



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

October 23, 2009

The Honorable Gregory B. Jaczko  
Chairman  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:     REPORT ON THE SAFETY ASPECTS OF THE LICENSE RENEWAL  
                  APPLICATION FOR THE SUSQUEHANNA STEAM ELECTRIC STATION,  
                  UNITS 1 AND 2**

Dear Chairman Jaczko:

During the 566<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, October 8-10, 2009, we completed our review of the license renewal application for the Susquehanna Steam Electric Station (SSES), Units 1 and 2, and the final Safety Evaluation Report (SER) prepared by the NRC staff. Our Plant License Renewal Subcommittee also reviewed this matter during its meeting on April 1, 2009. During these reviews, we had the benefit of discussions with representatives of the NRC staff and the applicant, PPL Susquehanna, LLC (PPL). We also had the benefit of the documents referenced. This report fulfills the requirement of 10 CFR 54.25 that the ACRS review and report on all license renewal applications.

### **CONCLUSION AND RECOMMENDATION**

1. The programs established and committed to by the applicant to manage age-related degradation provide reasonable assurance that SSES, Units 1 and 2 can be operated in accordance with its current licensing basis for the period of extended operation without undue risk to the health and safety of the public.
2. The PPL application for renewal of the operating licenses of SSES, Units 1 and 2 should be approved.

### **BACKGROUND AND DISCUSSION**

SSES consists of two General Electric Model 4 boiling water reactors (BWR-4) with Mark II containments and is located approximately 5 miles northeast of Berwick, Pennsylvania. In 2008, the NRC authorized an extended power uprate to increase the maximum power level for SSES, Units 1 and 2 from 3,489 MWt to 3,952 MWt. The gross electrical output of each reactor is approximately 1,300 megawatts-electric. The relevant evaluations of the license renewal application have been performed at the extended power conditions. PPL requested renewal of the SSES, Units 1 and 2 operating licenses for 20 years beyond the current license terms, which expire on July 17, 2022, for Unit 1, and on March 23, 2024, for Unit 2.

In the final SER, the staff documented its review of the license renewal application and other information submitted by the applicant or obtained from the staff audits and inspections at the

plant site. The staff reviewed the completeness of the applicant's identification of the structures, systems, and components (SSCs) that are within the scope of license renewal; the integrated plant assessment process; the applicant's identification of the plausible aging mechanisms associated with passive, long-lived components; the adequacy of the applicants Aging Management Programs (AMPs); and the identification and assessment of time-limited aging analyses (TLAAs) requiring review.

In the SSES license renewal application, PPL identified the SSCs that fall within the scope of license renewal. For these SSCs, the applicant performed a comprehensive aging management review. Based on this review, the applicant will implement 52 AMPs for license renewal, which include existing, new, and enhanced programs. Thirteen programs have exceptions to the corresponding programs described in the Generic Aging Lessons Learned (GALL) Report. Four of the programs are plant specific programs that do not have counterparts in the GALL Report.

The PPL application either demonstrates consistency with the GALL Report or documents deviations to the approaches specified in that Report. As noted above, 13 of the AMPs include exceptions to the corresponding programs in the GALL Report. We reviewed these exceptions and agree with the staff that they are acceptable. The staff conducted two license renewal audits and two inspections at the SSES site. The audits verified the appropriateness of the scoping and screening methodology, AMPs, aging management review, and TLAAs. The inspections verified that the license renewal requirements are appropriately implemented. Based on the audits and inspections, the staff concluded in the final SER that the proposed activities will adequately manage the effects of aging of SSCs identified in the application and that the intended functions of these SSCs will be maintained during the period of extended operation. We agree with this conclusion.

The staff's review of the applicant's operating experience revealed that inaccessible medium-voltage cables in certain manholes at SSES have experienced significant exposure to water, i.e., cable in standing water for more than a few days. In addition, during a walk down, the staff found several feet of water in Manhole Numbers 2 and 16. The staff identified water in manholes as a generic, current operating plant issue in Information Notice 2002-12, "Submerged Safety-Related Electrical Cables," and Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients." The staff will resolve the issue of water in manholes during the current period of operation through the Reactor Oversight Process, in accordance with the requirements of 10 CFR Part 50.

PPL has committed to implement a Non-EQ Inaccessible Medium-Voltage Cables Program involving two parts: first, inspection (and draining, if necessary) of the applicable manholes on a periodic basis; and second, the development of a testing program to confirm that the conductor insulation on the applicable cables is not degrading. This program applies to six cables associated with the offsite power supply for SSES. These are the only inaccessible medium-voltage cables at SSES that are within the scope of license renewal. These cables are exposed to significant moisture and are energized more than 25% of the time. The Non-EQ Inaccessible Medium-Voltage Cable Program is a new AMP which will require the applicant to test the cables

and to evaluate plant-specific operating experience to determine an appropriate inspection frequency for the manholes.

The staff has determined that implementation of the Non-EQ Inaccessible Medium-Voltage Cable Program will ensure that the aging effects on inaccessible medium-voltage cables will be adequately managed during the period of extended operation. We agree with this conclusion. The applicant identified the systems and components requiring TLAA's and reevaluated them for the period of extended operation. The staff concluded that the applicant has provided an adequate list of TLAA's. Further, the staff concluded that the applicant has met the requirements of the License Renewal Rule by demonstrating that the TLAA's will remain valid for the period of extended operation; or the TLAA's have been projected to the end of the period of extended operation; or the aging effects will be adequately managed for the period of extended operation.

We agree with the staff that there are no issues related to the matters described in 10 CFR 54.29(a)(1) and (a)(2) that preclude renewal of the operating licenses for SSES, Units 1 and 2. The programs established and committed to by PPL provide reasonable assurance that the SSES can be operated in accordance with its current licensing basis for the period of extended operation without undue risk to the health and safety of the public. The PPL application for renewal of the operating licenses for SSES, Units 1 and 2 should be approved.

Sincerely,

***/RA/***

Mario V. Bonaca  
Chairman

**REFERENCES**

1. Memorandum from E. Keegan, Acting Director, Projects Branch 1, Division of License Renewal, Office of Nuclear Reactor Regulation, to E. M. Hackett, Executive Director, ACRS, "Advisory Committee on Reactor Safeguards Review of the Susquehanna Steam Electric Station, Units 1 and 2 License Renewal Application Safety Evaluation Report," 08/31/2009 (ML092310331 and ML092390513)
2. Letter from B. T. McKinney, PPL Susquehanna, LLC, to U.S. Nuclear Regulatory Commission, "Susquehanna Steam Electric Station, "Application for Renewed Operating Licenses Number NPF-14 and NPF-22," 09/13/2006 (ML062620157)
3. Letter from R. Conte, Chief, Region 1, to W. H. Spence, Executive Vice President, PPL Corporation, "Susquehanna Steam Electric Station – NRC License Renewal Inspection Report 05000387/2008007 and 05000388/2008007," 02/27/2009 (ML090580211)
4. Letter from E. Gettys, Project Manager, Projects Branch 1, Division of License Renewal, Office of Nuclear Reactor Regulation, to B. T. McKinney, Sr. Vice President and Chief Nuclear Officer, PPL Susquehanna, LLC, "Audit Report Regarding the Susquehanna Steam Electric Station, Units 1 and 2, License Renewal Application," 01/16/2009 (ML082950351)
5. U.S. Nuclear Regulatory Commission, NUREG-1801, Volumes 1 & 2, Revision 1, "Generic Aging Lessons Learned Report," 09/2005 (ML052700171)
6. U. S. Nuclear Regulatory Commission Information Notice 2002-12: Submerged Safety-Related Electrical Cables, 03/21/2002 (ML020790238)
7. U. S. Nuclear Regulatory Commission Generic Letter 2007-01: Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients, 02/07/2007 (ML070360665)

and to evaluate plant-specific operating experience to determine an appropriate inspection frequency for the manholes.

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*/RA/*

Mario V. Bonaca  
Chairman

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Letter to the Honorable Gregory B Jaczko, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS, dated October 23, 2009

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