

March 10, 2005

Mr. D. E. Grissette  
Vice President  
Southern Nuclear Operating  
Company, Inc.  
Post Office Box 1295  
Birmingham, Alabama 35201-1295

SUBJECT: VOGTLE ELECTRIC GENERATING PLANTS UNITS 1 AND 2 -  
ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT  
IMPACT RELATED TO EXEMPTION TO ALLOW THE ELIMINATION OF THE  
REACTOR VESSEL FLANGE REQUIREMENTS FROM THE REACTOR  
COOLANT SYSTEM PRESSURE-TEMPERATURE LIMITS (TAC NOS. MC2227  
AND MC2228)

Dear Mr. Grissette:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption dated February 26, 2004, as supplemented on July 8, and October 22, 2004, for Vogtle Electric Generating Plant (Vogtle), Units 1 and 2. The proposed exemption would permit the use of Westinghouse Commercial Atomic Power Report (WCAP) 16142, Revision 1, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Vogtle Units 1 and 2," in lieu of the methodology required by Title 10 of the *Code of Federal Regulations* Part 50, Appendix G, Footnote 2 to Table 1.

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

Sincerely,

*/RA/*

Christopher Gratton, Sr. Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosure: Environmental Assessment

cc: See next page

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Christopher Gratton, Senior Project Manager, Section 1  
Project Directorate II  
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ADAMS Accession No.: ML043280621

\*No Legal Objection

NRR-042

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
SOUTHERN NUCLEAR OPERATING COMPANY  
DOCKET NOS. 50-424 AND 50-425  
VOGTLE ELECTRIC GENERATING PLANT, UNITS 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 Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix G, for Renewed Facility Operating License Nos. NPF-68 and NPF-81, issued to Southern Nuclear Operating Company (the licensee), for operation of the Vogtle Electric Generating Plant (Vogtle), Units 1, and 2, located in Waynesboro, Georgia. Therefore, as required by 10 CFR 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would exempt the licensee from the requirements of 10 CFR Part 50, Appendix G, Footnote 2 to Table 1, and allow the licensee to use the methodology in Westinghouse Commercial Atomic Power Report (WCAP), WCAP-16142, Revision 1, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Vogtle Units 1 and 2," to justify eliminating the reactor vessel/head flange region when determining pressure-temperature (P-T) limits for the reactor vessel.

The proposed action is in accordance with the licensee's application dated February 26, 2004, as supplemented on July 8, and October 22, 2004.

The Need for the Proposed Action:

Appendix G of 10 CFR Part 50, contains requirements for P-T limits for the primary system, and requirements for metal temperature of the closure head flange and vessel flange regions. The P-T limits are to be determined using the methodology of American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section XI, Appendix G, but the flange temperature requirements are specified in 10 CFR Part 50, Appendix G. This rule states that the metal temperature at the closure flange regions must exceed the material unirradiated  $RT_{NDT}$  by at least 120 °F for normal operation when the pressure exceeds 20 percent of the pre-service hydrostatic test pressure.

This requirement was originally based on concerns about the fracture margin in the closure flange region. During the boltup process, outside surface stresses in this region typically reach over 70 percent of the steady state stress, without being at steady state temperature. The margin of 120 °F and the pressure limitation of 20 percent of hydrostatic pressure were developed in the mid-1970s using the  $K_{Ia}$  fracture toughness to ensure that appropriate margins would be maintained.

Improved knowledge of fracture toughness and other issues that affect the integrity of the reactor vessel have led to the recent change to allow the use of  $K_{Ic}$  in the development of P-T curves, as contained in ASME Code Case N-640, "Alternative Reference Fracture Toughness for Development of P-T Limit Curves for Section XI, Division 1." ASME Code Case, N-640 has been approved for use without conditions by the NRC staff in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," published in June 2003.

However, P-T limit curves can still produce operational constraints by limiting the operational range available to the operator during heatup and cooldown of the plant, especially when considering requirements in the closure head flange and the vessel flange regions.

Implementing the P-T curves that use  $K_{Ic}$  material fracture toughness without exempting the flange requirement of 10 CFR Part 50, Appendix G, would place a restricted operating window in the temperature range associated with the closure head flange and reactor vessel flange, without a commensurate increase in plant safety.

Environmental Impacts of the Proposed Action:

The NRC has completed its safety evaluation of the proposed action and concludes that the more conservative minimum temperature requirements related to footnote (2) to Table 1 of 10 CFR Part 50, Appendix G are not necessary to meet the underlying intent of 10 CFR Part 50, Appendix G, to protect the Vogtle, Units 1 and 2 RPVs from brittle fracture during normal operation under both core critical and core non-critical conditions and RPV hydrostatic and leak test conditions.

The details of the NRC staffs safety evaluation will be provided in the amendment and exemption that will be issued as part of letter to the licensee approving the amendment and exemption to the regulation.

The proposed action will not significantly increase the probability or consequence of accidents, no changes are being made in the types of effluents that may be released off-site, 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 non-radiological impacts, the proposed action does not have a potential to affect any historic sites. It does not affect non-radiological plant effluents and has no other environmental impact. Therefore, there are no significant nonradiological environmental impacts associated with the proposed action.

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

Environmental Impacts of the Alternatives to the Proposed Action:

As an alternative to the proposed action, the NRC 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:

The action does not involve the use of any different resource than those previously considered in NUREG-1087, “Final Environmental Statement related to the operation of the Vogtle Electric Generating Plant, Units 1 and 2,” dated December 1985.

Agencies and Persons Consulted:

On January 6, 2005, the NRC staff consulted with the Georgia State official, Mr. Jim Hardeman of the Department of 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 February 26, 2004, as supplemented on July 8, and October 22, 2004. Documents may be examined, and/or copied for a fee, at the NRC’s Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the Agencywide Documents Access and Management System (ADAMS) Public Electronic Reading Room on the Internet at the NRC Web site, <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in

ADAMS, should contact the NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

Dated at Rockville, Maryland, this 10<sup>th</sup> day of March, 2005.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

John Nakoski, Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Vogtle Electric Generating Plant, Units 1 & 2

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