

May 8, 2001

Mr. Harold W. Keiser  
Chief Nuclear Officer & President  
PSEG Nuclear LLC - X04  
Post Office Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 -  
ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT  
IMPACT FOR EXEMPTIONS FROM THE REQUIREMENTS OF  
10 CFR PART 50, APPENDIX G (TAC NOS. MB0606 AND MB0607)

Dear Mr. Keiser:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application dated November 10, 2000, as supplemented on March 28 and April 2, 2001, for an exemption from the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix G, for the Salem Nuclear Generating Station, Unit Nos. 1 and 2. Your application requested an exemption from U.S. Nuclear Regulatory Commission regulations in order to revise the methodology used to determine the reactor pressure vessel pressure-temperature (P-T) limit curves. Specifically, the proposed exemption would allow the use of American Society of Mechanical Engineers (ASME) Code Case N-640, "Alternative Reference Fracture Toughness for Development of P/T Limit Curves for ASME Section XI, Division 1," in lieu of some of the specific requirements in 10 CFR Part 50, Appendix G.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

**/RA/**

Robert J. Fretz, Project Manager, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure: Environmental Assessment

cc w/encl: See next page

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Docket Nos. 50-272 and 50-311  
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Unit Nos. 1 and 2

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
PSEG NUCLEAR LLC  
DOCKET NOS. 50-272 and 50-311  
SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an exemption from certain requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix G, for Facility Operating License Nos. DPR-70 and DPR-75, issued to PSEG Nuclear LLC (the licensee), for operation of the Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. The facility is located at the licensee's site on the southern end of Artificial Island in Lower Alloways Creek Township, Salem County, New Jersey. Salem, New Jersey is located approximately 7.5 miles northeast of the site.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

Title 10 of the *Code of Federal Regulations*, Part 50, Appendix G, requires that pressure-temperature (P-T) limits be established for reactor pressure vessels (RPVs) during normal operating and hydrostatic or leak rate testing conditions. Specifically, 10 CFR Part 50, Appendix G, states, "The appropriate requirements on both the pressure-temperature limits and the minimum permissible temperature must be met for all conditions." The purpose of 10 CFR Part 50, Appendix G, is to protect the integrity of the reactor coolant pressure boundary in nuclear power plants. This is accomplished through these regulations that, in part, specify fracture toughness requirements for ferritic materials of the reactor coolant pressure boundary.

Appendix G of 10 CFR Part 50 specifies that the requirements for these limits are the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, Appendix G limits.

The proposed action would exempt the licensee from implementing specific requirements of 10 CFR Part 50, Appendix G, for operation of Salem, Unit Nos. 1 and 2. In conjunction with the staff granting the proposed exemption to the requirements of 10 CFR Part 50, Appendix G, the licensee is proposing to substitute ASME Code Case N-640, "Alternative Reference Fracture Toughness for Development of P/T Limit Curves for ASME Section XI, Division I."

The proposed action is in accordance with the licensee's application for exemption dated November 10, 2000, as supplemented by letters dated March 28 and April 2, 2001.

The Need for the Proposed Action:

ASME Code Case N-640 is needed to revise the method used to determine the reactor coolant system (RCS) P-T limits, since continued use of the present curves unnecessarily restricts the P-T operating window. The methodology currently used to determine the lower bound fracture toughness of RPV material for development of P-T limit curves is based on the  $K_{Ia}$  fracture toughness curve of ASME Section XI, Appendix G, Figure G-2210-1. The licensee has determined that the use of the  $K_{Ia}$  curve provided appropriate conservatism when it was codified in 1974 due to the limited knowledge of RPV materials. However, since that time, additional knowledge has been gained about RPV materials, that demonstrates that the lower bound on fracture toughness provided by the  $K_{Ia}$  curve is well beyond the margin of safety required to protect the public health and safety from potential RPV failure. Implementation of ASME Code Case N-640 would provide an alternative to the methodology used to develop P-T limit curves. The code case methodology uses the  $K_{Ic}$  fracture toughness curve shown in ASME Section XI, Appendix A, Figure A-2200-1, in lieu of the  $K_{Ia}$  fracture toughness curve of

ASME Section XI, Appendix G. Other margins involved with the ASME Section XI, Appendix G process for establishing P-T limit curves would remain unchanged. P-T curves based on the  $K_{lc}$  curve would enhance overall plant safety by opening the P-T operating window with the greatest safety benefit in the region of low temperature operations. The operating window through which the operator heats up and cools down the RCS is determined by the difference between the maximum allowable pressure determined by ASME Section XI, Appendix G, and the minimum required pressure for the reactor coolant pump (RCP) seals adjusted for instrument uncertainties.

The staff has determined that, pursuant to 10 CFR 50.12(a)(2)(ii), the underlying purpose of the regulation to protect the integrity of the reactor coolant pressure boundary will continue to be served with the implementation of Code Case N-640.

Environmental Impacts of the Proposed Action:

The NRC has completed its evaluation of the proposed action and concludes that the exemption and implementation of the proposed alternative as described is consistent with the intent of the applicable regulations and would provide an acceptable margin of safety against brittle failure of the Salem, Unit Nos. 1 and 2 RPV material.

The proposed action will not significantly increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released offsite, and there is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological environmental impacts, the proposed action does not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impact. Therefore, there are no significant nonradiological impacts associated with the proposed action.

Accordingly, the NRC concludes that there are no significant environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., the “no-action” alternative). Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for the Salem Nuclear Generating Station, dated April 1973.

Agencies and Persons Consulted:

In accordance with its stated policy, on May 1, 2001, the staff consulted with the New Jersey State official, Mr. R. Pinney of the New Jersey Department of Environmental Protection, regarding the environmental impact of the proposed action. The State official had no comments.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated November 10, 2000, as supplemented by letters dated March 28 and April 2, 2001. Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room, located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available

records will be accessible electronically from the ADAMS Public Library component on the NRC Web site, <http://www.nrc.gov> (the Electronic Reading Room).

Dated at Rockville, Maryland, this 8th day of May 2001.

FOR THE NUCLEAR REGULATORY COMMISSION

***/RA/***

Robert J. Fretz, Project Manager, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation