

August 21, 2008

Dr. William J. Shack, Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2, EXTENDED  
POWER UPRATE

Dear Dr. Shack:

On October 9 and 10, and November 14, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff presented its review of the Susquehanna Steam Electric Station, Units 1 and 2 (SSES) extended power uprate (EPU) application to the Advisory Committee on Reactor Safeguards (ACRS) subcommittee on power uprates. During the 547<sup>th</sup> and 548<sup>th</sup> meetings of the ACRS, on November 1 and December 7, 2007, respectively, the staff discussed the EPU with the ACRS full committee. By letter dated December 20, 2007, the ACRS forwarded its conclusions and recommendations on the staff's review of the SSES EPU application to Chairman Klein. The ACRS recommended that an appropriate margin (penalty) should be added to the Operating Limit Minimum Critical Power Ratio (OLMCP) as an interim measure to account for uncertainties in the void fraction correlation and the lack of data for its validation at a void fraction above 90 percent. The staff provided a response to the ACRS in a letter dated January 17, 2008, providing arguments as to why a penalty was not required. The ACRS responded to the January 17, 2008, letter in a letter dated June 3, 2008. The letter states that the ACRS is not persuaded by the staff's arguments in regards to Recommendation 2. The ACRS has also provided analyses conducted by the Committee's consultants.

To address the continuing ACRS concerns, the NRR staff requested that the Office of Research (RES) conduct an independent peer review of the SSES EPU safety evaluation report with the benefit of the Committee's consultants' analyses provided. The RES review and recommendations are documented in a memorandum from F. Eltawila to W. Ruland, "Independent Review of the Susquehanna Steam Electric Station Extended Power Update Safety Evaluation Report," dated July 3, 2008, (ADAMS Accession No. ML081980578).

The RES peer review concludes that if the ACRS consultants' report results were the only available information then it would not be unreasonable to conclude that a penalty is required. The RES peer review, however, also finds that the 20% void reactivity coefficient uncertainty assumed in the analysis may be too large. Therefore, RES recommends that another analysis be performed. NRR agrees with the RES peer review and, in response to the RES peer review open item, provided the staff's calculation of the void reactivity coefficient uncertainty as being approximately 4%, which is documented in the response to the peer review. A lower uncertainty would result in a reduction in the calculated uncertainty in the transient CPR. NRR provided its response to the RES recommendations and open item in a memorandum from W. Ruland to F. Eltawila, "Reply to the Independent Review of the Susquehanna Steam Electric Station Extended Power Update Safety Evaluation Report," dated July 17, 2008, (ADAMS Accession No. ML081980004). NRR has adopted all of the SSES specific recommendations.

The NRR staff has requested that additional detailed sensitivity analyses be performed by AREVA to quantify the impact of the void fraction uncertainties on the operating limit. These analyses are being performed consistent with the guidance provided in Reference 3 of the ACRS letter dated June 3, 2008. The staff will provide these analyses to the ACRS once they are complete. In the interim, the staff remains reasonably assured that the safety margins at SSES are adequate. In a memorandum to the Executive Director, ACRS, (ADAMS Accession No. ML082000981) the staff presents the detailed bases for its reasonable assurance finding and concludes that an interim penalty to the SSES 1 and 2 operating limit minimum critical power ratio is not required.

The NRC staff appreciates the Committee's insights concerning the SSES EPU amendment review. The NRC staff will address any future correspondence regarding the staff review of the SSES EPU license amendment.

In the interest of expeditiously responding to the Committee's concerns regarding the subject matter of your June 3, 2008, letter, should the Committee require additional information or clarification, please direct these types of inquiries directly to the Division of Safety Systems in NRR.

Sincerely,

***/RA Bruce Mallett for/***

R. W. Borchardt  
Executive Director  
for Operations

cc: Chairman Klein  
Commissioner Jaczko  
Commissioner Lyons  
Commissioner Svinicki  
SECY

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