



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 7, 2014

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 – REQUEST FOR ADDITIONAL INFORMATION REGARDING REQUEST FOR CHANGES TO TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS TO INCREASE DIESEL GENERATOR MINIMUM STEADY STATE VOLTAGE (TAC NOS. ME9607 AND ME9608)

Dear Mr. Rausch:

By letter dated September 18, 2012, as supplemented by letter dated May 10, 2013, PPL Susquehanna, LLC submitted a license amendment request for Susquehanna Steam Electric Station, Units 1 and 2, to the Nuclear Regulatory Commission (NRC) for review. The proposed amendments would change Technical Specification (TS) Surveillance Requirements 3.8.1.9, 3.8.1.11, 3.8.1.12 and 3.8.1.19 in TS 3.8.1, "AC [alternating current] Sources-Operating." Specifically, the proposed amendments would increase the Diesel Generator acceptable minimum steady state voltage when operating in emergency/isochronous mode. To complete its review, the NRC staff requests responses to the enclosed questions.

The draft questions were sent to Mr. Duane Filchner, of your staff, to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. On February 28, 2014, Mr. Filchner agreed that you would provide a response by December 31, 2014.

If you have any questions regarding this matter, please contact me at 301-415-4090.

Sincerely,

A handwritten signature in black ink, reading "Jeffrey A. Whited", is positioned above the typed name.

Jeffrey A. Whited, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
REGARDING PROPOSED LICENSE AMENDMENT REQUEST TO
CHANGE TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS
TO INCREASE DIESEL GENERATOR MINIMUM STEADY STATE VOLTAGE
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2
DOCKET NOS. 50-387 AND 50-388

By letter dated September 18, 2012,¹ as supplemented by letter dated, May 10, 2013,² PPL Susquehanna, LLC (PPL, the licensee) submitted a license amendment request (LAR) for Susquehanna Steam Electric Station (SSES), Units 1 and 2, to the Nuclear Regulatory Commission (NRC) for review. The proposed amendments would change Technical Specification (TS) Surveillance Requirements (SRs) 3.8.1.9, 3.8.1.11, 3.8.1.12 and 3.8.1.19 in TS 3.8.1, "AC [alternating current] Sources-Operating." Specifically, the proposed amendments would increase the Diesel Generator (DG) acceptable minimum steady state voltage when operating in emergency/isochronous mode.

The NRC staff has reviewed the information that the licensee provided in support of its proposed license amendments. In order for the staff to complete its review, the licensee is requested to address the following requests for additional information.

Background:

In order to be considered operable, structures, systems and components (SSCs) must be capable of performing the safety functions specified by its design, within the required range of design physical conditions, initiation times, and mission times. In addition, TS operability considerations require that SSCs meet all SRs. For operability determination purposes, the mission time is the duration of SSC operation that is credited in the design-basis for the SSC to perform its specified safety function.

The NRC staff considers that all SRs with specific parameters, including proper DG output voltage, demonstrate the capability of the DGs to satisfy the specified safety function, as credited in the design-basis accident conditions delineated in the Final Safety Analysis Report (FSAR).

¹ Agencywide Documents Access and Management System (ADAMS) Accession No. ML12262A322.

² ADAMS Accession No. ML13130A130.

The staff has made following observations:

- The licensee's response to NRC Question 3 (RAI 3) in the submittal dated, May 10, 2013, states, in part, that:

SSES DG loading calculations, in general, are based on nominal voltages.

- A separate license amendment request dated September 18, 2012,³ for changing minimum allowable frequency states, in part, that:

. . . An SSES calculation and cable data confirms that the voltage drop between Diesel Generator E and the 4.16 k V buses is significantly higher than that for Diesel Generators A-D. The increased voltage drop corresponds with an increase in current, causing the Diesel Generator to increase power output, which causes a frequency dip.

- Calculation EC-024-1031, attached to letter dated May 10, 2013, states, in part, that:

It is appropriate to base the maximum steady state current on the DG-A through D rating rather than the higher rating of DG-E. This is because steady state loads must stay within the capability of the lower machine rating. The highest DG load shown in the FSAR diesel loading tables is in FSAR table 8.3-3 which shows a maximum steady state diesel load of 3976.85 KW (DG-A). This is close to the 4000 KW machine nominal rating. For purposes of determining the maximum steady state current, a steady state loading of 4000 KW will be used . . .

Requests for Additional Information (RAI):

RAI 4: The licensee's response to NRC Question 1 (RAI 1) states, in part, that:

. . . The steady state output voltage when operating in the droop (test) mode is not being changed because when operating in the test configuration the DG output voltage is determined by the electrical power grid to which it is connected.

SR 3.8.1.3 requires each DG to be synchronized, loaded and operated for ≥ 60 minutes at a load ≥ 3600 kW and ≤ 4000 kW. The staff concurs that this SR requires operation of the DG in droop mode and as such, verification of DG voltage is not required. However, SRs 3.8.1.7, 3.8.1.15 and 3.8.1.20 do not require the DG to be synchronized to the grid, but have voltage parameters to be validated.

³ ADAMS Accession No. ML12262A321.

Explain how these SRs demonstrate the operability of the DGs when the LAR states that these parameters are non-conservative.

- RAI 5: Assuming that DGs A-D are operating at the proposed allowable voltage of 4000V, provide details on the maximum DG load due to the increase in current at the lower voltage, as nominal voltage was used to calculate maximum steady state diesel load of 3976.85 KW.
- RAI 6: Assuming DG-E is substituting for one of the other DGs and is operating at the proposed allowable output voltage of 4000V, provide details on the maximum load that DG-E will be supplying in view of the increased current flow at a voltage below the nominal voltage.
- RAI 7: At the onset of an event, some pumps may be operating under run out conditions for an extended duration, imposing a higher load on the associated motors. Validate that the consequential higher loading on DG-E, when operating at 4000V, will not result in steady state voltage less than the reset setpoint of degraded voltage relays.
- RAI 8: Validate that the current value used in Calculation EC-024-1031 is still bounding based on responses to RAIs 5, 6 and 7 above.
- RAI 9: Validate that plant procedures used to perform SRs verifying DG loading capability (e.g. SR 3.8.1.3) envelope the postulated accident loading based on limiting DG voltage.
- RAI10: Validate that the consequences of the change in DG loading due to operation at 4000V has been considered for impact on other DG SRs such as fuel oil and lube oil storage requirements.

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/RA/

Jeffrey A. Whited, Project Manager
Plant Licensing Branch I-2
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Enclosure:
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cc w/encl: Distribution via Listserv

Distribution:

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ADAMS Accession No.:ML13298A758

*via email

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NAME	JWhited	ABaxter	JZimmerman	MKhanna	JWhited
DATE	03/06/14	10/31/13	03/05/14	03/06/14	03/07/14

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