

July 17, 2000

Mr. James Scarola, Vice President  
Shearon Harris Nuclear Power Plant  
Carolina Power & Light Company  
Post Office Box 165, Mail Code: Zone 1  
New Hill, North Carolina 27562-0165

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT -  
EXEMPTION FROM THE REQUIREMENTS OF 10 CFR PART 50, SECTION 50.60  
AND APPENDIX G (TAC NO. MA8643)

Dear Mr. Scarola:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for an exemption from the requirements of Title 10 of the Code of Federal Regulations, (10 CFR) Part 50, Section 50.60(a) for the Shearon Harris Nuclear Power Plant (HNP). This action is in response to your letter dated April 12, 2000, as supplemented on June 2, 2000, that submitted new pressure-temperature (P-T) limits and low temperature overpressure protection (LTOP) system setpoints for HNP. The new P-T limits and LTOP setpoints were developed using the methodologies in the 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," instead of the methodologies in 10 CFR Part 50, Appendix G.

A copy of the environmental assessment has been forwarded to the Office of the Federal Register for publication.

Sincerely,

*/RA/*

Richard J. Laufer, Project Manager, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure: Environmental Assessment

cc w/encl: See next page

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UNITED STATES NUCLEAR REGULATORY COMMISSION

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-400

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

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, Section 50.60(a) for Facility Operating License No. NPF-63, issued to Carolina Power & Light Company (CP&L, the licensee) for operation of the Shearon Harris Nuclear Power Plant, Unit 1 (HNP), located in Wake and Chatham Counties, North Carolina.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

10 CFR 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 testing conditions. Specifically, 10 CFR Part 50, Appendix G, states that, “[t]he appropriate requirements on both the pressure-temperature limits and the minimum permissible temperature must be met for all conditions.” 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.

To address provisions of amendments to the technical specifications (TS) P-T limits and low temperature overpressure protection (LTOP) system setpoints, the licensee requested in its submittal dated April 12, 2000, as supplemented on June 2, 2000, that the staff exempt HNP from application of specific requirements of 10 CFR Part 50, Section 50.60(a) and Appendix G, and substitute use of ASME Code Case N-640. Code Case N-640 permits the use of an alternate reference fracture toughness ( $K_{Ic}$  fracture toughness curve instead of  $K_{Ia}$  fracture toughness curve) for reactor vessel materials in determining the P-T limits and LTOP setpoints. Since the  $K_{Ic}$  fracture toughness curve shown in ASME Section XI, Appendix A, Figure A-2200-1 (the  $K_{Ic}$  fracture toughness curve) provides greater allowable fracture toughness than the corresponding  $K_{Ia}$  fracture toughness curve of ASME Section XI, Appendix G, Figure G-2210-1 (the  $K_{Ia}$  fracture toughness curve), using Code Case N-640 for establishing the P-T limits and LTOP setpoints would be less conservative than the methodology currently endorsed by 10 CFR Part 50, Appendix G and, therefore, an exemption to apply the Code Case would be required by 10 CFR 50.60. It should be noted that, although Code Case N-640 was incorporated into the ASME Code recently, an exemption is still needed because the proposed P-T limits and LTOP setpoints (excluding Code Cases N-640) are based on the 1989 edition of the ASME Code.

The proposed action is in accordance with the licensee's application for exemption dated April 12, 2000, as supplemented on June 2, 2000.

The Need for the Proposed Action:

Use of the  $K_{Ic}$  curve, Code Case N-640, in determining the lower bound fracture toughness in the development of P-T operating limit curves and LTOP setpoints is more technically correct than use of the  $K_{Ia}$  curve since the rate of loading during a heatup or cooldown is slow and is more representative of a static condition than a dynamic condition. The  $K_{Ic}$  curve appropriately implements the use of static initiation fracture toughness behavior

to evaluate the controlled heatup and cooldown process of a reactor vessel. The staff has required use of the conservatism of the  $K_{Ia}$  curve since 1974, when the curve was adopted by the ASME Code. This conservatism was initially necessary due to the limited knowledge of the fracture toughness of RPV materials at that time. Since 1974, additional knowledge has been gained about RPV materials, which demonstrates that the lower bound on fracture toughness provided by the  $K_{Ia}$  curve greatly exceeds the margin of safety required to protect the public health and safety from potential RPV failure. In addition, P-T curves and LTOP setpoints based on the  $K_{Ic}$  curve will enhance overall plant safety by opening the P-T operating window, with the greatest safety benefit in the region of low temperature operations.

Since an unnecessarily reduced P-T operating window can reduce operator flexibility without just basis, implementation of the proposed P-T curves and LTOP setpoints as allowed by ASME Code Case N-640 may result in enhanced safety during critical plant operational periods, specifically heatup and cooldown conditions. Thus, pursuant to 10 CFR 50.12(a)(2)(ii), the underlying purpose of 10 CFR 50.60 and Appendix G to 10 CFR Part 50 will continue to be served.

Environmental Impacts of the Proposed Action:

The NRC has completed its evaluation of the proposed action and concludes that the exemption described above would provide an adequate margin of safety against brittle failure of the HNP reactor pressure vessel.

The proposed action will not 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 impacts. 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 HNP.

Agencies and Persons Consulted:

In accordance with its stated policy, on July 11, 2000, the staff consulted with the North Carolina State official, Mr. Johnny James of the North Carolina Department of Environment and Natural Resources, 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 April 12, 2000, as supplemented on June 2, 2000, which is available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW.,

Washington, DC. 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 17th day of July 2000.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Richard J. Laufer, Project Manager, Section 2  
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Office of Nuclear Reactor Regulation

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