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SUSQUEHANNA STEAM ELECTRIC STATION
REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 AND 2, LICENSE RENEWAL APPLICATION (LRA) SECTIONS B.2.23, B.2.24, B.2.26, B.2.27, B.2.28, B.2.31
PLA-6391

Docket Nos. 50-387 and 50-388

References: 1) *PLA-6110, Mr. B. T. McKinney (PPL) to Document Control Desk (USNRC), "Application for Renewed Operating License Numbers NPF-14 and NPF-22," dated September 13, 2006.*

2) *Letter from Ms. E. H. Gettys (USNRC) to Mr. B. T. McKinney (PPL), "Request for Additional Information for the Review of the Susquehanna Steam Electric Station, Units 1 and 2 License Renewal Application," dated June 23, 2008.*

In accordance with the requirements of 10 CFR 50, 51, and 54, PPL requested the renewal of the operating licenses for the Susquehanna Steam Electric Station (SSES) Units 1 and 2 in Reference 1.

Reference 2 is a request for additional information (RAI) related to License Renewal Application (LRA) Sections B.2.23 B.2.24, B.2.26, B.2.27, B.2.28, and B.2.31. The enclosure and attachments to this letter provide the additional requested information.

There are no new regulatory commitments contained herein as a result of the attached RAI responses. However, based on these responses, two license renewal commitments have been revised and one license renewal commitment has been deleted. LRA Commitment #25 is revised in response to RAI B.2.23-1 as shown in Attachment 1. Attachment 2 documents the response to RAI's B.2.26-1, B.2.26-2 and B.2.26-3 which concludes that the "Steam Flow Restrictor Inspection" is not required. Therefore, LRA Commitment #22 is deleted. LRA Commitment #27 is revised in response to RAI B.2.31-1 as shown in Attachment 3.

If you have any questions, please contact Mr. Duane L Filchner at (610) 774-7819.

A120
NRR

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

Executed on: 7/25/2008

for BTMcKinney

B. T. McKinney

Enclosure: PPL Responses to NRC's Request for Additional Information (RAI)

Attachments: Attachment 1 – LRA Revisions in Response to RAI B.2.23-1
Attachment 2 – LRA Revisions in Response to RAIs B.2.26-1, B.2.26-2, and B.2.26-3
Attachment 3 – LRA Revisions in Response to RAIs B.2.31-1 and B.2.31-3

Copy: NRC Region I
Ms. E. H. Gettys, NRC Project Manager, License Renewal, Safety
Mr. R. Janati, DEP/BRP
Mr. F. W. Jaxheimer, NRC Sr. Resident Inspector
Mr. A. L. Stuyvenberg, NRC Project Manager, License Renewal, Environmental

Enclosure to PLA-6391
PPL Responses to NRC's
Request for Additional Information (RAI)

RAI B.2.23-1:

In the "scope of program" program element, the LRA states that this program detects loss of material due to crevice and pitting corrosion and selective leaching of the copper alloy cooler channel in the Control Structure HVAC System. Selective leaching generally does not cause changes in dimensions and is difficult to detect. The examination techniques used by this program to detect degradation is visual and/or volumetric. Neither one of these techniques by itself will detect selective leaching.

Please justify how this program will manage selective leaching and explain why these components are not included in LRA AMP B.2.29, Selective Leaching Program.

PPL Response:

The LRA is amended as shown in Attachment 1 to credit the Selective Leaching Inspection, in place of the Cooling Units Inspection, to manage loss of material due to selective leaching of the copper Control Structure HVAC cooler channels.

RAI B.2.23-2:

The GALL AMP XI.M32, "One-time Inspection" program, "detection of aging effects" program element, has different inspection methods identified for monitoring specific aging mechanisms such as crevice corrosion, galvanic corrosion, etc. However, the LRA states generally that the program uses a combination of established volumetric or visual examination techniques. Please clarify which techniques will be used to detect the various aging mechanisms.

PPL Response:

Visual inspection (VT-1 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether crevice or pitting corrosion is occurring. Visual inspection (VT-3 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether galvanic or general corrosion is occurring. Visual inspection (VT-3 or equivalent) techniques will be used to determine whether reduction in heat transfer is occurring. The specific inspection technique will be determined prior to the inspection activities and will be consistent with the recommendations in GALL AMP XI.M32.

RAI B.2.23-3:

In the "monitoring and trending" program element, the LRA states that no actions are taken as part of this program, since it is a one-time inspection activity. Please confirm if the corrective action program will increase the sample size in the event aging effects are detected.

PPL Response:

Unacceptable inspection findings will be evaluated under the SSES corrective action program. The evaluation done under the SSES corrective action program will identify appropriate corrective actions including the need to perform additional inspections.

RAI B.2.23-4:

In the "acceptance criteria" program element, the GALL AMP XI.M32, "One-time Inspection" program states that any indication or relevant conditions of degradation detected are evaluated. LRA Section B.2.23 states that no unacceptable loss of material (or wall thinning) or fouling of heat exchanger tubes and fins that could result in a loss of component intended function during the period of extended operation, as determined by engineering evaluation. Explain why the acceptance criteria for B.2.23 differ from the recommendations of the GALL Report and clarify what "no unacceptable loss of material (or wall thinning) or fouling..." means.

PPL Response:

Any indications or relevant conditions of degradation detected during the inspections will be evaluated. Similar to the example provided in the GALL text, the inspection observations will be compared to predetermined acceptance criteria. Inspection results that do not meet the acceptance criteria will be entered into the corrective action program for evaluation.

The license renewal application is amended as follows to provide consistency with the GALL Acceptance Criteria.

B.2.23 Cooling Units Inspection

- The text under Acceptance Criteria in Section B.2.23 (on LRA page B-74) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined ~~The~~ acceptance criteria. ~~for the Cooling Units Inspection are: No unacceptable loss of material (or wall thinning), or fouling of heat exchanger tubes and fins, that~~ ***If the acceptance criteria are not met,***

then the indications/conditions will be evaluated under the SSES Corrective Action Program to determine whether they could result in a loss of component intended function during the period of extended operation~~, as determined by engineering evaluation~~.

RAI B.2.23-5:

The "operating experience" program element states that the Cooling Unit Inspection is a new program and there is no plant-specific program operating experience. Several condition reports have been generated during walkdowns, surveillance and maintenance activities on the cooling units that are included in the scope of this program. Please identify if there was any age related degradation documented for these cooling units.

PPL Response:

Condition reports associated with the cooling units within the scope of the Cooling Units Inspection have been generated during various routine plant activities. A review of the condition reports associated with the cooling units did not identify any age-related degradation for the specific subcomponents addressed by the Cooling Units Inspection.

RAI B.2.24-1:

The "operating experience" program element states that the "Heat Exchanger Inspection" is a new program and there is no plant-specific program operating experience. However, during performance of surveillance tests or maintenance activities on these heat exchangers any degradation of tubes that was observed would have been documented.

Please identify examples of issues that may have been documented to address age-related degradation of the heat exchanger tubes within the scope of this program and include them in your operating experience element.

PPL Response:

A review of documentation generated during various routine plant activities associated with the heat exchangers within the scope of the Heat Exchanger Inspection was performed. The review did not identify any age-related degradation of the heat exchanger tubes within the scope of this inspection.

RAI B.2.26-1:

The GALL AMP XI.M32, "One-time Inspection" program, "detection of aging effects" program element, has different inspection methods identified for monitoring specific aging mechanisms such as crevice corrosion, galvanic corrosion, etc. However, the LRA states generally that the program uses established visual examination techniques. Please clarify which visual technique will be used to detect reduction of fracture toughness as evidenced by cracking.

PPL Response:

Clarification of which visual technique that will be used for detection of fracture toughness is not required because aging management program (AMP) B.2.26, Main Steam Flow Restrictor, is eliminated in the response to RAI B.2.26-2 below. As stated in the PPL Response to RAI B.2.26-2, the Main Steam Flow Restrictor Inspection is not an aging management program required for license renewal. The LRA is amended to delete the Main Steam Flow Restrictor Inspection. As such, a response is not required for RAI B.2.26-1.

Attachment 2 contains the LRA amendment related to deleting the Main Steam Flow Restrictor Inspection.

RAI B.2.26-2:

The "acceptance criteria" program element states that no cracking that could result in a loss of component intended function(s) during the period of extended operation, as determined by engineering evaluation.

Please confirm if the cast austenitic stainless steel (CASS) main steam flow restrictors were screened for thermal aging? Are they susceptible? Will flaw tolerance evaluation be performed if cracking is detected?

Please explain what type of corrective actions and monitoring will be implemented if cracking is detected.

PPL Response:

Consistent with NUREG-1801 (GALL) Section XI.M12, "Thermal Embrittlement of Cast Austenitic Stainless Steel (CASS)," PPL has performed a screening of the CASS portions of the main steam flow restrictors to determine the susceptibility for thermal aging. PPL has determined that the CASS portions of the flow restrictors are not susceptible to reduction of fracture toughness due to thermal embrittlement.

The CASS portions of the flow restrictors were cast by a centrifugal casting method. A telephone conversation between PPL and an engineer with the company that produced the castings, Wisconsin Centrifugal Incorporated, who was employed at their facility at the time of fabrication, confirmed the castings were formed centrifugally. PPL reviewed the QA documentation packages for the flow restrictors and determined that the castings were constructed from cast austenitic stainless steel, in conformance with material specification SA-351 CF8. This material is a low-molybdenum grade of CASS, as opposed to a high-molybdenum grade (i.e., "M" grade) of CASS material, such as SA-351 CF8M, which requires 2-3% molybdenum content. Therefore, the steam line flow restrictor castings for SSES are considered to be constructed of low molybdenum (0.5% maximum) content material. In accordance with the guidance provided in the GALL Section XI.M12, the centrifugally-cast, low molybdenum CASS portions of the flow restrictors are not susceptible to thermal embrittlement.

As such, the Main Steam Flow Restrictor Inspection intended to manage reduction of fracture toughness due to thermal embrittlement is not an aging management program required for license renewal.

In addition to the screening for susceptibility for thermal aging, PPL re-evaluated the other conclusions from the aging management review of the Main Steam Flow Restrictors. The results of that re-evaluation are as follows:

- The flow restrictors in the Main Steam system are not pressure boundary components. Therefore, neither ASME Section III nor ANSI B31.1, which typically require a fatigue analysis or the use of stress range reduction factors for 7000 cycles, are applicable. As such, fatigue cracking of the main steam flow restrictors is not an applicable aging effect.

- The Inservice Inspection (ISI) Program was credited to confirm the effectiveness of the BWR Water Chemistry Program to manage a loss of material for the main steam flow restrictors. The basis for crediting the ISI program was that similar materials and environments were inspected by ISI. However, the Chemistry Program Effectiveness Inspection (CPEI) confirms the effectiveness of the BWR Water Chemistry Program. While ISI results may be considered in the development and implementation of the CPEI one-time inspection, the ISI Program is not an aging management program for the main steam flow restrictors.

- Stress Corrosion Cracking (SCC) is not an aging effect requiring management for the main steam flow restrictors because there is no tensile stress in the CASS portions of the flow restrictors to promote stress corrosion cracking. Also, the flow restrictors do not have a pressure boundary function that could be affected by cracking, and cracking will not affect the flow restriction function of the flow restrictors. Extreme cracking that could result in the loss of flow restrictor structural integrity, could affect its flow restriction function, however, such a

failure is not plausible, given the lack of a driving mechanism for crack initiation and/or crack growth.

LRA Section 3.1.2.1.3, Table 3.1.1, Table 3.1.2-3, Appendix A (Table of Contents, Section A.1.2.30, and Table A-1), and Appendix B (Table of Contents, Table B-1, Table B-2, and Section B.2.26) are revised to reflect these results. Attachment 2 contains the LRA amendment related to deleting the Main Steam Flow Restrictor Inspection.

RAI B.2.26-3:

In the "detection of aging effects" program element, the LRA states that the amp "Steam Flow Restrictor Inspection" will be applied to all eight (four per unit) main steam flow restrictors at SSES. Please clarify if this means that all eight flow restrictors will be inspected. Please provide the sample size, and identify if the program will provide for increasing the sample size in the event that aging effects are detected.

PPL Response:

As stated in the PPL Response to RAI B.2.26-2, above, the Main Steam Flow Restrictor Inspection is not an aging management program required for license renewal. The LRA is amended to delete the Main Steam Flow Restrictor Inspection. As such, a response is not required for RAI B.2.26-3.

Attachment 2 contains the LRA amendment which deletes the license renewal commitment to perform the Main Steam Flow Restrictor Inspection.

RAI B.2.27-1:

In the GALL AMP XI.M32 "One-time Inspection" program the "detection of aging effects" program element, has a different inspection methods identified for monitoring specific aging mechanisms such as crevice corrosion, general corrosion, etc. However, the LRA states generally that the program uses a combination of established volumetric or visual examination techniques. Please clarify which techniques will be used to detect the various aging mechanisms.

PPL Response:

Visual inspection (VT-1 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether crevice or pitting corrosion is occurring. Visual inspection (VT-3 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether galvanic or general corrosion is occurring. Visual inspection (VT-3 or equivalent) techniques will be used to determine whether

reduction in heat transfer is occurring. The specific inspection technique will be determined prior to the inspection activities and will be consistent with the recommendations in GALL AMP XI.M32.

RAI B.2.27-2:

In the "monitoring and trending" program element, the LRA states that no actions are taken as part of this program, since it is a one-time inspection activity. Please confirm if the corrective action program will increase the sample size in the event aging effects are detected.

PPL Response:

Unacceptable inspection findings will be evaluated under the SSES corrective action program. The evaluation done under the SSES corrective action program will identify appropriate corrective actions including the need to perform additional inspections.

RAI B.2.27-3:

In the "acceptance criteria" program element, GALL AMP XI.M32 states that any indication or relevant conditions of degradation detected are evaluated. LRA Section B.2.27 states that no unacceptable loss of material (or wall thinning) or fouling of heat exchanger tubes and fins that could result in a loss of component intended function during the period of extended operation, as determined by engineering evaluation. Explain why the acceptance criteria for B.2.27 differ from the recommendations of GALL and clarify what "no unacceptable loss of material (or wall thinning) or fouling..." means.

PPL Response:

Any indications or relevant conditions of degradation detected during the inspections will be evaluated. Similar to the example provided in the GALL text, the inspection observations will be compared to predetermined acceptance criteria. Inspection results that do not meet the acceptance criteria will be entered into the corrective action program for evaluation.

The license renewal application is amended as follows to provide consistency with the GALL Acceptance Criteria.

B.2.27 Monitoring and Collection System Inspection

- The text under Acceptance Criteria in Section B.2.27 (on LRA page B-86) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined ~~The~~ acceptance criteria. ~~for the Monitoring and Collection System Inspection will be: No unacceptable loss of material (or wall thinning) that~~ ***If the acceptance criteria are not met, then the indications/conditions will be evaluated under the SSES Corrective Action Program to determine whether they*** could result in a loss of component intended function during the period of extended operation~~, as determined by engineering evaluation~~.

RAI B.2.28-1:

In Table 3.2.2-9, the diesel generator starting air system, has the AMP "Supplemental Piping/Tank Inspection" program credited for managing the aging effect of loss of material for stainless steel drain trap bodies and carbon steel moisture separators. However, a review of the AMP Evaluation Results Document indicates that diesel generator starting air system is not included in the scope of the Supplemental Piping/Tank Inspection Program. Please justify why it is not included.

PPL Response:

The carbon steel moisture separators and stainless steel drain trap bodies in the diesel generator starting air system are within the scope of the Supplemental Piping/Tank Inspection. The Diesel Generators system should have been included in the listing of systems within the scope of this inspection, but was inadvertently omitted. Therefore, the Diesel Generators System is added to the scope of this inspection.

The license renewal application is amended as follows to reflect this change:

APPENDIX B, AGING MANAGEMENT PROGRAMS

- The text in LRA Section B.2.28 under the Scope of Program bullet (on LRA pages B-87 and B-88) is revised by addition (***bold italics***) as follows:

B.2.28 Supplemental Piping/Tank Inspection

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program

  The Supplemental Piping/Tank Inspection is credited for managing loss of material due to crevice and pitting corrosion on carbon steel surfaces at air-water interfaces in the following systems:

  - Condensate Transfer and Storage, Containment and Suppression, Control Structure Chilled Water, ***Diesel Generators System,*** High Pressure Coolant Injection (HPCI), Main Steam, Reactor Core Isolation Cooling (RCIC), Residual Heat Removal (RHR), and Residual Heat Removal Service Water systems
  - Standby Gas Treatment System (SGTS) – For SGTS, the inspection is also credited for managing loss of material due to microbiologically influenced corrosion (MIC) at the air-water interface with the mist eliminator loop seal, which is filled with raw water from the Service Water System, and galvanic corrosion at points of contact between the mist eliminator housing and the SGTS filter enclosure, where condensation and water pooling may occur.

  Additionally, the Supplemental Piping/Tank Inspection detects and characterizes whether, and to what extent, a loss of material due to crevice and pitting corrosion is occurring (or is likely to occur) for stainless steel surfaces at air-water interfaces in the following systems:

  - Condensate Transfer and Storage, ***Diesel Generators System,*** Fuel Pool Cooling and Cleanup, and Standby Liquid Control systems

RAI B.2.28-2:

The GALL AMP XI.M32, in the "detection of aging effects" program element, different inspection methods are identified for monitoring specific aging mechanisms such as crevice corrosion, galvanic corrosion, etc. However, the LRA states generally that the program uses a combination of established volumetric or visual examination techniques. Please clarify which techniques will be used to detect the various aging mechanisms.

PPL Response:

Visual inspection (VT-1 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether crevice or pitting corrosion is occurring. Visual inspection (VT-3 or equivalent) and/or Volumetric inspection (RT or UT) techniques will be used to determine whether galvanic or general corrosion is occurring. Visual inspection (VT-3 or equivalent) techniques will be used to determine whether reduction in heat transfer is occurring. The specific inspection technique will be determined prior to the inspection activities and will be consistent with the recommendations in GALL AMP XI.M32.

RAI B.2.28-3:

In the monitoring and trending element, the LRA states that no actions are taken as part of this program, since it is a one-time inspection activity. Please confirm if the corrective action program will increase the sample size in the event aging effects are detected.

PPL Response:

Unacceptable inspection findings will be evaluated under the SSES corrective action program. The evaluation done under the SSES corrective action program will identify appropriate corrective actions including the need to perform additional inspections.

RAI B.2.28-4:

In the "acceptance criteria" program element, the GALL AMP XI.M32 states that any indication or relevant conditions of degradation detected are evaluated. LRA Section B.2.28 states that no unacceptable loss of material (or wall thinning) that could result in a loss of component intended function during the period of extended operation, as determined by engineering evaluation. Explain why the acceptance criteria for B.2.28 differ from the recommendations of the GALL Report and clarify what "no unacceptable loss of material (or wall thinning)" means.

PPL Response:

Any indications or relevant conditions of degradation detected during the inspections will be evaluated. Similar to the example provided in the GALL text, the inspection observations will be compared to predetermined acceptance criteria. Inspection results that do not meet the acceptance criteria will be entered into the corrective action program for evaluation.

The license renewal application is amended as follows to provide consistency with the GALL Acceptance Criteria.

B.2.28 Supplemental Piping/Tank Inspection

- The text under Acceptance Criteria in Section B.2.28 (on LRA page B-89) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Any indications or relevant conditions of degradation detected during the inspections will be compared to pre-determined ~~The~~ acceptance criteria. ~~for the Supplemental Piping/Tank Inspection are: No unacceptable loss of material (or wall thinning) that~~ ***If the acceptance criteria are not met, then the***

indications/conditions will be evaluated under the SSES Corrective Action Program to determine whether they could result in a loss of component intended function during the period of extended operation~~, as determined by engineering evaluation~~.

RAI B.2.31-1:

The license renewal application (LRA) states that the aging management program (AMP) B.2.31 "Small Bore Class 1 Piping Inspection" is a new program that will be consistent with the generic aging lessons learned (GALL) AMP XI.M35, "One-time Inspection of ASME Code Class 1 Small Bore Piping." Provide your basis for categorizing AMP B.2.31 as being consistent with GALL AMP XI.M35 when AMP B.2.31 implies that non-volumetric examination techniques may be used as an alternate basis for performing the one-time inspections of the small bore Class 1 piping components and when AMP B.2.31 credits the program with managing an aging effect (i.e., loss of material) that is not within the scope of GALL AMP XI.M.35. Clarify whether the LRA will need to be amended to identify these aspects of the program as exceptions to GALL AMP XI.M35, and if so, justify your basis for crediting these exceptions for aging management of small bore Class 1 piping components.

In the LRA, both in the program description and in several aging management review line items, the AMP B.2.31 is credited with confirming the effectiveness of the Boiling Water Reactor (BWR) Water Chemistry Program in mitigating the aging effects of loss of material using "nondestructive examinations (including volumetric techniques)." However, GALL AMP XI.M35 is credited only with managing the aging effect of cracking and the only examination technique used in AMP XI.M35 is volumetric examination.

PPL Response:

The SSES LRA is amended in Attachment 3 to demonstrate that AMP B.2.31, Small Bore Class 1 Piping Inspection, is consistent with GALL AMP XI.M35 with no exceptions.

AMP B.2.31 is credited for managing the aging effect of cracking, as a result of stress corrosion or thermal or mechanical loading, and a one-time volumetric examination is the acceptable method for confirming that cracking of ASME Code Class 1 small-bore piping is not occurring.

AMP B.2.22, Chemistry Program Effectiveness Inspection, is credited with verifying the effectiveness of AMP B.2.2, BWR Water Chemistry Program, to mitigate loss of material.

Attachment 3 contains the revised LRA sections.

RAI B.2.31-2:

The LRA AMP B.2.31, "Small Bore Class 1 Piping Inspection," is being used to monitor both the aging effect of cracking and the aging effect of loss of material in Class 1 small bore piping. However, the environmental stressors that may lead to cracking are not necessarily the same as the environmental stressors that may lead to loss of material. Clarify the selection processes and criteria that will be applied as part of this program to ensure that SSES will select and schedule inspection of the most limiting small bore Class 1 piping locations for both of these aging effects.

PPL Response:

The Small Bore Class 1 Piping Inspection, as amended in the response to RAI B.2.31-1, is credited to manage only cracking. As such, in the selection of the small bore Class 1 piping locations for the one-time inspection, there is no need to consider environmental stressors that may lead to loss of material. The selection criteria to be applied as part of this program are provided in the "Monitoring and Trending" program element discussion in LRA Section B.2.31.

RAI B.2.31-3:

For AMP B.2.31, under the program element "monitoring and trending," the LRA states that actual inspection locations will be based on physical accessibility, exposure levels, nondestructive examination techniques, and locations identified in NRC [Information Notice 97-46]. The NRC Information Notice was written relative to cracking that was detected in small bore unisolable high pressure injection piping at Oconee, Unit 2, which is a pressurized -water reactor (PWR). Justify your basis for using Oconee Unit 2 experience as being applicable operating experience for the SSES Small Bore Class 1 Piping Inspection Program and clarify how the information contained in NRC Information Notice 97-46 will be applied in selection process in order to ensure that the most susceptible small bore Class 1 piping locations to cracking (as a result of thermal and mechanical loading, or stress corrosion cracking) will be selected for the one-time inspection.

PPL Response:

The considerations in determining the inspection locations for AMP B.2.31, Small Bore Class 1 Piping Inspection, include operating experience and related industry guidance documents. Operating experience to date includes NRC Information Notice (IN) 97-46, which was issued to all holders of operating licenses or construction permits for nuclear power reactors (BWRs and PWRs). IN 97-46 states that a gap between a thermal sleeve and the associated safe-end allowed intermittent mixing of the hot reactor coolant and the

cooler makeup water flowing through the pipeline, resulting in alternate heating and cooling of the weld between the pipe and the safe-end. This phenomenon was a likely contributor to the fatigue cracking that occurred at the weld. PPL will consider the potential for piping locations to experience intermittent mixing between hot and cold flows in the sample selection of inspection locations for AMP B.2.31.

The SSES LRA is amended to state, more generally, that operating experience will be considered, without referencing a specific document such as IN 97-46. Attachment 3 contains the revised LRA sections.

RAI B.2.31-4:

In AMP B.2.31, under program element "Detection of Aging Effects," the LRA states that SSES has found cracking due to vibrational fatigue of small bore piping and is performing augmented inspections as part of the Inservice Inspection program. Identify the small bore piping components that experienced the vibrational-induced cracks and the augmented inspection techniques that resulted in the detection of the cracking in the piping components. Clarify whether or not PPL has taken appropriate corrective actions either to repair the flaw indications in the components or to replace the impacted components, and identify whether or not these components locations will be re-inspected in the future. If these components will be inspected in the future, identify the inspection technique and frequency that will be used, with justification, for the re-inspections of the components.

PPL Response:

SSES experienced nine socket weld failures (leaks) between 1992 and 2005. All of the leaks were on small bore piping attached to the Unit 2 reactor recirculation system. No socket weld failures have been experienced on Unit 1. All of the leaking welds were cut-out and replaced, or entirely eliminated by modification of the pipeline.

SSES Unit 2 Socket Weld Failure History:

3/1992	SPDBD222-1 Reactor Recirculation Pump 2A Seal Stage Flow Line
12/1993	SPHBD230-6 To Reactor Bldg Closed Cooling Water From Pump Seal & Cooler E401A
9/1995	SPDBD222-1 Reactor Recirculation Pump 2A Seal Stage Flow Line (Same weld from 3/1992)
10/1995	SPDCA250-1 Stem Leakoff for HV243F023B
3/1997	SPDCA251-2 Stem Leakoff for HV243F031B
9/1997	SPDCA251-2 Bonnet Vent for HV243F031B
12/1999	SPDCB220-1 From Reactor Recirculation Pump 2A Upper Seal Chamber To Penetration X52A

8/2000	SPDCB220-1 From Reactor Recirculation Pump 2A Upper Seal Chamber To Penetration X52A (Different weld than the failure in 12/1999)
3/2005	SPDCA251-2 Bonnet Vent for HV243F031B (Different weld than failure in 9/1997)

In response to the socket weld failures experienced at SSES and other plants, the SSES ISI group developed a shear wave ultrasonic (UT) inspection technique to volumetrically inspect socket welds. The shear wave UT is an augmented technique that has been used extensively during plant outages since 2000 to inspect welds that had been determined to be at-risk for vibrational fatigue due to their proximity to a vibration source (e.g., a recirculation pump). Crack-like indications were identified in 10%-15% of the inspected welds. The shear wave UT technique cannot definitively determine if an indication is a crack or a weld defect. For example, welding defects such as metallic and non-metallic inclusions, incomplete fusion, incomplete penetration and porosity are identified by the UT and are not discernible from actual crack indications.

While a weld defect may never result in a leaking crack, it does increase the potential for a fatigue failure if the weld is subjected to sufficient cyclic loading. As such, PPL conservatively chose to replace all welds found to have crack-like indications as a proactive defense against future fatigue failures. Every weld with a crack-like indication was either cut-out and replaced or eliminated by a piping modification. Numerous modifications were made to replace socket-welded fittings with solid pipe (using pipe bends, instead of fittings) and to alter the natural frequency of the piping to avoid excitation by the vibration source. All new socket welds were made with the EPRI 2x1 configuration to improve fatigue resistance. To date, none of the 2x1 welds have resulted in a leaking crack at SSES.

The shear wave UT socket weld inspections described above were specifically requested by engineering to assist in the evaluation and resolution of the vibrational fatigue failures. Those inspections were in addition to the periodic volumetric inspections that were already being performed under the Augmented Inservice Inspection (ISI) for Vibration Induced Failures (AUG8), which was implemented at SSES in 1992-1993. The scope of the augmented ISI program includes socket welds on small bore branch lines in the Reactor Recirculation and RHR systems inside containment with similar configurations to other lines that had experienced prior weld indications or failures. Subsets of those welds are inspected periodically during outages, dependent on radiological and access considerations. Welds that have been successfully inspected more than once are typically removed from the inspection scope.

Recent inspection results have indicated a substantial reduction in the number of indications. PPL is confident that vibrational fatigue on the subject piping welds has been successfully addressed. As such, the necessity to continue volumetric inspections under the augmented ISI program is currently being evaluated.

Attachment 1 to PLA-6391
LRA Revisions in
Response to RAI B.2.23-1

➢ The text in LRA Section 3.3.2.1.5 (on LRA page 3.3-10) is revised by addition (***bold italics***) as follows:

3.3.2.1.5 Control Structure HVAC Systems

Aging Management Programs
The following aging management programs manage the aging effects for the Control Structure HVAC Systems components/commodities:

- Bolting Integrity Program
- Closed Cooling Water Chemistry Program
- Cooling Units Inspection
- Fire Water System Program
- ***Selective Leaching Inspection***
- System Walkdown Program

➢ The text under Discussion in LRA Table 3.3.1 (on LRA page 3.3-64) is revised by addition (***bold italics***) as follows:

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-25	Copper alloy HVAC piping, piping components, piping elements exposed to condensation (external)	Loss of material due to pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific	Except as noted, the System Walkdown Program is credited to manage loss of material for copper alloy components (HVAC and non-HVAC) that are exposed to condensation (external). The Cooling Units Inspection is a one-time inspection that will detect and characterize loss of material for copper alloy HVAC heat exchanger components that are exposed to condensation (external). The Selective Leaching Inspection is a one-time inspection that will detect and characterize loss of material due to selective leaching for ***HVAC and*** non-HVAC copper alloy components that are exposed to condensation (external). Note H is used. Further evaluation is documented in Section 3.3.2.2.10.3.

The text under Discussion in LRA Table 3.3.1 (on LRA page 3.3-92) is revised by deletion (~~strikethrough~~) as follows:

Table 3.3.1 Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect/Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.3.1-84	Copper alloy >15% Zn piping, piping components, piping elements, and heat exchanger components exposed to raw water, treated water or closed cycle cooling water	Loss of material due to selective leaching	Selective Leaching of Materials	No	Consistent with NUREG-1801. The Selective Leaching Inspection is credited to manage loss of material due to selective leaching for copper alloy >15% Zn components that are exposed to raw water or treated water. ~~For certain HVAC heat exchanger components, the Cooling Units Inspection, a one-time inspection, is credited to detect and characterize loss of material due to selective leaching.~~

➢ The text in LRA Table 3.3.2-5 (on LRA page 3.3-131) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
H&V Unit, Control Structure (0E146A1/2 & 0E146B1/2) Channels	Pressure Boundary	Copper Alloy (Red Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Loss of Material (selective leaching)	***Selective Leaching Inspection*** ~~Cooling Units Inspection~~	VII.F1-9	3.3.1-84	***A*** ~~E~~
			Indoor Air (External)	Loss of Material	Cooling Units Inspection	VII.F1-16	3.3.1-25	E, ~~0337~~
				Loss of Material (selective leaching)	***Selective Leaching Inspection***	***VII.F1-16***	***3.3.1-25***	***H***

- The text in LRA Table 3.3.2-5 (on LRA page 3.3-132) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Unit, Control Room Floor (0E151A1/2 & 0E151B1/2) Channels	Pressure Boundary	Copper Alloy (Red Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Loss of Material (selective leaching)	***Selective Leaching Inspection*** ~~Cooling Units Inspection~~	VII.F1-9	3.3.1-84	***A*** ~~E~~
			Indoor Air (External)	Loss of Material	Cooling Units Inspection	VII.F1-16	3.3.1-25	E, ~~0337~~
				Loss of Material (selective leaching)	***Selective Leaching Inspection***	***VII.F1-16***	***3.3.1-25***	***H***

➢ The text in LRA Table 3.3.2-5 (on LRA page 3.3-134) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table 3.3.2-5 Aging Management Review Results – Control Structure HVAC Systems								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Cooling Unit, Computer Room Floor (0E150A1/2 & 0E150B1/2) Channels	Pressure Boundary	Copper Alloy (Red Brass)	Treated Water (Internal)	Cracking	Closed Cooling Water Chemistry Program	N/A	N/A	H
				Loss of Material	Closed Cooling Water Chemistry Program	VII.C2-4	3.3.1-51	D, 0312
				Loss of Material (selective leaching)	***Selective Leaching Inspection*** ~~Cooling Units Inspection~~	VII.F1-9	3.3.1-84	***A*** ~~E~~
			Indoor Air (External)	Loss of Material	Cooling Units Inspection	VII.F1-16	3.3.1-25	E, ~~0337~~
				Loss of Material (selective leaching)	***Selective Leaching Inspection***	***VII.F1-16***	***3.3.1-25***	***H***

- The text for the Plant-Specific Notes associated with the LRA Section 3.3 aging management review summary tables (on LRA page 3.3-349) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Plant-Specific Notes:	
0337	***Not Used.*** ~~AMP also manages loss of material due to selective leaching.~~

➢ The text in LRA Table A-1 (on LRA page A-43) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

A.1.4 License Renewal Commitment List

Table A-1
SSES License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
25) Selective Leaching Inspection	Program is a new one-time inspection. The Selective Leaching Inspection detects and characterizes conditions to determine whether, and to what extent a loss of material due to selective leaching is occurring (or likely to occur) for susceptible components including piping and tubing, valve bodies, pump and turbocharger casings, heat exchanger, cooler, and chiller components, hydrants, sprinkler heads, strainers, level gauges, orifices, and heater sheaths. The components within the scope of the program are formed of cast iron, brass, bronze, and copper alloy materials. The components are subject to raw water, treated water, groundwater (buried), indoor air with condensation, outdoor air, and fuel oil environments. The components within the scope of this program are located in ~~twenty-five~~ ***twenty-six*** different plant systems.	A.1.2.43	Within the 10-year period prior to the period of extended operation.

➢ The text in LRA Section B.2.23 under the Scope of Program bullet (on LRA page B-73) is revised by deletion (~~strikethrough~~) as follows:

B.2.23 Cooling Units Inspection

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program
  The Cooling Units Inspection detects and characterizes conditions relative to the following to determine whether, and to what extent degradation is occurring:

- Loss of material due to crevice and pitting corrosion ~~and selective leaching~~ on the internal and external surfaces of the copper alloy (red brass) cooler channels in the Control Structure HVAC System.

➢ The text in LRA Section B.2.29 under the Scope of Program bullet (on LRA page B-91) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

B.2.29 Selective Leaching Inspection

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

- Scope of Program
  The Selective Leaching Inspection detects and characterizes conditions to determine whether, and to what extent, a loss of material due to selective leaching is occurring (or likely to occur) for susceptible components including piping and tubing, valve bodies, pump and turbocharger casings, heat exchanger, cooler, and chiller components, hydrants, sprinkler heads, strainers, level gauges, orifices, and heater sheaths. The components within the scope of the program are formed of cast iron or copper alloy (brass and bronze) materials. The components are subject to raw water, treated water, groundwater (buried), indoor air with condensation, outdoor air, and fuel oil environments. The components within the scope of this program are located in ~~25~~ ***26*** plant systems within the scope of license renewal.

Attachment 2 to PLA-6391
LRA Revisions in
Response to RAIs B.2.26-1, B.2.26-2, and B.2.26-3

➢ The text in LRA Section 3.1.2.1.3 (on LRA pages 3.1-6 and 3.1-7) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

3.1.2.1.3 Reactor Coolant System Pressure Boundary

Aging Management Programs

The following aging management programs manage the aging effects for the Reactor Coolant System Pressure Boundary components:

- Bolting Integrity Program
- BWR Stress Corrosion Cracking (SCC) Program
- BWR Water Chemistry Program
- ***Chemistry Program Effectiveness Inspection***
- Closed Cooling Water (CCW) Chemistry Program
- Flow-Accelerated Corrosion (FAC) Program
- Inservice Inspection (ISI) Program
- ~~Main Steam Flow Restrictor Inspection~~
- Small Bore Class 1 Piping Inspection
- System Walkdown Program

➢ The text in LRA Table 3.1.1 (on LRA pages 3.1-25, 32, and 33) and in LRA Table 3.1.2-3 (on LRA pages 3.1-75 and 76) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-41	Stainless steel and nickel alloy piping, piping components, and piping elements greater than or equal to 4 NPS; nozzle safe ends and associated welds	Cracking due to stress corrosion cracking and intergranular stress corrosion cracking	BWR Stress Corrosion Cracking and Water Chemistry	No	Consistent with NUREG-1801. The BWR Stress Corrosion Cracking Program in conjunction with the BWR Water Chemistry Program is credited to manage cracking for stainless steel and nickel alloy safe ends and piping components (including ~~MS flow elements/ restrictors and~~ valve bodies) equal to or greater than 4 inch NPS. The combined programs are also credited to manage cracking of stainless steel pump casings and covers, and weld overlays.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-55	Cast austenitic stainless steel Class 1 pump casings, and valve bodies and bonnets exposed to reactor coolant >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Inservice inspection (IWB, IWC, and IWD). Thermal aging susceptibility screening is not necessary, inservice inspection requirements are sufficient for managing these aging effects. ASME Code Case N-481 also provides an alternative for pump casings.	No	Consistent with NUREG-1801 with exceptions. The Inservice Inspection (ISI) Program is credited to manage loss of fracture toughness for CASS pump casings, pump covers, thermal barriers, and valve bodies. The ISI Program contains an exception. ~~For CASS valve bodies less than 4 inch NPS, the Small Bore Class 1 Piping Inspection is credited to manage loss of fracture toughness.~~ ~~Main steam flow elements / flow restrictors formed of CASS are also compared to this item. The Main Steam Flow Restrictor Inspection is credited to detect loss of fracture toughness for these components.~~

Note: Revised in response to RAI B.2.31-1, but also shown here for clarity

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-57	Cast austenitic stainless steel Class 1 piping, piping component, and piping elements and control rod drive pressure housings exposed to reactor coolant >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Thermal Aging Embrittlement of CASS	No	Reduction of fracture toughness for CASS ~~main steam flow restrictors,~~ pump casings, pump covers, thermal barriers, and valve bodies, is addressed under item 3.1.1-55. Reduction of fracture toughness for CASS orificed fuel support pieces, control rod guide tube bases, jet pump assemblies, and core spray line sparger elbows is addressed under item 3.1.1-51. SSES has no other Class 1 piping, piping components, piping elements, or control rod drive housings formed of CASS material.

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flow Elements / Restrictors, Main Steam	Throttling	CASS	Treated Water (External)	Loss of Material	BWR Water Chemistry Program ~~Inservice Inspection (ISI) Program~~ ***Chemistry Program Effectiveness Inspection***	IV.C1-14	3.1.1-15	~~E~~***C***
				~~Cracking - Fatigue~~	~~TLAA~~	~~IV.C1-15~~	~~3.1.1-03~~	~~A~~
				~~Reduction of Fracture Toughness~~	~~Main Steam Flow Restrictor Inspection~~	~~IV.C1-3~~	~~3.1.1-55~~	~~E~~
				~~Cracking~~	~~BWR SCC Program~~ ~~BWR Water Chemistry Program~~	~~IV.C1-9~~	~~3.1.1-41~~	~~A~~

Table 3.1.2-3	Aging Management Review Results – Reactor Coolant System Pressure Boundary							
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Flow Elements / Restrictors, Main Steam	Throttling	Carbon Steel	Treated Water (External)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection***	IV.A1-11	3.1.1-11	~~D~~ *C*
				~~Cracking - Fatigue~~	~~TLAA~~	~~IV.C1-15~~	~~3.1.1-03~~	~~A~~

➢ The text in the LRA Appendix A Table of Contents (on LRA page A-3) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

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➢ The text in LRA Section A.1.2.30 (on LRA page A-15) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

A.1.2.30 ~~Main Steam Flow Restrictor Inspection~~*Not Used*

~~The Main Steam Flow Restrictor Inspection detects and characterizes reduction of fracture toughness of the cast austenitic stainless steel (CASS) subcomponents of the main steam flow restrictors. The inspection will detect cracking that is symptomatic of reduction of fracture toughness. Reduction of fracture toughness does not cause cracking, but the reduced toughness allows existing cracks to propagate at higher rates. This inspection provides direct evidence as to whether, and to what extent, cracking has occurred or is likely to occur in the main steam flow restrictors.~~

~~The Main Steam Flow Restrictor Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.~~

➢ The text in LRA Table A-1 (on LRA page A-40) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table A-1
SSES License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
22) ~~Main Steam Flow Restrictor Inspection~~ *Not Used*	~~Program is a new one-time inspection.~~ ~~The Main Steam Flow Restrictor Inspection is credited for managing reduction of fracture toughness, as evidenced by cracking, for the main steam flow restrictors.~~	~~A.1.2.30~~	~~Within the 10-year period prior to the period of extended operation.~~

➢ The text in LRA Appendix B Table of Contents (on LRA page B-3) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

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➢ The text in LRA Appendix B Table B-1 (on LRA page B-10) is revised by deletion (~~strikethrough~~) as follows:

Table B-1
Correlation of NUREG-1801 and SSES Aging Management Programs

Number	NUREG-1801 Program	Corresponding SSES Program
XI.M32	One-Time Inspection	• Chemistry Program Effectiveness Inspection See Section B.2.22. • Cooling Units Inspection See Section B.2.23. • Heat Exchanger Inspection See Section B.2.24. • Lubricating Oil Inspection See Section B.2.25. • ~~Main Steam Flow Restrictor Inspection See Section B.2.26.~~

➢ The text in LRA Appendix B Table B-2 (on LRA page B-16) is revised by deletion (~~strikethrough~~) as follows:

Table B-2
Consistency of SSES Aging Management Programs with NUREG-1801
(continued)

Program Name	New /Existing	Consistent with NUREG-1801	Exceptions to NUREG-1801	Plant-Specific	Enhancement Required
~~Main Steam Flow Restrictor Inspection~~	~~New~~	~~Yes~~	--	--	--

➢ The text in LRA Section B.2.26 (on LRA pages B-81, 82, and 83) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

B.2.26 ~~Main Steam Flow Restrictor Inspection~~*Not Used*

~~**Program Description**~~

~~The purpose of the Main Steam Flow Restrictor Inspection is to detect and characterize reduction of fracture toughness of the cast austenitic stainless steel (CASS) subcomponents of the main steam flow restrictors. The inspection will detect cracking that is symptomatic of reduction of fracture toughness. Reduction of fracture toughness does not cause cracking, but the reduced toughness allows existing cracks to propagate at higher rates.~~

~~This inspection provides direct evidence as to whether, and to what extent, cracking has occurred or is likely to occur in the main steam flow restrictors. Implementation of the Main Steam Flow Restrictor Inspection will ensure that the flow restriction function of the subject restrictors is maintained consistent with the current licensing basis during the period of extended operation.~~

~~The Main Steam Flow Restrictor Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.~~

~~The Main Steam Flow Restrictor Inspection is a new one-time inspection for SSES that will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M32, "One-Time Inspection."~~

~~**Exceptions to NUREG-1801**~~

~~None.~~

~~**NUREG-1801 Consistency**~~

~~The Main Steam Flow Restrictor Inspection is a new one-time inspection for SSES that will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M32, "One-Time Inspection."~~

~~**Aging Management Program Elements**~~

~~The results of an evaluation of each program element are provided below.~~

- ~~Scope of Program~~
  ~~The Main Steam Flow Restrictor Inspection is credited for managing reduction of fracture toughness, as evidenced by cracking, for the main steam flow restrictors.~~

- ~~Preventive Actions~~

~~No actions are taken as part of the Main Steam Flow Restrictor Inspection to prevent aging effects or to mitigate aging degradation.~~

- ~~Parameters Monitored or Inspected~~
  ~~The parameters inspected by the Main Steam Flow Restrictor Inspection include visual evidence of cracking. Visual examination will be performed by qualified personnel using established nondestructive examination (NDE) techniques appropriate to the system/location being inspected.~~

- ~~Detection of Aging Effects~~
  ~~The Main Steam Flow Restrictor Inspection will be applied to all eight (four per unit) main steam flow restrictors at SSES. The Main Steam Flow Restrictor Inspection will use established visual nondestructive examination (NDE) techniques to detect reduction of fracture toughness as evidenced by cracking, and will be performed by qualified personnel. The inspection is consistent with the NUREG-1801 one-time inspection recommendations for detection of cracking. Due to the specific focus of this inspection, the other aging effects and inspection methods in the NUREG-1801 one-time inspection are not applicable to this inspection.~~

  ~~The Main Steam Flow Restrictor Inspection activities will be conducted after the issuance of the renewed licenses and prior to the end of the current operating licenses for SSES Unit 1 and Unit 2, with sufficient time to implement programmatic oversight for the period of extended operation, if necessary. The activities will be conducted no earlier than 10 years prior to the end of the current operating licenses, so that aging effects with long incubation periods have time to manifest.~~

- ~~Monitoring and Trending~~
  ~~No actions are taken as part of the Main Steam Flow Restrictor Inspection to monitor and/or trend inspection results. This is a one-time inspection used to determine if, and to what extent, further actions, including monitoring and trending, may be required.~~

- ~~Acceptance Criteria~~
  ~~The acceptance criterion for the Main Steam Flow Restrictor Inspection is: no cracking that could result in a loss of component intended function(s) during the period of extended operation, as determined by engineering evaluation.~~

- ~~Corrective Actions~~
  ~~This element is common to SSES programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.~~

- ~~Confirmation Process~~
  ~~This element is common to SSES programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.~~

- ~~Administrative Controls~~
  ~~This element is common to SSES programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.~~

- Operating Experience
  The Main Steam Flow Restrictor Inspection is a new one-time inspection activity for which there is no operating experience indicating the need for an aging management program. However, inspection methods are consistent with accepted industry practices.

Required Enhancements

None.

Conclusion

Implementation of the Main Steam Flow Restrictor Inspection will verify that there are no aging effects requiring management for the subject components or will identify appropriate corrective actions, possibly including programmatic oversight, to be taken to ensure that the component intended function(s) will be maintained consistent with the current licensing basis during the period of extended operation.

Attachment 3 to PLA-6391
LRA Revisions in
Response to RAIs B.2.31-1 and B.2.31-3

- The text in LRA Section 3.1.2.2.2.1 (on LRA page 3.1-8) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

3.1.2.2.2.1 BWR Top Head and Top Head Nozzles, PWR Steam Generator Shell Assembly

The BWR Water Chemistry Program is supplemented by the Inservice Inspection (ISI) Program for managing loss of material due to general, pitting, and crevice corrosion for the steel reactor vessel upper head and the top head nozzles exposed to reactor coolant. A one-time inspection is not credited.

The BWR Water Chemistry Program in association with the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ manages loss of material due to general, pitting, and crevice corrosion for steel piping and valves less than 4 inches exposed to reactor coolant. The ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ is a one-time inspection.

Loss of material for a steam generator shell assembly is only applicable to PWRs.

- The text in LRA Section 3.1.2.2.2.3 (on LRA page 3.1-9) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

3.1.2.2.2.3 Flanges, Nozzles, Penetrations, Pressure Housings, Safe Ends, and Vessel Shells, Heads, and Welds

The BWR Water Chemistry Program is supplemented by the Inservice Inspection (ISI) Program for managing loss of material due to crevice and pitting corrosion for the steel reactor vessel upper head closure flange and shell closure flange with stainless steel cladding exposed to reactor coolant. A one-time inspection is not credited.

The BWR Water Chemistry Program alone is credited for managing loss of material due to crevice and pitting corrosion of the steel reactor vessel shell rings, ID attachments and welds, bottom head, nozzles, safe ends, and CRD stub tubes and housings with stainless steel cladding exposed to reactor coolant. A one-time inspection is not credited.

The BWR Water Chemistry Program in association with the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ or the Inservice Inspection (ISI) Program manages loss of material due to pitting and crevice corrosion for stainless steel components of the reactor coolant system (RCS) pressure boundary exposed to reactor coolant. The ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ is a one-time inspection.

- The text in LRA Section 3.1.2.2.4.1 (on LRA page 3.1-10) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

3.1.2.2.4.1 BWR Top Head Enclosure Vessel Flange Leak Detection Lines

The reactor vessel flange leak detection line at SSES is a Class 1 line that is normally dry. The stainless steel line is evaluated for a treated water environment and is therefore susceptible to cracking due to stress corrosion cracking. This aging effect is managed with a combination of the BWR Water Chemistry Program and the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~.

- The text in LRA Section 3.1.2.2.8.1 (on LRA page 3.1-10) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

3.1.2.2.8.1 Stainless Steel BWR Jet Pump Sensing Lines

For SSES, the jet pump instrumentation lines inside the vessel are not subject to aging management review, as they do not perform an intended function. The lines outside of the vessel are part of the RCS pressure boundary and are subject to aging management review for a reactor coolant environment. Cracking of the stainless steel lines external to the vessel is managed with a combination of the BWR Water Chemistry Program and the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~.

- The text in LRA Table 3.1.1 (on LRA pages 3.1-16, 19, and 32) and in LRA Table 3.1.2-3 (on LRA pages 3.1-74, 76, 79, 80, 81, 88, 89, 90, and 92) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-11	Steel top head enclosure (without cladding) top head nozzles (vent, top head spray or RCIC, and spare) exposed to reactor coolant	Loss of material due to general, pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	The BWR Water Chemistry Program in association with the Inservice Inspection (ISI) Program is credited to manage loss of material for the reactor vessel upper head dome and closure flange, top head nozzles N6 and N7, and piping and valves ≥4 inches. The BWR Water Chemistry Program alone is credited to manage loss of material for nozzles (except N6 and N7), safe ends, and flanges, and also for main steam flow elements. The BWR Water Chemistry Program in association with the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ is credited to manage loss of material for piping and valves < 4 inches. Refer to Section 3.1.2.2.2.1 for further information.

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-15	Stainless steel; steel with nickelalloy or stainless steel cladding; and nickel-alloy reactor coolant pressure boundary components exposed to reactor coolant	Loss of material due to pitting and crevice corrosion	Water Chemistry and One-Time Inspection	Yes, detection of aging effects is to be evaluated	The BWR Water Chemistry Program in association with the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ or the Inservice Inspection (ISI) Program is credited to manage loss of material for stainless steel components of the RCS pressure boundary. This item is consistent with NUREG-1801 where the ***Chemistry Program Effectiveness Inspection***~~Small Bore Class 1 Piping Inspection~~ is credited. It is not consistent where the ISI Program is credited. Refer to Section 3.1.2.2.2.3 for further information

Table 3.1.1 Summary of Aging Management Programs for Reactor Vessel, Internals, and Reactor Coolant System Evaluated in Chapter IV of the GALL Report					
Item Number	**Component/Commodity**	**Aging Effect / Mechanism**	**Aging Management Programs**	**Further Evaluation Recommended**	**Discussion**
3.1.1-55	Cast austenitic stainless steel Class 1 pump casings, and valve bodies and bonnets exposed to reactor coolant >250°C (>482°F)	Loss of fracture toughness due to thermal aging embrittlement	Inservice inspection (IWB, IWC, and IWD). Thermal aging susceptibility screening is not necessary, inservice inspection requirements are sufficient for managing these aging effects. ASME Code Case N-481 also provides an alternative for pump casings.	No	Consistent with NUREG-1801 with exceptions. The Inservice Inspection (ISI) Program is credited to manage loss of fracture toughness for CASS pump casings, pump covers, thermal barriers, and valve bodies. The ISI Program contains an exception. ~~For CASS valve bodies less than 4 inch NPS, the Small Bore Class 1 Piping Inspection is credited to manage loss of fracture toughness.~~ ~~Main steam flow elements / flow restrictors formed of CASS are also compared to this item. The Main Steam Flow Restrictor Inspection is credited to detect loss of fracture toughness for these components.~~

Note: Revised in response to RAI B.2.26-2, but also shown here for clarity

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Condensing Chamber	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.C1-14	3.1.1-15	A ~~0105~~
Flow orifice < 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.C1-14	3.1.1-15	A ~~0105~~
Piping & Fittings < 4 in.	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.A1-11	3.1.1-11	C ~~0105~~
Piping & Fittings < 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.C1-14	3.1.1-15	A ~~0105~~
Piping & Fittings Flange leak detection lines	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.C1-14	3.1.1-15	A

Table 3.1.2-3 Aging Management Review Results – Reactor Coolant System Pressure Boundary								
Component / Commodity	**Intended Function**	**Material**	**Environment**	**Aging Effect Requiring Management**	**Aging Management Programs**	**NUREG-1801 Volume 2 Item**	**Table 1 Item**	**Notes**
Valve bodies < 4 in.	Pressure Boundary	Carbon Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.A1-11	3.1.1-11	C ~~0105~~
Valve bodies < 4 in.	Pressure Boundary	Stainless Steel	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.C1-14	3.1.1-15	A ~~0105~~
Valve bodies < 4 in.	Pressure Boundary	CASS	Treated Water (Internal)	Loss of Material	BWR Water Chemistry Program ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~	IV.C1-14	3.1.1-15	A ~~0105~~
~~Valve bodies < 4 in.~~	~~Pressure Boundary~~	~~CASS~~	~~Treated Water (Internal)~~	~~Reduction of Fracture Toughness~~	~~Small Bore Class 1 Piping Inspection~~	~~IV.C1-3~~	~~3.1.1-55~~	~~E~~

Plant-Specific Notes:	
0105	***Not Used.*** ~~Several NUREG-1801 Items call for the aging management program of Water Chemistry Control augmented by One-Time Inspection. Here Water Chemistry Control is augmented by the Small Bore Class 1 Piping Inspection, which is a One-Time Inspection program for Class 1 small bore piping. Therefore a note A (or C) was used.~~

- The text in LRA Section A.1.2.44 (on LRA page A-19) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

A.1.2.44 Small Bore Class 1 Piping Inspection

~~The Small Bore Class 1 Piping Inspection confirms the effectiveness of the BWR Water Chemistry Program in mitigating loss of material and cracking for small bore Class 1 piping. It will also verify, by inspections for cracking, that reduction of fracture toughness due to thermal embrittlement requires no additional aging management for small bore Class 1 piping.~~ ***The Small Bore Class 1 Piping Inspection is a one-time inspection to detect cracking resulting from thermal and mechanical loading or intergranular stress corrosion. The inspection will provide assurance that either cracking of small bore Class 1 piping is not occurring or the cracking is insignificant, such that an aging management program (AMP) is not warranted. The inspection will also confirm the effectiveness of the BWR Water Chemistry Program in mitigating cracking due to intergranular stress corrosion.*** The Small Bore Class 1 Piping Inspection is applicable to small bore ASME Code Class 1 piping ~~and systems~~ less than 4 inches nominal pipe size (NPS 4), which includes pipes, fittings, and branch connections. ~~The inspection provides additional assurance that either aging of small bore ASME Code Class 1 piping is not occurring or that the aging is insignificant, such that an additional aging management program is not warranted.~~

The Small Bore Class 1 Piping Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

➢ The text in LRA Table A-1 (on LRA page A-44) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

Table A-1
SSES License Renewal Commitments

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
27) Small-Bore Class 1 Piping Inspection	Program is a new one-time inspection. The SSES program will include measures to verify that ***cracking*** ~~unacceptable degradation~~ is not occurring in Class 1 small-bore piping, thereby validating the effectiveness of the Chemistry Program to mitigate ***cracking*** ~~aging-related degradation~~ and confirming that no additional aging management programs are needed for the period of extended operation.	A.1.2.44	Within the 10-year period prior to the period of extended operation.

➢ The text in the Scope of Program discussion in LRA Section B.2.22 (on LRA page B-68) is revised by addition (***bold italics***) as follows:

B.2.22 Chemistry Program Effectiveness Inspection

• Scope of Program

The scope of the Chemistry Program Effectiveness Inspection includes the internal surfaces of aluminum, copper alloy, carbon and low alloy steel, cast iron, and stainless steel components in the following license renewal systems that contain treated water, treated water that is closed cooling water, or fuel oil that is controlled by a SSES chemistry program:

Treated Water (BWR water) – Condensate Transfer and Storage, Containment and Suppression, Control Rod Drive Hydraulics, Core Spray, Feedwater, Fuel Pool Cooling and Cleanup, High Pressure Coolant Injection, Main Steam, Makeup Demineralizer, Makeup Transfer and Storage, Reactor Core Isolation Cooling, Reactor Nonnuclear Instrumentation, Reactor Recirculation (nonsafety-related instrument tubing/valve bodies), Reactor Vessel & Auxiliaries (nonsafety-related RPV level/backfill instrument tubing/valve bodies), ***Reactor Coolant System Pressure***

Boundary, Reactor Water Cleanup, Refueling Water Transfer and Storage, Residual Heat Removal, Sampling (reactor area and post-accident sampling), and Standby Liquid Control systems.

- The text in LRA Section B.2.31 (on LRA pages B-98, 99, and 100) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

B.2.31 Small Bore Class 1 Piping Inspection

Program Description

~~The purpose of the Small Bore Class 1 Piping Inspection is to confirm the effectiveness of the BWR Water Chemistry Program in mitigating loss of material and cracking for small bore Class 1 piping. It will also verify, by inspections for cracking, that reduction of fracture toughness due to thermal embrittlement requires no additional aging management for small bore Class 1 piping.~~ ***The Small Bore Class 1 Piping Inspection is a one-time inspection to detect cracking resulting from thermal and mechanical loading or intergranular stress corrosion. The inspection will provide assurance that either cracking of small bore Class 1 piping is not occurring or the cracking is insignificant, such that an aging management program (AMP) is not warranted. The inspection will also confirm the effectiveness of the BWR Water Chemistry Program in mitigating cracking due to intergranular stress corrosion.***

This inspection is applicable to small bore ASME Code Class 1 piping and systems less than 4 inches nominal pipe size (NPS 4), which includes pipes, fittings, and branch connections. ~~The inspection provides additional assurance that either aging of small bore ASME Code Class 1 piping is not occurring or that the aging is insignificant, such that an additional aging management program (AMP) is not warranted.~~ This program is applicable only to plants that have not experienced cracking of ASME Code Class 1 small bore piping resulting from stress corrosion or thermal and mechanical loading. Should evidence of significant ***cracking***~~aging~~ be revealed by a one-time inspection or previous operating experience, periodic inspection will be proposed, as managed by a plant specific AMP. SSES has found no cracking of small bore piping due to stress corrosion or thermal and mechanical loading.

The Small Bore Class 1 Piping Inspection is a new one-time inspection that will be implemented prior to the period of extended operation. The inspection activities will be conducted within the 10-year period prior to the period of extended operation.

NUREG-1801 Consistency

The Small Bore Class 1 Piping Inspection is a new SSES one-time inspection that will be consistent with the 10 elements of an effective aging management inspection as described in NUREG-1801, Section XI.M35, "One-time Inspection of ASME Code Class 1 Small-Bore Piping."

Exceptions to NUREG-1801

None.

Aging Management Program Elements

The results of an evaluation of each program element are provided below.

• Scope of Program

The SSES inspection will include measures to verify that ***cracking*** ~~unacceptable degradation~~ is not occurring in Class 1 small bore piping, thereby validating the effectiveness of the BWR Water Chemistry Program to mitigate ***cracking***~~aging-related degradation~~ and confirming that no additional aging management programs are needed for the period of extended operation. See *Monitoring and Trending* for a discussion of sample selection.

• Preventive Actions

The SSES inspection will be an inspection and evaluation activity with no actions to prevent aging effects.

• Parameters Monitored or Inspected

The SSES inspection will include ***volumetric*** nondestructive examinations ~~(including volumetric techniques)~~ performed by qualified personnel following procedures consistent with Section XI of ASME Code and 10CFR50, Appendix B. ***The program may also include destructive examinations.***

• Detection of Aging Effects

SSES has not experienced cracking of small bore class 1 piping due to stress corrosion or thermal and mechanical loading; therefore, this inspection is appropriate. This inspection will perform volumetric examinations on selected weld locations. SSES has found ~~cracking~~ ***crack-like indications*** due to vibrational fatigue of small bore piping and ~~continues to inspect by~~ ***has performed additional inspections for vibrational fatigue through*** augmentation of the SSES Inservice Inspection Program.

• Monitoring and Trending

The SSES inspection will include a representative sample of the system population, and, where practical, will focus on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin. Actual inspection locations will be based on physical accessibility, exposure levels, ***available*** non-destructive examination (NDE) techniques, ***and operating experience.*** ~~locations identified in Nuclear Regulatory Commission (NRC)~~

~~Information Notice (IN) 97-46.~~ Nondestructive ***volumetric*** examinations ~~(including volumetric techniques)~~ will be performed by qualified personnel following procedures that are consistent with Section XI of ASME Code and 10 CFR 50, Appendix B. Inspections already ~~being~~ performed by augmentation of the SSES Inservice Inspection Program for vibrational fatigue of small bore piping, will be factored into the sample determination for the Small Bore Class 1 Piping Inspection.

Unacceptable inspection findings will be evaluated by the SSES corrective action process. The SSES Small Bore Class 1 Piping Inspection will require an increased sample size in response to unacceptable inspection findings. Evaluation of indications may lead to the creation of a plant-specific AMP.

- Acceptance Criteria

  Indications detected during inspections will be evaluated in accordance with the ASME Code. The evaluation of indications will include determining the extent of condition and necessary expansion of samples.

- Corrective Actions

  This element is common to SSES programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Confirmation Process

  This element is common to SSES programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Administrative Controls

  This element is common to SSES programs and activities that are credited with aging management during the period of extended operation and is discussed in Section B.1.3.

- Operating Experience

  The Small Bore Class 1 Piping Inspection is a new inspection for which there is no SSES specific operating experience. The evaluations and examinations to be performed by this inspection will use existing techniques with demonstrated capability and a proven industry record to detect cracking in piping weld and base metal.

Required Enhancements

None.

Conclusion

The Small Bore Class 1 Piping Inspection will ***provide assurance that either cracking of small bore Class 1 piping is not occurring or the cracking is insignificant, such that an AMP is not warranted.*** ~~verify that loss of material, cracking due to stress corrosion or thermal and mechanical loading, and cracking due to reduction of fracture toughness are being effectively managed for the subject piping.~~ The Small Bore Class 1 Piping Inspection will ***require an increased sample size in response to unacceptable inspection findings. Evaluation of indications may lead to the creation of a plant-specific AMP to*** provide assurance that ~~the aging effects~~ *cracking* will be managed such that components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

- The text in LRA Appendix C (on LRA page C-23) is revised by addition (***bold italics***) and deletion (~~strikethrough~~) as follows:

LRA APPENDIX C

RESPONSE TO BWRVIP APPLICANT ACTION ITEMS

BWRVIP-74-A **BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines for License Renewal**	
(4) The staff is concerned that leakage around the reactor vessel seal rings could accumulate in the VFLD lines, cause an increase in the concentration of contaminants and cause cracking in the VFLD line. The BWRVIP-74 report does not identify this component as within the scope of the report. However, since the VFLD line is attached to the RPV and provides a pressure boundary function, LR applicants should identify any AMP for the VFLD line.	The SSES reactor vessel flange leak detection lines are in the scope of license renewal. See the scoping and screening results in the LRA for the Reactor Coolant System Pressure Boundary (piping and fittings, flange leak detection lines, Section 2.3.1.3 and Table 3.1.2-3). Refer to Section 3.1.2.2.4 of the LRA for further information, and also see item 3.1.1-19 in Table 3.1.1. Cracking of these lines is mitigated by the BWR Water Chemistry Program, the effectiveness of which is verified by the ***Chemistry Program Effectiveness Inspection*** ~~Small Bore Class 1 Piping Inspection~~. These aging management programs are described in Appendix B of the LRA.