**From:** Syed Ali
**To:** Olshan, Leonard
**Date:** 11/7/01 8:24AM
**Subject:** EPRI RI-ISI Methodology Extension

Lenny:

Enclosed is an advance copy of the staff RAI on EPRI RI-ISI methodology extension to break exclusion region (BER) piping. The formal dispatch will be coming to you soon. Please forward these to EPRI (I assume Pat O'Reagan). Thanks.

Syed A. Ali
NRR/DE/EMCB
301-415-2776
O-9C14

**CC:** Chan, Terence; Dinsmore, Stephen; Rubin, Mark; Sullivan, Edmund

MEMORANDUM TO: Herbert N. Berkow, Director
Project Directorate II
Division of Licensing Project Management

FROM: Terence Chan, Chief
Materials Inspection Section
Materials and Chemical Engineering Branch
Division of Engineering

Mark P. Rubin, Chief
Safety Program Section
Probabilistic Safety Assessment Branch
Division of Systems Safety & Analysis

SUBJECT: COMMENTS AND REQUEST FOR ADDITIONAL INFORMATION RELATED TO ELECTRIC POWER RESEARCH INSTITUTE EXTENSION OF RISK-INFORMED INSERVICE INSPECTION METHODOLOGY

Reference: Electric Power Research Institute Letter on "Extension of Risk-informed Inservice Inspection Methodology" dated February 28, 2001.

Attached for issuance to the Electric Power Research Institute (EPRI) are the comments and request for additional information (RAI) that have been developed by the NRC staff reviewers on the subject report. Since the receipt of the report, the staff has discussed the issues related to the report in several meetings and phone conversations. The object of this letter is to summarize the staff comments and questions and request EPRI's response to these issues.

The staff appreciates EPRI's willingness to work with the NRC to help define the methods and criteria necessary to produce acceptable applications of risk-informed inservice inspection (RI-ISI) methodologies. The staff's interactions with the industry have been and continue to be instrumental in helping the staff develop regulatory guidance that can be used by plant licensees to produce safe and more cost-effective ISI programs.

Attachment: As stated

CONTACTS: Syed A. Ali, EMCB/DE
415-2776
Stephen Dinsmore, SPSB/DSSA
415-8482

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The staff appreciates EPRI's willingness to work with the NRC to help define the methods and criteria necessary to produce acceptable applications of risk-informed inservice inspection (RI-ISI) methodologies. The staff's interactions with the industry have been and continue to be instrumental in helping the staff develop regulatory guidance that can be used by plant licensees to produce safe and more cost-effective ISI programs.

Attachment: As stated

CONTACTS: Syed A. Ali, EMCB/DE
415-2776
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**COMMENTS AND REQUEST FOR ADDITIONAL INFORMATION RELATED TO EXTENSION OF EPRI RISK-INFORMED INSERVICE INSPECTION (RI-ISI) METHODOLOGY TO BREAK EXCLUSION REGION (BER) PIPING**

1. Branch Technical Position MEB 3-1 of SRP 3.6.2 states that this position on pipe rupture postulation is intended to comply with the requirements of General Design Criterion 4 (GDC 4), of Appendix A to 10 CFR Part 50. SRP 3.6.2 provides guidelines for locations where breaks should be postulated in high-energy fluid system piping. The licensees have designed and constructed hardware such as pipe whip restraints and jet impingement shields in areas where breaks were postulated. SRP 3.6.2 also defined areas where breaks and cracks need not be postulated, also called the break exclusion region (BER), provided a number of design requirements are met including a 100% volumetric examination of all pipe welds during each inspection interval. In the BER, pipe break mitigation devices, such as whip restraints and jet shields are not constructed. In order to provide assurance that structures, systems, and components (SSC) in the BER are protected from the dynamic effects of pipe breaks, and to verify that the probability of piping rupture is extremely low in these areas, it is essential that a minimum amount of inspection is continued for the piping in the BER. The staff recommends a minimum inspection of 25% of welds in the BER. This minimum percentage is the same as required by ASME XI for Class 1 butt welds. The reduction of BER piping inspection from 100% to 25% would result in significant reduction in burden but still maintain an acceptable level of quality and safety and provide sufficient margin of safety and defense-in-depth as required by the guidelines of RG 1.174 and RG 1.178. Please provide your response to this discussion.

2. Please provide the available data on industry experience with the inspection of welds in the break exclusion zone. Section 3.4.2 provides a review of the degradation mechanisms experienced at operating nuclear power plants. However, Table 3-6 is for relatively recent pipe leak/break events from 1995 to 2000, and Table 3-7 is for events from 1987 to 1995. The discussion does not provide a clear, complete and concise description of number of pipe leak/break events that were discovered in the BERs of the plants and the number of plants surveyed. Please state if the Tables included in this Section provide an all-inclusive list of events in the BERs of plants. Also, please clarify the following items under this discussion:

   a. Table 3-6 does not provide sufficient details; e.g., plants affected, dates of occurrences, sizes of flaws/leaks, etc. are not included.
   b. The discussion states that nine events were identified under the categories of K1, K2, and K3 in Table 3-7. However, Table 3-7 includes 10 events.

3. Section 3.8.2 states that no formal submittal of the RI-ISI evaluations for BER programs or a template to the NRC is expected. The submittal further states that the NRC would be notified of the adoption of an RI-ISI BER program through the licensees' periodic 10 CFR 50.59 summary report. Please provide detailed justification, along with an example 10 CFR 50.59 package, for making this change through the 10 CFR 50.59 process. Please document why this approach satisfies the applicable regulations, in

particular GDC 4.

4. If EPRI considers that the Appendices provide a format for information to be retained on-site, it should be noted that the contents of the Appendices do not appear to fully comport with the Addendum. Does EPRI acknowledge that the Appendices depart from the Addendum methodology in at least the following items, and what is the significance of these departures with respect to approval of the Addendum and the eventual 50.59 evaluations?

   a. Both Appendix A Section A.3.7.2 and Appendix B Section B.3.7.2 state that "criteria established requires the cumulative change in core damage frequency (CDF) and large, early release frequency (LERF) be less than 1E-7 and 1E-8 per year per system, respectively. If this is not met for all systems, the total CDF and LERF should not exceed 1E-6 and 1E-7, respectively." This does not comport with the criteria in the EPRI Topical report (referenced in the Addendum). The EPRI Topical Report states that the system level changes in CDF and LERF should not exceed 1E-7 and 1E-8 year respectively and that the total change should not exceed 1E-6 and 1E-7 per year respectively.
   b. Section 3.7 of the Addendum does not discuss estimates of total CDF and LERF caused by BER piping alone although both Appendices include these calculations.
   c. Appendix B does not provide the "BER only" results nor the system level results required by the Addendum.

5. Please discuss if the application of the RI-ISI process to BER piping will be independent of its application to balance of plant (BOP) piping (i.e., non-BER piping), and provide justification for the position taken. The Addendum states that if a BER program change is done with or after an RI-ISI program implementation, the two results will be developed and maintained as part of the on-site documentation: the cumulative RI-ISI results including changes in the BER program, and the results of only the BER program change. Is it anticipated that a licensee could implement the BER program change without implementing an RI-ISI program? The descisionmaking process should take into account the impact on the number and location of inspections for the BER and other piping and the regulatory vehicle for the implementation of RI-ISI to BER as well as BOP piping. The staff believes that a uniform position on this subject will have to be reflected in staff approval of the methodology for RI-ISI of the BER.

6. Currently, the EPRI RI-ISI method is approved for application to Class 1 piping (which can be considered a system for change in risk calculation), a combination of pipe classes (in which the systems included are each subject to the change in risk guidelines), or a selection of systems. The most common observed application scope is to either Class 1, or Class 1 + 2. Does EPRI envision that there could be a Class 1 + BER application scope or a Class 1 + 2 + BER application scope? How does EPRI intend to apply the system level change in risk guidelines to these different scopes?

7. Section 2.5 states that "since existing regulatory documents provide a basis for using a consequence-based approach to limiting the scope of piping in the augmented ISI

program, this would not require generic relief but may involve a number of individual licensee submittals and accompanying NRC review." Please clarify as to which regulatory documents are being referred to in this statement.

8. Section 3.3.2 states that BER piping is almost exclusively low stress piping. Please provide a basis for this statement.

9. EPRI extension of RI-ISI methodology for BER piping does not appear to provide adequate guidance on the indirect consequence evaluation for these piping segments. The staff's specific concern is that it may not be consistent with the guidance provided in SRP 3.6.2 related to the criteria for evaluating dynamic effects associated with the postulated rupture of piping. Examples of issues that are not addressed in the report include:

   a. Criteria for postulating types of breaks (i.e., circumferential versus longitudinal breaks) including their postulated locations and break sizes.
   b. Criteria for pipe whip dynamics analysis, including the determination of unrestrained whipping pipe motion and its associated dynamic impact on the nearby safety-related SSCs including containment penetration.
   c. Effect of a whipping pipe impacting pipes of equal or larger nominal pipe size with thinner wall thickness.
   d. Criteria for postulating through wall leakage cracks and evaluation of its associated environmental effects.
   e. Criteria for determining jet thrust, jet impingement forces including jet direction and jet expansion model (i.e., steam, water steam mixture, saturated water, or subcooled water blowdown) and its impact on the nearby safety-related SSCs including containment penetration.
   f. Effect of temperature, pressure, water spray, flooding, and compartment pressurization, if any.

   Please describe how the methodology addresses these concerns. If conservative assumptions are implemented in lieu of detailed analyses, please describe those assumptions as applicable.

10. Sections A.3.7.1 and B.3.3 provide assumptions used in the indirect consequence evaluation (spatial effects) for NMP2 and CCNPP, respectively. Aside from several identified areas, it appears that the CCDPs and CLERPs based on the assumptions that the isolation valves do not close (or that the penetration fails) are intended to bound the spatial impacts. While an initial screening analysis to identify areas requiring detailed analyses may be appropriate, the screening analysis must bound the potential impacts of pipe rupture in the area. It is not clear that assuming a single valve fails to close will bound the potential impact of a pipe rupture that could fail other equipment, including other pipes, in the area. Please provide the generic assumptions, and the implications and bases for each of these assumptions, to be used in the screening analysis in the main body of the report.

11. The addendum repeats much, but not all, of the text in the original EPRI TR-112657. For

example, large parts of Section 3.3.3 in the EPRI TR are repeated in section 3.3 of the Addendum although the equations, for example, are not repeated.

a. Is the only difference between the methodology in the EPRI TR and the methodology in the Addendum the evaluation of spatial effects for BER piping? If not, what are the other differences?
b. Is it the intent that the addendum be a self-contained document that could be used, for example, by a licensee that does not implement an RI-ISI program but only changes its BER program? If not, what is the intended relationship between the EPRI TR and the Addendum?

**From:** "O'Regan" <poregan@mediaone.net>
**To:** <lno@nrc.gov>
**Date:** 12/17/01 3:19PM
**Subject:** BER RAIs

Len,

Attached are the draft responses to the RAIs. Attachment 3 to the responses is not included here. It has been prepared but is still under review. Hope to send it later this week.

Thanks, PJO'R

**CC:** <poregan@epri.com>

**Proposed Responses to:**

**COMMENTS AND REQUEST FOR ADDITIONAL INFORMATION RELATED TO EXTENSION OF EPRI RISK-INFORMED INSERVICE INSPECTION (RI-ISI) METHODOLOGY TO BREAK EXCLUSION REGION (BER) PIPING**

1. Branch Technical Position MEB 3-1 of SRP 3.6.2 states that this position on pipe rupture postulation is intended to comply with the requirements of General Design Criterion 4 (GDC 4), of Appendix A to 10 CFR Part 50. SRP 3.6.2 provides guidelines for locations where breaks should be postulated in high-energy fluid system piping. The licensees have designed and constructed hardware such as pipe whip restraints and jet impingement shields in areas where breaks were postulated. SRP 3.6.2 also defined areas where breaks and cracks need not be postulated, also called the break exclusion region (BER), provided a number of design requirements are met including a 100% volumetric examination of all pipe welds during each inspection interval. In the BER, pipe break mitigation devices, such as whip restraints and jet shields are not constructed. In order to provide assurance that structures, systems, and components (SSC) in the BER are protected from the dynamic effects of pipe breaks, and to verify that the probability of piping rupture is extremely low in these areas, it is essential that a minimum amount of inspection is continued for the piping in the BER. The staff recommends a minimum inspection of 25% of welds in the BER. This minimum percentage is the same as required by ASME XI for Class 1 butt welds. The reduction of BER piping inspection from 100% to 25% would result in significant reduction in burden but still maintain an acceptable level of quality and safety and provide sufficient margin of safety and defense-in-depth as required by the guidelines of RG 1.174 and RG 1.178. Please provide your response to this discussion.

**Proposed Response:**

In general, a minimum level of assurance is warranted to confirm, on a continuing basis, that the probability of rupture is extremely low in the break exclusion region (BER). In particular, given that the approval can be implemented on a generic basis, consistency of application on an individual plant basis needs to be assured. This level of assurance is currently (and will continue to be) addressed by (1) a robust design process that assures that the probability of catastrophic rupture is low and (2) the sample size for inservice inspection.

(1) The probability of catastrophic rupture is a function of a number of factors. These include design, material, construction practices, pre-service inspection, operating conditions, etc. The effect of inservice inspection only serves to confirm this low probability rather than assure (i.e. prevent) its low probability of failure. In addition, NDE requirements for BER piping per SRP 3.6.2 are only one of three programs that

address the various levels of inspection for these components. The three levels are NDE requirements for BER/Section XI purposes, pressure testing requirements and other augmented inspection programs (e.g. FAC, thermal stratification, IGSCC in BWRs).

(2) The sample size for NDE inspection can be impacted by risk perspective, plant specific analysis and plant specific design features (e.g. analysis, hardware, etc.). To this end, EPRI intends to update the February, 2001 submittal with the information contained in Attachment 1 to this RAI response. Essentially, Attachment 1 provides an update to section 3.6.2 of the submittal. This update explicitly defines the steps necessary to be taken by a licensee in order to allow RI-BER inspection populations to fall below 10 percent. This update provides explicit criteria, thereby providing reasonable assurance that inspection populations are representative of the physical plant (e.g. whip restraints, vent openings, jet shields, FSAR analyses) and consistent with the goals of risk-informed regulation.

This ten percent trigger value is consistent with previous RI-ISI applications for important piping (EPRI TR-112657; Reference R-1), ASME Code Case N560 (Reference R-2), and the performance based criteria for stainless steel piping exposed to BWR reactor coolant (Reference R-3), which have been previously approved by the USNRC for generic use.

In summary, the revised section 3.6.2 (see Attachment 1 to this letter) provides explicit considerations of a minimum level of assurance that the probability of catastrophic failure of BER piping remains extremely low, while at the same time reduces burden and provides for a stable and predictable inspection population.

2. Please provide the available data on industry experience with the inspection of welds in the break exclusion zone. Section 3.4.2 provides a review of the degradation mechanisms experienced at operating nuclear power plants. However, Table 3-6 is for relatively recent pipe leak/break events from 1995 to 2000, and Table 3-7 is for events from 1987 to 1995. The discussion does not provide a clear, complete and concise description of number of pipe leak/break events that were discovered in the BERs of the plants and the number of plants surveyed. Please state if the Tables included in this Section provide an all-inclusive list of events in the BERs of plants. Also, please clarify the following items under this discussion:

   Table 3-6 does not provide sufficient details; e.g., plants affected, dates of occurrences, sizes of flaws/leaks, etc. are not included.

The discussion states that nine events were identified under the categories of K1, K2, and K3 in Table 3-7. However, Table 3-7 includes 10 events.

**Proposed Response:**
The intent of section 3.4.2 was to independently assess the applicability of the degradation mechanism evaluation process contained in EPRI TR-112657 to BER programs. In particular, the goal was to determine if there were any degradation mechanisms not covered by EPRI TR-112657 that should be addressed by the RI-BER application. As can be seen from Tables 3-6 and 3-7 of the submittal, no new mechanisms were identified via this review.

Table 3-6 provides a brief summary of recent operating experience. Table 3-7 is taken from NUREG/CR-5750 (Reference R-4). It is true that Table 3-7 has ten entries versus the nine events as discussed in section 3.4.2. The last entry in Table 3-7 (i.e. the tenth entry) was provided to show that NUREG/CR-5750 did not identify any K3 type (steam line breaks inside containment) events.

As part of the traditional RI-ISI approach, as well as its application to BER programs, each licensee will conduct a plant-specific service history review. This review assures that plant specific operating history (including BER inspection history) is consistent with the results of failure potential evaluation conducted as part of the RI-BER process.

In summary, no new degradation mechanisms or criteria for assessing degradation were identified as a result of this additional review of piping operating experience beyond that contained in the EPRI TR-112657 (Reference R-1).

1. Section 3.8.2 states that no formal submittal of the RI-ISI evaluations for BER programs or a template to the NRC is expected. The submittal further states that the NRC would be notified of the adoption of an RI-ISI BER program through the licensees' periodic 10 CFR 50.59 summary report. Please provide detailed justification, along with an example 10 CFR 50.59 package, for making this change through the 10 CFR 50.59 process. Please document why this approach satisfies the applicable regulations, in particular GDC 4.

**Proposed Response:**
Attachment 2 provides an example of the process to be followed by licensees implementing a RI-BER application. This process would apply to licensees whose BER

commitment is contained in the UFSAR or other licensee controlled document. That is, it would not be applicable to Technical Specifications or other licensee commitments requiring NRC pre-approval.

Attachment 3 provides a copy of the meeting summary from an October 3, 2001 NRC/NEI meeting. In this meeting, it was agreed that RI-BER applications would be consistent with applicable regulations, including GDC-4, and the only change would be to the number of augmented inspections.

2. If EPRI considers that the Appendices provide a format for information to be retained on-site, it should be noted that the contents of the Appendices do not appear to fully comport with the Addendum. Does EPRI acknowledge that the Appendices depart from the Addendum methodology in at least the following items, and what is the significance of these departures with respect to approval of the Addendum and the eventual 50.59 evaluations?

   a. Both Appendix A Section A.3.7.2 and Appendix B Section B.3.7.2 state that "criteria established requires the cumulative change in core damage frequency (CDF) and large, early release frequency (LERF) be less than 1E-7 and 1E-8 per year per system, respectively. If this is not met for all systems, the total CDF and LERF should not exceed 1E-6 and 1E-7, respectively." This does not comport with the criteria in the EPRI Topical report (referenced in the Addendum). The EPRI Topical Report states that the system level changes in CDF and LERF should not exceed 1E-7 and 1E-8 year respectively and that the total change should not exceed 1E-6 and 1E-7 per year respectively.
   b. Section 3.7 of the Addendum does not discuss estimates of total CDF and LERF caused by BER piping alone although both Appendices include these calculations.
   c. Appendix B does not provide the "BER only" results nor the system level results required by the Addendum.

**Proposed Response:**

RAI 4.1 It is true that TR-112657 states that change in risk assessment system level criteria be set at 1E-7 for CDF (1E-8 for LERF). As stated in TR-112657, these criteria are based upon plant level criteria of 1E-6 for CDF (1E-7 for LERF). The intent of partitioning this acceptance criteria was twofold: the first was to streamline the change in risk assessment process, and the second was to provide a buffer for plants wishing to implement RI-ISI in a phased approach. For example, a Class 1 application succeeded by a Class 2 application. This philosophy would assure that there was "risk margin" available for future RI-ISI applications. However, it was not the intent of TR-112657 to impose more restrictive requirements on acceptable risk changes for RI-ISI

programs than that currently allowed for other risk-informed applications.

As such, for RI-ER applications, the intent is that the system level criteria of 1E-7/1E-8 be used for initial screening purpose. These guidelines may be exceeded at the system level (BER level) provided the cumulative impact of all RI-ISI changes (past, current or approved in the future) are met at the plant level.

RAI 4.2

Section 3.7.1 of the Addendum indicates that the guidance in TR-112657, Rev B-A provides an acceptable process for application of the RI-ISI process to BER programs, which incorporates the acceptance criteria described in RAI 4.1 above. Then, Section 3.7.2 of the Addendum indicates that the BER program alone is also to be evaluated and meet the acceptance criteria. Together these sections require both methods (Traditional RI-ISI + BER and BER only) to be evaluated and to meet acceptance criteria.

RAI 4.3

Appendix B provides an evaluation of the BER scope only and does not provide results at the system level. Since the change in risk for the total BER scope was less than the system level criteria, system level results were not provided. Also, the results when combined with the traditional RI-ISI will not be important due to the low risk indicated for the BER only scope. However, Appendix B will be revised to explicitly address these conclusions.

1. Please discuss if the application of the RI-ISI process to BER piping will be independent of its application to balance of plant (BOP) piping (i.e., non-BER piping), and provide justification for the position taken. The Addendum states that if a BER program change is done with or after an RI-ISI program implementation, the two results will be developed and maintained as part of the on-site documentation: the cumulative RI-ISI results including changes in the BER program, and the results of only the BER program change. Is it anticipated that a licensee could implement the BER program change without implementing an RI-ISI program? The descisionmaking process should take into account the impact on the number and location of inspections for the BER and other piping and the regulatory vehicle for the implementation of RI-ISI to BER as well as BOP piping. The staff believes that a uniform position on this subject will have to be reflected in staff approval of the methodology for RI-ISI of the BER.

**Proposed Response:**
EPRI concurs that an uniform position on this subject is necessary to support consistent, stable and predictable program implementation. With respect to the specific questions raised by this RAI, the following is provided:

- Licensees may implement a RI-BER application without applying RI-ISI to the remaining piping systems (or portions of systems). That is, the ASME Section XI and other augmented inspection programs and requirements would remained unchanged. Thus, other licensee commitments (e.g. Section XI requirements) may determine the limiting number of inspections.

- Licensees that currently have approved RI-ISI applications may implement a RI-BER application at some future date (i.e. after approval of a traditional RI-ISI application). The RI-BER must not invalidate any of the requirements contained in the SER on the traditional RI-ISI application or the basis for the SER on the traditional RI-ISI application.

- From a resource management perspective, licensees that do not currently have an approved traditional RI-ISI application will most likely conduct the analysis for the traditional RI-ISI program and the RI-BER at the same time.

From a documentation perspective, each program (i.e. traditional RI-ISI and RI-BER) and supporting analyses needs to be independently documented. The physical documentation can be contained in separate packages (e.g. calculations, evaluations, reports) or in a common package provided each program is clearly defined together with its supporting basis.

The regulatory vehicle for traditional RI-ISI applications is well defined and has been in use for several years. As stated in the submittal, except for plants with other commitments (e.g. Technical Specifications), the regulatory process for RI-BER applications will be the plant's 50.59 process. Again, as stated above, the RI-BER application must not invalidate the results of the traditional RI-ISI program, its approval or basis for approval.

2. Currently, the EPRI RI-ISI method is approved for application to Class 1 piping (which can be

considered a system for change in risk calculation), a combination of pipe classes (in which the systems included are each subject to the change in risk guidelines), or a selection of systems. The most common observed application scope is to either Class 1, or Class 1 + 2. Does EPRI envision that there could be a Class 1 + BER application scope or a Class 1 + 2 + BER application scope? How does EPRI intend to apply the system level change in risk guidelines to these different scopes?

**Proposed Response:**
As discussed in the response to RAI-5, due to the status of the industry's implementation of traditional RI-ISI programs there will be a spectrum of ways in which RI-BER programs will be adopted. It is envisioned, as a minimum, that the scopes of application could include BER only, Class 1 + BER, Class 1 + 2 + BER, or fullscope + BER.

As stated in the submittal, the change in risk assessment needs to be conducted for the traditional RI-ISI program by itself, the combined RI-ISI + BER program and the BER program by itself.

With respect to risk acceptance criteria, as discussed in the response to RAI-4.1, the change in risk assessment system level criteria was set at 1E-7 for CDF (1E-8 for LERF). As stated in TR-112657, these criteria are based upon plant level criteria of 1E-6 for CDF (1E-7 for LERF). The intent of partitioning this acceptance criteria was twofold: the first was to streamline the change in risk assessment process, and the second was to provide a buffer for plants wishing to implement RI-ISI in a phased approach. For example, a Class 1 application succeeded by a Class 2 application. This philosophy would assure that there was "risk margin" available for future RI-ISI applications. However, it was not the intent of TR-112657 to impose more restrictive requirements on acceptable risk changes for RI-ISI programs than that currently allowed for other risk-informed applications.

As such, for BER applications, the intent is that the system level criteria of 1E-7/1E-8 be used for initial screening purpose. These guidelines may be exceeded at the system level (BER level) provided the cumulative impact of all RI-ISI changes (past, currently or approved in the future) are met at the plant level.

4. Section 2.5 states that "since existing regulatory documents provide a basis for using a consequence-based approach to limiting the scope of piping in the augmented ISI

program, this would not require generic relief but may involve a number of individual licensee submittals and accompanying NRC review." Please clarify as to which regulatory documents are being referred to in this statement.

**Proposed Response:**
The intent of section 2.5, and section 2.0 in general, was to provide a historical perspective of the BER concept. The relevant sections of the Standard Review Plan (e.g. section 3.6.2) are strictly consequence based. That is, a piping failure is postulated and equipment available to respond to the event is identified. No consideration of failure likelihood is factored into the SRP 3.6.2 assessment.

The paragraph in question was identifying that during a review of plant specific implementation of these requirements, a number of plants conservatively interpreted these requirements. It was felt that removal of these conservative interpretations could be addressed on a plant-by-plant basis.

6. Section 3.3.2 states that BER piping is almost exclusively low stress piping. Please provide a basis for this statement.

**Proposed Response:**
Plants that meet the Standard Review Plan section 3.6.2 as well as plants that responded to the Giambusso and O'Leary's letters were required to assure that a number of issues were specifically addressed. This included maintaining design stresses below a threshold value.

It should also be noted that operating experience has shown us that even if the design stresses are higher, but below allowable values, they do not correlate well with failure potential. In fact, all piping with stress levels below code allowable values are assured, with a high degree of confidence, that it will not fail under design loading conditions.

9. EPRI extension of RI-ISI methodology for BER piping does not appear to provide adequate guidance on the indirect consequence evaluation for these piping segments. The staff's

specific concern is that it may not be consistent with the guidance provided in SRP 3.6.2 related to the criteria for evaluating dynamic effects associated with the postulated rupture of piping. Examples of issues that are not addressed in the report include:

Criteria for postulating types of breaks (i.e., circumferential versus longitudinal breaks) including their postulated locations and break sizes.
Criteria for pipe whip dynamics analysis, including the determination of unrestrained whipping pipe motion and its associated dynamic impact on the nearby safety-related SSCs including containment penetration.
Effect of a whipping pipe impacting pipes of equal or larger nominal pipe size with thinner wall thickness.
Criteria for postulating through wall leakage cracks and evaluation of its associated environmental effects.
Criteria for determining jet thrust, jet impingement forces including jet direction and jet expansion model (i.e., steam, water steam mixture, saturated water, or subcooled water blowdown) and its impact on the nearby safety-related SSCs including containment penetration.
Effect of temperature, pressure, water spray, flooding, and compartment pressurization, if any.

Please describe how the methodology addresses these concerns. If conservative assumptions are implemented in lieu of detailed analyses, please describe those assumptions as applicable.

**Proposed Response:**
It is agreed that the level of guidance provided in Section 3.3.2 of EPRI TR can be enhanced. Attachment 4 is a revised section containing additional guidance on the required evaluation criteria. It was not the intent to be consistent with the guidance provided in SRP 3.6.2 because this is a risk-informed application where GDC 4 is not being changed nor is the design basis, including SRP 3.6.2 being changed, except for the percentage of weld inspections. Further, we decided to conservatively assume a double-ended-guillotine break (DEGB) in the analysis of the BER scope, while a more realistic application would certainly challenge this basic assumption of having to analyze for a DEGB. That is, the frequency of a DEGB is below the threshold of events needing to be postulated as a design basis event.

The improved guidance provided in the attached and described below for such unlikely scenarios consider SRP 3.6.2, but the intent is not to create a comprehensive analysis burden. We found that some conservative guidance or assumptions can be applied even for the DEGB assumption without impacting the likelihood for a cost-effective and successful risk-informed application. This philosophy reduces the analysis burden while providing the benefits of a risk-informed approach. On the other hand, once a

DEGB is assumed, some engineering judgment is necessary to preclude an excessive analysis burden. The following summarizes changes to the attached Section 3.3.2 for each of the six issues:

1. Criteria for postulating breaks – both circumferential and longitudinal breaks are postulated at each BER weld.
2. Criteria for pipe whip dynamic analysis – pipe whip due to an unrestrained pipe is postulated and evaluated for impact on structures, systems, and components. SRP 3.6.2 or plant specific high-energy pipe break analyses can be used or in lieu of this, conservative assumptions may be used such as looking at targets within the unrestrained whipping pipe length.
3. Effect on pipes of equal or larger size with thinner wall – similar to SRP 3.6.2, through wall cracks are assumed unless otherwise justified.
4. Criteria for postulating through wall cracks and environmental effects – as indicated in item 1, both circumferential and longitudinal breaks are postulated for each weld. Environmental impacts from these breaks must be evaluated.
5. Jet impingement – impingement impacts must be assessed for impact on structures, systems, and components. SRP 3.6.2 or plant specific high-energy pipe break analysis can be used or in lieu of this, conservative assumptions or engineering judgments based on plant design may be used.
6. Effects of temperature, pressure, water spray, flooding, and compartment pressure – these effects must be considered. Generally, electrical equipment in the area containing the break is assumed to fail unless there is a basis for survival (e.g., equipment qualification or analysis). Engineering judgment may be applied based on plant design and analysis. Spatial propagation must also be considered.

1. Sections A.3.7.1 and B.3.3 provide assumptions used in the indirect consequence evaluation (spatial effects) for NMP2 and CCNPP, respectively. Aside from several identified areas, it appears that the CCDPs and CLERPs based on the assumptions that the isolation valves do not close (or that the penetration fails) are intended to bound the spatial impacts. While an initial screening analysis to identify areas requiring detailed analyses may be appropriate, the screening analysis must bound the potential impacts of pipe rupture in the area. It is not clear that assuming a single valve fails to close will bound the potential impact of a pipe rupture that could fail other equipment, including other pipes, in the area. Please provide the generic assumptions, and the implications and bases for each of these assumptions, to be used in the screening analysis in the main body of the report.

**Proposed Response:**
Section A.3.7.1 provides a more traditional PRA evaluation (i.e. risk-based versus risk-informed) and may have caused some confusion. This section could be removed without having any impact on the report or its conclusions; it was conducted to investigate insights from this type of analysis and there is no intent of requiring such an analysis in the main report.

It was not the intent to assume that isolation failure bounded spatial impact. Both isolation success and failure cases are considered, including the probability of each. We agree that any screening types of assumptions should clearly show that they envelop all impacts including those on other piping systems and equipment. Both Sections A.3.3 and B.3.3 will be updated to more clearly address the enhance criteria described in response to RAI 9 above.

2. The addendum repeats much, but not all, of the text in the original EPRI TR-112657. For example, large parts of Section 3.3.3 in the EPRI TR are repeated in section 3.3 of the Addendum although the equations, for example, are not repeated.

3.

Is the only difference between the methodology in the EPRI TR and the methodology in the Addendum the evaluation of spatial effects for BER piping? If not, what are the other differences?

Is it the intent that the addendum be a self-contained document that could be used, for example, by a licensee that does not implement an RI-ISI program but only changes its BER program? If not, what is the intended relationship between the EPRI TR and the Addendum?

**Proposed Response:**

RAI 11.1 The philosophy in developing the submittal was to conduct a clean sheet evaluation of the TR-112657 methodology for its applicablity to BER programs. The submittal provided a summary of the TR-112657 methodology and identified any updates/enhancements useful in conducting a RI-BER application. Additional considerations contained in the submittal include the change in risk assessment criteria for RI-ISI + BER applications, regulatory approval process and example applications.

RAI 11.2 Originally it was EPRI's intent to treat the submittal as an addendum to

TR-112657. This has now changed and we intend to publish the submittal as a separate technical report. This report will reference TR-112657 for the methodology requirements not explicitly contained in the submittal. In order to conduct a RI-ISI application to BER programs, a licensee would need to use both documents.

**References:**

R-1 U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, "Safety Evaluation Report Related to "Revised Risk-Informed Inservice Inspection Evaluation Procedure" (EPRI TR-112657, Rev. B, July 1999)," October 28, 1999.

R-2 ASME Code Case N-560, "Alternative Examination Requirements for Class 1, Category B-J Piping Welds," (Supplement 6 - Approval Date August 9, 1996).

R-3 SAFETY EVALUATION OF THE "BWRVIP VESSEL AND INTERNALS PROJECT, BWR VESSEL AND INTERNALS PROJECT, TECHNICAL BASIS FOR REVISIONS TO GENERIC LETTER 88-01 INSPECTION SCHEDULES (BWRVIP-75)", EPRI REPORT TR-113932, OCTOBER 1999 (TAC NO. MA5012).

R-4 NUREG/CR-5750, "Rates of Initiating Events at U.S. Nuclear Power Plants: 1987 – 1995", February 1999.

# ATTACHMENT 1

## Revised Section 3.6.2

### *3.6.2 Adaptation to BER Programs*

While no changes to the element selection process are expected, consideration shall be given to the size of the final sample population size. If a plant is applying RI-ISI to BER programs after completion of the traditional RI-ISI, the risk category population sizes may change for BER systems since some welds may move to higher risk categories (e.g. risk category 6 to 4). Appendix A provides an example of the risk ranking and element selection results change for one application. In addition, the element selection process must consider the BER scope to ensure that this scope is appropriately covered during the element selection process. Again, Appendix A provides an example for an example plant.

Similar to traditional RI-ISI applications to Class 1 piping (Section 3.6.4.2 of TR-112657), it is expected that BER piping will tend to be grouped into three subsets. The first is brought about by the exceptional performance history of BER piping (see section 3.4) coupled with its typical high consequence of failure which results in the large number of elements being assigned to risk category 4 (10 percent inspection size). There is a second subset were a 25 percent sample is chosen due to a number of elements identified as potentially susceptible to some degradation mechanism (e.g. risk category 2, due to thermal fatigue). The third subset consists of those elements assigned to risk categories 6 or 7, which do not require volumetric NDE. As such, it is anticipated that unless plant specific design features control, inspection populations for BER programs to be approximately 10 percent of the current population.

If a situation occurs where a very large number of elements are assigned to low risk categories (i.e. Risk Categories 6 or 7) to the point that BER inspections falls significantly below 10 percent of the BER piping population, the basis for the low risk ranking shall be investigated. Although BER piping is typically highly reliable (i.e. low failure potential), inspection percentages significantly below 10% should not be expected unless plant design features have been incorporated to specifically address assumed breaks in the BER region.

This ten percent trigger value is consistent with previous RI-ISI applications for important piping (EPRI TR-112657; Reference R-1), ASME Code Case N560 (Reference R-2), and the performance based criteria for BWR stainless steel piping in BWR reactor coolant systems (Reference R-3), which have been previously approved by the USNRC for generic use.

Figure 3.6-1 provides a flowchart of the process required to be followed to assure that the final BER inspection population (i.e. below 10 percent) are consistentwith the intent of this methodology. This required process is described as follows:

- **Item 1** Are there a number of welds included in the BER program scope that are physically located outside the BER boundaries as defined in SRP 3.6.2 (e.g. beyond the containment isolation valve (and boundary restraint)? A number of cases have been identified where plants conservatively extended the BER boundary beyond that required by SRP requirements. Therefore, many of these "non-BER" welds, located beyond the isolation valve (and boundary restraint) will not result in a BER type consequences and therefore, provided there are no other plant unique issues, these welds would be expected to be of lower importance from a consequence perspective.

**Item 2** For some plants, the piping within the BER program was also provided with break limiting devices/analyses. In the cases where pipe whip restraints, jet shields, vent opening and/or analyses are available, the consequence of postulated failure should be reduced. It is important to note that these analyses and plant hardware need to be designed to respond to the BER break of interest.

***Summary 1 and 2*** If plant specific physical characteristics do not support a smaller sample size then further evaluation is necessary to understand the basis for the limited sample size. Items 3, and 4 provide examples of this type of evaluation.

**Item 3** The EPRI RI-ISI methodology analyzes failure potential and consequence of failure independently. As such, the final results (i.e. risk significance) are adversely impacted by conservatisms in either of the supporting analyses. However, as with the consequence analysis discussed in items 1 and 2, if inspection populations fall below 10 percent then the failure potential evaluation should be re-assessed. This evaluation should assure that plant specific and industry operating experience with this type of piping has been appropriately factored into the analysis (e.g. comparison to similar plant designs) and that no degradation mechanisms have been inadvertently screened out.

**Item 4** A key insight from probabilistic risk assessments pertains to the concept of common mode (common cause) failure. BER piping provides a classic example of the potential for one postulated failure to impact more than one key safety function (i.e. cascading effect). As such, from a consequence perspective, larger bore BER piping is expected to result in a high consequence of failure. If the evaluation identifies any of the large bore piping as medium to low consequence, a distinct evaluation shall be conducted to assure robustness in the consequence assignment. This evaluation shall include one or more of the following

(1) identification of the plant specific hardware (whip restraints, jet shields, penetration designs, separation) supporting the lower consequence assignment,

(2) identification of additional, unaffected equipment that will reliably perform the same safety function (e.g. RCS inventory control, injection, heat removal, containment isolation and heat removal and fission product scrubbing, and (3) comparison to other similar units based upon conditional consequence (as opposed to CDF/LERF) that shows the analysis is realistic/conservative.

In summary, the element selection process should satisfy the following criteria:

The percentage requirements for high risk (25%) and medium risk (10%) must be satisfied for the complete RI-ISI Program scope population including BER.

The percentage requirements for high risk (25%) and medium risk (10%) must be satisfied for the "BER Only" scope population.

The number of BER inspections should not be significantly less than 10% of the BER scope unless plant design features justify otherwise.

Determine Inspection Sample Size for BER Scope of Piping

Is Inspection Sample Size $\geq$ 10 percent?

Yes

No

Physical plant characteristics supportive of sample size? (e.g. items 1 & 2)

Yes

No

Is the sample size dominated by FR/FP assumptions? (e.g. item 3)

Yes

No

Combined effect of the Consequence and Failure Potential evaluations are reasonable? (see item 4)

YesNo

Adjust sample size

No further action required

# ATTACHMENT 2

## Example 10CFR50.59 Evaluation

**- To Be Provided LATER -**

**ATTACHMENT 3**

**Meeting Summary**

**October 3, 2001**

**USNRC Offices**
**Rockville, MD**

# NRC/NEI RI-ISI Meeting
# October 3, 2001

## Meeting Summary

A meeting was held at the USNRC Rockville offices. This meeting was a follow-up to a May 22, 2001 meeting. The two main topics of conversation were application of RI-ISI to break exclusion requirements (BER) and RI-ISI living program criteria (LPC).

Key points agreed to during the meeting are as follows:

**BER Programs**

Industry position is that barring other plant specific commitments (e.g. Technical Specification requirements); the regulatory process will consist of a 50.59 evaluation, against the approved generic methodology. NRC notification will be through 50.59 summary reports and SAR updates per 50.71(e).

NRC suggested that given the 50.59 process, they would need to review the generic methodology in detail so that potential interpretations are clearly understood between industry/NRC.

NRC suggested an example 50.59 evaluation would be helpful.

The GDC4 assumption, that the subject piping should have a low probability of failure, would not be adversely impacted by the BER application.

Scope of the BER application will need to be clearly defined. BER applications do not need to look at other high-energy piping. Its impact on previous or future RI-ISI applications will also need to be clearly defined. Any interaction or dependencies with other programs (e.g. Section XI) will need to be clearly defined.

Inspection sample size was discussed. NRC is concerned with past inconsistent application of the approved RI-ISI generic methodology. Similar to the 50.59 evaluation, NRC will need to review the generic methodology in detail so that potential interpretations are clearly understood between industry/NRC.

Schedule for the SE on the EPRI application has been delayed until March 31, 2002.

Schedule for the SE on the Westinghouse application is June 30, 2002.

**RI-ISI Living Program Criteria**

It was agreed that the intent of the RI-ISI template process was to provide NRC with the information necessary to conclude with reasonable assurance that the licensees:

- conducted the RI-ISI evaluation consistent with a Topical Report and its Safety Evaluation (SE),
- the change in risk as a result of the RI-ISI program is within acceptance criteria

It was agreed that the intent of the RI-ISI template process was to provide a fixed snapshot in time of the RI-ISI program and as such the following may change without requiring NRC approval or notification:

- delta risk numbers, provided they remain within acceptance criteria,
- number of inspections,
- allocation of inspections.

NRC notification and approval would be required when:

- changing from one methodology to another,
- changing the scope of application (see note below),
- Class 1 only to Class 1 & 2,
- Class 1 & 2 only to full scope,
- Plant-specific impact of revised Methodology or SE,
- Significant Industry/Plant event (not addressed by Generic/Methodology update),
- ASME Section XI Ten Year updates (unless not required by plant specific SE),
- changes, which impact the basis for NRC approval in the plant specific SE, are identified.

**Note:** minor changes to class boundaries (e.g. piping reroute, P&ID revisions) do not require re-submittal as they do not impact the basis for NRC's approval of the previous RI-ISI submittal.

It was agreed that generic conclusions discussed during the meeting apply to both "template" plants and "pilot" plants unless there are other commitments/requirements in the pilot plant's SE.

Both EPRI and Westinghouse are developing procedures/guidance documents to support maintaining RI-ISI programs as current. The intent is to have the RI-ISI update process be as consistent with the existing Section XI process as possible.

# ATTACHMENT 4

## Revised Section 3.3.2

### *3.3.2 Adaptation to BER Programs*

In contrast to traditional RI-ISI applications, which are intended to be best estimate evaluations, application to BER programs provides for bounding estimates and assumptions. This conservative application reduces the need to conduct resource intensive analyses, computations and their accompanying uncertainty.

By definition, BER piping is normally pressurized ("operating" configuration in Table 3-1), therefore the "Initiating" and "Combination" impact groups in Table 3-1 should be evaluated.

The consequence of failure of each circumferential weld in the BER scope is evaluated (i.e. pipe whip, jet impingement and other impacts). Both circumferential and longitudinal breaks are postulated at each weld. This is more conservative than the SRP requirement, which requires that only terminal ends and some higher stressed locations be evaluated. In addition, as BER piping is almost exclusively low stress piping, only terminal end breaks will need to be postulated due to SRP requirements. The RI-ISI evaluation requires each BER weld to be assessed. In addition, a double-ended guillotine pipe break is conservatively assumed for each weld. The criteria for postulating and analyzing pipe whip and jet impingement impacts are to be consistent with existing plant high-energy pipe break analyses (e.g., SRP 3.6.2 if that is the plants basis for analyses). However, the consequences of pipe breaks are to be consistent with a risk-informed approach. For example, single failure criteria does not have to be considered explicitly and structures, systems, and components are allowed to fail. The importance of single failure criteria and the protection of equipment are encompassed in the risk-informed approach (e.g., estimates of CCDP and CLERP, and the delta risk assessment acceptance criteria ensure an adequate level of safety).

As discussed above, BER programs vary throughout the industry. The following guidelines related to the consequence evaluation process are defined and should be applied to each BER weld in order to assure consistent application.

1. Containment performance is an important aspect of having to utilize the BER assumption in design basis (e.g. single failure relative to containment isolation). Postulated breaks outside containment should not take credit for the outside containment isolation valve or other isolation valves in the vicinity unless there is plant design and/or analysis that supports equipment operability during the event. Likewise breaks inside containment should not credit equipment inside the containment unless plant design and/or analysis provide justification.
2. The containment penetration is assumed to fail (containment bypass) if the penetration is not designed and analyzed for a double-ended guillotine pipe break (DEGB).

Note that design features may be utilized to preclude DEGB loads on the penetration (e.g. encapsulated pipe designed to preclude a DEGB load on a penetration). When failure of the penetration is assumed (e.g., no design or analysis information to demonstrate otherwise), the leakage around the penetration failure is assumed large enough to satisfy the "Large Release" portion of CLERP (conditional large early release probability) in the consequence evaluation unless analysis can justify smaller releases.

4. An unrestrained whipping pipe is not considered capable of causing a circumferential break in pipe of equal or larger nominal pipe size (SRP 3.6.2, Reference 6). The penetration of the equal or larger impacted pipe is also assumed not to fail. Through-wall cracks are postulated if the impacted pipe has thinner wall thickness except where analytical or experimental, or both, data for the expected range of impact energies demonstrate the capability of to withstand the impact without rupture (e.g. SRP 3.6.2).
5. An unrestrained whipping pipe is assumed to fail a smaller line and its penetration unless demonstrated capable by design or analysis. Circumferential and longitudinal breaks are postulated for the smaller line except where analytical or experimental, or both, data for the expected range of impact energies demonstrate the capability of to withstand the impact without rupture (e.g. SRP 3.6.2).
6. SRP 3.6.2 may be used to evaluate unrestrained whipping pipe and its potential physical impact on structures, systems and components. In lieu of SRP 3.6.2, plant specific criteria and analyses may be used and conservative assumptions or engineering judgments derived from plant design and analyses may be used as follows:
   a. Conservatively apply unrestrained piping length to identify potential targets.
   b. If a structural target is designed similar to another structural target already analyzed for pipe whip impact with similar loads, this may be used as a reasonable basis. Otherwise, the structural target (e.g., common wall with adjacent area) is assumed to fail.
   c. Equipment with active functions or electrical equipment such as a motor or air operated valve are assumed to fail (valve is assumed to fail in its normal position prior to the break). Check valves may be treated as piping as described above.
   d. The determination of pipe whip potential (e.g., potential for developing a hinge) may be derived from plant analyses of similar configurations.
7. Jet Impingement – SRP 3.6.2 may be used to evaluate jet impingement targets and potential load impact on structures, systems and components. In lieu of SRP 3.6.2, plant specific criteria and analyses may be used, and conservative assumptions and engineering judgments derived from plant design and analysis may be used as

follows:

a. Electrical or active equipment within the zone of influence of the break is assumed to fail (e.g., active valve is assumed to fail in its normal position prior to break) unless otherwise qualified. The typical zone of influence is 10 to 20 pipe diameters (e.g. NUREG/CR-2913, Reference 3.3-1).

b. If a structural or passive component type of target is designed similar to another similar target already analyzed for similar loads and found to be acceptable, this may be used as a reasonable basis. Otherwise, the target (e.g., common wall with adjacent area) is assumed to fail.

c. Plant analyses of jet impingement may be used to derive insights into potential impacts. For example, jet impingement impact from another analyzed pipe having a similar zone of influence may be used.

9. Other Spatial Impacts (indirect effects) – Structures, systems and components in the area of the break are assumed to fail as a result of the break unless design basis/analysis or appropriate engineering judgment based on plant design and spatial evaluations justifies otherwise. The following provides additional guidance:

   a. Physical separation can be credited with regard to the containment structure and isolation. For example, equipment inside containment can be credited with isolating a break outside containment. For high-energy line breaks, only automatic isolation can be credited and it must be qualified per design basis.

   b. Equipment Qualification (EQ) – Equipment in affected area may have been qualified as part of an EQ program. If this equipment is to be credited in the RI-ISI evaluation, the harsh environment identified as part of the EQ profile (temperature, pressure humidity, jet impingement and pipe whip) will need to envelope (or equal) the environment created by the assumed RI-ISI break. Caution should be applied, in that, the RI-ISI break will always assume that equipment available to isolate the break has an inherent unreliability. That is, the RI-ISI evaluation looks at both successful and unsuccessful isolation (and the resultant environments).

   c. Temperature, pressure, water spray, flooding, and compartment pressure must be considered when evaluating impacts as described above. Electrical equipment in the break area is assumed to fail unless a technical basis and/or qualification are available. Engineering judgments based on plant design may be used to evaluate whether compartment pressure can cause catastrophic failure of the room. An isolated room should be assumed to fail unless analysis can demonstrate otherwise.

10. Spatial Propagation - when postulating propagation to adjacent areas (e.g., adjacent wall failure due to pipe whip), both the isolation success and failure case must be

considered where applicable. For the failure to isolate case, the consequences are likely to be unanalyzed (beyond design basis), thus spatial propagation impacts must be analyzed or core damage assumed (CCDP = probability of isolation failure). For the isolation success case, the environmental impacts may be similar to analyzed cases; engineering judgment may be utilized based on plant design and analysis consistent with PRA/IPEEE studies:

a. Equipment in the vicinity of the propagation path (on other side of a door or wall failure) is assumed to fail unless qualified or protected from the break (similar to design basis or SRP 3.6.2).

b. For the isolation failure case, spatial propagation must be evaluated relative to impacts and equipment is assumed to fail unless qualified or protected (similar to design basis or SRP 3.6.2). Secondary propagation paths have to be considered as propagation continues to other areas.

c. For the successful isolation case, impacts beyond the immediate vicinity of the propagation path depend on distance, size of the adjacent room or area, and vent path (e.g., openings to adjacent room or upper elevations).

**Concerning the March 8, 2002 Meeting with Hatch**
**on the LAR for a Permanent TS modification to extent CTs for LCO 3.8.1**

The licensee will be expected to discuss of the following issues, and present quantitative and qualitative analyses where specifically requested:

1) The maximum risk associated with failure to meet the LCO (Condition A) would occur in connection with the CT of 17 days for Required Action A.3. According to the TS, at any time during the (14 day) maintenance interval to restore an inoperable EDG, one required offsite circuit may be declared inoperable for up to 3 days. Even though the change was made for consistency, increasing the EDG CT from 3 days to 14 days increases considerably the likelihood of concurring events. For this reason, Hatch is requested to estimate the maximum EOOS risk associated with the 2nd A.3 CT (i.e., that for a 14 day EDG CT with concurring 3 day offsite circuit CT) for restoration of required AC sources to OPERABLE status.

   This is the "third" request for this information.

2) It is noted that every time an LCO is entered taking an EDG in either unit out of service to perform maintenance, by procedure, the B EDG is out of service for the other unit, hence, a single LCO entry adversely affects the risk to both units approximately to the same degree. For this reason, Hatch is requested to estimate and discuss the factors responsible for, i.e., contributing to, the calculated ICLERP(EOOS-EDG).

3) In order for a program developed for - and used to - support the maintenance rule to also be an adequate substitute for a CRMP it must specifically include the attributes discussed in Regulatory Guide 1.177. Discuss how the Hatch program incorporates and implements these characteristics in managing risk, i.e., how risk management is proceduralized for TS application. Discuss the Hatch EOOS color code in terms of quantitative measures of risk.

4) With regard to what we have been referring to as a "corrective maintenance" concern, but should be calling an "overlapping outages" issue, CRMPs provide only part of the solution. In order to be confident that the risk is managable, the likely risk change associated with an AOT change needs to be anticipated by analysis of the proposed AOT in terms of outages of other risk significant equipment. This has become important due the increase in the frequency and length of preventative maintenance outages. The only way to anticipate these risk changes is to analyze recent risk history, e.g., by evaluating the risk profile for the previous cycle. Hence, for the highest risk unit, Hatch is requested to present and discuss the EOOS risk profile for the last or current cycle and estimates of the maximum, minimum, and mean risks associated with having the EDG out of service during the cycle for the proposed AOT.

**From:** "O'Regan, Patrick" <PORegan@epri.com>
**To:** "'Lenny Olshan'" <lno@nrc.gov>, "'Syed Ali'" <saa3@nrc.gov>
**Date:** 12/31/01 6:57AM
**Subject:** 50.59 example

Len/Syed,

Attached is an example 50.59 which was missing from the earlier e-mail. It is in three files. The first file is the 50.59 screen, the second file is the 50.59 evaluation and the third is an example FSAR change.

Thanks, PJO'R

<<10CFR 50.59 Screening Form_rb.doc>> <<10CFR 50.59 Evaluation Form_rc.doc>> <<ber draft 5059 ldcr_rb.doc>>

## 10 CFR 50.59 APPLICABILITY DETERMINATION

Part 1 – Initiation

| Implementing Document No. | Revision | Title |
|---|---|---|
| **USAR 3.6A.2.1.5 AND 6.6.8** | **13** | **Update to UFSAR sections 3.6and 6.6 to allow the use of risk-informed technology in determining the number of augmented piping inspections in the break exclusion region (BER).** |

| (Check one proposed activity type only): | (Check one proposed activity type only): |
|---|---|
| ☐Unit 1 ☒Unit 2 ☐Common | ☒ Permanent ☐ Temporary |

Part 2 – Applicable Regulations/Criteria

Address the questions below for all aspects of the Proposed Activity. See NAI-DSE-01, Section 4.2 for a discussion of regulatory requirements and controls. If the answer is "YES" for any portion of the activity, apply the identified regulation/process(es) to that portion of the activity. (Note: It is common to have more than one regulation/process apply to a proposed activity.)

| | | | |
|---|---|---|---|
| A. | Is the regulatory authority, controlling the proposed activity, any of the following? | | |
| | 1. 10CFR50.90 (Operating License, Technical Specifications or Environmental Protection Plan) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01 |
| | 2. 10CFR50.54(a) (QA Program Description) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| | 3. 10CFR50.54(p) (Security Plans) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| | 4. 10CFR50.54(q) (Emergency Plan) | ☐ YES ☒NO | If "Yes," process change per NIP-LPP-01. |
| | 5. 10CFR50.55a(f) and (g) (IST/ISI Requirements) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| | 6. 10CFR Part 20 (Standards for Radiation Protection) | ☐ YES ☒ NO | If "Yes," process change per NIP-PRO-02 or NIP-PRO-03. |
| | 7. 10CFR50.65(a)(4) (Maintenance Rule)<br>• Maintenance activities and associated procedures.<br>• Temporary Alteration (facility or procedure) supporting maintenance that will be installed not longer than 90 days at power.<br>•<br>• | ☐ YES ☒ NO | If "Yes," maintenance activity is assessed under NIP-OUT-01 or GAP-PSH-03, and procedure change(s) process per NIP-PRO-03 and NIP-PRO-04. |
| | 8. 10 CFR 50.46 ECCS Model (changes and errors) | ☐ YES ☒ NO | If "Yes," process per NIP-IRG-01 |
| B. | Does the proposed activity change plant-specific programs (ODCM or COLR,) which are controlled by the Technical Specifications? | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| C. | Does the proposed activity involve an editorial or administrative change to the UFSAR update as described in Section 4.2.3 of NAI-DSE-01? | ☐ YES ☒NO | If "Yes," process change per NIP-LPP-01. |
| D. | Does the proposal have an effect on the environment (e.g., changes to nonradiological gaseous or liquid effluents, power level, or thermal effluents), **OR** involve construction activities that introduce measurable nonradiological environmental effects to onsite areas that were NOT previously disturbed during site preparation and construction? | ☐ YES ☒ NO | If "Yes," an Environmental Evaluation may be required. Contact Supervisor Environmental Protection. |
| E. | Does the proposed activity involve a Fire Protection Program change? | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01 and the applicable Unit License Condition. |

| | | | |
|---|---|---|---|
| F. | Does the proposed change or activity change or negate an existing NRC commitment? | ☐ YES ☒ NO | If "Yes," process per NIP-IRG-01. |

| | | |
|---|---|---|
| Part 3 – Conclusions (Check Conclusion A or B): | | |
| A. | ☐ | All aspects of the proposed activity are controlled by one or more of the processes above; therefore, **10 CFR 50.59 is not applicable** and a 10 CFR 50.59 Screening is **not** required. Proceed with change per applicable procedures/processes. |
| B. | ☒ | Activity only partially covered by other regulations. Proceed with covered change(s) per applicable procedure/process. Initiate 10CFR 50.59 Screening for aspects not covered. |

| | |
|---|---|
| Part 4 – Preparer (Include Completed Applicability Determination with Implementing Document or Activity Package) | |
| Preparer - (Print/Initial) | Date Prepared |

10 CFR 50.59 SCREENING FORM

(Page 1 of 2)

| | | |
|---|---|---|
| **Part 1 - Initiation[Upon Completion of Screen – Attach to Implementing Document/Package]** | | |
| Implementing Document No.<br>**UFSAR 3.6A.2.1.5 and 6.6.8** | Revision<br>**13** | Title<br>**Updated Safety Analysis Report** |
| (Check one proposed activity type only):<br>☐ Unit 1 ☒ Unit 2 ☐ Common | | (Check one proposed activity type only):<br>☒ Permanent ☐ Temporary |

(Check one proposed activity type only):

☐ Procedure Activity ☐ Design Activity ☐ Test or Experiment ☐ Temporary Alteration ☒ Other

**Part 2 - Brief description of the *proposed activity*: Check one:**

A) ☐ Immediate Change to a Technical Procedure (Type 1 PCE) controlled by NIP-PRO-04. If checked, go to Part 10.
(N/A Part 3, 4, 5, 6, 7, 8, and 9)

B) ☒ Other, provide written description of activity: **UFSAR change to include the Risk-Informed Inservice Inspection process for the Break Exclusion Region piping welds.**

**Part 3 - Technical Specifications/License Conditions** **N/A** ☐

1. ☐ YES ☒ NO Does the *proposed activity* require/involve a change to the Technical Specifications/License Conditions?

If "**NO**," continue with the screening. If "**YES**," a license amendment is required. Exit Screen and prepare a License Document Change Request (LDCR) per NIP-LPP-01.

**Part 4 - General** **N/A** ☐

1. Is the *proposed activity* an Inte condition?

☐ YES If "**YES,**" (reference ESA # if applicable _) go to Part 6 (skip Part 5).

☒ NO If "**NO,**" go to Part 5 (skip Part 6).

**Part 5 - Changes to Facility/Procedures** **N/A** ☐

1. ☐ YES ☒ NO Does the *proposed activity* involve a modification, addition to, or removal from, adversely affects any UFSAR described design function?

2. ☐ YES ☒ NO Does the *proposed activity* involve a modification, addition to, or removal from, adversely affects how any UFSAR described design functions are performed or controlled?

Justify "**NO**" answers below: **No physical change to any design function. No change to procedures that affect how design functions are performed or controlled.**

Why are UFSAR described design functions not adversely affected? **The only change is to the methodology used to define the number of augmented piping inspections required to be conducted in the break exclusion region.**

## Part 6 - Changes to Facility/Procedure (Interim Compensatory Actions) N/A ☒

1. ☐ YES ☐ NO Does the *proposed activity* involve a modification, addition to, or removal from, the facility that adversely affects UFSAR described design functions other than those design functions that are degraded/nonconforming?

2. ☐ YES ☐ NO Does the *proposed activity* involve a modification, addition to, or removal from, adversely affects how UFSAR described functions are performed or controlled other than those design functions that are degraded/nonconforming?

Justify "**NO**" answers below:

Why are other UFSAR described design functions not adversely affected?

10 CFR 50.59 SCREENING FORM (Cont)

**Part 7 - Changes to Evaluation Methodologies** N/A ☐

1. ☒ YES ☐ NO Does the *proposed activity* involve revising or replacing an UFSAR described Method of Evaluation, used in establishing the Design Bases or in the Safety Analyses?

Justify "**NO**" answer below:

Justification: **The proposed activity provides an alternative to the current UFSAR section 3.6 methodology for determining the number of augmented inspections required in the break exclusion region..**

**Part 8 - Tests and Experiments** N/A ☐

1. ☐ YES ☒ NO Does the *proposed activity* involve conducting a test or experimen the UFSAR, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design bases as described in the UFSAR, or is inconsistent with the analyses or descriptions in the UFSAR?

Justify "**NO**" answer below: **These examinations are described in the UFSAR, and therefore are not new.**

Justification: **Only the number of inspections, which are based upon EPRI TR-112657 Rev. B-A and Nuclear Engineering Report NER-2A-025, are changing.**

If **ANY** Part 5, 6, 7 or 8 answers are "**YES,**" a 10 CFR 50.59 Evaluation **is** required. Discontinue Screen, prepare Evaluation

If **ALL** Part 5, 6, 7 or 8 answers are "**NO,**" a 10 CFR 50.59 Evaluation is **not** required. Proceed to Part 9.

**Part 9 - Relevant UFSAR/Tech Spec Sections** N/A ☐

| UFSAR Sections reviewed where relevant information was found: | Tech Spec Sections reviewed where relevant information was found: |
|---|---|
| **3.6A.2.1.5**<br>**6.6.8** | **N/A** |

**Part 10 - Conclusion and Signoff [Upon completion of Screen - Attach to Implementing Document /Package]**

Based upon all Part 5, 6, 7, and 8 answers being "NO," a 10CFR50.59 Evaluation is NOT required.

Preparer: _____ Date _____ [Requal Date:_____]

Print Name and Sign

Reviewer: _____ Date _____ [Requal Date:_____]

Print Name and Sign

# 10 CFR 50.59 EVALUATION FORM

50.59 Evaluation No: Draft: Revision:

Plant: (Unit 1, Unit 2, or Common) **Unit 2**

Affected Systems: **Multiple**

Title: **Update to UFSAR sections 3.6 and 6.6 to allow the use of risk-informed technology in determining the number of augmented piping inspection in the break exclusion region (BER).**

Mod/Temp Mod/SDC/Procedure No:

Duration: ☒ Permanent or ☐ Temporary

Based on the attached discussion, does the *Proposed Activity*:

☐ YES ☒ NO Require a License Amendment for a change to the Technical Specifications/License Conditions.

☐ YES ☒ NO Require a License Amendment because it meets one (or more) of the eight (8) criteria of 10CFR50.59( c)(2).

********** REVIEW, APPROVAL AND CONCURRENCE**********

1. PREPARED BY: _____ / _____ _____
   Qualified Evaluator Signature Requal Date Date

2. REVIEWED BY: _____ / _____ _____
   Qualified Reviewer Signature Requal Date Date

3. REVIEWED BY: _____ _____
   Branch Manager Date

4. SORC APPROVAL RECOMMENDATION:

   SORC: ☐ As Submitted ☐ As Revised _____ _____
   SORC Meeting No. Date

5. APPROVAL: _____ _____
   Plant Manger or Designee (both Plant Mangers if common) Date

   _____ _____
   Plant Manger or Designee (both Plant Mangers if common) Date

6. SRAB: Meeting Number: _____ ☐ Concurs ☐ Does Not Concur

10 CFR 50.59 EVALUATION FORM (Cont)

| 50.59 Evaluation No.: | Page 2 of |
|---|---|
| **Part A - Description:** | |
| 1. Reason for Activity: | Provide an alternative methodology for determining the number of augmented inspections for the break exclusion region (BER). |
| 2. Function(s) of affected SSC: | Pressure boundary integrity |
| **Part B - Analysis** | |
| 1. Applicable Criteria: | UFSAR section 3.6 provides criteria for postulated piping breaks. In particular, section 3.6 also defines the requirements that need to be met in order to not postulate piping breaks. One of the criterion involves defining the number of augmented piping inspections that need to be performed on the BER piping. These UFSAR criteria are consistent with Standard Review Plan (section 3.6) criteria. |
| 2. Conformance: | The proposed activity implements an NRC approved alternative methodology for defining the number of augmented piping inspections to be performed on the BER piping. |

| UFSAR Sections reviewed where relevant information was found: | Tech Spec Sections reviewed where relevant information was found: |
|---|---|
| UFSAR section 3.6A.2.1.5 defines the methodology for postulating piping breaks.<br>UFSAR section 6.6.8 defines the piping inspection program including augmented piping inspections. | N/A |

**Part C – Evaluation** **(NOTE: If the proposed activity only affects a "method of evaluation," only evaluation question 8 need be evaluated. If the proposed activity does not affect a "method of evaluation'" only questions 1 through 7 need be evaluated.**

**Does the proposed activity:**

1. ☐ YES ☐ NO Result in more than a minimal increase in frequency of occurrence of an accident previously evaluated in the UFSAR?

Justification:

2. ☐ YES ☐ NO Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system or component (SSC) important to safety previously evaluated in the UFSAR?

Justification:

3. ☐ YES ☐ NO Result in more than a minimal increase in the consequences of an accident previously evaluated in the UFSAR?

Justification:

4. ☐ YES ☐ NO Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the UFSAR?

Justification:

5. ☐ YES ☐ NO Create a possibility for an accident of a different type than any previously evaluated in the UFSAR?

Justification:.

10 CFR 50.59 EVALUATION FORM (Cont)

| 50.59 Evaluation No.: | Page 3 of |
|---|---|

| | |
|---|---|
| 6. ☐ YES ☐ NO | Create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR?<br><br>Justification: |
| 7. ☐ YES ☐ NO | Result in a design basis limit for a fission product barrier as described in the UFSAR being exceeded or altered?<br><br>Justification: |
| 8. ☐ YES ☒ NO | Result in a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses?<br><br>Justification: The proposed activity allows the use of an alternate method for determining the number of augmented piping inspections required to meet the criteria of UFSAR 3.6. UFSAR 3.6 is based upon the criteria contained in section 3.6.2 of the Standard Review Plan (Determination of Rupture Locations and Dynamic Effects Associated With the Postulated Rupture of Piping) and specifically Branch Technical Position MEB 3-1 (Postulated Rupture Locations In Fluid System Piping Inside And Outside Containment). The proposed activity implements a methodology approved by the NRC for this intended application and as such, per NAI-DSE-01 (section 6.2.8), is not a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.<br><br>The NRC approved this alternate method in "Safety Evaluation Report Related to "Application of Risk and Performance Technology to Break Exclusion Requirements" (EPRI TR-XXXXXX, Rev. 0, February, 2001)," March 31, 2002. The NRC SER concluded that the methodology was applicable to all NSSS designs and all terms and conditions as stipulated in the SER are met by this proposed activity. |

**Part D – Conclusions** The proposed activity implements an NRC approved methodology as an alternative to existing UFSAR requirements. All terms and conditions as stipulated in the SER are met by this proposed activity.

**Part E – References** **(1) EPRI TR-112657 Rev. B-A, Risk-Informed Inservice Inspection Evaluation Procedure,**

**(2) EPRI TR-XXXXXX, Application of Risk and Performance Technology to Break Exclusion Requirements**

**(3) Nuclear Engineering Report NER-2A-025**

**Part F – Attachments**

## 10 CFR 50.59 APPLICABILITY DETERMINATION

Part 1 – Initiation

| Implementing Document No. | Revision | Title |
|---|---|---|
| **USAR 3.6A.2.1.5 AND 6.6.8** | **13** | **Update to UFSAR sections 3.6and 6.6 to allow the use of risk-informed technology in determining the number of augmented piping inspection in the break exclusion region (BER).** |

| (Check one proposed activity type only): | (Check one proposed activity type only): |
|---|---|
| ☐ Unit 1 ☒ Unit 2 ☐ Common | ☒ Permanent ☐ Temporary |

Part 2 – Applicable Regulations/Criteria

Address the questions below for all aspects of the Proposed Activity. See NAI-DSE-01, Section 4.2 for a discussion of regulatory requirements and controls. If the answer is "YES" for any portion of the activity, apply the identified regulation/process(es) to that portion of the activity. (Note: It is common to have more than one regulation/process apply to a proposed activity.)

| | | | |
|---|---|---|---|
| A. | Is the regulatory authority, controlling the proposed activity, any of the following? | | |
| | 1. 10CFR50.90 (Operating License, Technical Specifications or Environmental Protection Plan) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01 |
| | 2. 10CFR50.54(a) (QA Program Description) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| | 3. 10CFR50.54(p) (Security Plans) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| | 4. 10CFR50.54(q) (Emergency Plan) | ☐ YES ☒NO | If "Yes," process change per NIP-LPP-01. |
| | 5. 10CFR50.55a(f) and (g) (IST/ISI Requirements) | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| | 6. 10CFR Part 20 (Standards for Radiation Protection) | ☐ YES ☒ NO | If "Yes," process change per NIP-PRO-02 or NIP-PRO-03. |
| | 7. 10CFR50.65(a)(4) (Maintenance Rule)<br>• Maintenance activities and associated procedures.<br>• Temporary Alteration (facility or procedure) supporting maintenance that will be installed not longer than 90 days at power.<br>•<br>• | ☐ YES ☒ NO | If "Yes," maintenance activity is assessed under NIP-OUT-01 or GAP-PSH-03, and procedure change(s) process per NIP-PRO-03 and NIP-PRO-04. |
| | 8. 10 CFR 50.46 ECCS Model (changes and errors) | ☐ YES ☒ NO | If "Yes," process per NIP-IRG-01 |
| B. | Does the proposed activity change plant-specific programs (ODCM or COLR,) which are controlled by the Technical Specifications? | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01. |
| C. | Does the proposed activity involve an editorial or administrative change to the UFSAR update as described in Section 4.2.3 of NAI-DSE-01? | ☐ YES ☒NO | If "Yes," process change per NIP-LPP-01. |
| D. | Does the proposal have an effect on the environment (e.g., changes to nonradiological gaseous or liquid effluents, power level, or thermal effluents), **OR** involve construction activities that introduce measurable nonradiological environmental effects to onsite areas that were NOT previously disturbed during site preparation and construction? | ☐ YES ☒ NO | If "Yes," an Environmental Evaluation may be required. Contact Supervisor Environmental Protection. |
| E. | Does the proposed activity involve a Fire Protection Program change? | ☐ YES ☒ NO | If "Yes," process change per NIP-LPP-01 and the applicable Unit License Condition. |

| | | | |
|---|---|---|---|
| F. | Does the proposed change or activity change or negate an existing NRC commitment? | ☐ YES ☒ NO | If "Yes," process per NIP-IRG-01. |

Part 3 – Conclusions (Check Conclusion A or B):

| | | |
|---|---|---|
| A. | ☐ | All aspects of the proposed activity are controlled by one or more of the processes above; therefore, **10 CFR 50.59 is not applicable** and a 10 CFR 50.59 Screening is **not** required. Proceed with change per applicable procedures/processes. |
| B. | ☒ | Activity only partially covered by other regulations. Proceed with covered change(s) per applicable procedure/process. Initiate 10CFR 50.59 Screening for aspects not covered. |

Part 4 – Preparer (Include Completed Applicability Determination with Implementing Document or Activity Package)

| Preparer - (Print/Initial) | Date Prepared |
|---|---|
| | |

10 CFR 50.59 SCREENING FORM

(Page 1 of 2)

**Part 1 - Initiation[Upon Completion of Screen – Attach to Implementing Document/Package]**

| Implementing Document No. | Revision | Title |
|---|---|---|
| **UFSAR 3.6A.2.1.5 and 6.6.8** | **13** | **Updated Safety Analysis Report** |

(Check one proposed activity type only):

☐ Unit 1 ☒ Unit 2 ☐ Common

(Check one proposed activity type only):

☒ Permanent ☐ Temporary

(Check one proposed activity type only):

☐ Procedure Activity ☐ Design Activity ☐ Test or Experiment ☐ Temporary Alteration ☒ Other

**Part 2 - Brief description of the *proposed activity*: Check one:**

A) ☐ Immediate Change to a Technical Procedure (Type 1 PCE) controlled by NIP-PRO-04. If checked, go to Part 10.
(N/A Part 3, 4, 5, 6, 7, 8, and 9)

B) ☒ Other, provide written description of activity: **UFSAR change to include the Risk-Informed Inservice Inspection process for the Break Exclusion Region piping welds.**

**Part 3 - Technical Specifications/License Conditions** **N/A** ☐

1. ☐ YES ☒ NO Does the *proposed activity* require/involve a change to the Technical Specifications/License Conditions?

If "**NO**," continue with the screening. If "**YES**," a license amendment is required. Exit Screen and prepare a License Document Change Request (LDCR) per NIP-LPP-01.

**Part 4 - General** **N/A** ☐

1. Is the *proposed activity* an Inte condition?

☐ YES If "**YES,**" (reference ESA # if applicable ) go to Part 6 (skip Part 5).

☒ NO If "**NO,**" go to Part 5 (skip Part 6).

**Part 5 - Changes to Facility/Procedures** **N/A** ☐

1. ☐ YES ☒ NO Does the *proposed activity* involve a modification, addition to, or removal from, adversely affects any UFSAR described design function?

2. ☐ YES ☒ NO Does the *proposed activity* involve a modification, addition to, or removal from, adversely affects how any UFSAR described design functions are performed or controlled?

Justify "**NO**" answers below: **No physical change to any design function. No change to procedures that affect how design functions are performed or controlled.**

Why are UFSAR described design functions not adversely affected? **The only change is to the methodology used to define the number of augmented piping inspections required to be conducted in the break exclusion region.**

## Part 6 - Changes to Facility/Procedure (Interim Compensatory Actions) N/A ☒

1. ☐ YES ☐ NO Does the *proposed activity* involve a modification, addition to, or removal from, the facility that adversely affects UFSAR described design functions other than those design functions that are degraded/nonconforming?

2. ☐ YES ☐ NO Does the *proposed activity* involve a modification, addition to, or removal from, adversely affects how UFSAR described functions are performed or controlled other than those design functions that are degraded/nonconforming?

Justify "**NO**" answers below:

Why are other UFSAR described design functions not adversely affected?

10 CFR 50.59 SCREENING FORM (Cont)

**Part 7 - Changes to Evaluation Methodologies** N/A ☐

1. ☒ YES ☐ NO Does the *proposed activity* involve revising or replacing an UFSAR described Method of Evaluation, used in establishing the Design Bases or in the Safety Analyses?

Justify "**NO**" answer below:

Justification: **The proposed activity provides an alternative to the current UFSAR section 3.6 methodology for determining the number of augmented inspections required in the break exclusion region..**

**Part 8 - Tests and Experiments** N/A ☐

1. ☐ YES ☒ NO Does the *proposed activity* involve conducting a test or experimen the UFSAR, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design bases as described in the UFSAR, or is inconsistent with the analyses or descriptions in the UFSAR?

Justify "**NO**" answer below: **These examinations are described in the UFSAR, and therefore are not new.**

Justification: **Only the number of inspections, which are based upon EPRI TR-112657 Rev. B-A and Nuclear Engineering Report NER-2A-025, are changing.**

If **ANY** Part 5, 6, 7 or 8 answers are "**YES,**" a 10 CFR 50.59 Evaluation **is** required. Discontinue Screen, prepare Evaluation

If **ALL** Part 5, 6, 7 or 8 answers are "**NO,**" a 10 CFR 50.59 Evaluation is **not** required. Proceed to Part 9.

**Part 9 - Relevant UFSAR/Tech Spec Sections** N/A ☐

| UFSAR Sections reviewed where relevant information was found: | Tech Spec Sections reviewed where relevant information was found: |
|---|---|
| **3.6A.2.1.5**<br>**6.6.8** | **N/A** |

**Part 10 - Conclusion and Signoff [Upon completion of Screen - Attach to Implementing Document /Package]**

Based upon all Part 5, 6, 7, and 8 answers being "NO," a 10CFR50.59 Evaluation is NOT required.

Preparer: _____ Date _____ [Requal Date: _____ ]

Print Name and Sign

Reviewer: _____ Date _____ [Requal Date: _____ ]

Print Name and Sign

| LICENSING DOCUMENT CHANGE REQUEST | LDCR Number | Rev |
|---|---|---|
| | 2 _ 0 1 _ U F S _ X X X 0 0 | . |

## Part 1 – Initiation *(Originator)*

Page 5 of ___

| A. Affected Doc | OPL | UFS | Plans & Programs | |
|---|---|---|---|---|
| ☐ Unit 1<br>X Unit 2<br>☐ Site | ☐ Facility Operating License<br>☐ Technical Specifications<br>☐ Technical Specification Bases<br>☐ Environmental Prot. Plan | X UFSAR | ☐ Site Emergency Plan (SEP)<br>☐ Security Plans (SPS)<br>☐ Process Control Program (PCP)<br>☐ Offsite Dose Calc. Manual (ODM) | ☐ ISI Program Plan (ISI)<br>☐ IST Program Plan (IST)<br>☐ Core Operating Limits Report (COL)<br>☐ QA Topical Report (QAT) |

B. Description X Permanent ☐ Temporary; Expected Duration: _

**Change to the wording in Sections 3.6A.2.1.5 and 6.6.8 to read as attached.**

| C. Page | Section, Figure, Table | Page | Section, Figure, Table |
|---|---|---|---|
| 3.6A-14<br>6.6-3 | 3.6A.2.1.5<br>6.6.8 | | |

D. Source of Change; References

**EPRI Topical Report 112657 Rev. B-A "Revised Risk-Informed Inservice Inspection Evaluation Procedure" and Nuclear Engineering Report NER-2A-025.**

| E. NIP–SEV–01 Review | ☐ Applicability Review No.:<br>☐ Safety Evaluation No.: | F. Originator *(Print)* | Date 12/11/01 |
|---|---|---|---|

● **Forward to License Document Owner for Further Processing** ●

## Part 2 – Review and Approval *(LDO)*

| A. Independent Review *(Print / Initial / Date)* NIP–IRG–01 ☐ Obtained per | B. Effectiveness Review ☐ N/R ☐ Attached | C. SORC ☐ N/R Mtg. No.: Mtg. Date: | |
|---|---|---|---|
| D. SRAB ☐ N/R Mtg. No.: Mtg. Date: | E. Plant Mgr. ☐ N/R *(UFSAR Only)* ☐ Obtained per Doc Coversheet | ☐ Obtained per NIP–IRG–01 ☐ Obtained per NIP–SEV–01 | |
| F. NRC *(NIP–IRG–01 Submittal Required)* ☐ N/R ☐ Letter No. / Date: ☐ NRC Appl. Date: | G. LDO Branch Manager / Designee *(Print / Initial)* | Date | |

## Part 3 – Implementation *(LDO)*

A. OPL Only: Affected Documents Updated ☐

B. UFS Only: Need "As–Built" or Affected Document ☐

C. Other: _____ ☐

## Part 4 – Closure *(LDO)*

| A. ☐ Incorporated into License Document, Revision / Amendment: _____ | OR | B. ☐ Not Incorporated into License Document |
|---|---|---|
| C. Closed by *(Print / Initial)* | | Date |

3.6A.2.1.5 Postulated Pipe Break Locations

h. For these portions of high-energy fluid system piping, preservice and subsequent inservice examinations are performed in accordance with the requirements specified in ASME Section XI. During each inspection interval, as defined in IWA-2400, an ISI is performed on all nonexempt ASME Code Section XI circumferential and longitudinal welds within the break exclusion region for high-energy fluid system piping. These inspections consist of augmented volumetric examinations (nominal pipe size greater than or equal to 4 in) and augmented surface examinations (nominal pipe size less than 4 in) such that 100 percent of the previously defined welds are inspected at each interval **or as required per the Risk-Informed process for piping outlined in EPRI Topical Report TR-112657.** The break exclusion zone consists of those portions of high-energy fluid system piping between the moment limiting restraint(s) outside the outboard containment isolation valve and the moment limiting restraint(s) beyond the inboard containment isolation valve. The choice of the restraint(s) that define the limits of the break exclusion zone is based upon those restraint(s) which are necessary to ensure the operability of the primary containment isolation valves.

6.6.8 Augmented Inservice Inspection to Protect Against Postulated Piping Failures

No augmented ISI will be required for ASME Class 2 and 3 systems and components since there is no ASME Class 2 or 3 high-energy piping between containment isolation valves. As indicated in Table 1.9-1, Note 12, Difference 3, B31.1 Class 2 and Class 3 piping exists between the containment isolation valve and the associated first restraint. During each inspection interval, as defined in IWA-2400, an ISI is performed on all nonexempt ASME Code, Section XI circumferential and longitudinal welds within the break exclusion region for B31.1 Class 2 and 3 high-energy fluid system piping. These inspections consist of augmented volumetric examinations (nominal pipe size greater than or equal to 4 in) and augmented surface examinations (nominal pipe size less than 4 in) such that 100 percent of the previously defined welds are inspected at each interval **or as required per the Risk-Informed process for piping outlined in EPRI Topical Report TR-112657.** The break exclusion zone consists of those portions of high-energy fluid system piping between the moment limiting restraint(s) outboard of the outside primary containment isolation valve and the moment limiting restraint(s) beyond the inside primary containment isolation valve. The criteria that determine which restraint(s) are chosen to determine the limits of the break exclusion zone are based upon those restraints which are necessary to ensure the operability of the primary containment isolation valves.