PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, NJ 08038

PSEG
Nuclear LLC

JUL 28 2010

10 CFR 50
10 CFR 51
10 CFR 54

LR-N10-0271

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Salem Nuclear Generating Station, Unit No. 1 and Unit No. 2
Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: Responses to 1) NRC Request for Additional Information, dated June 29, 2010, Related to the Steam Generator Tube Integrity Program; 2) NRC Request for Additional Information, dated June 30, 2010, Related to the Metal Fatigue of Reactor Coolant Pressure Boundary Program, all associated with the Salem Nuclear Generating Station, Units 1 and 2 License Renewal Application

Reference: 1. Letter from Ms. Bennett Brady (USNRC) to Mr. Thomas Joyce (PSEG Nuclear, LLC) "REQUEST FOR ADDITIONAL INFORMATION FOR SALEM NUCLEAR GENERATING STATION UNITS 1 AND 2 LICENSE RENEWAL APPLICATION REGARDING SUBSECTION 3.1.2.2.14 (TAC NO ME1834 / ME1836)", dated June 29, 2010
2. Letter from Ms. Bennett Brady (USNRC) to Mr. Thomas Joyce (PSEG Nuclear, LLC) "REQUEST FOR ADDITIONAL INFORMATION FOR SALEM NUCLEAR GENERATING STATION UNITS 1 AND 2 LICENSE RENEWAL APPLICATION REGARDING SECTION B.3.1.1 (TAC NOS. ME1834 AND ME1836)," dated June 30, 2010

In the reference 1 letter, the NRC requested additional information related to the Steam Generator Tube Integrity Program of the Salem Nuclear Generating Station, Units 1 and 2 License Renewal Application. In the Reference 2 letter, the NRC requested additional information related to the Metal Fatigue of Reactor Coolant Pressure Boundary Program. Enclosed are the responses to these requests for additional information.

This letter and its enclosure contain no regulatory commitments.

A141
NRR

JUL 28 2010

If you have any questions, please contact Mr. Ali Fakhar, PSEG Manager - License Renewal, at 856-339-1646.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 7/28/10

Sincerely,

Robert C. Braun
Senior Vice President Nuclear
PSEG Nuclear LLC

Enclosure: Responses to Request for Additional Information

cc: Regional Administrator – USNRC Region I
B. Brady, Project Manager, License Renewal – USNRC
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector – Salem
P. Mulligan, Manager IV, NJBNE
L. Marabella, Corporate Commitment Tracking Coordinator
Howard Berrick, Salem Commitment Tracking Coordinator

Enclosure

Response to Request for Additional Information related to Sections 3.1.2.2.14 and B.3.1.1 of the Salem Nuclear Generating Station, Units 1 and 2 License Renewal Application (LRA)

RAI 3.1.2.2.14-01
RAI B.3.1.1-01
RAI B.3.1.1-02
RAI B.3.1.1-03
RAI B.3.1.1-04

Note: For clarity, portions of the original LRA text are repeated in this Enclosure. Added text is shown in ***Bold Italics***, and deletions are shown with strikethrough text.

RAI 3.1.2.2.14-01

Background:

SNGS LRA Table 3.1.1, Item 3.1.1-32 and subsection 3.1.2.2.14 state that the Steam Generator Tube Integrity Program will be used to manage the aging effect of wall thinning in the steam generator Feedwater inlet ring and supports. LRA subsection B.2.1.10 states that the Steam Generator Tube Integrity Program will manage the aging effect of wall thinning, but it does not specify for which components, not what techniques would be used.

Issue:

GALL AMP XI.M17, which is credited for managing wall thinning due to flow accelerated corrosion for many steel components, includes analysis, inspection, and verification to ensure that flow accelerated corrosion is not occurring at an unacceptable rate and that components are repaired or replaced before wall thinning becomes unacceptable. However, it is not clear to the staff whether the Steam Generator Tube Integrity Program uses both analysis and inspection to verify that unacceptable wall thinning is not occurring.

Request:

1) Describe the analytical methodology and inspection technique used to manage wall thinning in the steam generator feedwater inlet ring and supports.

2) Justify that the analytical methodology, together with verification by inspection, are adequate to ensure that the loss of component intended function does not occur during the period of extended operation.

3) Alternatively, if inspection alone is credited to manage the aging effect, justify that the inspection and associated acceptance criteria are adequate to ensure that need for corrective action is timely identified so that corrective actions are taken before loss of component intended function occurs.

PSEG Response:

LRA Table 3.1.2-4, "Steam Generators", indicates Salem substituted the Steam Generator Tube Integrity aging management program (Salem LRA Appendix B, Section B.2.1.10) to manage the aging effect and mechanism of wall thinning due to flow accelerated corrosion of the steam generator feedwater ring and support in a treated water environment for the GALL AMP XI.M17, "Flow-Accelerated Corrosion". The Steam Generator Tube Integrity aging management program uses degradation assessments in accordance with NEI 97-06, "Steam Generator Program Guidelines", and applicable EPRI documents to determine the scope of inspections and acceptance criteria for the secondary side internals such as the feedwater ring and support.

The Unit 1 Steam Generators are Westinghouse Model F, and each of their feedwater rings and supports is constructed of carbon steel as identified in LRA Table 3.1.2-4, on page 3.1-130.

The Unit 2 Steam Generators are AREVA Model 61/19T. Each of their feedwater ring supports is constructed of low alloy steel plates. The feedwater rings are constructed of 316L stainless steel. The stainless steel material for the Unit 2 steam generator feedwater ring was inadvertently omitted from LRA Table 3.1.2-4. The 316L stainless steel materials are not susceptible to flow accelerated corrosion. Therefore, the aging effect and mechanism of wall thinning due to flow accelerated corrosion does not apply to the stainless steel portion of the Salem Unit 2 steam generator feedwater ring. However, Salem will continue to inspect the low alloy steel steam generator feedwater ring support for Salem Unit 2 to ensure its structural integrity through the period of extended operation.

1) The Salem Steam Generator Tube Integrity aging management program (Salem LRA Appendix B, Section B.2.1.10) is an existing program and does not currently use an analytical methodology to manage wall thinning in the Unit 1 steam generator feedwater ring, and Unit 1 and Unit 2 feedwater ring supports. This program uses visual inspections of the secondary side internals , which includes the Unit 1 steam generator feedwater ring, and Unit 1 and Unit 2 feedwater ring supports.

   The inspection techniques are determined by the steam generator degradation assessments, which evaluate internal and external operating experience, industry guidance, design features, materials of construction, etc.

2) The Salem Steam Generator Tube Integrity aging management program does not currently use an analytical methodology, or verification by inspection, to manage wall thinning in the Unit 1 steam generator feedwater ring, and Unit 1 and Unit 2 feedwater ring supports.

3) The Steam Generator Tube Integrity aging management program currently uses visual inspections alone for the secondary side internals, which includes the Unit 1 feedwater ring and Unit 1 and Unit 2 feedwater ring supports. The inspection techniques and associated acceptance criteria are determined by the steam generator degradation assessments, which evaluate internal and external operating experience, industry guidance, design features, materials of construction, etc. The existing Steam Generator Tube Integrity aging

management program also uses the Corrective Action Program to identify, evaluate, and correct conditions adverse to quality.

As required by the steam generator degradation assessments, the current inspection techniques for the Unit 1 feedwater ring and Unit 1 and Unit 2 feedwater ring supports are visual inspections. These inspections identify the general condition of the components and inspect for evidence of erosion-corrosion (material loss, flow patterns ingrained in magnetite surface, etc.), irregular geometry (deteriorated corners or edges, etc.), and significant structural change (cracked welds, physical distortion, dislocation, movement, buckling, or missing parts). The associated acceptance criteria are no visible signs of deterioration of the feedwater ring and support as previously discussed. If the visual inspections indicate a need for further evaluation to assess a condition adverse to quality, Salem will use the Corrective Action Program. Following the inspections, but prior to restart of the unit, Salem performs a preliminary operational assessment in accordance with NEI 97-06 and applicable EPRI documents to provide assurance that the acceptance criteria was met for the steam generators to return to service and operate for the following cycle. The operational assessment ensures that deficiencies were identified and corrective actions were taken before a loss of component intended function (e.g., Direct Flow) occurs. Salem has performed inspections of Unit 1 and Unit 2 steam generator secondary side components, and to date, has not observed any visible signs of deterioration of the Unit 1 feedwater ring, or the Unit 1 and Unit 2 feedwater ring supports.

In summary, Salem substituted the Steam Generator Tube Integrity aging management program for the Flow Accelerated Corrosion aging management program to manage the aging effect and mechanism of wall thinning due to flow accelerated corrosion of the Unit 1 steam generator carbon steel feedwater ring, and Unit 1 carbon steel feedwater ring supports and Unit 2 low alloy steel feedwater ring supports. The Unit 2 stainless steel feedwater ring is not susceptible to flow accelerated corrosion, and therefore, this aging effect is not required to be managed. The Steam Generator Tube Integrity aging management program uses degradation assessments to determine inspection techniques and associated acceptance criteria to manage the applicable aging effects. Also, the acceptance criteria to ensure that corrective actions are taken in a timely manner will be determined as part of the degradation assessments.

To complete this RAI response, LRA Table 3.1.2-4 is revised to provide clarity between the two Salem Unit feedwater ring materials and separate out the feedwater ring supports as follows.

Table 3.1.2-4 Steam Generators

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Steam Generators (Feedwater Ring ~~and Support~~ – ***Unit 1***)	Direct Flow	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Steam Generator Tube Integrity	IV.D1-12	3.1.1-16	E, 3
Steam Generators (Feedwater Ring ~~and Support~~ – ***Unit 1***)	Direct Flow	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry	IV.D1-12	3.1.1-16	A
Steam Generators (Feedwater Ring ~~and Support~~ – ***Unit 1***)	Direct Flow	Carbon Steel	Treated Water (Internal)	Wall Thinning/Flow Accelerated Corrosion	Steam Generator Tube Integrity	IV.D1-26	3.1.1-32	E, 3
Steam Generators (Feedwater Ring – Unit 2)	***Direct Flow***	***Stainless Steel***	***Treated Water (Internal)***	***Loss of Material/ Pitting and Crevice Corrosion***	***One-Time Inspection***	***VIII.F-23***	***3.4.1-16***	***A***
Steam Generators (Feedwater Ring – Unit 2)	***Direct Flow***	***Stainless Steel***	***Treated Water (Internal)***	***Loss of Material/ Pitting and Crevice Corrosion***	***Water Chemistry***	***VIII.F-23***	***3.4.1-16***	***A***
Steam Generators (Feedwater Ring – Unit 2)	***Direct Flow***	***Stainless Steel***	***Treated Water (Internal) > 140 F***	***Cracking/Stress Corrosion Cracking***	***One-Time Inspection***	***VIII.F-24***	***3.4.1-14***	***A***
Steam Generators (Feedwater Ring – Unit 2)	***Direct Flow***	***Stainless Steel***	***Treated Water (Internal) >140 F***	***Cracking/Stress Corrosion Cracking***	***Water Chemistry***	***VIII.F-24***	***3.4.1-14***	***A***
Steam Generators (Feedwater Ring ~~and~~ Support)	Structural Support	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Steam Generator Tube Integrity	IV.D1-12	3.1.1-16	E, 3
Steam Generators (Feedwater Ring ~~and~~ Support)	Structural Support	Carbon Steel	Treated Water (Internal)	Loss of Material/General, Pitting and Crevice Corrosion	Water Chemistry	IV.D1-12	3.1.1-16	A
Steam Generators (Feedwater Ring Support)	***Structural Support***	***Carbon Steel***	***Treated Water (Internal)***	***Wall Thinning/Flow Accelerated Corrosion***	***Steam Generator Tube Integrity***	***IV.D1-26***	***3.1.1-32***	***E, 3***

RAI B.3.1.1-01

Background:

Enhancement 1 of license renewal application (LRA) aging management program (AMP) B.3.1.1, Metal Fatigue of Reactor Coolant Pressure Boundary Program, states that the "parameters monitored or inspected" program element of the AMP will be enhanced to "include additional transients beyond those defined in the Technical Specifications (TS) and the updated final safety analysis report (UFSAR), and expanding the fatigue monitoring program to encompass other components identified to have fatigue as an analyzed aging effect, which require monitoring."

The U.S. Nuclear Regulatory Commission's (NRC's or the staff's) recommended program elements for these types of AMPs are given in Section X.M1, "Metal Fatigue of Reactor Coolant Pressure Boundary," of NUREG-1801, Revision 1, Volume 2 (Generic Aging Lessons Learned [GALL] AMP X.M1). Section 3.0 of NUREG-1800, Revision 1, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), defines such enhancements.

Issue 1:

It is not evident whether the stated enhancement is being made to make the "parameters monitored or inspected" program element of AMP B.3.1.1 consistent with the corresponding program element in GALL AMP X.M1. It is also not apparent to the staff what is being enhanced relative to the information that has been provided for LRA AMP B.3.1.1, and specifically whether the enhancement will be of the 'basis document or procedure" for this AMP or the implementing procedure for this AMP, or both.

Request 1:

Confirm that the stated enhancement is being proposed to make the "parameter monitored or inspected" program element of LRA AMP B.3.1.1 consistent with that in GALL AMP X.M1. Also, clarify what documents or procedures will be enhanced (e.g., basis document, implementing procedure, etc.) relative to enhancement 1 of LRA AMP B3.1.1.

PSEG Response:

Enhancement 1 is proposed to make the "parameters monitored or inspected" program element 3 of the Salem Metal Fatigue of Reactor Coolant Pressure Boundary (MFRCPB) LRA AMP B.3.1.1 consistent with the GALL AMP X.M1. Element 3, "Parameters Monitored/Inspected", of the GALL program recommends monitoring of all plant transients that cause cyclic strains, which are significant contributors to cumulative fatigue usage. Additional transients meeting this GALL criterion, beyond those in the current Salem MFRCPB program, have been identified and will be added to the enhanced program.

The addition of new transients to be monitored by the Salem MFRCPB program is identified as Enhancement 1 to the current program, and is included in LRA Appendix B Section B.3.1.1 as Enhancement 1. This program enhancement will be implemented by issuing new implementing procedures and revising current program implementing procedures to include monitoring of the additional transients added by Enhancement 1 to the Salem LRA AMP B.3.1.1 program.

Issue 2:

The current licensing basis transients for Salem Nuclear Generating Station (SNGS) are those specified in TS Table 5.7.1-1, which are required to be tracked pursuant to the requirements in TS 5.7.1. The design basis transients for SNGS are identified in UFSAR Sections 3.9.1.1.1 through 3.9.1.1.11 and in UFSAR Tables 3.9-1 and 3.9-1a. The UFSAR sections and tables include transients that are listed in TS Table 5.7.1-1. SNGS would require tracking design basis transients that are listed in one of the stated UFSAR sections or tables but are not within the scope of the stated TS requirements.

Request 2:

Clarify the process, procedure, or protocol that will be used at SNGS to track the occurrences of those design basis transients that are listed in UFSAR but are not within the scope of TS 5.7.1.

PSEG Response:

The process that is currently used at Salem to track the occurrences of those design basis transients that are listed in the UFSAR, but are not within the scope of TS 5.7.1, is implemented by station procedures. These procedures will also be used, and supplemented as necessary, in conjunction with a fatigue monitoring software program, through the period of extended operation as stated in Enhancement 2.

Note that the existing Salem design basis transients are described in UFSAR Section 5.2.1.5, and listed in UFSAR Tables 5.2-10 and 5.2-10a, and not contained in Section 3.9.1.1 and Tables 3.9-1 and 3.9-1a.

Existing plant procedures currently track transients listed in the Technical Specifications. These procedures will be enhanced to ensure that the design basis transient occurrences that are listed in the UFSAR, but are not currently within the scope of TS 5.7.1, are tracked through the period of extended operation. These enhanced procedures will be credited to implement the Salem MFRCPB program for license renewal. These implementing procedures will be annotated to identify the associated license renewal program commitments. The MFRCPB program is described in the Salem LRA Appendix A, Section A.3.1.1. Enhancements 1 and 2 are included in Appendix A, Table A.5, Commitment 47. Appendix A is the Salem UFSAR Supplement that will become part of the UFSAR following approval of the renewed operating license.

Issue 3:

The enhancement states that the program will be enhanced to track additional transients that are not within the scope of either the applicable TS requirements or UFSAR design basis sections or tables. The staff needs to know which transients are being referred to here, and if it is necessary to track them for possible inclusion in updated cumulative usage factor (CUF) analyses, and whether the applicant will be updating the design basis in UFSAR Section 3.9.1.1 to include them.

Request 3:

Identify the additional transients that are being referred to in Enhancement 1 of the AMP, and clarify which American Society of Mechanical Engineers (ASME) Code Class 1 components these additional transients are related to. Clarify whether an update of the design basis will be performed to include these transients. If the design basis will be updated, identify which of the Sections or Tables in UFSAR Section 3.9.1.1 will be updated to include these transients and clarify whether this will be covered within the scope of an applicable LRA commitment. Justify your basis for omitting these transients from the design basis (as given in applicable sections or tables in UFSAR Section 3.9.1.1) if the design basis will not be updated to include these transients.

PSEG Response:

The only additional transient referred to in Enhancement 1 of the AMP that is related to a Class 1 component is the "Inadvertent Auxiliary Spray to Pressurizer". This design basis transient is related to the Reactor Coolant System Class 1 Pressurizers and their associated surge nozzles.

Note that the existing Salem design basis transients are described in UFSAR Section 5.2.1.5, and listed in UFSAR Tables 5.2-10 and 5.2-10a, and not contained in Section 3.9.1.1.

The "Inadvertent Auxiliary Spray to Pressurizer" transient is a design basis transient not listed in the Salem Technical Specifications or UFSAR, however, is manually counted by the current fatigue monitoring program.

Since this additional transient is included in the design basis, no changes to the design basis are being made, and therefore no changes to the UFSAR sections are required as a result of the additional transient being added to the MFRCPB program. Since UFSAR Section 5.2.1.5 and UFSAR Tables 5.2-10 and 5.2-10a are not changed, revision of these sections of the UFSAR are not required, and are not within the scope of the Salem LRA Table A.5 Commitment 47.

Issue 4:

The enhancement states, in part, that the program will be enhanced to expand the "fatigue monitoring program to encompass other components identified to have fatigue as an analyzed aging effect, which require monitoring." However, it appears that a similar enhancement is given in Enhancement 4 of the AMP, which was placed appropriately on the "corrective actions" program element in GALL AMP X.M1. The "corrective action" program element recommendation in GALL AMP X.M1 states, in part, that for programs that monitor a sample of high fatigue usage locations, "corrective actions include a review of additional affected reactor coolant pressure boundary locations," and appears to be the only program element in GALL AMP X.M1 that specifically mentions expansion of program to additional reactor coolant pressure boundary components. Thus, it is not apparent to the staff whether the expansion criteria in Enhancement 1 should be applied to "scope of program," "monitoring and trending," or "corrective actions" program elements for the program (or to some combination of these elements), or whether it is redundant with the enhancement discussed in Enhancement 4 of the AMP.

Request 4:

Clarify whether the expansion criterion in Enhancement 1 is being applied as an enhancement of the "monitoring and trending" program element or "corrective actions" program element of the AMP, or whether it is redundant with the enhancement discussed in Enhancement 4 of the AMP. Justify why the expansion aspect of Enhancement 1 has also not been placed on the "scope of program" or "monitoring and trending" program elements of the AMP, if the expansion aspect of the enhancement does not relate to a corrective action activity.

PSEG Response:

The expansion criterion in Enhancement 1 is for expansion of the number of transients and components being monitored by the MFRCPB program, and not for expansion of the reactor coolant pressure boundary locations to be reviewed as a result of an environmental fatigue sample location usage factor approaching its design limit in Enhancement 4, and therefore is not redundant. Enhancement 1 does not provide enhancements to the "scope of program" or the "corrective action" program elements, since these elements do not discuss the transients or components to be monitored by the program. Enhancement 1 should be applied to the "monitoring and trending" program element 5, since the expansion of components increased the number of "high fatigue usage locations" beyond those in the current fatigue monitoring program.

The GALL AMP X.M1, Element 5 recommends the program monitor a sample of high fatigue usage locations and this sample is to include the locations identified in NUREG/CR-6260, as a minimum, or alternatives are proposed based on plant configuration. Additional transients and a sample of high fatigue usage locations meeting this GALL criterion, beyond those in the current Salem MFRCPB program, have been identified and will be added to the enhanced Salem LRA AMP B.3.1.1 program.

It was determined Enhancement 1 should be applied to the GALL X.M1, Element 5, "Monitoring and Trending". Therefore, Salem LRA Appendix B, Section B.3.1.1, on page B-232, will be revised as shown below to apply Enhancement 1 to the "monitoring and trending" program element 5.

B.3.1.1 METAL FATIGUE OF REACTOR COOLANT PRESSURE BOUNDARY

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

1. The Metal Fatigue of Reactor Coolant Pressure Boundary program will be enhanced to include additional transients beyond those defined in the Technical Specifications and the UFSAR, and expanding the fatigue monitoring program to encompass other components identified to have fatigue as an analyzed aging effect, which require monitoring. **Program Elements Affected: (Elements 3 *and 5)***

RAI B.3.1.1-02

Background:

Enhancement 2 of LRA AMP B.3.1.1 states that the "Metal Fatigue of Reactor Coolant Pressure Boundary Program will be enhanced to use a software program to automatically count transients and calculate cumulative usage on select components." The applicant identifies that this enhancement is applicable to the following program elements of the AMP: (1) "scope of program;" (2) "preventative actions;" (3) "parameters monitored or inspected;" (4) "monitoring and trending;" and (5) "acceptance criteria."

The GALL and SRP-LR criteria stated as background information for request for additional information (RAI) B.3.1.1-1 apply to this RAI as well.

Issue:

It is not evident whether the stated enhancement is being made to the "scope of program;" "preventative actions;" "parameters monitored or inspected;" "monitoring and trending;" and "acceptance criteria" program elements of AMP B.3.1.1 in order to make them consistent with the corresponding program elements in GALL AMP X.M1. It is also not apparent to the staff exactly what is being enhanced and specifically whether the enhancement will involve an enhancement of the computer programming for WESTEMS® monitoring software, the stated program elements in the basis document or procedure for this AMP, the implementing procedure for this AMP, or some combination of these software/document bases. It is also not evident to the staff how this enhancement will be tied to the stated program elements of this AMP and to the implementing procedure for the software package if the enhancement only pertains to an anticipated update of WESTEMS® software programming to cover the scope of the "scope of program;" "preventative actions;" "parameters monitored or inspected;" "monitoring and trending;" and "acceptance criteria" program elements in GALL AMP X.M1.

Request:

Confirm that the stated enhancement is being proposed to make the "scope of program;" "preventative actions;" "parameters monitored or inspected;" "monitoring and trending;" and "acceptance criteria" program elements of AMP B3.1.1 consistent with those in GALL AMP X.M1. Clarify exactly what will be enhanced (e.g., WESTEMS® software programming, program elements in the basis document, implementing procedure, etc.) relative to Enhancement 1 of LRA AMP B.3.1.1. Justify why the associated program elements in AMP B.3.1.1 and the associated implementing procedure would not have to be updated as well to account for this enhancement if the implementation of the enhancement will be limited only to an anticipated update of WESTEMS® software programming (i.e., only for the purpose of adjusting the scope of the software programming to include and bound the scope of the "scope of program;" "preventative actions;" "parameters monitored or inspected;" "monitoring and trending;" and "acceptance criteria" program element recommendations in GALL AMP X.M1).

PSEG Response:

Enhancement 2 will make the "scope of program", "preventive actions", "parameters monitored/inspected", "monitoring and trending", and "acceptance criteria" program elements of LRA AMP B.3.1.1 consistent with those in GALL AMP X.M1. Each of these elements has attributes which will be enhanced with expansion to the existing fatigue monitoring software program. For example, for the "scope of program" element, the software program will provide the capability to monitor cumulative fatigue usage such that it provides as stated in GALL AMP X.M1, "preventive measures to mitigate fatigue cracking of metal components".

The current Salem Metal Fatigue of Reactor Coolant Pressure Boundary program as described in LRA AMP B.3.1.1 uses a fatigue monitoring software program for monitoring cumulative fatigue usage on the Pressurizer lower head and surge nozzle. Enhancement 2 will implement the use of the fatigue monitoring software program to monitor cumulative fatigue usage at other select locations (e.g., remainder of NUREG/CR-6260 locations), and not be limited to only an update of the software program. Implementation of the fatigue monitoring software program involves not only installation of the fatigue monitoring software program to include monitoring for other locations, but also implementation of new procedures and revision to existing procedures. Since the program element recommendations in GALL AMP X.M1 affected by this enhancement have not changed, program elements in the program basis document do not need to be updated.

As indicated above, Enhancement 2 will involve implementation of a fatigue monitoring software program for monitoring cumulative fatigue usage, issuing, and updating implementing procedures, but will not involve updating the program elements in LRA AMP B.3.1.1.

RAI B.3.1.1-03

Background:

Enhancement 3 of LRA AMP B.3.1.1 states that the "Metal Fatigue of Reactor Coolant Pressure Boundary Program will be enhanced to address the effects of the reactor coolant environment on component fatigue life by assessing the impact of the reactor coolant environment on a sample of critical components for the plant identified in NUREG/CR-6260." The applicant identifies that this enhancement is applicable to the following program elements of the AMP: (1) "preventative actions;" (2) "parameters monitored or inspected;" (3) "monitoring and trending;" and (4) "acceptance criteria."

The GALL and SRP-LR criteria stated as background information for RAI B.3.1.1-1 apply to this RAI as well. The "monitoring and trending" and "acceptance criteria" program elements in GALL AMP X.M1 are the only program elements that deal with the adequacy of environmental fatigue calculations. The "monitoring and trending" program element recommendation relates the need to the AMP to monitor and trend the impact of environmental fatigue on the CUF values of the Class 1 reactor coolant pressure boundary components that correspond to those listed and analyzed in NUREG/CR-6260 or that are considered to be bounding for the component locations listed in the NUREG. The "acceptance criteria" program element recommendation relates the need to the AMP to establish acceptance criteria for CUF calculations based on the ASME Section III design limit for CUF calculations, and for the need to adjust this criterion (in either the calculations themselves or on a reduction of the acceptance limit) if the component being analyzed is one of the components for the environmental fatigue calculations in the AMP.

Issue:

The relationship of Enhancement 3 to the "monitoring and trending" program element recommendation in GALL AMP X.M1 appears to be self evident. However, it is not apparent to the staff whether this enhancement is being used to make the "preventative actions," "parameters monitored or inspected," and "acceptance criteria" program elements for AMP B.3.1.1 consistent with those in GALL AMP X.M1. If this is the purpose, the staff seeks clarification on how this enhancement relates to the acceptance criterion recommendation for environmental fatigue calculations in the "acceptance criteria" program element of GALL AMP X.M1. It is also not evident to the staff how this enhancement relates to the "preventative actions" and "parameters monitored or trended" program elements in GALL AMP X.M1 (which do not mention criteria for environmental calculations or assessments).

Request:

Confirm that the stated enhancement is being proposed to make the "preventative actions;" "parameters monitored or inspected;" "monitoring and trending;" and "acceptance criteria" program elements of AMP B.3.1.1 consistent with that in GALL AMP X.M1. Clarify how this enhancement relates to conforming with the acceptance criterion recommendation for environmental fatigue calculations in the "acceptance criteria" program element of GALL AMP X.M1 and with the aging management recommendations in the "preventative actions" and "parameters monitored or trended" program elements in GALL AMP X.M1 (which are silent relative to criteria for environmental fatigue calculations).

PSEG Response:

Enhancement 3 is being proposed to make the "preventative actions"; "parameters monitored or inspected"; "monitoring and trending"; and "acceptance criteria" program elements of AMP B.3.1.1 consistent with that in GALL AMP X.M1.

Enhancement 3 provides additional acceptance criterion to the existing Metal Fatigue of Reactor Coolant Pressure Boundary program to maintain the fatigue usage factor below the design code limit using the fatigue life correction factors developed to assess the impact of environmental fatigue. Therefore, this was determined to be an enhancement to make the "acceptance criteria" program element of LRA AMP B.3.1.1 consistent with GALL AMP X.M1.

Enhancement 3 also relates to recommendations in the "preventative actions" program element in GALL AMP X.M1 by considering the effects of the reactor coolant environment on the component fatigue usage factor.

Enhancement 3 relates to recommendations in the "parameters monitored or inspected" and "monitoring and trending" program elements in GALL AMP X.M1 by adding the monitoring of a sample of critical components for the plant identified in NUREG/CR-6260.

RAI B.3.1.1-04

Background:

Enhancement 4 of LRA AMP B.3.1.1 states that the "Metal Fatigue of Reactor Coolant Pressure Boundary Program will be enhanced to require a review of additional reactor coolant pressure boundary locations if the usage factor for one of the environmental fatigue sample locations approaches its design limit." The applicant identifies that this enhancement is applicable to the "corrective action" program element of the AMP.

The GALL and SRP-LR criteria stated as background information for RAI B.3.1.1-1 apply to this RAI as well.

Issue:

It is not evident whether the stated enhancement is being made to make the "corrective actions" program element of AMP B.3.1.1 consistent with the corresponding program element in GALL AMP X.M1. It is also not apparent to the staff about what is being enhanced relative to the information that has been docketed for LRA AMP B.3.1.1, and specifically whether the enhancement will involve an enhancement of the "basis document or procedure" for this AMP, the implementing procedure for this AMP, or both.

Request:

Confirm that the stated enhancement is being proposed to make the "corrective actions" program element of LRA AMP B.3.1.1 consistent with that in GALL AMP X.M1. Clarify what will be enhanced (e.g., basis document, implementing procedure, etc.) relative to Enhancement 4 of LRA AMP B.3.1.1.

PSEG Response:

Enhancement 4 is being proposed to make the “corrective actions” program element of LRA AMP B.3.1.1 consistent with that in GALL AMP X.M1. New and revisions to existing implementing procedures will be issued to include the review of additional reactor coolant pressure boundary locations, if the usage factor for one of the environmental fatigue sample locations approaches its design limit, but will not involve updating the program basis document.