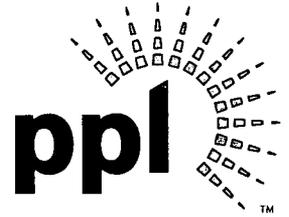


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SEP 11 2008

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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)
SUPPLEMENTAL RESPONSE TO RAI's B.2.31-5 and B.2.31-6
PLA-6419**

**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 August 13, 2008.
 - 3) PLA-6391, 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.2.23, B.2.24, B.2.26, B.2.27, B.2.28, B.2.31)" dated July 25, 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 LRA Section B.2.31 and RAI responses previously submitted to the NRC in Reference 3. The enclosure to this letter provides the additional requested information.

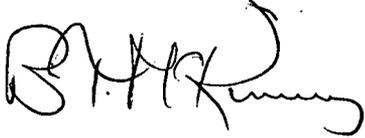
There are no new regulatory commitments contained herein as a result of the attached responses.

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: 9-11-08

A handwritten signature in black ink, appearing to read "B. T. McKinney". The signature is written in a cursive style with a large initial "B" and a long, sweeping underline.

B. T. McKinney

Enclosure: PPL Responses 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-6419
PPL Responses to NRC's
Request for Additional Information (RAI)**

RAI B.2.31-5:

Attachment 3 of PLA-6391 revised License Renewal Application (LRA) Section 3.1.2.2.4.1 - Boiling Water Reactor (BWR) Top Head Enclosure Vessel Flange Leak Detection Lines; LRA Section 3.1.2.2.8.1 - Stainless Steel BWR Jet Pump Sensing Lines; and LRA Appendix C for BWRVIP-74-A. All of these changes replace the Small Bore Class 1 Piping Inspection with the Chemistry Program Effectiveness Inspection for monitoring or detecting the aging effect of cracking in stainless steel, small-bore Reactor Coolant System pressure boundary piping exposed to a reactor coolant environment.

Please confirm the changes in Attachment 3 of PLA-6391 and give the technical basis for the change from Small Bore Class 1 Piping Inspection to Chemistry Program Effectiveness.

- (a) If the changes are intentional, then please state what examination techniques will be used for the flange leak detection lines and the jet pump sensing lines, which are a part of the reactor coolant pressure boundary, when the components are examined as a part of the Chemistry Program Effectiveness Inspection.
- (b) If the changes are not intentional, then please correct Attachment 3 of PLA-6391 to eliminate these changes.

PPL Response:

The changes in Attachment 3 of Reference 3 (PLA-6391) for LRA Section 3.1.2.2.4.1, BWR Top Head Enclosure Vessel Flange Leak Detection Lines; LRA Section 3.1.2.2.8.1, Stainless Steel BWR Jet Pump Sensing Lines; and LRA Appendix C for BWRVIP-74-A which replaced the Small Bore Class 1 Piping Inspection with the Chemistry Program Effectiveness Inspection for managing cracking in stainless steel, small-bore RCS pressure boundary piping exposed to a reactor coolant environment should not have been made. The LRA statements in Section 3.1.2.2.4.1, Section 3.1.2.2.8.1, and Appendix C for BWRVIP-74-A, as submitted to the NRC in Reference 1, are correct.

The LRA is amended to reverse the changes made in Attachment 3 of Reference 3, as follows:

- 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 (~~striketrough~~) 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 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	
<p>(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.</p>	<p>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.</p>

RAI B.2.31-6:

Attachment 3 of PLA-6391 revised the LRA Section B.2.31 - Small Bore Class 1 Piping Inspection "Program Description" to include the following statements:

- "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."
- "Should evidence of significant cracking be revealed by a one-time inspection ... periodic inspection will be proposed..."

A similar reference to "insignificant" cracking is also made in the Conclusion to LRA Section B.2.31.

Please provide objective criteria by which cracking would be classified as "significant" or "insignificant," or revise the Program Description and Conclusion to eliminate the problematic wording.

PPL Response:

The Program Description in LRA Section B.2.31 used the phrase "cracking is insignificant" to convey a general understanding that a flaw could be identified, evaluated, and determined to be acceptable for continued operation to the end of the period of extended operation. Acceptable indications could include minor surface flaws and internal construction defects that have been known to be present in metallic components. These flaws are considered to be "insignificant" when it is determined by evaluation that they existed from the time the component was fabricated and are not expected to propagate.

The LRA is amended as shown below to eliminate subjective wording. The changes to LRA Section A.1.2.44 and LRA Section B.2.31 from Attachment 3 of Reference 3 have been incorporated in the LRA sections below.

- 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 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~~ ***an evaluation of any detected crack indications will be performed to justify continued operation with no further***

monitoring, 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 less than 4 inches nominal pipe size (NPS 4), which includes pipes, fittings, and branch connections.

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

B.2.31 Small Bore Class 1 Piping Inspection

Program Description

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~~ ***an evaluation of any detected crack indications will be performed to justify continued operation with no further monitoring***, 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. 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 be revealed by a one-time inspection or previous operating experience, periodic inspection will be ***performed*** ~~proposed, as managed by~~ ***under*** a plant specific AMP, ***unless the cracking is evaluated and determined to be acceptable for continued operation during the period of extended operation with no further monitoring***. 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 is not occurring in Class 1 small bore piping, thereby validating the effectiveness of the BWR Water Chemistry Program to mitigate cracking 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 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 crack-like indications due to vibrational fatigue of small bore piping and 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. Nondestructive volumetric examinations 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 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.~~ ***If an evaluation of any detected crack indications requires further monitoring and evaluation, a plant-specific AMP will be created to manage cracking during the period of extended operation.***

- 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~~ ***an evaluation of any detected crack indications will be performed to justify continued operation with no further monitoring***, such that an AMP is not warranted. 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~~ ***If the evaluation of any detected crack indications requires further monitoring and evaluation, a plant-specific AMP will be to created*** to provide assurance that 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.