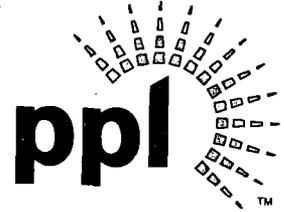


William H. Spence
Executive Vice President and
Chief Operating Officer/Chief Nuclear Officer
Tel. 610.774.3683 Fax 610.774.5019
Whspence@pplweb.com

PPL Corporation
Two North Ninth Street
Allentown, PA 18101-1179
Tel. 610.774.5151
www.pplweb.com



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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.2.8 AND B.2.32
PLA-6445**

**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 October 17, 2008.*
 - 3) *PLA-6406, Mr. B. T. McKinney (PPL) to Document Control Desk (USNRC), "Request for Additional Information for the Review of the Susquehanna Steam Electric Station Units 1 and 2, License Renewal Application (LRA) Sections B.2.8, B.2.9, 3.1.2, 3.2.2, 3.3.2, and 3.4.2," dated August 27, 2008.*
 - 4) *PLA-6400, Mr. B. T. McKinney (PPL) to Document Control Desk (USNRC), "Request for Additional Information for the Review of the Susquehanna Steam Electric Station Units 1 and 2, License Renewal Application (LRA) Sections B.2.14, B.2.25, B.2.32, and B.2.33," dated August 12, 2008.*
 - 5) *PLA-6435, Mr. B. T. McKinney (PPL) to Document Control Desk (USNRC), "Susquehanna Steam Electric Station Units 1 and 2, License Renewal Application (LRA) Amendments to Sections B.2.13, B.2.17, B.2.20, B.2.22, B.2.28, B.2.32, and B.2.48 in Response to NRC Regional Inspection," dated October 21, 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.

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Reference 2 is a request for additional information (RAI) related to License Renewal Application (LRA) Sections B.2.8 and B.2.32. The enclosure to this letter provides the question responses and the additional requested information.

There are no new regulatory commitments contained herein as a result of the attached response. However, LRA Commitment #28 is revised in response to RAI B.2.32-4-R and RAI B.2.32-5, as shown in the enclosure.

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

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

Executed on: 11-11-08

Richard D. Fogelino for W.H. Spence

W. H. Spence

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

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-6445
PPL Response to NRC's
Request for Additional Information (RAI)**

RAI B.2.8-1R:

In a letter dated August 27, 2008, SSES responded to RAI B.2.8-1 providing a basis for adding drain penetrations, flange leak-off penetrations, CRD penetrations, and incore flux monitoring penetrations. The response also stated that CRD and flux monitor penetrations are managed in accordance with BWRVIP-47-A and BWRVIP-74A. The flange leak-off and the drain penetrations are managed in accordance with BWRVIP-74A.

However, SSES did not revise LRA Appendix A.1.2.7, FSAR summary description for BWR Penetrations Program, to include BWRVIP-47 and BWRVIP-74.

Please provide justification for not including these BWRVIP documents in the FSAR summary description or please amend the LRA to include the BWRVIP documents.

PPL Response:

PPL has concluded that BWRVIP-47-A and BWRVIP-74-A should have been included in the descriptions of the BWR Penetrations Program in LRA Sections A.1.2.7 and B.2.8.

The LRA is amended as follows to make it consistent with PPL's response to RAI B.2.8-1 in Reference 3:

- The following text in LRA Section A.1.2.7 (on LRA page A-7) and LRA Section B.2.8 (on LRA page B-32) is revised by addition (***bold italics***) and deletion (~~strikethrough~~).

A.1.2.7 BWR Penetrations Program

The BWR Penetrations Program is an existing program that manages cracking of selected reactor vessel penetrations. The BWR Penetrations Program is implemented via the Inservice Inspection (ISI) Program in compliance with ASME Section XI and the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines.

The program includes (a) inspection and flaw evaluation in conformance with the guidelines of NRC-approved BWRVIP reports ~~BWRVIP-49-A~~ and BWRVIP-27-A, ***BWRVIP-47-A, BWRVIP-49-A, and BWRVIP-74-A*** and (b) monitoring and control of reactor coolant water chemistry in accordance with the guidelines of BWRVIP-29 to ensure the long-term integrity and safe operation of reactor vessel internal components. The ~~BWRVIP-49-A report provides guidelines for instrument penetrations, and the BWRVIP-27-A report addresses the standby liquid control system nozzle or housing, the BWRVIP-47-A report addresses the control rod drive and flux monitor penetrations in the lower plenum, the BWRVIP-49-A report provides guidelines for instrument penetrations, and the BWRVIP-74-A report addresses the reactor vessel flange leak off penetrations and the reactor vessel drain penetrations.~~

B.2.8 BWR Penetrations Program

Program Description

The purpose of the BWR Penetrations Program is to manage cracking of selected reactor vessel penetrations. The BWR Penetrations Program is implemented via the Inservice Inspection (ISI) Program (Refer to Section B.2.1) in compliance with ASME Section XI and the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines. The program includes (a) inspection and flaw evaluation in conformance with the guidelines of NRC-approved BWRVIP reports ~~BWRVIP-49~~ and BWRVIP-27-A, ***BWRVIP-47-A, BWRVIP-49-A, and BWRVIP-74-A*** and (b) monitoring and control of reactor coolant water chemistry in accordance with the guidelines of BWRVIP-29 to ensure the long-term integrity and safe operation of reactor vessel internal components. ~~The BWRVIP-49 report provides guidelines for instrument penetrations, and the BWRVIP-27-A report addresses the standby liquid control (SLC) system nozzle or housing, the BWRVIP-47-A report addresses the control rod drive and flux monitor penetrations in the lower plenum, the BWRVIP-49-A report provides guidelines for instrument penetrations, and the BWRVIP-74-A report addresses the reactor vessel flange leak off penetrations and the reactor vessel drain penetrations.~~

NUREG-1801 Consistency

The SSES BWR Penetrations Program is an existing program that is consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M8, "BWR Penetrations Program," with the following exception:

Exceptions to NUREG-1801

Program Element Affected:

• Scope –

NUREG-1801 Section XI.M8 implies that the BWR Penetrations Program applies only to the standby liquid control (SLC) penetration (per BWRVIP-27) and instrument penetrations (per BWRVIP-49). However, NUREG-1801 Section IV.A1, also credits this program for managing the effects of aging for additional penetrations. The SSES BWR Penetrations Program is applied to additional penetrations, as follows, consistent with Section IV.A1 rather than XI.M8.

In addition to the SLC and instrument penetrations, the BWR Penetrations Program is also credited for managing the effects of aging for the vessel flange leakoff penetration, vessel drain penetration, control rod drive penetrations, and incore flux monitor penetrations. ***The program includes (a) inspection and flaw***

evaluation in conformance with the guidelines of NRC-approved BWRVIP reports BWRVIP-47-A and BWRVIP-74-A, and (b) monitoring and control of reactor coolant water chemistry in accordance with the guidelines of BWRVIP-29 to ensure the long-term integrity and safe operation of reactor vessel components. The BWRVIP-47-A report provides guidelines for the control rod drive and flux monitor penetrations in the lower plenum, and the BWRVIP-74-A report addresses the reactor vessel flange leak off penetrations and the reactor vessel drain penetrations.

RAI B.2.32-4-R:

In response to RAI B.2.32-4, Susquehanna Steam Electric Station (SSES) provided updates to the program elements to address the aging management of the external surfaces of elastomeric components. Based on its review, the staff required additional clarification and information.

- a) Please clarify why the updates to the program elements to expand the scope of the program to include elastomers and polymers are not enhancements to the GALL Report AMP XI.M36.
- b) Please clarify the acceptance criteria for the supplemental physical manipulation and/or prodding that will be used as measures of the elastomer and polymer material condition.

PPL Response:

- a) Expansion of the scope of the program to include elastomers and polymers is identified as an enhancement, and as an exception to the GALL Report AMP XI.M36. The program element enhancement has been added to Commitment #28 in LRA Table A-1, as shown below following the PPL response to RAI B.2.32-5.
- b) In addition to visual inspection, elastomers and polymers will be subject to physical (tactile) evaluation. Both visual inspection and physical evaluation will be conducted in accordance with EPRI guidance documents (primarily EPRI 1007933, "Aging Assessment Field Guide").

Visual inspections of elastomers and polymers will be performed to determine whether, and to what extent, the following may be occurring:

- degradation (e.g., chalking, cracking, crazing)
- discoloration (e.g., yellowing of polymers)
- physical distortion (e.g., shrinkage, swelling, wrinkling)

Physical evaluation (manipulation and/or prodding) of elastomers and polymers will be performed to determine whether, and to what extent, the following may be occurring:

- Hardening or lack of resiliency (e.g., spontaneous cracking or crazing when bent or pressed)
- Surface film/residue (e.g., chalky, slimy, waxy)
- Unusual odors

Any signs of degradation will be evaluated to determine the component's acceptability for continued operation. Unacceptable components are those that are determined to be damaged or degraded to the extent that the components may not be capable of performing their intended function(s), or if allowed to continue uncorrected, may not meet their design basis requirement(s).

RAI B.2.32-5:

The GALL Report recommends that XI.M36 "External Surfaces Monitoring" is only applicable for steel (carbon steel) components to detect loss of material with the use of visual inspections. However based on the program description in the LRA, the staff noted that the applicant has expanded the scope of materials to include aluminized steel, copper alloy, and stainless steel.

- a) Please justify why the expansion in the scope of materials is not considered an enhancement to the GALL Report AMP XI.M36.
- b) Please justify how this program will adequately manage the aging effects of loss of material as it applies to the additional metallic components (aluminized steel, copper alloy, and stainless steel) added to the scope of this program.

PPL Response:

- a) Expansion of the scope of the program to include copper alloy and stainless steel is identified as an enhancement, and as an exception to the GALL Report XI.M36. The program element enhancement has been added to Commitment #28 in LRA Table A-1.

Note that for purposes of the aging management review, aluminized steel is considered to be the equivalent of steel, since no credit was taken for the aluminum coating. Therefore, aluminized steel need not be explicitly added to the scope of the program.

b) The aging mechanisms of interest for copper alloy and stainless steel (crevice, galvanic, general, and pitting corrosion) are such that, similar to steel (carbon steel and aluminized steel) visual inspection techniques are effective in identifying loss of material. Parameters monitored for these materials include the following:

- Corrosion and material wastage (loss of material)
- Leakage from, or onto, external surfaces
- Worn, flaking, or oxide-coated surfaces
- Corrosion stains on thermal insulation
- Protective coating degradation (cracking and flaking), if applicable.

Any signs of degradation will be evaluated to determine the component's acceptability for continued operation. Unacceptable components are those that, as determined by engineering evaluation, are damaged or degraded such that the components may not be capable of performing their intended function(s), or if degraded to such an extent (and allowed to continue uncorrected) that they may not meet their design basis requirement(s).

For RAI B.2.32-4-R and RAI B.2.32-5, LRA Sections B.2.32, A.1.2.47, and Table A-1, Commitment #28, for the System Walkdown Program are amended as shown below. The previous changes to these LRA sections, in response to RAI B.2.32-4 in Reference 4 and the NRC Regional Inspection in Reference 5, have been incorporated below.

B.2.32 System Walkdown Program

- The following text in LRA Section B.2.32 (on LRA pages B-101 and B-102) is revised by addition (***bold italics***) and deletion (~~strikethrough~~).

NUREG-1801 Consistency

The System Walkdown Program is an existing SSES program that, with enhancement, will be consistent with the 10 elements of an effective aging management program as described in NUREG-1801, Section XI.M36, "External Surfaces Monitoring," with the following exception(s):

Exceptions to NUREG-1801

Program Elements Affected:

- Scope, Parameters Monitored or Inspected, Detection of Aging Effects, Monitoring and Trending

Elastomers and polymers are included within the scope of the System Walkdown Program. The program is credited with managing cracking and change in material properties for elastomers and polymers exposed to indoor air or ventilation environments.

Copper alloy and stainless steel are included within the scope of the System Walkdown Program. The program is credited with managing loss of material for copper alloy and stainless steel exposed to indoor air, outdoor air, or ventilation environments.

Required Enhancements

Prior to the period of extended operation the enhancements listed below will be implemented in the identified program elements:

- Scope –
The governing procedure for the System Walkdown Program must be revised to add the listing of systems crediting the program for license renewal, ***and to explicitly include other metals, copper alloy and stainless steel. A routine activity to supplement the existing plant program must be generated to inspect elastomers and polymers.***
- Parameters Monitored or Inspected-
A routine activity must be generated, ***and based at least in part on EPRI 1007933, "Aging Assessment Field Guide,"*** to inspect elastomers and polymers for cracking and/or change in material properties. Evidence of surface degradation, such as cracking or discoloration, as well as physical manipulation and/or prodding, will be used as measures of the material condition.
- Detection of Aging Effects -
All of the systems to be added to the procedure contain mechanical components whose external surfaces require aging management during the period of extended operation. It may be determined by engineering evaluation that these components do not require monitoring every two weeks, and the basis for a different walkdown frequency must be documented on the appropriate procedure form.
- Detection of Aging Effects -
The governing procedure for the System Walkdown Program must be enhanced to address the license renewal requirement for opportunistic inspections of normally inaccessible components (e.g., those that are insulated), and those that are accessible only during refueling outages. For underground vaults, an initial sample of at least one vault/pit/manhole from each grouping of components with identical material and environment combinations will be inspected prior to entering the period of extended

operation. A representative sample of the entire population will be inspected within the first 6 years of the period of extended operation. Results of the inspection activities that require further engineering evaluation/resolution (e.g., sample expansion and inspection frequency changes if degradation is detected), if any, will be evaluated using the SSES corrective action process.

- Detection of Aging Effects –

Also, within the 10 year period prior to the period of extended operation, a visual and ultrasonic inspection of the external surfaces of piping passing into structures through penetrations (underground piping) will be performed, for those penetrations with a history of leakage. These inspections will be focused on penetrations that are leaking at that time and will include a representative sample of each material, environment combination from those piping systems within the scope of license renewal (which includes those for the RHRSW, ESW, and Fire Protection systems) that enter structures below grade.

- Detection of Aging Effects –

The routine activity to inspect elastomers and polymers, *to include physical manipulation and/or prodding*, will be based on inspection of a representative sample of components. The sample will be determined by engineering evaluation with a focus on components considered to be most susceptible to aging, such as due to their time in service, the severity of conditions during normal plant operations, and any pertinent design margins.

A.1.2.47 System Walkdown Program

- The following text in LRA Section A.1.2.47 (on LRA page A-21) is revised by addition (*bold italics*).

Prior to the period of extended operation, the System Walkdown Program will be enhanced to include the license renewal systems that contain mechanical components whose external surfaces require aging management during the period of extended operation. The program will also be enhanced to address opportunistic inspections of normally inaccessible components (e.g., those that are insulated), and those that are accessible only during refueling outages. The program will also be enhanced by addition of a routine activity to inspect elastomers and polymers for cracking and/or change in material properties *and to include inspection of other metals, copper alloy and stainless steel*. The program will also be enhanced to sample normally inaccessible components in underground vaults, pits, and manholes. In addition, the program will be enhanced to include a visual and ultrasonic inspection of the external surfaces of piping passing into structures through penetrations (underground piping) for those penetrations with a history of leakage.

Table A-1 SSES License Renewal Commitments

➤ LRA Table A-1, SSES License Renewal Commitments (page A-44), is revised by addition (*bold italics*) as follows:

Table A-1 SSES License Renewal Commitments			
Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
28) System Walkdown Program	<p>Existing program is credited with the following enhancements:</p> <ul style="list-style-type: none"> • The governing procedure for the System Walkdown Program must be revised to add the listing of systems crediting the program for license renewal, <i>and to explicitly include inspection of other metals, copper alloy and stainless steel.</i> <ul style="list-style-type: none"> ○ <i>It may be determined by engineering evaluation that these components do not require monitoring every two weeks, and the basis for a different walkdown frequency must be documented on the appropriate procedure form.</i> • The governing procedure for the System Walkdown Program must be enhanced to address the license renewal requirement for opportunistic inspections of normally inaccessible components (e.g., those that are insulated), and those that are accessible only during refueling outages. For underground vaults/pits/manholes, an initial sample of at least one vault/pit/manhole from each grouping of components with identical material and environment combinations will be inspected prior to entering the period of extended operation. A representative sample of the entire population will be inspected within the first 6 years of the period of extended operation. Results of the inspection activities that require further engineering evaluation/resolution (e.g., sample expansion and inspection frequency changes if degradation is detected), if any, will be evaluated using the SSES corrective action process. 	A.1.2.47	Prior to the period of extended operation

**Table A-1
SSES License Renewal Commitments**

Item Number	Commitment	FSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule
	<ul style="list-style-type: none"> • The governing procedure for the System Walkdown Program will be enhanced to include a visual and ultrasonic inspection of the external surfaces of piping passing into structures through penetrations (underground piping) for those penetrations with a history of leakage. These inspections will be focused on penetrations that are leaking at that time and will include a representative population of each material, environment combination from those piping systems within the scope of license renewal (which includes those for the RHRSW, ESW, and Fire Protection systems) that enter structures below grade. • A routine activity to supplement the existing plant program will be generated, <i>and based at least in part on EPRI 1007933, "Aging Assessment Field Guide,"</i> to inspect elastomers and polymers for cracking and/or change in material properties. <ul style="list-style-type: none"> ○ Evidence of surface degradation, such as cracking or discoloration, as well as physical manipulation and/or prodding, will be used as measures of the material condition. ○ <i>A representative sample will be determined by engineering evaluation with a focus on components considered to be most susceptible to aging, such as due to their time in service, the severity of conditions during normal plant operations, and any pertinent design margins.</i> 		