March 19, 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 (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 during a teleconference on January 31, 2007. As agreed to by your staff, we request you respond within 30 days of the date of this letter.

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

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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.

1. For postulated large and small recirculation line loss-of-coolant-accidents (LOCAs), provide a justification of the limiting axial power shapes employed in the Appendix K evaluation to determine the peak cladding temperature. For different exposures, select bundles with limiting axial power peaking operating with bottom peaked, double-hump or mid-peaked, and top peaked axial power distributions. Provide the peak fuel bundle-to-average fuel bundle power ratio (radial peaking factor). Provide the peak fuel rod to peak bundle power ratio (local peaking factor). Provide the average and hot bundle exit void fraction.

   a. For ATRIUM-10 fuel provide the following information.

      - Fuel rod diameter for an average and a hot rod
      - Cladding thickness
      - Gap gas mole fractions for an average and a hot rod
      - Gap thickness for an average and a hot rod
      - Gap internal pressure for an average rod and for the hot rod
      - Cladding heat capacity vs temperature
      - Cladding thermal conductivity vs temperature
      - Fuel heat capacity vs temperature
      - Fuel thermal conductivity vs temperature
      - Channel box heat capacity vs temperature
      - Channel box thermal conductivity vs temperature
      - Temperature distribution within an average and within a hot rod
      - Channel box dimensions and thickness

   b. Reactor Kinetics Information

      - Delayed neutron fraction
      - Prompt neutron generation time
      - Core reactivity feedback vs moderator density
      - Core reactivity feedback vs fuel temperature
      - Moderator temperature coefficient of reactivity
      - Fuel temperature coefficient of reactivity

c. Cross sectional drawing of the fuel bundles showing rod spacing and pitch.

- Location of the highest power rod
- Location and dimensions of water rods

d. Pressure drop information: provide the flow loss coefficients as a function of axial height for the fuel bundles.

2. For a postulated recirculation pump suction break, provide a graph of drywell pressure as a function of time.

3. Provide the emergency core cooling system (ECCS) flows for the limiting large and small break sizes. In addition, provide the Low Pressure Core Spray (LPCS), Low Pressure Core Injection (LPCI), and High-Pressure Coolant Injection (HPCI) head-flow curves assumed in the LOCA analyses. Provide the capacity (in pounds-per-hour (lbs/hr) at pounds-per-square-inch absolute (psia) of the Automatic Depressurization System (ADS) valves assumed in the analyses.

4. Provide the sequence events table for the Appendix K limiting design-basis accident (DBA) large-break and small-break LOCAs. The table should identify all trip signals and delays such as reactor scram, ECCS injection times, and ADS valve opening.

5. Provide the reactor vessel level setpoints used for reactor scram and activation of the various ECCS (such as ADS actuation, core spray, HPCI and LPCI) in terms of height above the core.

6. Provide a table of steady state initial conditions. The table should include reactor power, reactor pressure, downcomer water level in the RPV, and average core axial void distribution, total core mass flow, hot bundle mass flow, feedwater flow, steam flow, recirculation flow rates, core inlet temperatures, and etc.

7. The NRC staff plans to use the RELAP5 computer code as part of its audit/review process. If not available for the NRC staff, the staff has an input deck for the Browns Ferry boiling-water reactor/4 (BWR/4) plant which could be modified to represent SSES 1 and 2. To that end, provide any known configuration differences between the Browns Ferry BWR and the Susquehanna BWR.

Susquehanna Steam Electric Station, Unit Nos. 1 and 2

cc:

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