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

June 25, 2015

The Honorable Stephen G. Burns
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: PSEG EARLY SITE PERMIT

Dear Chairman Burns:

During the 625th meeting of the Advisory Committee on Reactor Safeguards, June 10-12, 2015, we completed our review of the early site permit application submitted by PSEG (PSEG Power, LLC and PSEG Nuclear, LLC or "applicant") and selected chapters of the associated safety evaluation report prepared by the NRC staff. Our Regulatory Policies and Practices Subcommittee reviewed these matters at its meetings on March 19, 2014, September 29-30, 2014, and June 9, 2015. During our reviews, we had the benefit of discussions with representatives of the NRC and PSEG. We also had the benefit of the documents referenced. This is the fifth early site permit application we have reviewed.

RECOMMENDATION

The PSEG early site permit should be issued.

DISCUSSION

PSEG applied for a 20-year early site permit for a location adjacent to its existing nuclear power plants, Salem Units 1 and 2 (each 3459 MW_{th}) and Hope Creek Unit 1 (3840 MW_{th}). The proposed site is Artificial Island, located at the transition between the Delaware River and the Delaware Bay. The site is approximately 30 miles southwest of Philadelphia, Pennsylvania, 7½ miles southwest of Salem, New Jersey, and about 18 miles south of Wilmington, Delaware. The 50-mile emergency planning radius for the site includes portions of New Jersey, Delaware, Pennsylvania, and Maryland.

The early site permit application is based on the "plant parameter envelope" approach. Plants considered in the development of the parameter envelope were single units of the US-APWR, the US-EPR, and the ABWR designs, and two units of the AP-1000 design. The application included a complete and integrated emergency plan. A limited work authorization was not requested.

Review of the application was complicated by new requirements dealing with seismic events, flooding events, and emergency planning imposed in the aftermath of the reactor accidents at Fukushima. The proposed site is located in a region of generally low seismic activity. The applicant analyzed the seismic hazard at the site using the complete, updated catalogue of seismic sources for the central and eastern United States including sources at Mineral, Virginia and Charleston, South Carolina. These analyses yielded a ground motion response spectrum that is acceptable for plants considered in the development of the plant parameter envelope.

The proposed site is susceptible to flooding. The applicant proposes that any unit located on the site be a so-called “dry” unit that does not require water tight closures such as those installed at the existing Salem and Hope Creek units. The power block for any new unit will be located on an engineered fill with grade level about 37 feet above sea level. The limiting flood for the site has been deduced to be a storm surge produced by a hurricane with a trajectory roughly parallel to the Delaware River. Screening analyses using a bounding one-dimensional model suggested that a limiting Category IV hurricane could produce, under extreme conditions, a storm surge including wave run-up above the proposed grade level. A Category IV hurricane would greatly exceed the intensity of historically observed hurricanes in the region, which have been of Category I. Two-dimensional models that account more realistically for details of the site showed the storm surge for a Category IV hurricane with wave run-up to remain below the proposed grade level. Independent staff analysis confirmed this prediction. The two-dimensional model used to analyze the storm surge has been validated by comparison of predictions with data for Hurricane Isabel and Northeaster Ida.

The staff has done a thorough review of the early site permit application. The effective use of site visits and audits by the staff during this review is noteworthy. Also noteworthy has been effective coordination of the staff review with other Federal agencies including the U.S. Coast Guard, the U.S. Army Corps of Engineers, and the Federal Emergency Management Agency. This coordination has leveraged agency resources and staff expertise for the review.

The safety evaluation report from the staff has no open items. It includes nine routine permit conditions and appropriate combined license action items. There are no contentions associated with the early site permit application.

Based on our reviews of the application and the staff safety evaluation report, we conclude that the early site permit should be issued.

Sincerely,

/RA/

John W. Stetkar
Chairman

REFERENCES

1. NRC, Selected Chapters from the Final Safety Evaluation Report, “Safety Evaluation of Early Site Permit Application for PSEG Site,” presented to the ACRS from March 2014 to June 2015 (ML14203A225, ML103090303, ML13211A144, ML14226A921, ML103090381, ML103090395, ML14045A260, ML103090654, ML103090665, ML15044A381 (Fukushima NTTF Recommendations – covered in specific Chapters))

2. PSEG Early Site Permit Application, Revision 4, June 5, 2015 (ML15168A201)

3. NRC, Review Standard, RS-002, “Processing Applications for Early Site Permit Applications,” May 3, 2004 (ML040700236)

4. NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," March 2007 (ML070810350)

5. NRC, SECY12-0025 “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami,” February 17, 2012 (ML12039A103)

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1. NRC, Selected Chapters from the Final Safety Evaluation Report, “Safety Evaluation of Early Site Permit Application for PSEG Site,” presented to the ACRS from March 2014 to June 2015 (ML14203A225, ML103090303, ML13211A144, ML14226A921, ML103090381, ML103090395, ML14045A260, ML103090654, ML103090665, ML15044A381 (Fukushima NTTF Recommendations – covered in specific Chapters))

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NAME	QNguyen	QNguyen	MLBanks	EMHackett	EMH for JWS
DATE	06/23/15	06/23/15	6/24/15	06/24/15	06/24/15

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