. The IGSCC Program and RI-ISI Program inspection location selected for examination was not previously credited in the Section XI Program.
10. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
11. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
12. The IGSCC Program and RI-ISI Program inspection location selected for examination was not previously credited in the Section XI Program.

Table 3.6-2 Unit 2 - Risk Impact Analysis Results											
System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[4]		LERF Impact[4]	
			DMs	Rank	Section XI[2]	RI-ISI[3]	Delta	w/ POD	w/o POD	w/ POD	w/o POD
RPV	4 (2)	High	None (IGSCC)	Low (Medium)	2	1[5]	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
RPV	4	High	None	Low	0	1	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RPV	5	Medium	TASCS	Medium	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
RPV	6	Medium	None	Low	0	0	0	no change	no change	no change	no change
RPV Total								**-1.80E-11**	**-1.00E-11**	**-1.80E-12**	**-1.00E-12**
RCR	2	High	CC	Medium	10	3	-7	7.00E-09	7.00E-09	2.10E-09	2.10E-09
RCR	4 (2)	High	None (IGSCC)	Low (Medium)	16	2[6]	-14	7.00E-10	7.00E-10	2.10E-10	2.10E-10
RCR	4	High	None	Low	13	5	-8	4.00E-10	4.00E-10	1.20E-10	1.20E-10
RCR Total								**8.10E-09**	**8.10E-09**	**2.43E-09**	**2.43E-09**
RWCU	4 (1)	High	None (FAC)	Low (High)	3	1	-2	1.00E-10	1.00E-10	3.00E-11	3.00E-11
RWCU	4 (2)	High	None (IGSCC)	Low (Medium)	0	0[7]	0	no change	no change	no change	no change
RWCU	4	High	None	Low	3	2	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
RWCU	6 (5)	Medium	None (IGSCC)	Low (Medium)	1	0	-1	negligible	negligible	negligible	negligible
RWCU	6	Medium	None	Low	2	0	-2	negligible	negligible	negligible	negligible
RWCU Total								**1.50E-10**	**1.50E-10**	**4.50E-11**	**4.50E-11**
RCIC	4 (1)	High	None (FAC)	Low (High)	3	2	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
RCIC	4	High	None	Low	0	1	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
RCIC	6 (3)	Medium	None (FAC)	Low (High)	0	0	0	no change	no change	no change	no change
RCIC	6	Medium	None	Low	0	0	0	no change	no change	no change	no change
RCIC Total								**no change**	**no change**	**no change**	**no change**
RHR	4 (2)	High	None (IGSCC)	Low (Medium)	4	1[8]	-3	1.50E-10	1.50E-10	4.50E-11	4.50E-11
RHR	4	High	None	Low	0	2	2	-1.00E-10	-1.00E-10	-3.00E-11	-3.00E-11
RHR	7	Low	None	Low	6	0	-6	negligible	negligible	negligible	negligible
RHR Total								**5.00E-11**	**5.00E-11**	**1.50E-11**	**1.50E-11**

Table 3.6-2 Unit 2 - Risk Impact Analysis Results											
System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[4]		LERF Impact[4]	
			DMs	Rank	Section XI[2]	RI-ISI[3]	Delta	w/ POD	w/o POD	w/ POD	w/o POD
CS	2 (2)	High	CC, (IGSCC)	Medium (Medium)	2	1	-1	1.00E-09	1.00E-09	3.00E-10	3.00E-10
CS	4 (2)	High	None (IGSCC)	Low (Medium)	2	1[9]	-1	5.00E-11	5.00E-11	1.50E-11	1.50E-11
CS	4	High	None	Low	8	4	-4	2.00E-10	2.00E-10	6.00E-11	6.00E-11
CS	7	Low	None	Low	2	0	-2	negligible	negligible	negligible	negligible
CS Total								**1.25E-09**	**1.25E-09**	**3.75E-10**	**3.75E-10**
HPCI	4	High	None	Low	5	3	-2	1.00E-10	1.00E-10	3.00E-11	3.00E-11
HPCI	6	Medium	None	Low	4	0	-4	negligible	negligible	negligible	negligible
HPCI Total								**1.00E-10**	**1.00E-10**	**3.00E-11**	**3.00E-11**
MS	4	High	None	Low	27	12	-15	7.50E-10	7.50E-10	2.25E-10	2.25E-10
MS	6	Medium	None	Low	2	0	-2	negligible	negligible	negligible	negligible
MS Total								**7.50E-10**	**7.50E-10**	**2.25E-10**	**2.25E-10**
FW	2 (1)	High	TASCS, CC, (FAC)	Medium (High)	0	1	1	-1.80E-09	-1.00E-09	-5.40E-10	-3.00E-10
FW	2 (1)	High	TASCS, (FAC)	Medium (High)	3	2	-1	-1.80E-09	1.00E-09	-5.40E-10	3.00E-10
FW	2 (1)	High	CC, (FAC)	Medium (High)	0	0	0	no change	no change	no change	no change
FW	4 (1)	High	None (FAC)	Low (High)	17	6	-11	5.50E-10	5.50E-10	1.65E-10	1.65E-10
FW	5 (3)	Medium	TASCS, (FAC)	Medium (High)	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
FW	6 (3)	Medium	None (FAC)	Low (High)	0	0	0	no change	no change	no change	no change
FW Total								**-3.07E-09**	**5.40E-10**	**-9.17E-10**	**1.64E-10**

Table 3.6-2

Unit 2 - Risk Impact Analysis Results

System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[4]		LERF Impact[4]	
			DMs	Rank	Section XI[2]	RI-ISI[3]	Delta	w/ POD	w/o POD	w/ POD	w/o POD
CRD	4	High	None	Low	0	1	1	-5.00E-11	-5.00E-11	-1.50E-11	-1.50E-11
CRD Total								**-5.00E-11**	**-5.00E-11**	**-1.50E-11**	**-1.50E-11**
JPI	4 (2)	High	None (IGSCC)	Low (Medium)	0	0[10]	0	no change	no change	no change	no change
JPI Total								**no change**	**no change**	**no change**	**no change**
Grand Total								**7.26E-09**	**1.09E-08**	**2.19E-09**	**3.27E-09**

Notes

1. Systems are described in Table 3.1-2.
2. Only those ASME Section XI Code inspection locations that received a volumetric examination in addition to a surface examination were included in the count. Inspection locations previously subjected to a surface examination only were not considered in accordance with Section 3.7.1 of EPRI TR-112657.
3. Risk Category 4 (1) inspection locations selected for examination by both the FAC and RI-ISI Programs should not be included in the count since they do not represent additional examinations. This consideration was not applicable to the Brunswick RI-ISI application. Conversely, Risk Category 4 (2) inspection locations selected for examination by both the IGSCC Program and the RI-ISI Program should be included in both counts, but only those locations that were previously credited in the Section XI Program and are now being credited in the RI-ISI Program. This consideration was applicable to the Brunswick RI-ISI application.
4. 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".
5. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
6. Two of the seven IGSCC Program and RI-ISI Program inspection locations selected for examination were previously credited in the Section XI Program.
7. The IGSCC Program and RI-ISI Program inspection location selected for examination was not previously credited in the Section XI Program.
8. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
9. The IGSCC Program and RI-ISI Program inspection location selected for examination was previously credited in the Section XI Program.
10. The IGSCC Program and RI-ISI Program inspection location selected for examination was not previously credited in the Section XI Program.

Table 5-1-1

Unit 1 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Region

System[1]	Code Category	High Risk Region					Medium Risk Region					Low Risk Region				
		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657	
			Vol/Sur	Sur Only	RI-ISI	Other[2]		Vol/Sur	Sur Only	RI-ISI	Other[2]		Vol/Sur	Sur Only	RI-ISI	Other[2]
RPV	B-F						7	2	5	3[3]		2	0	2	0	
	B-J											4	0	0	0	
RCR	B-F	10	10	0	3		2	2	0	0						
	B-J						99	29	0	11[4]						
RWCU	B-F						1	1	0	1[5]						
	B-J						17	2	0	4[6]		6	2	0	0	
RCIC	B-J						14	3	0	2		23	0	7	0	
RHR	B-F						3	3	0	0						
	B-J						13	1	0	3[7]		23	6	0	0	
CS	B-F	2	2	0	1		2	2	0	0						
	B-J						39	8	0	5		6	2	0	0	
HPCI	B-J						28	5	0	3		7	3	0	0	
MS	B-J						109	26	0	11		4	1	0	0	
FW	B-F	6	6	0	2[8]		2	2	0	1[9]						
	B-J	16	2	0	5[10]		65	19	0	9[11]		1	1	0	0	
CRD	B-F						1	0	1	1						
JPI	B-J						2	0	0	1[12]						
Total	B-F	18	18	0	6		18	12	6	6		2	0	2	0	
	B-J	16	2	0	5		387	93	0	49		74	15	7	0	

Notes

1. Systems are described in Table 3.1-1.

Notes for Table 5.1-1 (con't)

2. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. The EPRI methodology allows augmented inspection program locations to be credited if the inspection locations selected strictly for RI-ISI purposes produce less than a 10% sampling of the overall Class 1 weld population. As stated in Section 3.5 of this template, BSEP achieved greater than a 10% sampling without relying on augmented inspection program locations beyond those selected by the RI-ISI process. The "Other" column has been retained in this table solely for uniformity purposes with the other RI-ISI application template submittals.
3. One of these three welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
4. Seven of these eleven welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
5. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
6. One of these four welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
7. One of these three welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
8. These two welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Crevice corrosion was identified along with IGSCC as a potential damage mechanism for one of these welds, and TASCS was identified along with IGSCC as a potential damage mechanism for the other weld. In order to be credited toward both the IGSCC Program and the RI-ISI Program, the examinations will include the requirements identified in EPRI TR-112657 for crevice corrosion examinations and TASCS examinations, for the respective welds.
9. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
10. One of these five welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since TASCS was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for TASCS examinations in order to be credited toward both the IGSCC and RI-ISI Programs.
11. One of these nine welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
12. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Table 5-1-2

Unit 2 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Region

System[1]	Code Category	High Risk Region					Medium Risk Region					Low Risk Region				
		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657	
			Vol/Sur	Sur Only	RI-ISI	Other[2]		Vol/Sur	Sur Only	RI-ISI	Other[2]		Vol/Sur	Sur Only	RI-ISI	Other[2]
RPV	B-F						7	2	5	3[3]		2	0	2	0	
	B-J											4	0	0	0	
RCR	B-F	10	10	0	3		2	2	0	2[4]						
	B-J						106	27	0	10[5]						
RWCU	B-F											1	1	0	0	
	B-J						17	6	0	4[6]		6	2	0	0	
RCIC	B-J						15	3	0	3		23	0	2	0	
RHR	B-F						3	3	0	0						
	B-J						13	1	0	3[7]		22	6	0	0	
CS	B-F	2	2	0	1[8]		2	2	0	1[9]						
	B-J						39	8	0	4		6	2	0	0	
HPCI	B-J						26	5	0	3		8	4	0	0	
MS	B-J						112	27	0	12		4	2	0	0	
FW	B-J	12	2	0	3		57	18	0	7		1	0	0	0	
CRD	B-F						1	0	1	1						
JPI	B-J						2	0	0	1[10]						
Total	B-F	12	12	0	4		15	9	6	7		3	1	2	0	
	B-J	10	2	0	3		388	95	0	46		75	16	2	0	

Notes

1. Systems are described in Table 3.1-2.

Notes for Table 5.1-2 (con't)

2. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. The EPRI methodology allows augmented inspection program locations to be credited if the inspection locations selected strictly for RI-ISI purposes produce less than a 10% sampling of the overall Class 1 weld population. As stated in Section 3.5 of this template, BSEP achieved greater than a 10% sampling without relying on augmented inspection program locations beyond those selected by the RI-ISI process. The "Other" column has been retained in this table solely for uniformity purposes with the other RI-ISI application template submittals.
3. One of these three welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
4. These two welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
5. Five of these ten welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
6. One of these four welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
7. One of these three welds was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs
8. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since crevice corrosion was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for crevice corrosion examinations in order to be credited toward both the IGSCC and RI-ISI Programs.
9. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
10. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Table 5-2-1 Unit 1 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Category											
System(1)	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	1989 Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other(2)
RPV	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	2	2	0	1(3)	
RPV	4	Medium	High	None	Low	B-F	3	0	3	1	
RPV	5	Medium	Medium	TASCS	Medium	B-F	2	0	2	1	
RPV	6	Low	Medium	None	Low	B-F	2	0	2	0	
						B-J	4	0	0	0	
RCR	2	High	High	CC	Medium	B-F	10	10	0	3	
RCR	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	2	2	0	0	
						B-J	64	19	0	7(4)	
RCR	4	Medium	High	None	Low	B-J	35	10	0	4	
RWCU	4 (1)	Medium (High)	High	None (IGSCC, FAC)	Low (High)	B-F	1	1	0	1(5)	
RWCU	4 (1)	Medium (High)	High	None (FAC)	Low (High)	B-J	3	1	0	1	
RWCU	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-J	1	0	0	1(6)	
RWCU	4	Medium	High	None	Low	B-J	13	1	0	2	
RWCU	6	Low	Medium	None	Low	B-J	6	2	0	0	
RCIC	4 (1)	Medium (High)	High	None (FAC)	Low (High)	B-J	11	3	0	1	
RCIC	4	Medium	High	None	Low	B-J	3	0	0	1	
RCIC	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	B-J	1	0	0	0	
RCIC	6	Low	Medium	None	Low	B-J	22	0	7	0	
RHR	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	3	3	0	0	
						B-J	2	0	0	1(7)	
RHR	4	Medium	High	None	Low	B-J	11	1	0	2	
RHR	7	Low	Low	None	Low	B-J	23	6	0	0	

Table 5-2-1

Unit 1 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Category

System[1]	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	1989 Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other[2]
CS	2	High	High	CC	Medium	B-F	2	2	0	1	
CS	4	Medium	High	None	Low	B-F	2	2	0	0	
						B-J	39	8	0	5	
CS	7	Low	Low	None	Low	B-J	6	2	0	0	
HPCI	4	Medium	High	None	Low	B-J	28	5	0	3	
HPCI	6	Low	Medium	None	Low	B-J	7	3	0	0	
MS	4	Medium	High	None	Low	B-J	109	26	0	11	
MS	6	Low	Medium	None	Low	B-J	4	1	0	0	
FW	2 (1)	High (High)	High	TASCS, CC, (IGSCC, FAC)	Medium (High)	B-F	2	2	0	0	
FW	2 (1)	High (High)	High	TASCS, (IGSCC, FAC)	Medium (High)	B-F	2	2	0	1[8]	
FW	2 (1)	High (High)	High	CC, (IGSCC, FAC)	Medium (High)	B-F	2	2	0	1[9]	
FW	2 (1)	High (High)	High	TASCS, CC, (FAC)	Medium (High)	B-J	4	0	0	2	
FW	2 (1)	High (High)	High	TASCS, (FAC)	Medium (High)	B-J	6	1	0	2	
FW	2 (1)	High (High)	High	CC, (FAC)	Medium (High)	B-J	4	1	0	0	
FW	2 (2)	High (High)	High	TASCS, (IGSCC)	Medium (Medium)	B-J	2	0	0	1[10]	
FW	4 (1)	Medium (High)	High	None (IGSCC, FAC)	Low (High)	B-F	2	2	0	1[11]	
FW	4 (1)	Medium (High)	High	None (FAC)	Low (High)	B-J	63	17	0	7	
FW	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-J	2	2	0	1[12]	
FW	5 (3)	Medium (High)	Medium	TASCS, (FAC)	Medium (High)	B-J	1	0	0	1	
FW	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	B-J	1	1	0	0	
CRD	4	Medium	High	None	Low	B-F	1	0	1	1	
JPI	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-J	2	0	0	1[13]	

Notes

1. Systems are described in Table 3.1-1.
2. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. The EPRI methodology allows augmented inspection program locations to be credited if the inspection locations selected strictly for RI-ISI purposes produce less than a 10% sampling of the overall Class 1 weld population. As stated in Section 3.5 of this template, BSEP achieved greater than a 10% sampling without relying on augmented inspection program locations beyond those selected by the RI-ISI process. The "Other" column has been retained in this table solely for uniformity purposes with the other RI-ISI application template submittals.
3. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
4. These seven welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
5. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
6. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
7. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
8. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since TASCS was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for TASCS examinations in order to be credited toward both the IGSCC and RI-ISI Programs.
9. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since crevice corrosion was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for crevice corrosion examinations in order to be credited toward both the IGSCC and RI-ISI Programs.
10. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since TASCS was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for TASCS examinations in order to be credited toward both the IGSCC and RI-ISI Programs.
11. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
12. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
13. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Table 5-2-2

Unit 2 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Category

System[1]	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	1989 Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other[2]
RPV	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	2	2	0	1[3]	
RPV	4	Medium	High	None	Low	B-F	3	0	3	1	
RPV	5	Medium	Medium	TASCS	Medium	B-F	2	0	2	1	
RPV	6	Low	Medium	None	Low	B-F	2	0	2	0	
						B-J	4	0	0	0	
RCR	2	High	High	CC	Medium	B-F	10	10	0	3	
RCR	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	2	2	0	2[4]	
						B-J	64	14	0	5[5]	
RCR	4	Medium	High	None	Low	B-J	42	13	0	5	
RWCU	4 (1)	Medium (High)	High	None (FAC)	Low (High)	B-J	4	3	0	1	
RWCU	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-J	1	0	0	1[6]	
RWCU	4	Medium	High	None	Low	B-J	12	3	0	2	
RWCU	6 (5)	Low (Medium)	Medium	None (IGSCC)	Low (Medium)	B-F	1	1	0	0	
RWCU	6	Low	Medium	None	Low	B-J	6	2	0	0	
RCIC	4 (1)	Medium (High)	High	None (FAC)	Low (High)	B-J	12	3	0	2	
RCIC	4	Medium	High	None	Low	B-J	3	0	0	1	
RCIC	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	B-J	1	0	0	0	
RCIC	6	Low	Medium	None	Low	B-J	22	0	2	0	
RHR	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	3	3	0	0	
						B-J	2	1	0	1[7]	
RHR	4	Medium	High	None	Low	B-J	11	0	0	2	
RHR	7	Low	Low	None	Low	B-J	22	6	0	0	

Table 5-2-2

Unit 2 – Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Category

System(1)	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	1989 Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other(2)
CS	2 (2)	High (High)	High	CC, (IGSCC)	Medium (Medium)	B-F	2	2	0	1(8)	
CS	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-F	2	2	0	1(9)	
CS	4	Medium	High	None	Low	B-J	39	8	0	4	
CS	7	Low	Low	None	Low	B-J	6	2	0	0	
HPCI	4	Medium	High	None	Low	B-J	26	5	0	3	
HPCI	6	Low	Medium	None	Low	B-J	8	4	0	0	
MS	4	Medium	High	None	Low	B-J	112	27	0	12	
MS	6	Low	Medium	None	Low	B-J	4	2	0	0	
FW	2 (1)	High (High)	High	TASCS, CC, (FAC)	Medium (High)	B-J	2	0	0	1	
FW	2 (1)	High (High)	High	TASCS, (FAC)	Medium (High)	B-J	8	3	0	2	
FW	2 (1)	High (High)	High	CC, (FAC)	Medium (High)	B-J	2	0	0	0	
FW	4 (1)	Medium (High)	High	None (FAC)	Low (High)	B-J	56	17	0	6	
FW	5 (3)	Medium (High)	Medium	TASCS, (FAC)	Medium (High)	B-J	1	0	0	1	
FW	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	B-J	1	0	0	0	
CRD	4	Medium	High	None	Low	B-F	1	0	1	1	
JPI	4 (2)	Medium (High)	High	None (IGSCC)	Low (Medium)	B-J	2	0	0	1(10)	

Notes

1. Systems are described in Table 3.1-2.
2. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. The EPRI methodology allows augmented inspection program locations to be credited if the inspection locations selected strictly for RI-ISI purposes produce less than a 10% sampling of the overall Class 1 weld population. As stated in Section 3.5 of this template, BSEP achieved greater than a 10% sampling without relying on augmented inspection program locations beyond those selected by the RI-ISI process. The "Other" column has been retained in this table solely for uniformity purposes with the other RI-ISI application template submittals.
3. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.

Notes for Table 5.1-2 (con't)

4. These two welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
5. These five welds were selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for these welds, the IGSCC examinations will be credited toward both programs.
6. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
7. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
8. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since crevice corrosion was identified along with IGSCC as a potential damage mechanism for this weld, the examination will include the requirements identified in EPRI TR-112657 for crevice corrosion examinations in order to be credited toward both the IGSCC and RI-ISI Programs.
9. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.
10. This one weld was selected for examination by both the IGSCC Program and the RI-ISI Program. Since IGSCC was the only potential damage mechanism identified for this weld, the IGSCC examination will be credited toward both programs.