April 12, 2007

Mr. Britt T. McKinney
Sr. Vice President
and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0467

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION (RAI) - SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 (SSES 1 AND 2) - EXTENDED POWER UPRATE APPLICATION RE: MATERIALS AND CHEMICAL ENGINEERING TECHNICAL REVIEW (TAC NOS. MD3309 AND MD3310)

Dear Mr. McKinney:

In reviewing your letter dated October 11, 2006, concerning the request to increase the maximum steady-state power level at the SSES 1 and 2 from 3489 megawatts thermal (MWt) to 3952 MWt, the Nuclear Regulatory Commission staff has determined that additional information contained in the enclosure to this letter is needed to complete its review. These questions were discussed with your staff on March 29, 2007. As agreed to by your staff, we request you respond by May 4, 2007.

If you have any questions, please contact me at 301-415-1030.

Sincerely,

***/RA/***

Richard V. Guzman, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosure:
RAI

cc w/encl: See next page

April 12, 2007

Mr. Britt T. McKinney
Sr. Vice President
and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0467

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION (RAI) - SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 (SSES 1 AND 2) - EXTENDED POWER UPRATE APPLICATION RE: MATERIALS AND CHEMICAL ENGINEERING TECHNICAL REVIEW (TAC NOS. MD3309 AND MD3310)

Dear Mr. McKinney:

In reviewing your letter dated October 11, 2006, concerning the request to increase the maximum steady-state power level at the SSES 1 and 2 from 3489 megawatts thermal (MWt) to 3952 MWt, the Nuclear Regulatory Commission staff has determined that additional information contained in the enclosure to this letter is needed to complete its review. These questions were discussed with your staff on March 29, 2007. As agreed to by your staff, we request you respond by May 4, 2007.

If you have any questions, please contact me at 301-415-1030.

Sincerely,

***/RA/***

Richard V. Guzman, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosure:
RAI

cc w/encl: See next page

DISTRIBUTION:

| | | | | |
|---|---|---|---|---|
| Public | RidsOgcMailCenter | RidsNrrPmRGuzman | RidsNrrCsgbBC | GMakar |
| LPLI-1 R/F | RidsNrrDorlLpl1-1 | RidsAcrsAcnwMailCenter | RidsNrrLaSLittle | |

Accession Number: ML071030031 * RAI provided by memo. No substantive changes made.

| OFFICE | NRR/LPLI-1/PM | NRR/LPLI-1/LA | NRR/CSGB/BC | NRR/LPLI-1/BC(A) |
|---|---|---|---|---|
| NAME | RGuzman | SLittle | AHiser* | DPickett |
| DATE | 4/12/07 | 4/12/07 | 3/16/07 | 4/12/07 |

OFFICIAL RECORD COPY

REQUEST FOR ADDITIONAL INFORMATION

RELATING TO THE

APPLICATION FOR EXTENDED POWER UPRATE (EPU)

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 (SSES 1 AND 2)

PPL SUSQUEHANNA, LLC

DOCKET NOS. 50-387 AND 50-388

The Nuclear Regulatory Commission (NRC) staff is reviewing the request from PPL Susquehanna, LLC (PPL, the licensee) to support the application of the EPU for SSES 1 and 2. The NRC staff has determined that additional information requested below will be needed to complete its review.

Protective Coating Systems (Paints) – Organic Materials

1. Based on the updated final safety analysis report (UFSAR), it is the NRC staff's understanding that, (1) Service Level I coatings were not procured and applied according to Regulatory Guide (RG) 1.54 because it was not yet issued at the time most plant nuclear steam supply system (NSSS) equipment was ordered, (2) most NSSS equipment has coatings that were qualified under ANSI Standard N101.2, "Protective Coatings (Paints) for Light Water Nuclear Reactor Containment Facilities," (3) the amount of unqualified coatings on NSSS equipment is less than 12 kilograms (not including paint tightly covered with insulation), (4) the drywell liner and structural steel in the drywell are coated with zinc and epoxy systems qualified to ANSI N101.2, and (5) part of each suppression pool is coated with inorganic zinc qualified to ANSI Standard N101.2. Please provide a discussion on the qualification requirements for original and repair coatings to confirm or correct the NRC staff's understanding.

2. Please discuss the conditions (temperature, pressure, radiological dose) used to qualify Service Level I protective coatings in containment for current operating conditions and whether they remain bounding for design-basis accident (DBA) conditions following the extended power uprate. If the original qualification conditions were not bounding for any coatings, please discuss your plans to qualify those coatings.

3. According to Section 6.1.2 of the UFSAR, an in-situ DBA test was conducted on samples representing 42,100 square feet of coatings that could be qualified but were not applied using qualified procedures. Regarding this testing:

   (a) The term "in situ" (i.e., "in position", or "in its original place") seems to contradict the term, "samples representing." Similarly, the titles of the test reports referenced in the UFSAR contain the phrase, "Testing of Specimens Representing Drywell Hanger Steel Painted with Inorganic Zinc," suggesting the testing was performed on neither the actual

steel nor the actual paint in service. Please provide a description of how this testing was performed and the standards that governed it.

(b) Do the conditions for the "in situ" testing bound DBA conditions following the EPU?

4. The NRC staff considered the following regarding the effect of coatings on the Emergency Core Cooling System (ECCS): (1) Power Uprate Safety Analysis Report (PUSAR) Section 4.2.6 states "all debris sources in the drywell and suppression chamber are available for transport to the suction strainers" (more conservative than associated topical report NEDO-32686, (2) UFSAR Section 6.1.2 states "qualified coatings are expected to remain intact following a DBA," and (3) the amount recommended for qualified coating debris in NEDO-32686 ranges from 47 lb to 71 lb. Based on these items, it is unclear to the NRC staff what was assumed about coatings debris in the evaluation of ECCS performance during postulated DBAs. For example, it is not clear how much debris is attributed to qualified coatings or how you evaluated the unqualified paint "tightly covered with insulation" (UFSAR Section 6.1.2). In addition, the units used in the UFSAR (area) are different from those used in NEDO-32686 (weight). Please discuss your evaluation of the effects of changing to CPPU conditions on the zone of influence, the amount of coatings debris generated, and the operation of emergency cooling systems.

5. Please discuss your requirements for inspecting, removing, and replacing degraded containment coatings, and the effects of EPU conditions on these activities.

6. Please describe the evaluations you performed, and discuss the results of those evaluations, to determine the effects of EPU conditions on the generation of hydrogen and organic gases from paints and other organic materials (such as Hypalon electrical cable insulation) in containment.

Flow Accelerated Corrosion (FAC)

1. According to the PUSAR, page 10-33, your FAC inspection program is based on guidelines from the Electric Power Research Institute (EPRI) in EPRI NSAC-202L-R2, "Recommendations for an Effective Flow-Accelerated Corrosion Program". Please describe in more detail your criteria for scoping and prioritizing components in your FAC program.

2. Please describe your most recent repair or replacement performed as a result of FAC. Include in your description the component replaced, the extent of degradation, actions to prevent recurrence, and whether you made any changes to your FAC program for existing or EPU conditions as a result of this experience.

3. Please discuss how components are inspected and evaluated with respect to the guidance in EPRI NSAC-202L-R2, in which suitability for continued service is based on current wall thickness, acceptable wall thickness, and predicted wall thickness at the time of the next inspection. Discuss how your acceptance criteria for minimum wall thickness are consistent with maintaining structural integrity.

4. Table 10-14 in the PUSAR describes changes in the variables that affect FAC rates. However, because the FAC rate is determined by the interactions of these variables, comparing the parameters may not indicate how they affect the FAC rate. Please discuss the effect of the EPU on the FAC rates as predicted by your CHECWORKS model, for example, by providing the FAC rates for several (e.g., 5 to 10) components representing the highest predicted FAC rates before the uprate and the highest rates after the uprate (i.e., two potentially different sets of components). Include the calculated corrosion rates for comparison.

5. Please discuss your FAC program for small bore piping, including how it compares to the guidance in Appendix A of NSAC-202L-R2.

6. Please discuss how your program addresses flow-related thinning other than FAC, such as erosion-corrosion due to high velocity fluids or suspended particles.

Reactor Water Cleanup (RWCU) System

1. Section 3.11 of the PUSAR states that the RWCU system was analyzed at a flow rate of 146,300 pounds mass per hour (lbm/hr). Based on FSAR Table 5.4-2, it is the NRC staff's understanding that 146,300 lbm/hr is the design maximum, and that the system is operated at a lower rate. Please provide the operating flow rate or correct the staff's understanding of this issue.

2. Section 3.11 of the PUSAR concludes that at power uprate conditions the RWCU system will perform adequately at the original flow rate. Please discuss the aspects of the system that were evaluated and the parameters evaluated to reach this conclusion (for example, the effects of changes in temperature, pressure, chemistry, and flow rate on heat exchanger heat transfer and materials).

3. According to PUSAR Section 3.11, the concentration of iron in the reactor water is expected to increase from 11.55 ppb to 13.24 ppb in Unit 1, and from 7.5 ppb to 8.6 ppb in Unit 2, but that these changes are within the design chemistry limits and do not affect performance of the RWCU system. Please quantify the significance of this change by comparing the expected iron level and the design limit.

4. PUSAR Section 3.11 states that the effect of increased feedwater line pressure was included in the Section 4.1 containment isolation assessment. Section 4.1.3 states that the "capabilities of isolation actuation devices to perform during normal operations and under post-accident conditions have been determined to be acceptable." Please describe in quantitative terms how you evaluated the effects of EPU conditions on the performance of the RWCU system containment isolation valves and determined the valves will perform their intended function.

5. According to Section 3.11 of the PUSAR, the proposed power uprate would cause an increase in the filter/demineralizer backwash frequency. Section 3.11 also indicates in qualitative terms that the increase is negligible. Please quantify the amount of the increase in solid and liquid waste from the RWCU system relative to the capacity for processing liquid and solid radwaste.

Susquehanna Steam Electric Station, Unit Nos. 1 and 2

cc:

Robert A. Saccone
Vice President - Nuclear Operations
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0467

Terry L. Harpster
General Manager - Plant Support
PPL Susquehanna, LLC
769 Salem Blvd., NUCSA4
Berwick, PA 18603-0467

Rocco R. Sgarro
Manager - Nuclear Regulatory Affairs
PPL Susquehanna, LLC
Two North Ninth Street, GENPL4
Allentown, PA 18101-1179

Supervisor -
Nuclear Regulatory Affairs
PPL Susquehanna, LLC
769 Salem Blvd., NUCSA4
Berwick, PA 18603-0467

Michael H. Crowthers
Supervising Engineer
Nuclear Regulatory Affairs
PPL Susquehanna, LLC
Two North Ninth Street, GENPL4
Allentown, PA 18101-1179

Steven M. Cook
Manager - Quality Assurance
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB2
Berwick, PA 18603-0467

Luis A. Ramos
Community Relations Manager,
Susquehanna
PPL Susquehanna, LLC
634 Salem Blvd., SSO
Berwick, PA 18603-0467

Bryan A. Snapp, Esq
Assoc. General Counsel
PPL Services Corporation
Two North Ninth Street, GENTW3
Allentown, PA 18101-1179

Supervisor - Document Control Services
PPL Susquehanna, LLC
Two North Ninth Street, GENPL4
Allentown, PA 18101-1179

Richard W. Osborne
Allegheny Electric Cooperative, Inc.
212 Locust Street
P.O. Box 1266
Harrisburg, PA 17108-1266

Director, Bureau of Radiation Protection
Pennsylvania Department of
Environmental Protection
Rachel Carson State Office Building
P.O. Box 8469
Harrisburg, PA 17105-8469

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 35, NUCSA4
Berwick, PA 18603-0035

Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Board of Supervisors
Salem Township
P.O. Box 405
Berwick, PA 18603-0035

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
443 Orlando Avenue
State College, PA 16803