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W3F1-2007-0046

October 18, 2007

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

SUBJECT: Request for Alternative W3-ISI-005
Request to Use ASME Code Case N-716
Waterford Steam Electric Station, Unit 3
Docket No. 50-382
License No. NPF-38

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy requests authorization to implement a risk-informed Inservice Inspection (ISI) program based on ASME Code Case N-716, as documented in Request for Alternative W3-ISI-005 contained in Enclosure 1 to this letter. W3-ISI-005 is being submitted in a template format similar to the submittal the NRC staff has recently approved for Grand Gulf Nuclear Station. A copy of ASME Code Case N-716 is also provided in Enclosure 2.

Entergy requests staff approval of Request for Alternative W3-ISI-005 by March 14, 2008, to support the upcoming fifteenth refueling outage (RF15) at Waterford 3 (W3), currently scheduled for spring 2008. Waterford 3 will withdraw the Request for Alternative CEP-ISI-007 pertaining to the application of Code Case N-663 for use at W3 upon NRC approval of this risk-informed ISI program submittal.

A047

NRR

Should you have any questions regarding this submittal, please contact Ron Williams at (504) 739-6255.

This letter contains two commitments identified in Enclosure 3.

Sincerely,

RJM/RLW

Enclosures:
1. Request for Alternative W3-ISI-005
2. ASME Code Case N-716
3. Licensee-Identified Commitments

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ENCLOSURE 1

W3F1-2007-0046

REQUEST FOR ALTERNATIVE
W3-ISI-005

ENTERGY OPERATIONS, INC.
WATERFORD STEAM ELECTRIC STATION, UNIT 3

REQUEST FOR ALTERNATIVE
W3-ISI-005

Application of ASME Code Case N-716

RISK-INFORMED / Safety-based INSERVICE INSPECTION program plan

Table of Contents

ENTERGY OPERATIONS, INC.
WATERFORD STEAM ELECTRIC STATION, UNIT 3

REQUEST FOR ALTERNATIVE
W3-ISI-005

1. INTRODUCTION

Waterford Steam Electric Station Unit 3 (W3) is currently in the second 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. W3 plans to complete the current (second) ISI interval by implementing a risk-informed / safety-based inservice inspection (RIS_B) program during the third inspection period of the interval. Entergy will also implement 100% of the RIS_B program in the third interval.

The ASME Section XI code of record for the second ISI interval at W3 is the 1992 Edition for Examination Category B-F, B-J, C-F-1, and C-F-2 Class 1 and 2 piping components. The ASME Section XI code of record for the third ISI interval at W3 is the 2001 Edition through 2003 Addenda for these welds.

The objective of this submittal is to request the use of the RIS_B process for the inservice inspection of Class 1 and 2 piping. The RIS_B process used in this submittal is based upon ASME Code Case N-716, *Alternative Piping Classification and Examination Requirements, Section XI Division 1*, which is founded in large part on the RI-ISI process as described in Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Rev. B-A, *Revised Risk-Informed Inservice Inspection Evaluation Procedure.*

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*. Additional information is provided in Section 3.4.2 relative to defense-in-depth.

1.2 Probabilistic Safety Assessment (PSA) Quality

The W3 Level 1 PSA was initially developed in response to the NRC Generic Letter 88-20 on Individual Plant Examinations. The Individual Plant Examination (IPE) was submitted to the NRC in August 1992. The W3 IPE consisted of the Level 1 PSA and back-end analysis (Level 2) consistent with the requirements of NRC Generic Letter (GL) 88-20, *Individual Plant Examination for Severe Accident Vulnerabilities – 10 CFR 50.54(f)*. The NRC responded with a Safety Evaluation Report (SER) in a letter dated March 4, 1997 and approved the W3 IPE results. The letter concluded that the W3 IPE met the intent of GL 88-20; that is, the W3 IPE process was capable of identifying the most likely severe accidents and severe accident vulnerabilities for W3.

The IPE was subjected to a number of reviews. In addition to normal engineering and cross-discipline reviews, the IPE received a peer review by PRA experts from a PRA consultant, and comments were addressed prior to its August 1992 submittal to NRC. The NRC review of the IPE, transmitted to W3 in March 1997, identified several weaknesses. All but one of the weaknesses in the Level 1 analysis (with one exception noted below) were addressed by the June 2003 model update. The exception had to do with a lack of simulator exercises for in-control room operator response times and walkdowns for ex-control room times. Current PRA quality standards identify either walkthroughs, talkthroughs (detailed procedure reviews with operators), or simulator observations as acceptable bases for operator response times (ASME PRA Standard, Supporting Requirement HR-G5, Categories II & III). The W3 PRA used operator talkthroughs for all of the post-initiator operator actions.

Several PRA model updates have been completed on the W3 PSA since the IPE was submitted. These were done in order to maintain the PSA model reasonably consistent with the as-built, as-operated plant. The scope of the updates was based on review of results, plant input to the model, updated plant failure and initiating event data as well as model enhancements.

An industry peer review of the W3 PSA was conducted in January 2000 on the Revision 2 PSA and the report was subsequently published in April 2000. The peer review concluded that there were several areas where the W3 model was very weak and needed improvement. The W3 PSA model update completed in June 2003 addressed most of the significant Facts and Observations (F&O's) from this certification.

In June 2003, Revision 3 of the W3 Level 1 PSA was issued. The scope of this revision included the incorporation of new methodologies in addition to revisions to various elements of the model. The modeling changes were made as a result of changes to the plant, revised plant procedures, revisions to system success criteria, more detailed system models and the addition of systems to the model. New methodologies for various tasks necessary for the PSA update were also utilized. These include the following:

- Utilized a more accepted methodology (alpha factor method) for the common cause analysis. In addition, the common cause analysis was much more extensive (applied to more components) than the analysis in the previous revision.
- Updated the human reliability analysis (HRA) with a more comprehensive and thorough methodology. This analysis was also much more extensive and took into account dependencies between multiple human error events when they occurred within a single cut set.
- Incorporated a new method for accounting for recovery of losses of offsite power. This method uses a convolution approach to account for time dependencies in individual cut sets. A plant-specific offsite power recovery curve was also developed utilizing only those loss-of-offsite-power events that are applicable to W3.

- Utilized more detailed fault trees to determine the frequency for certain support system initiating events.
- Utilized updated data to determine basic event probabilities and initiating event frequencies. There was more extensive use of plant-specific data (primarily major components of risk significant maintenance rule systems).

As part of the Revision 3 update of the PSA, most of the important observations resulting from the peer review were also addressed. Following Revision 3 of the Level 1 update, a decision was made to develop a Large Early Release Frequency (LERF) model rather than update the W3 IPE Level 2 model. The LERF model was developed using the methods described in NUREG/CR-6595, Rev. 1, *An Approach for Estimating the Frequencies of Various Containment Failure Modes and Bypass Events*, and is directly linked to the internal events model. Because of the different method, most of the Level 2 peer review observations are not applicable and have not been addressed. The W3 LERF model was completed and issued in June 2004.

Recently, in preparation for W3's transition to NFPA 805, a gap assessment of the W3 PSA model has been completed. Gaps to the ASME PSA standard and Reg Guide 1.200 Revision have been identified. The gaps impacting the fire PRA are being closed in the near term in order to meet the NFPA 805 transition schedule. HRA interviews are needed with Plant Operations personnel and have not been able to be scheduled because of unavailability of operators. It is expected that all of the significant model gaps to the ASME Standard impacting the Fire PRA will be closed with the Revision 4 Model Update that is slated to be completed in early 2008. W3 will also attempt to close many of the remaining significant model gaps with this update. Irrespective of the above, a review of the open A&B F&Os for impact on the RIS_B application was conducted and identified that they would not have a significant impact on the RIS_B results.

Request for Alternative W3-ISI-005 is based on the W3 PSA Revision 3 model and the W3 LERF model. The base case Core Damage Frequency (CDF) is 1.69E-5/year and the base case LERF is 2.47E-7/year.

Based on the above, Entergy believes that the current PSA model, used in the RIS_B evaluation, has an acceptable level of quality to support this application.

2. PROPOSED ALTERNATIVE TO CURRENT ISI PROGRAMS

2.1 ASME Section XI

ASME Section XI Examination Categories B-F, B-J, C-F-1, and C-F-2 currently contain requirements for the nondestructive examination (NDE) of Class 1 and 2 piping components, except as amended by application of ASME Code Case N-663 (Request for Alternative CEP-ISI-007) that was approved for use at W3 by the NRC on August 26, 2003.

The alternative RIS_B Program for piping is described in Code Case N-716. The RIS_B Program will be substituted for the current program for Class 1 and 2 piping (Examination Categories B-F, B-J, C-F-1 and C-F-2) 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.

2.2 Augmented Programs

The impact of the RIS_B application on the various plant augmented inspection programs listed below were considered. This section documents only those plant augmented inspection programs that address common piping with the RIS_B application scope (e.g., Class 1 and 2 piping).

- The original plant augmented inspection program for high-energy line breaks outside containment, implemented in accordance with W3 Final Safety Analysis Report (FSAR) Section 6.6.8, "Augmented Inservice Inspection to Protect against Postulated Piping Failures," is being revised in accordance with the risk-informed break exclusion region methodology (RI-BER) described in EPRI Report 1006937, *Extension of EPRI Risk Informed ISI Methodology to Break Exclusion Region Programs*. EPRI Report 1006937 was approved by the NRC in 2002. The results of the RI-BER application demonstrated that the volumetric examination requirement for this scope of piping could be reduced from 100% to approximately 13%. As a result, 13% of the BER population will be examined during the course of each ten-year interval which exceeds the 10% requirement imposed by Code Case N-716.

- A plant augmented inspection program has been implemented at W3 in response to NRC Bulletin 88-08, *Thermal Stresses in Piping Connected to Reactor Coolant Systems*. The thermal fatigue concern addressed by this bulletin was explicitly considered in the application of the RIS_B process and is subsumed by the RIS_B Program.

- The plant augmented inspection program for flow accelerated corrosion (FAC) per GL 89-08, *Erosion/Corrosion-Induced Pipe Wall Thinning*, is relied upon to manage this damage mechanism but is not otherwise affected or changed by the RIS_B Program.

- A plant augmented inspection program is being implemented at W3 in response to MRP-139, *Materials Reliability Program: Primary System Piping Butt Weld Inspection and Evaluation Guidelines*. The requirements of MRP-139 will be used for the inspection and management of PWSCC susceptible welds and will supplement the RIS_B Program selection process. The RIS_B Program will not be used to eliminate any MRP-139 requirements.

- W3 is in the process of evaluating MRP-146, *Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines*, and these results will be incorporated into the RIS_B Program, if warranted.

3. RISK-INFORMED / SAFETY-BASED ISI PROCESS

The process used to develop the RIS_B Program conformed to the methodology described in Code Case N-716 and consisted of the following steps:

- Safety Significance Determination
- Failure Potential Assessment
- Element and NDE Selection
- Risk Impact Assessment
- Implementation Program
- Feedback Loop

3.1 Safety Significance Determination

The systems assessed in the RIS_B Program are provided in Table 3.1. The piping and instrumentation diagrams and additional plant information including the existing plant ISI Program were used to define the piping system boundaries.

Per Code Case N-716 requirements, piping welds are assigned safety-significance categories, which are used to determine the treatment requirements. High safety-significant (HSS) welds are determined in accordance with the requirements below. Low safety-significant (LSS) welds include all other Class 2, 3, or Non-Class welds.

(1) Class 1 portions of the reactor coolant pressure boundary (RCPB), except as provided in 10 CFR 50.55a(c)(2)(i) and (c)(2)(ii);

(2) Applicable portions of the shutdown cooling pressure boundary function. That is, Class 1 and 2 welds of systems or portions of systems needed to utilize the normal shutdown cooling flow path either:

  (a) As part of the RCPB from the reactor pressure vessel (RPV) to the second isolation valve (i.e., farthest from the RPV) capable of remote closure or to the containment penetration, whichever encompasses the larger number of welds; or

  (b) Other systems or portions of systems from the RPV to the second isolation valve (i.e., farthest from the RPV) capable of remote closure or to the containment penetration, whichever encompasses the larger number of welds;

(3) That portion of the Class 2 feedwater system [> 4 inch nominal pipe size (NPS)] of pressurized water reactors (PWRs) from the steam generator to the outer containment isolation valve;

(4) Piping within the break exclusion region (> NPS 4) for high-energy piping systems as defined by the Owner. This may include Class 3 or Non-Class piping; and

(5) Any piping segment whose contribution to CDF is greater than 1E-06 (or 1E-07 for LERF) based upon a plant-specific PSA of pressure boundary failures (e.g., pipe whip, jet impingement, spray, inventory losses). This may include Class 3 or Non-Class piping.

3.2 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 (i.e., the EPRI RI-ISI methodology), with the exception of the deviation discussed below.

As described in section 3.1 above, Code Case N-716 augments the generic HSS welds with a search for plant-specific HSS welds based on the flooding analysis. Waterford is consistent with NUREG-0800 and meets the requirements of Branch Technical Position APCSB 3-1, Protection Against Postulated Piping Failures in Fluid Systems Outside Containment for jet impingement and pipe whip. Therefore, the damage associated with internal flood hazards included only short term (less than 24 hour) liquid inundation effects on IPE related equipment. Other hazards such as pipe whip, steam impingement, and specific liquid jet or spray patterns were outside the scope of the analysis. However, in the flooding analysis, any source of water (including liquid jets and sprays) was assumed to fail all IPE equipment located in the associated flood initiation flood zone, so the analysis implicitly included the effects of spray. The flooding analysis identifies areas that may be sensitive to floods (i.e., potential HSS areas) and then evaluates the failure potential of piping segments in areas that are sensitive to flooding. The failure frequencies used in the WF3 flooding study were not based on W3 plant specific data as there had not been significant flooding experience at WF3. As such, failure frequencies were obtained from PLG-0624 (*see Reference list*). This report provides flooding frequencies based on plant areas and are derived from industry experience with flooding events due to failures in piping, piping connections, tanks and other sources. This data reflects the various causes of components failures (e.g. degradation mechanism). These building level failure frequencies are then spread across W3 flood zones to provide scenario level flood frequencies. This spreading is accomplished by developing weighting factors based upon room volume and flood source density (i.e. physical density of piping, piping components, tanks and other flood sources).

Table 3.2 summarizes the failure potential assessment by system for each degradation mechanism that was identified as potentially operative.

A deviation to the EPRI RI-ISI methodology has been implemented in the failure potential assessment for W3. 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 NPS 1 include:

1. The potential exists for low flow in a pipe section connected to a component allowing mixing of hot and cold fluids; or

2. The 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. The potential exists for convective heating in dead-ended pipe sections connected to a source of hot fluid; or

4. The potential exists for two phase (steam/water) flow; or

5. The 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 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., shutdown cooling 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 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 considering cycle severity. The above criteria have previously been submitted by EPRI to the NRC for generic approval [letters dated February 28, 2001 and March 28, 2001, from P.J. O'Regan (EPRI) to Dr. B. Sheron (USNRC), *Extension of Risk-Informed Inservice Inspection Methodology*]. The methodology used in the W3 RIS_B application for assessing TASCS potential conforms to these updated criteria. Final materials reliability program (MRP) guidance on the subject of TASCS will be incorporated into the W3 RIS_B application, if warranted. It should be noted that the NRC has granted approval for RI-ISI relief requests incorporating these TASCS criteria at several facilities, including Comanche Peak (NRC letter dated September 28, 2001) and South Texas Project (NRC letter dated March 5, 2002).

3.3 Element and NDE Selection

Code Case N-716 provides criteria for identifying the number and location of required examinations. Ten percent of the HSS welds shall be selected for examination as follows:

(1) Examinations shall be prorated equally among systems to the extent practical, and each system shall individually meet the following requirements:

(a) A minimum of 25% of the population identified as susceptible to each degradation mechanism and degradation mechanism combination shall be selected.

(b) If the examinations selected above exceed 10% of the total number of HSS welds, the examinations may be reduced by prorating among each degradation mechanism and degradation mechanism combination, to the extent practical, such that at least 10% of the HSS population is inspected.

(c) If the examinations selected above are not at least 10% of the HSS weld population, additional welds shall be selected so that the total number selected for examination is at least 10%.

(2) At least 10% of the RCPB welds shall be selected.

(3) For the RCPB, at least two-thirds of the examinations shall be located between the inside first isolation valve (IFIV) (i.e., isolation valve closest to the RPV) and the RPV.

(4) A minimum of 10% of the welds in that portion of the RCPB that lies outside containment (OC) (e.g., portions of the main feedwater system in BWRs) shall be selected.

(5) A minimum of 10% of the welds within the break exclusion region (BER) shall be selected.

In contrast to a number of RI-ISI Program applications where the percentage of Class 1 piping locations selected for examination has fallen substantially below 10%, Code Case N-716 mandates that 10% be chosen. A brief summary is provided below, and the results of the selections are presented in Table 3.3. Section 4 of EPRI TR-112657 was used as guidance in determining the examination requirements for these locations.

Unit	Class 1 Welds(1)		Class 2 Welds(2)		NNS Welds(3)		All Piping Welds(4)	
	Total	Selected	Total	Selected	Total	Selected	Total	Selected
3	729	74	1674	25	4	0	2407	99

Notes

(1) Includes all Category B-F and B-J locations. All 729 Class 1 piping weld locations are HSS.
(2) Includes all Category C-F-1 and C-F-2 locations. Of the 1674 Class 2 piping weld locations, 221 are HSS and the remaining 1453 are LSS.
(3) All four of these non-nuclear safety (NNS) piping weld locations are HSS.
(4) Regardless of safety significance, Class 1 and 2 in-scope piping components will continue to be pressure tested as required by the ASME Section XI Program. VT-2 visual examinations are scheduled in accordance with the station's pressure test program that remains unaffected by the RIS_B Program.

3.3.1 Additional Examinations

The RIS_B 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 those elements with the same root cause conditions or degradation mechanisms. The additional examinations will include HSS elements up to a number equivalent to the number of elements required to be inspected during the current outage. If unacceptable flaws or relevant conditions are again found similar to the initial problem, the remaining elements identified as susceptible will be examined during the current outage. No additional examinations need be performed if there are no additional elements identified as being susceptible to the same root cause conditions.

3.3.2 Program Relief Requests

An attempt has been made to select RIS_B 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 at the time of the examination fail to meet the >90% coverage requirement, the process outlined in 10 CFR 50.55a will be followed.

Request for Alternative CEP-ISI-007 pertaining to the application of Code Case N-663 will be withdrawn for use at W3 upon NRC approval of the RIS_B Program submittal.

3.4 Risk Impact Assessment

The RIS_B Program has been conducted in accordance with Regulatory Guide 1.174 and the requirements of Code Case N-716, 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 categorized segments as high safety significant or low safety significant in accordance with Code Case N-716, and then determined what inspection changes are proposed for each system. The changes include changing the number and location of inspections and in many cases improving the effectiveness of the inspection to account for the findings of the RIS_B degradation mechanism assessment. For example, examinations of locations subject to thermal fatigue will be conducted on an expanded volume and will be focused to enhance the probability of detection (POD) during the inspection process.

3.4.1 Quantitative Analysis

Code Case N-716 has adopted the EPRI TR-112657 process for risk impact analyses whereby limits are imposed to ensure that the change in risk of implementing the RIS_B Program meets the requirements of Regulatory Guides 1.174 and 1.178. The EPRI criterion requires that the cumulative change in CDF and LERF be less than 1E-07 and 1E-08 per year per system, respectively.

W3 has conducted a risk impact analysis per the requirements of Section 5 of Code Case N-716 that is consistent with the "Simplified Risk Quantification Method" described in Section 3.7 of EPRI TR-112657. The analysis estimates the net change in risk due to the positive and negative influences of adding and removing locations from the inspection program.

The conditional core damage probability (CCDP) and conditional large early release probability (CLERP) values used to assess risk impact were estimated based on pipe break location. Based on these estimated values, a corresponding consequence rank was assigned per the requirements of EPRI TR-112657 and upper bound threshold values were used as provided below. Consistent with the EPRI risk-informed methodology, the upper bound for all break locations that fall within the high consequence rank range was based on the highest CCDP value obtained (i.e., Large LOCA for W3).

CCDP and CLERP Values Based on Break Location

Break Location Designation	Estimated		Consequence Rank	Upper Bound	
	CCDP	CLERP		CCDP	CLERP
LOCA	4.20E-03	4.20E-04	**HIGH**	4.20E-03	4.20E-04
RCPB pipe breaks that result in a loss of coolant accident – The highest CCDP for Large LOCA was used (0.1 margin used for CLERP)					
ILOCA	8.40E-06	8.40E-07	**MEDIUM**	1.00E-04	1.00E-05
RCPB pipe breaks that result in an isolable LOCA – Calculated based on Large LOCA CCDP of 4.2E-3 and valve fail to close probability of 2E-3 (0.1 margin used for CLERP)					
PLOCA	4.20E-06	4.20E-07	**MEDIUM**	1.00E-04	1.00E-05
RCPB pipe breaks that result in a potential LOCA – Calculated based on Large LOCA CCDP of 4.2E-3 and valve rupture probability of <1E-3 (0.1 margin used for CLERP)					
PLOCA – SD	1.00E-04	1.00E-05	**HIGH**	4.20E-03	4.20E-04
RCPB pipe breaks that occur in shutdown cooling piping and result in a potential LOCA – Values obtained from RI-BER analysis (0.1 margin used for CLERP)					
BER – SI1	1.00E-04	1.00E-05	**HIGH**	4.20E-03	4.20E-04
Class 2 pipe breaks that occur in shutdown cooling piping inside containment – Values obtained from RI-BER analysis (0.1 margin used for CLERP)					
BER – SI2	1.00E-04	1.00E-04	**HIGH**	4.20E-03	4.20E-04
Class 2 pipe breaks that occur in shutdown cooling piping outside containment – Values obtained from RI-BER analysis (no margin used for CLERP)					
BER – FW1	7.00E-04	7.00E-05	**HIGH**	4.20E-03	4.20E-04
Class 2 pipe breaks that occur in main feedwater piping inside containment – Values obtained from RI-BER analysis (0.1 margin used for CLERP)					
BER – FW2	7.00E-04	7.00E-05	**HIGH**	4.20E-03	4.20E-04
Class 2 pipe breaks that occur in main feedwater and emergency feedwater piping outside containment – Values obtained from RI-BER analysis (0.1 margin used for CLERP)					
BER – MS	7.00E-04	7.00E-05	**HIGH**	4.20E-03	4.20E-04
Class 2 pipe breaks that occur in main steam piping inside and outside containment – Values obtained from RI-BER analysis (0.1 margin used for CLERP)					
Class 2 LSS	1.00E-04	1.00E-05	**MEDIUM**	1.00E-04	1.00E-05
Class 2 pipe breaks that occur in the remaining system piping designated as low safety significant – Estimated based on upper bound for Medium Consequence					

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 $20x_o$. These PBF likelihoods are consistent with References 9 and 14 of EPRI TR-112657. 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 RIS_B approach.

Table 3.4-1 presents a summary of the RIS_B Program versus 1992 ASME Section XI Code Edition program requirements on a "per system" basis. The presence of FAC was adjusted for in the quantitative analysis by excluding its impact on the failure potential rank. The exclusion of the impact of FAC on the failure potential rank and therefore in the determination of the change in risk is performed, because FAC is a damage mechanism managed by a separate, independent plant augmented inspection program. The RIS_B Program credits and relies upon this plant augmented inspection program to manage this damage mechanism. The plant FAC Program will continue to determine where and when examinations shall be performed. Hence, since the number of FAC examination locations remains the same "before" and "after" and no delta exist, there is no need to include the impact of FAC in the performance of the risk impact analysis.

As indicated in the following table, this evaluation has demonstrated that unacceptable risk impacts will not occur from implementation of the RIS_B Program, and satisfies the acceptance criteria of Regulatory Guide 1.174 and Code Case N-716.

W3 Risk Impact Results

System(1)	ΔR_{CDF} Results		ΔR_{LERF} Results	
	w/ POD	w/o POD	w/ POD	w/o POD
RC	-9.66E-10	6.09E-09	-9.66E-11	6.09E-10
CH	-8.36E-09	-4.66E-09	-8.36E-10	-4.66E-10
SI	-2.14E-08	-5.44E-09	-2.14E-09	-5.44E-10
EF	-1.76E-09	-4.20E-10	-1.76E-10	-4.20E-11
FW	-2.92E-09	-7.35E-10	-2.92E-10	-7.35E-11
MS	1.12E-10	1.12E-10	1.12E-11	1.12E-11
CS	1.50E-10	1.50E-10	1.50E-11	1.50E-11
TOTAL	-3.51E-08	-4.90E-09	-3.51E-09	-4.90E-10

Note

(1) Systems are described in Table 3.1.

3.4.2 Defense-in-Depth

The intent of the inspections mandated by ASME Section XI for piping welds is to identify conditions such as flaws or indications that may be precursors to leaks or ruptures in a system's pressure boundary. Currently, the process for picking inspection locations is based upon structural discontinuity and stress analysis results. As depicted in ASME White Paper 92-01-01 Rev. 1, *Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds*, this method has been ineffective in identifying leaks or failures. EPRI TR-112657 and Code Case N-716 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, a generic assessment of high-consequence sites has been determined by Code Case N-716 supplemented by plant-specific evaluations thereby requiring a minimum threshold of inspection for important piping whose failure would result in a LOCA or BER break. Finally, Code Case N-716 requires that any piping on a plant-specific basis that has a contribution to CDF of greater than 1E-06 (or 1E-07 for LERF) be included in the scope of the application. W3 did not identify any such piping.

All locations within the Class 1, 2, and 3 pressure boundaries will continue to be pressure tested in accordance with the Code, regardless of its safety significance.

4. IMPLEMENTATION AND MONITORING PROGRAM

Upon approval of the RIS_B 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 second ISI interval. No changes to the Technical Specifications or 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 RIS_B 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 RIS_B Program is a living program requiring feedback of new relevant information to ensure the appropriate identification of HSS piping locations. As a minimum, this review will be conducted 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 RIS_B Program and ASME Section XI 1992 Code Edition program requirements for in-scope piping is provided in Table 5.

W3 intends to start implementing the RIS_B Program during the plant's third period of the current (second) inspection interval. By the end of last refueling outage (RF-14), 65% of the piping weld examinations required by ASME Section XI have been completed thus far in the second ISI interval for Examination Categories B-F, B-J, C-F-1 and C-F-2. To ensure the performance of 100% of the required examinations during the current (second) ten-year ISI interval, 35% of the inspection locations selected for examination per the RIS_B process will be examined in the third period of the interval. The third ISI interval will implement 100% of the inspection locations selected for examination per the RIS_B Program. Examinations shall be performed such that the period percentage requirements of ASME Section XI are met.

6. REFERENCES/DOCUMENTATION

USNRC Safety Evaluation on the use of ASME Code Case N-663, dated August 26, 2003 (letter CNRI-2003-00010)

EPRI Report 1006937, *Extension of EPRI Risk Informed ISI Methodology to Break Exclusion Region Programs*

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

ASME Code Case N-716, *Alternative Piping Classification and Examination Requirements, 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

ENTP-19Q-301, *Degradation Mechanism Evaluation for Waterford*, Revision 0

ENTP-19Q-302, *RI-BER Evaluation for Waterford Unit 3*, Revision 0

ENTP-19Q-303, *N-716 Evaluation of Waterford 3*, Revision 0

PLG-0624, *Internal Flood Frequencies during Shutdown and Operation for Nuclear Power Plants*, N. O. Siu, et al., prepared for Public Service of New Hampshire, Pickard, Lowe and Garrick, Inc., dated May 1988

Table 3.1
N-716 Safety Significance Determination

System Description	Weld Count	N-716 Safety Significance Determination					Safety Significance	
		RCPB	SDC	PWR: FW	BER	CDF > 1E-6 LERF > 1E-7	High	Low
RC – Reactor Coolant	282	✓					✓	
CH – Chemical and Volume Control	129	✓					✓	
SI – Safety Injection	277	✓	✓				✓	
	41	✓					✓	
	28		✓		✓		✓	
	12		✓				✓	
	34				✓		✓	
	1209							✓
EF – Emergency Feedwater	22			✓			✓	
FW – Main Feedwater	44			✓	✓		✓	
	6			✓			✓	
	2				✓		✓	
MS – Main Steam	77				✓		✓	
	43							✓
CS – Containment Spray	201							✓
SUMMARY RESULTS FOR ALL SYSTEMS	277	✓	✓				✓	
	452	✓					✓	
	28		✓		✓		✓	
	12		✓				✓	
	44			✓	✓		✓	
	28			✓			✓	
	113				✓		✓	
	1465							✓
TOTALS	**2407**						**954**	**1453**

Table 3.2
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
RC	✓	✓				✓					
CH		✓									
SI(2)	✓	✓	✓			✓					
EF		✓									✓
FW	✓										✓
MS(2)											
CS(2)											

Notes

1. Systems are described in Table 3.1.
2. A degradation mechanism assessment was not performed on low safety significant piping segments. This includes the CS system in its entirety, as well as portions of the SI and MS systems.

Table 3.3
N-716 Element Selections

System(1)	Weld Count		N-716 Selection Considerations					Selections
	HSS	LSS	DMs	RCPB	$\text{RCPB}^{\text{IFIV}}$	RCPB^{OC}	BER	
RC	1		TASCS, TT, PWSCC	✓	✓			1
RC	19		TASCS, TT	✓	✓			6
RC	2		TT, PWSCC	✓	✓			1
RC	16		TASCS	✓	✓			4
RC	3		TT	✓	✓			0
RC	14		PWSCC	✓	✓			4
RC	213		None	✓	✓			13
RC	14		None	✓				0
CH	36		TT	✓	✓			11
CH	5		TT	✓				0
CH	76		None	✓	✓			2
CH	12		None	✓				0
SI	8		TT, IGSCC	✓				2
SI	14		TASCS	✓	✓			4
SI	52		TT	✓	✓			17
SI	106		TT	✓				8
SI	36		TT				✓	8
SI	4		TT					0
SI	2		PWSCC	✓	✓			1
SI	40		None	✓	✓			0
SI	96		None	✓				0
SI	26		None				✓	0
SI	8		None					0
SI		1209						
EF	2		TT, (FAC)					0
EF	18		TT					3
EF	2		None (FAC)					0
FW	6		TASCS, (FAC)				✓	2
FW	3		TASCS				✓	3
FW	2		TASCS					0
FW	8		None (FAC)				✓	0
FW	29		None				✓	1
FW	4		None					0
MS	77		None				✓	8
MS		43						
CS		201						

Table 3.3 (Cont'd) N-716 Element Selections								
System[1]	Weld Count		N-716 Selection Considerations					Selections
	HSS	LSS	DMs	RCPB	RCPB^{IFIV}	RCPB^{OC}	BER	
SUMMARY RESULTS FOR ALL SYSTEMS	1		TASCS, TT, PWSCC	✓	✓			1
	19		TASCS, TT	✓	✓			6
	6		TASCS, (FAC)				✓	2
	8		TT, IGSCC	✓				2
	2		TT, PWSCC	✓	✓			1
	2		TT, (FAC)					0
	30		TASCS	✓	✓			8
	3		TASCS				✓	3
	2		TASCS					0
	91		TT	✓	✓			28
	111		TT	✓				8
	36		TT				✓	8
	22		TT					3
	16		PWSCC	✓	✓			5
	8		None (FAC)				✓	0
	2		None (FAC)					0
	329		None	✓	✓			15
	122		None	✓				0
	132		None				✓	9
	12		None					0
		1453						
TOTALS	954	1453						99

Note

1. Systems are described in Table 3.1.

Table 3.4-1 Risk Impact Analysis Results											
System(1)	Safety Significance	Break Location	Failure Potential		Inspections			CDF Impact		LERF Impact	
			DMs	Rank	SXI(2)	RIS_B	Delta	w/ POD	w/o POD	w/ POD	w/o POD
RC	High	LOCA	TASCS, TT, PWSCC	Medium	1	1	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RC	High	LOCA	TASCS, TT	Medium	19	6	-13	2.52E-10	5.46E-09	2.52E-11	5.46E-10
RC	High	LOCA	TT, PWSCC	Medium	2	1	-1	4.20E-10	4.20E-10	4.20E-11	4.20E-11
RC	High	LOCA	TASCS	Medium	0	4	4	-3.02E-09	-1.68E-09	-3.02E-10	-1.68E-10
RC	High	LOCA	TT	Medium	3	0	-3	7.56E-10	1.26E-09	7.56E-11	1.26E-10
RC	High	LOCA	PWSCC	Medium	3	4	1	-4.20E-10	-4.20E-10	-4.20E-11	-4.20E-11
RC	High	LOCA	None	Low	63	13	-50	1.05E-09	1.05E-09	1.05E-10	1.05E-10
RC	High	PLOCA	None	Low	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RC TOTAL								**-9.66E-10**	**6.09E-09**	**-9.66E-11**	**6.09E-10**
CH	High	LOCA	TT	Medium	0	11	11	-8.32E-09	-4.62E-09	-8.32E-10	-4.62E-10
CH	High	ILOCA	TT	Medium	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CH	High	LOCA	None	Low	0	2	2	-4.20E-11	-4.20E-11	-4.20E-12	-4.20E-12
CH	High	PLOCA	None	Low	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CH TOTAL								**-8.36E-09**	**-4.66E-09**	**-8.36E-10**	**-4.66E-10**
SI	High	PLOCA – SD	TT, IGSCC	Medium	2	2	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SI	High	LOCA	TASCS	Medium	3	4	1	-2.27E-09	-4.20E-10	-2.27E-10	-4.20E-11
SI	High	LOCA	TT	Medium	8	17	9	-1.08E-08	-3.78E-09	-1.08E-09	-3.78E-10
SI	High	PLOCA – SD	TT	Medium	4	8	4	-5.04E-09	-1.68E-09	-5.04E-10	-1.68E-10
SI	High	BER – SI1	TT	Medium	2	0	-2	5.04E-10	8.40E-10	5.04E-11	8.40E-11
SI	High	BER – SI2	TT	Medium	4	8	4	-5.04E-09	-1.68E-09	-5.04E-10	-1.68E-10
SI	High	LOCA	PWSCC	Medium	2	1	-1	4.20E-10	4.20E-10	4.20E-11	4.20E-11
SI	High	LOCA	None	Low	6	0	-6	1.26E-10	1.26E-10	1.26E-11	1.26E-11
SI	High	PLOCA – SD	None	Low	1	0	-1	2.10E-11	2.10E-11	2.10E-12	2.10E-12
SI	High	PLOCA	None	Low	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SI	High	BER – SI1	None	Low	4	0	-4	8.40E-11	8.40E-11	8.40E-12	8.40E-12
SI	High	BER – SI2	None	Low	2	0	-2	4.20E-11	4.20E-11	4.20E-12	4.20E-12
SI	Low	Class 2 LSS	N/A	Assume Medium	59	0	-59	5.90E-10	5.90E-10	5.90E-11	5.90E-11
SI TOTAL								**-2.14E-08**	**-5.44E-09**	**-2.14E-09**	**-5.44E-10**

Table 3.4-1 (Cont'd)
Risk Impact Analysis Results

System[(1)]	Safety Significance	Break Location	Failure Potential		Inspections			CDF Impact		LERF Impact	
			DMs	Rank	SXI[(2)]	RIS_B	Delta	w/ POD	w/o POD	w/ POD	w/o POD
EF	High	BER – FW2	TT, (FAC)	Medium (High)	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EF	High	BER – FW2	TT	Medium	2	3	1	-1.76E-09	-4.20E-10	-1.76E-10	-4.20E-11
EF	High	BER – FW2	None (FAC)	Low (High)	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EF TOTAL								**-1.76E-09**	**-4.20E-10**	**-1.76E-10**	**-4.20E-11**
FW	High	BER – FW1	TASCS, (FAC)	Medium (High)	0	2	2	-1.51E-09	-8.40E-10	-1.51E-10	-8.40E-11
FW	High	BER – FW1	TASCS	Medium	3	3	0	-1.51E-09	0.00E+00	-1.51E-10	0.00E+00
FW	High	BER – FW1	None (FAC)	Low (High)	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	High	BER – FW2	None (FAC)	Low (High)	1	0	-1	2.10E-11	2.10E-11	2.10E-12	2.10E-12
FW	High	BER – FW1	None	Low	2	1	-1	2.10E-11	2.10E-11	2.10E-12	2.10E-12
FW	High	BER – FW2	None	Low	3	0	-3	6.30E-11	6.30E-11	6.30E-12	6.30E-12
FW TOTAL								**-2.92E-09**	**-7.35E-10**	**-2.92E-10**	**-7.35E-11**
MS	High	BER – MS	None	Low	10	8	-2	4.20E-11	4.20E-11	4.20E-12	4.20E-12
MS	Low	Class 2 LSS	N/A	Assume Medium	7	0	-7	7.00E-11	7.00E-11	7.00E-12	7.00E-12
MS TOTAL								**1.12E-10**	**1.12E-10**	**1.12E-11**	**1.12E-11**
CS	Low	Class 2 LSS	N/A	Assume Medium	15	0	-15	1.50E-10	1.50E-10	1.50E-11	1.50E-11
CS TOTAL								**1.50E-10**	**1.50E-10**	**1.50E-11**	**1.50E-11**
GRAND TOTAL								**-3.51E-08**	**-4.90E-09**	**-3.51E-09**	**-4.90E-10**

Notes

1. Systems are described in Table 3.1.
2. Only those ASME Section XI Code inspection locations that received a volumetric examination in addition to a surface examination are 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.

Table 5
Inspection Location Selection Comparison Between ASME Section XI Code and Code Case N-716

System[(1)]	Safety Significance		Break Location	Failure Potential		Code Category	Weld Count	Section XI		Code Case N-716	
	High	Low		DMs	Rank			Vol/Sur	Sur Only	RIS_B	Other[(2)]
RC	✓		LOCA	TASCS, TT, PWSCC	Medium	B-J[DMW]	1	1	0	1	–
RC	✓		LOCA	TASCS, TT	Medium	B-J	19	19	0	6	–
RC	✓		LOCA	TT, PWSCC	Medium	B-F	2	2	0	1	–
RC	✓		LOCA	TASCS	Medium	B-J	16	0	0	4	–
RC	✓		LOCA	TT	Medium	B-J	3	3	0	0	–
RC	✓		LOCA	PWSCC	Medium	B-F	3	3	0	1	–
						B-J[DMW]	11	0	1	3	–
RC	✓		LOCA	None	Low	B-J[DMW]	13	8	5	0	–
						B-J	200	55	36	13	–
RC	✓		PLOCA	None	Low	B-J	14	0	1	0	–
CH	✓		LOCA	TT	Medium	B-J[DMW]	2	0	2	0	–
						B-J	34	0	8	11	–
CH	✓		ILOCA	TT	Medium	B-J	5	0	3	0	–
CH	✓		LOCA	None	Low	B-J[DMW]	1	0	1	0	–
						B-J	75	0	1	2	–
CH	✓		PLOCA	None	Low	B-J	12	0	1	0	–
SI	✓		PLOCA – SD	TT, IGSCC	Medium	B-J	8	2	0	2	–
SI	✓		LOCA	TASCS	Medium	B-J	14	3	0	4	–
SI	✓		LOCA	TT	Medium	B-J[DMW]	4	4	0	0	–
						B-J	48	4	0	17	–
SI	✓		PLOCA – SD	TT	Medium	B-J	106	4	1	8	–
SI	✓		BER – SI1	TT	Medium	C-F-1	8	2	0	0	–
SI	✓		BER – SI2	TT	Medium	C-F-1	32	4	0	8	–
SI	✓		LOCA	PWSCC	Medium	B-J[DMW]	2	2	0	1	–
SI	✓		LOCA	None	Low	B-J	40	6	7	0	–
SI	✓		PLOCA – SD	None	Low	B-J	55	1	3	0	–
SI	✓		PLOCA	None	Low	B-J	41	0	7	0	–
SI	✓		BER – SI1	None	Low	C-F-1	26	4	0	0	–
SI	✓		BER – SI2	None	Low	C-F-1	8	2	0	0	–
SI		✓	Class 2 LSS	N/A	Assume Medium	C-F-1	1209	59	25	0	–

Table 5 (Cont'd) Inspection Location Selection Comparison Between ASME Section XI Code and Code Case N-716											
System[1]	Safety Significance		Break Location	Failure Potential		Code	Weld	Section XI		Code Case N-716	
	High	Low		DMs	Rank	Category	Count	Vol/Sur	Sur Only	RIS_B	Other[2]
EF	✓		BER – FW2	TT, (FAC)	Medium (High)	C-F-2	2	0	0	0	–
EF	✓		BER – FW2	TT	Medium	C-F-2	18	2	0	3	–
EF	✓		BER – FW2	None (FAC)	Low (High)	C-F-2	2	0	1	0	–
FW	✓		BER – FW1	TASCS, (FAC)	Medium (High)	C-F-2	6	0	0	2	–
FW	✓		BER – FW1	TASCS	Medium	C-F-2	5	3	0	3	–
FW	✓		BER – FW1	None (FAC)	Low (High)	C-F-2	4	0	0	0	–
FW	✓		BER – FW2	None (FAC)	Low (High)	C-F-2	4	1	0	0	–
FW	✓		BER – FW1	None	Low	C-F-2	17	2	0	1	–
FW	✓		BER – FW2	None	Low	C-F-2	14	3	0	0	–
						NNS	2	0	0	0	–
MS	✓		BER – MS	None	Low	C-F-2	75	10	0	8	–
						NNS	2	0	0	0	–
MS		✓	Class 2 LSS	N/A	Assume Medium	C-F-2	43	7	0	0	–
CS		✓	Class 2 LSS	N/A	Assume Medium	C-F-1	201	15	0	0	–

Notes

1. Systems are described in Table 3.1.
2. The column labeled "Other" is generally used to identify plant augmented inspection program locations credited per Section 4 of Code Case N-716. Code Case N-716 allows the existing plant augmented inspection program for IGSCC (Categories B through G) in a BWR to be credited toward the 10% requirement. This option is not applicable for the W3 RIS_B application. The "Other" column has been retained in this table solely for uniformity purposes with other RIS_B application template submittals.

ENCLOSURE 2

W3F1-2007-0046

ASME CODE CASE N-716

Approval Date: April 19, 2006

The ASME Boiler and Pressure Vessel Standards Committee took action to eliminate Code Case expiration dates effective March 11, 2005. This means that all Code Cases listed in this Supplement and beyond will remain available for use until annulled by the ASME Boiler and Pressure Vessel Standards Committee.

Case N-716
Alternative Piping Classification and Examination Requirements
Section XI, Division 1

Inquiry: What alternative to the requirements of IWB-2420, IWB-2430, and IWB-2500 (Examination Categories B-F and B-J) and IWC-2420, IWC-2430, and IWC-2500 (Examination Categories C-F-1 and C-F-2), or as additional requirements for Subsection IWD, may be used for inservice inspection and preservice inspection of Class 1, 2, 3, or Non-Class piping?

Reply: It is the opinion of the Committee that the following requirements may be used in lieu of the requirements of IWB-2420, IWB-2430, Table IWB-2500-1 (Examination Categories B-F and B-J), IWC-2420, IWC-2430, and Table IWC-2500-1 (Examination Categories C-F-1 and C-F-2) for inservice inspection of Class 1 or 2 piping and IWB-2200 and IWC-2200 for preservice inspection of Class 1 or 2 piping, or as additional requirements for Class 3 piping or Non-Class piping, for plants issued an initial operating license prior to December 31, 2000.

1 SCOPE

The scope shall include Class 1 and 2 piping as identified in IWB-1200 and IWC-1200, Components Subject to Examination. The provisions of this Case may define additional requirements for Class 3 or Non-Class piping.

2 GENERAL REQUIREMENTS

(a) Welds shall be assigned a category that shall be used to determine the treatment requirements of this Case. High safety significant welds consist of welds that are

(1) Class 1 portions of the reactor coolant pressure boundary (RCPB), except as provided in (c)(2)(i) and (c)(2)(ii) of Title 10 of the U.S. Code of Federal Regulations (10 CFR), Part 50.55a

(2) applicable portions of the shutdown cooling pressure boundary function shall be included. That is, Class 1 and 2 welds of systems or portions of systems needed to utilize the normal shutdown cooling flowpath either

(a) as part of the RCPB from the reactor pressure vessel (RPV) to the second isolation valve (i.e., farthest from the RPV) capable of remote closure, or to the containment penetration, whichever encompasses the larger number of welds, or

(b) other systems or portions of systems from the reactor pressure vessel (RPV) to the second isolation valve (i.e., farthest from the RPV) capable of remote closure or to the containment penetration, whichever encompasses the larger number of welds.

(3) that portion of the Class 2 feedwater system [> NPS 4 (DN 100)] of pressurized water reactors (PWRs) from the steam generator to the outer containment isolation valve,

(4) piping within the break exclusion region [NPS 4 (DN 100)] for high energy piping systems[1] as defined by the Owner, and

(5) any piping segment whose contributions to core damage frequency is greater than IE-06 based upon a plant-specific probabilistic risk assessment (PRA) of pressure boundary failures (e.g., pipe whip, jet impingement, spray, and inventory losses). This may include Class 3 or Non-Class piping. The PRA quality basis shall be

[1] NUREG-0800, 3.6.2 provides a method for defining this scope of piping.

reviewed to confirm it is applicable to the high safety significant categorization of this Case.[2]

(b) Low safety significant welds shall include all other Class 2, 3, or Non-Class welds not classified as high safety significant in accordance with this Case.

3 PRESERVICE EXAMINATION REQUIREMENTS

Welds classified as high safety significant require preservice inspection. The examination volumes, techniques, and procedures shall be in accordance with Table 1. Welds classified as low safety significant do not require preservice inspection.

4 INSERVICE INSPECTION REQUIREMENTS

Low safety significant welds are exempt from the volumetric, surface, VT-1, and VT-3 visual examination requirements of Section XI. Ten percent of the high safety significant welds shall be selected for examination. The examination requirements for these locations are defined in Table 1. The existing plant FAC inspection program and localized corrosion inspection program, excluding crevice corrosion (per Table 2), shall not be credited toward the 10% requirement. The existing plant IGSCC (Categories B through G) inspection program may be credited toward the 10% requirement, provided the requirements of this Case are met. Selection of welds for examination shall be as follows:

(a) The susceptibility of each high safety significant item to the degradation mechanisms listed in Table 2 shall be determined. High safety significant welds shall be assigned an item number in Table 1 based upon the results of the degradation mechanism evaluation. High safety significant welds identified as not susceptible shall be assigned to Item No. R1.20 of Table 1.

(b) Examinations shall be prorated equally among systems to the extent practical, and each system shall individually meet the following requirements:

(1) A minimum of 25% of the population identified as susceptible to each item number and item number combination (e.g., R1.11 and R11.16) shall be selected, excluding Item Nos. R1.18 and R1.20.

(2) If the examinations selected above exceed 10% of the total number of high safety significant welds, the examinations may be reduced by prorating among each item number and item number combination, to the extent practical, such that at least 10% of the high quality significant population is inspected.

(3) If the examinations selected above are not at least 10% of the high safety significant weld population, additional welds shall be selected so that the total number selected for examination is at least 10%. The additional welds may be selected from any item number of Table 1, including R1.20, within the limitations of (4)(c), (4)(d), (4)(e), (4)(f), and (5).

(c) For the RCPB, at least two-thirds of the examinations shall be located between the first isolation valve (i.e., isolation valve closest to RPV) and the reactor pressure vessel.

(d) A minimum of 10% of the welds in that portion of the RCPB that lies outside containment (e.g., portions of the main feedwater system in BWRs) shall be selected.

(e) A minimum of 10% of the welds within the break exclusion region shall be selected.

(f) When selecting welds for examination, the following shall be considered:

(1) plant-specific cracking experience

(2) weld repairs

(3) random selection

(4) minimization of worker exposure

5 CHANGE-IN-RISK EVALUATION

A change-in-risk evaluation shall be performed prior to the initial implementation of this Case.

(a) Bounding Failure Frequency. The failure frequencies of 2E-06 per weld-year for welds in the high failure potential category, 2E-07 per weld-year for welds in the medium failure potential category, and 1E-08 per weld-year in the low failure potential category may be used as bounding failure frequencies as defined in Table 3.

(b) Conditional Risk Estimates. The estimated conditional core damage probability (CCDP) and conditional large early release probability (CLERP) may be used if available. Bounding values of the highest estimated CCDP and CLERP may be used if specific estimates are not available.

(c) The following general equations shall be used to estimate the change-in-risk. One estimate shall be made for the change in core damage frequency (CDF) and one

[2] If there is a previously approved, risk-informed inservice inspection (RI-ISI) program, the PRA quality basis for that application shall be reviewed to confirm it is applicable to the high safety significant categorization of this Case. If there is no approved RI-ISI program at the plant, where the regulatory authority having jurisdiction at the plant site has already accepted the use of the PRA in the RI-ISI application, the Owner shall review the results of previous independent reviews of the PRA (including regulatory authority review) and ensure that any comments that could influence the results of the categorization are incorporated or otherwise dispositioned. EPRI TR-1006937, "Extension of the EPRI RI-ISI Methodology to Break Exclusion Region (BER) Programs," Rev. 0-A, provides an acceptable approach for conducting this review.

TABLE 1
EXAMINATION CATEGORIES

EXAMINATION CATEGORY R-A							
Item No.	Parts Examined	Examination Requirement/Fig. No. [Note (2)]	Examination Method	Acceptance Standard	Extent and Frequency [Note (3)] 1st Interval	Extent and Frequency [Note (3)] Successive Intervals	Defer to End of Interval
R1.10	High Safety Significant Piping Structural Elements						
R1.11	Elements Subject to Thermal Fatigue	IWB-2500-8(c) [Note (1)] IWB-2500-9, 10, 11	Volumetric [Note (8)]	IWB-3514	Element [Notes (2), (4)]	Same as 1st	Not Permissible
R1.12	Not Used						
R1.13	Elements Subject to Erosion-Cavitation	[Note (6)]	Volumetric [Note (7)]	IWB-3514 [Note (6)]	Element [Note (2)]	Same as 1st	Not Permissible
R1.14	Elements Subject to Crevice Corrosion Cracking	[Note (5)]	Volumetric [Notes (9), (10)]	IWB-3514	Element [Note (2)]	Same as 1st	Not Permissible
R1.15	Elements Subject to Primary Water Stress Corrosion Cracking (PWSCC)	IWB-2500-8(c) [Note (1)] IWB-2500-9, 10, 11	Volumetric [Notes (7), (9), (10)]	IWB-3514	Element [Notes (2), (4)]	Same as 1st	Not Permissible
R1.16	Elements Subject to Intergranular or Transgranular Stress Corrosion Cracking (IGSCC or TGSCC)	IWB-2500-8(c) [Note (1)] IWB-2500-9, 10, 11	Volumetric [Notes (7), (9), (10)]	IWB-3514	Element [Notes (2), (4)]	Same as 1st	Not Permissible
R1.17	Elements Subject to Localized Corrosion [Microbiologically-Influenced Corrosion (MIC) or Pitting]	IWB-2500-8(a) IWB-2500-8(b) IWB-2500-8(c) IWB-2500-9, 10, 11	Visual, VT-3 Internal Surfaces or Volumetric [Notes (6) or (7)]	[Note (6)]	Element [Note (2)]	Same as 1st	Not Permissible
R1.18	Elements Subject to Flow Accelerated Corrosion (FAC)	[Note (7)]	[Note (7)]	[Note (7)]	[Note (7)]	[Note (7)]	[Note (7)]

TABLE 1
EXAMINATION CATEGORIES (CONT'D)

EXAMINATION CATEGORY R-A

Item No.	Parts Examined	Examination Requirement/ Fig. No. [Note (2)]	Examination Method	Acceptance Standard	Extent and Frequency [Note (3)] 1st Interval	Successive Intervals	Defer to End of Interval
R1.19	Elements Subject to External Chloride Stress Corrosion Cracking (ECSCC)	IWB-2500-8(a), IWB-2500-8(b), IWB-2500-8(c), IWB-2500-9, 10, 11	Surface	IWB-3514	Element [Note (2)]	Same as 1st	Not Permissible
R1.20	Elements Not Subject to a Degradation Mechanism	IWB-2500-8(c) IWB-2500-9, 10, 11	Volumetric [Notes (9), (10)]	IWB-3514	Element [Notes (2), (4)]	Same as 1st	Not Permissible

NOTES:

(1) The length of the examination volume shown in Fig. IWB-2500-8(c) shall be increased by enough distance [approximately ½ in. (13 mm)] to include each side of the base metal thickness transition or counterbore transition.

(2) Includes examination locations and Class 1 weld examination requirement figures that typically apply to Class 1, 2, 3, or Non-Class welds identified in accordance with 4 Inservice Inspection Requirements.

(3) Includes essentially 100% of the examination location. When the required examination volume or area cannot be examined due to interference by another component or part geometry, limited examinations shall be evaluated for acceptability. Acceptance of limited examinations or volumes shall not invalidate the results of the change-in-risk evaluation (see 5). Areas with acceptable limited examinations and their bases, shall be documented.

(4) The examination shall include any longitudinal welds at the location selected for examination in Note (2). The longitudinal weld examination requirements shall be met for both transverse and parallel flaws within the examination volume defined in Note (2) for the intersecting circumferential welds.

(5) The examination volume shall include the volume surrounding the weld, weld HAZ, and base metal, where applicable, in the crevice region. Examination should focus on detection of cracks initiating and propagating from the inner surface.

(6) The examination volume shall include base metal, welds, and weld HAZ in the affected regions of carbon and low alloy steel, and the welds and weld HAZ of austenitic steel. Examinations shall verify the minimum wall thickness required. Acceptance criteria for localized thinning is in the course of preparation. The examination method and examination region shall be sufficient to characterize the extent of the element degradation.

(7) In accordance with the Owner's existing programs, such as PWSCC, IGSCC, MIC, or FAC programs, as applicable.

(8) Socket welds of any size and branch pipe connection welds NPS 2 (DN 50) and smaller selected for examination require a volumetric examination of the piping base metal within ½ in. (13 mm) of the toe of the weld, and the fitting itself shall receive a VT-2 visual examination .

(9) Socket welds of any size and branch pipe connection welds NPS 2 (DN 50) and smaller require only a VT-2 visual examination. For PWSCC susceptible locations, the insulation shall be removed.

(10) VT-2 visual examinations shall be conducted during a system pressure test or a pressure test specific to that element or segment, in accordance with IWA-5000, IWB-5000, IWC-5000, or IWD-5000, as applicable, and shall be performed during each refueling outage or at a frequency consistent with the time (e.g., 18 to 24 months) between refueling outages.

TABLE 2
DEGRADATION MECHANISMS

Mechanisms		Attributes	Susceptible Regions
TF	TASCS	— piping > NPS 1 (DN 25) — piping segment has a slope < 45 deg from horizontal (includes elbow or tee into a vertical pipe) — potential exists for a low flow in a piping section connected to a component allowing mixing of hot and cold fluids, or potential exists for leakage flow past a valve (i.e., in-leakage, out-leakage, cross-leakage) allowing mixing of hot and cold fluids, or potential exists for convection heating in dead-ended piping sections connected to a source of hot fluid, or potential exists for two phase (steam/water) flow, or potential exists for turbulent penetration in branch piping connected to header piping containing hot fluid with high turbulent flow — calculated or measured $\Delta T > 50°F$ (28°C) — Richardson number > 4.0	nozzles, branch piping connections, safe ends, welds, heat affected zones (HAZ), base metal, and regions of stress concentration
	TT	— operating temperature > 270°F (130°C) for stainless steel, or operating temperature > 220°F (105°C) for carbon steel — potential for relatively rapid temperature changes including cold fluid injection into hot pipe segment, or hot fluid injection into cold pipe segment — $\lvert \Delta T \rvert > 200°F$ (110°C) for stainless steel, or $\lvert \Delta T \rvert > 150°F$ (83°C) for carbon steel, or $\lvert \Delta T \rvert > \Delta T$ allowable (applicable to stainless and carbon)	
SCC	IGSCC (BWR)	— evaluated in accordance with existing plant IGSCC program per NRC Generic Letter 88-01, or alternative (e.g., BWRVIP-075)	austenitic stainless steel welds and HAZ
	IGSCC (PWR)	— operating temperature > 200°F (93°C) — susceptible material (carbon content ≥ 0.035%) — tensile stress (including residual stress) is present — oxygen or oxidizing species are present OR — operating temperature < 200°F (93°C), the attributes above apply — initiating contaminants (e.g., thiosulfate, fluoride, chloride) are also required to be present	
	TGSCC	— operating temperature > 150°F (65°C) — tensile stress (including residual stress) is present — halides (e.g., fluoride or chloride) are present, or caustic (NaOH) is present — oxygen or oxidizing species are present (only required to be present in conjunction with halides, not required with caustic)	austenitic stainless steel base metal, welds, and HAZ
	ECSCC	— operating temperature > 150°F (65°C) — an outside piping surface is within five diameters of a probable leak path (e.g., valve stems) and is covered with nonmetalic insulation that is not in compliance with Reg. Guide 1.36, or an outside piping surface is exposed to wetting from concentrated chloride-bearing environments (e.g., seawater, brackish water, brine)	
	PWSCC	— piping or weld material is UNS N06600, N06082, or W86182 — exposed to primary water at $T > 570°F$ (300°C) — the material is mill-annealed and cold-worked, or cold-worked and welded without stress relief	nozzles, welds, and HAZ without stress relief
LC	MIC	— operating temperature < 150°F (65°C) — low or intermittent flow — pH < 10 — presence/intrusion of organic material (e.g., raw water system), or water source is not treated with biocides (e.g., refueling water tank)	fittings, welds, HAZ, base metal, dissimilar metal joints (e.g., welds, flanges), and regions containing crevices
	PIT	— potential exists for low flow — oxygen or oxidizing species are present — initiating contaminants (e.g., fluoride, chloride) are present	
	CC	— crevice condition exists (e.g., thermal sleeves) — operating temperature > 150°F (65°C) — oxygen or oxidizing species are present	

TABLE 2
DEGRADATION MECHANISMS (CONT'D)

Mechanisms		Attributes	Susceptible Regions
FS	E-C	— existence of cavitation source (i.e., throttling or pressure reducing valves or orifices) — operating temperature < 250°F (120°C) — flow present > 100 hr/yr — velocity > 30 ft/s (9.1 m/s) — $(P_d - P_v)/\Delta P < 5$ where, P_d = static pressure downstream of the cavitation source, P_v = vapor pressure, and ΔP = pressure difference across the cavitation source	fittings, welds, HAZ, and base metal
	FAC	— evaluated in accordance with existing plant FAC program	per plant FAC program

LEGEND:
Thermal Fatigue (TF)
Thermal Stratification, Cycling, and Striping (TASCS)
Thermal Transients (TT)
Stress Corrosion Cracking (SCC)
Intergranular Stress Corrosion Cracking (IGSCC)
Transgranular Stress Corrosion Cracking (TGSCC)
External Chloride Stress Corrosion Cracking (ECSCC)
Primary Water Stress Corrosion Cracking (PWSCC)
Localized Corrosion (LC)
Microbiologically-Influenced Corrosion (MIC)
Pitting (PIT)
Crevice Corrosion (CC)
Flow Sensitive (FS)
Erosion-Cavitation (E-C)
Flow-Accelerated Corrosion (FAC)

TABLE 3
DEGRADATION MECHANISM CATEGORY

Failure Potential	Conditions	Degradation Category	Degradation Mechanism
High [Note (1)]	Degradation mechanism likely to cause a large break	Large Break	Flow-Accelerated Corrosion
Medium	Degradation mechanism likely to cause a small leak	Small Leak	Thermal Fatigue, Erosion-Cavitation, Corrosion, Stress Corrosion Cracking
Low	None	None	None

NOTE:
(1) Segments having degradation mechanism listed in the small leak category shall be upgraded to the high failure potential large/break category if the pipe segments also have the potential for water hammer loads.

for large early release frequency (LERF). The equations only illustrate the change in CDF. The change in LERF due to application of the process shall be estimated by substituting the CLERP for CCDP in the equations.

$$\Delta R_{CDF} = \Sigma_j (I_{rj} - I_{ej}) * PF_j * CCDP_j$$

where

Σ_j = summation of locations selected for examination

ΔR_{CDF} = change in CDF due to replacing the prior deterministic ISI program with the ISI program developed in accordance with this Case

I_{rj} = factor of reduction in pipe rupture frequency at location j associated with the ISI program developed by this Case

I_{ej} = factor of reduction in pipe rupture frequency at location j associated with the prior deterministic ISI program

PF_j = piping failure frequency at location j without examination

$CCDP_j$ = conditional core damage probability at location j

In terms of probability of detection $[POD_j = (1 - I_j)]$, the equation becomes

$$\Delta R_{CDF} = \Sigma_j (POD_{ej} - POD_{rj}) * PF_j * CCDP_j$$

where

POD_{ej} = probability of detection at location j associated with the prior deterministic ISI program

POD_{rj} = probability of detection at location j associated with the ISI program developed in accordance with this Case

It is acceptable to use bounding estimates for pipe failure frequency, conditional core damage probability, and conditional large early release probability, to simplify the calculations. If the bounding estimates for pipe failure frequency and conditional probability are used, the equation becomes:

$$\Delta R_{CDF} = [(POD_e{*}N_{efc} - POD_r{*}N_{rfc})]{*}PF_f{*}CCDP_c$$

where

POD_e = probability of detection in the existing ISI program (may be degradation mechanism specific)

N_{efc} = number of examination locations in the consequence f and failure frequency c categories associated with the prior deterministic ISI program

POD_r = probability of detection in the ISI program developed by this Case (may be degradation mechanism specific)

N_{rfc} = number of examination locations in the consequence f and failure frequency c categories associated with the ISI program developed using this Case

PF_f = piping failure frequency for the high, medium, and low failure frequency estimates

$CCDP_c$ = conditional core damage probability consequence estimates

(d) Acceptance Criteria. Any increase in CDF and LERF for each system shall be less than 1E-07 per year and 1E-08 per year, respectively, and the total increase in CDF and LERF should be less than 1E-06 per year and 1E-07 per year respectively. If necessary, additional examinations shall be selected to meet this acceptance criteria.

6 SUCCESSIVE INSPECTIONS AND ADDITIONAL EXAMINATIONS

(a) Successive Inspections. As an alternative to the successive inspection requirements of IWB-2420, IWC-2420, or IWD-2420, the following requirements shall be met.

(1) The sequence of piping examinations established during the first inspection interval using this Case shall be repeated during each successive inspection interval to the extent practical. The examination sequence may be modified to optimize scaffolding, radiological, insulation removal, or other considerations, provided the percentage requirements of Tables IWB-2411-1 or IWB-2412-1 are met.

(2) If piping structural elements are accepted for continued service by analytical evaluation in accordance with IWB-3132.4 or IWB-3142.4, before, during, or after implementation of this Case, the areas containing flaws or relevant conditions shall be reexamined during the next three inspection periods.

(3) If the reexaminations required by 6(a)(2) reveal that the flaws or relevant conditions remain essentially unchanged for three successive inspection periods, the examination schedule shall revert to the original schedule of successive inspections.

(b) Additional Examinations. As an alternative to the additional examination requirements of IWB-2430, IWC-2430, or IWD-2430, the following requirements shall be met. Additional examinations for Item No. R1.18 are outside the scope of this Case.

(1) Examinations performed in accordance with Table 1 of this Case, excluding Item No. R1.18, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1, shall be extended to include a first sample of additional examinations during the current outage.

(a) The piping structural elements (welds) to be examined in the first sample of additional examinations shall include HSS elements with the same postulated degradation mechanism in systems whose materials and service conditions are similar to the element that exceeded the acceptance standards.

(b) The number of examinations required is the number of HSS elements with the same postulated degradation mechanism scheduled for the current inspection period. If there are not enough HSS elements to equal this number, the Owner shall include remaining HSS elements and LSS elements up to and including this number that are subject to the same degradation mechanism.

(2) If the additional examinations required by 6(b)(1) reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1, the examinations shall be extended to include a second sample of additional examinations during the current outage.

(a) The second sample of additional piping structural elements to be examined shall include all remaining HSS piping structural elements in Table 1 subject to the same degradation mechanism.

(b) The Owner shall also examine LSS piping structural elements subject to the same degradation mechanism or document the basis for their exclusion.

(3) For the inspection period following the period in which the examination of 6(b)(1) and 6(b)(2) were completed, the examinations shall be performed as originally scheduled in accordance with IWB-2400.

7 PROGRAM UPDATES

Examination selections made in accordance with this Case shall be reevaluated on the basis of inspection periods that coincide with the inspection program requirements for Inspection Program A or B of IWA-2431 or IWA-2432, as applicable. For Inspection Program B, the third inspection period reevaluation will serve as the subsequent inspection interval reevaluation. The performance of each inspection period reevaluation may be accelerated or delayed by as much as one year. Each reevaluation shall consider the cumulative effects of previous reevaluations. The reevaluation shall determine if any changes to the examination selections need to be made, by evaluation of the following:

(a) plant design changes (e.g., physical: new piping or equipment installation; programmatic: power uprating/ 18 to 24 month fuel cycle; and procedural: operating procedure changes)

(b) changes in postulated conditions or assumptions (e.g., check valve seat leakage is greater than previously assumed)

(c) examination results (e.g., discovery of leakage or flaws)

(d) piping failures (e.g., plant-specific or industry occurrences of through-wall or through-weld leakage, failure due to a new degradation mechanism, or a nonpostulated mechanism)

(e) PRA updates that would increase the scope of (2)(a)(5) (e.g., new initiating events, new system functions, more detailed model used, and initiating event and failure data changes)

(f) the impact of 7(a) through 7(e) on the change-in-risk evaluation in 5

8 OWNER'S RESPONSIBILITY

(a) The Owner shall determine the appropriate classification for welds in accordance with the provisions of this Case.

(b) Personnel with expertise in the following disciplines shall be included in this process. The Owner shall ensure adequate experience levels for each discipline. This experience shall be documented and maintained by the Owner.

(1) probabilistic risk assessment (PRA)

(2) plant operations

(3) design

(4) safety accident analysis

(c) The results of the application of this Case (e.g., determination of high safety significant weld, change-in-risk evaluation) shall be documented and reviewed.

ENCLOSURE 3

W3F1-2007-0046

LICENSEE-IDENTIFIED COMMITMENTS

LICENSEE-IDENTIFIED COMMITMENTS

COMMITMENT	TYPE (Check one) ONE-TIME ACTION	CONTINUING COMPLIANCE	SCHEDULED COMPLETION DATE
W3 is in the process of evaluating MRP-146, *Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines*, and these results will be incorporated into the RIS_B Program, if warranted.	✓		June 30, 2011
Request for Alternative CEP-ISI-007 pertaining to the application of Code Case N-663 will be withdrawn for use at W3 upon NRC approval of the RIS_B Program submittal.	✓		Upon NRC approval of W3-ISI-005