

April 20, 2004

Mr. H. L. Sumner, Jr.
Vice President - Nuclear
Hatch Project
Southern Nuclear Operating Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: REVIEW OF THE LICENSEE'S RESPONSE TO GENERIC LETTER 96-06 FOR
HATCH, UNITS 1 AND 2, REGARDING WATERHAMMER AND TWO-PHASE
FLOW (TAC NOS. M96819 AND M96820)

Dear Mr. Sumner:

The purpose of this letter is to provide you with the results of the Nuclear Regulatory Commission (NRC) staff's review of the information you provided regarding Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions." GL 96-06, dated September 30, 1996, included a request for licensees to evaluate cooling water systems that serve containment air coolers to assure that they are not vulnerable to waterhammer and two-phase flow conditions. Subsequent to issuance of GL 96-06, the Electric Power Research Institute (EPRI) developed an analytical methodology for evaluating the GL 96-06 waterhammer issue that was documented in EPRI Technical Reports 1003098 and 1006456 (previously known as EPRI Report TR-113594), and approved by the NRC in an evaluation dated April 3, 2002 (included as an Appendix to the EPRI Technical Reports). Section 3.3 of the NRC staff's Safety Evaluation requested that licensees who chose to use the EPRI methodology provide additional information to confirm that the EPRI methodology was properly applied and that plant-specific risk considerations were consistent with the EPRI risk perspective; to justify any proposed exceptions to the EPRI methodology; and to provide any additional information that is required to address the GL 96-06 two-phase flow issue.

The Georgia Power Company (GPC), then licensee for the Hatch units, provided its initial response addressing the waterhammer and two-phase flow aspects of GL 96-06 in letters dated October 21, 1996, and January 27, 1997. In response to questions that were asked by the NRC, the Southern Nuclear Operating Company (SNC), successor of GPC as the licensee for the Hatch units, provided additional information in letters dated June 30, July 8, and November 20, 1998. The licensee indicated that the answers to some questions would be deferred pending completion of the EPRI initiative. Upon completion of the EPRI initiative, SNC updated its response for the waterhammer and two-phase flow issues by letter dated August 6, 2002, providing responses to questions that had been deferred and supplementing the information that had been submitted previously. However, because SNC used computer codes that have not been reviewed and approved by the NRC to facilitate its application of the EPRI methodology, the licensee was asked to provide additional information in order to demonstrate

Mr. Sumner

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that its analyses were in fact conservative. The NRC also requested that SNC clarify certain aspects of the structural analyses that had been completed. The licensee provided this additional information in letters dated January 17, April 7, June 24, and November 21, 2003.

Based on our review of the information that was provided, we are satisfied with SNC's evaluation and resolution of the GL 96-06 waterhammer and two-phase flow issues. In the case of Hatch Unit 1, the licensee has provided sufficient confirmation that the EPRI methodology was properly applied for analyzing the GL 96-06 waterhammer issue, and that plant-specific risk considerations are consistent with the EPRI risk perspective. In order to lessen the waterhammer severity and ensure the integrity of the piping following a loss-of-coolant-accident (LOCA) in conjunction with a loss-of-offsite-power, the licensee modified the logic for the plant service water inlet valves to the drywell coolers to keep the valves open during this event. For Hatch Unit 2, the Emergency Operating Procedure was revised to prohibit operation of the drywell coolers, in conjunction with a LOCA, when boiling due to containment high temperature may have occurred in any of the drywell cooling units or related piping systems. With respect to two-phase flow, the licensee has determined that the potential for two-phase flow does not exist at either unit.

While we are satisfied with the licensee's resolution of the GL 96-06 waterhammer and two-phase flow issues, we have not performed a detailed quantitative assessment of the licensee's waterhammer or two-phase flow analyses; and we have not reviewed the licensee's use and application of computer codes for performing these analyses. Consequently, these areas could be the subject of future NRC audit or inspection activities. The GL 96-06 issue concerning thermal over pressurization was reviewed by the Mechanical Engineering Branch and documented in a letter to you dated January 21, 1999.

Sincerely,

/RA/

Christopher Gratton, Senior Project Manager
Project Directorate II-1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

cc: See next page

that its analyses were in fact conservative. The NRC also requested that SNC clarify certain aspects of the structural analyses that had been completed. The licensee provided this additional information in letters dated January 17, April 7, June 24, and November 21, 2003.

Based on our review of the information that was provided, we are satisfied with SNC's evaluation and resolution of the GL 96-06 waterhammer and two-phase flow issues. In the case of Hatch Unit 1, the licensee has provided sufficient confirmation that the EPRI methodology was properly applied for analyzing the GL 96-06 waterhammer issue, and that plant-specific risk considerations are consistent with the EPRI risk perspective. In order to lessen the waterhammer severity and ensure the integrity of the piping following a loss-of-coolant-accident (LOCA) in conjunction with a loss-of-offsite-power, the licensee modified the logic for the plant service water inlet valves to the drywell coolers to keep the valves open during this event. For Hatch Unit 2, the Emergency Operating Procedure was revised to prohibit operation of the drywell coolers, in conjunction with a LOCA, when boiling due to containment high temperature may have occurred in any of the drywell cooling units or related piping systems. With respect to two-phase flow, the licensee has determined that the potential for two-phase flow does not exist at either unit.

While we are satisfied with the licensee's resolution of the GL 96-06 waterhammer and two-phase flow issues, we have not performed a detailed quantitative assessment of the licensee's waterhammer or two-phase flow analyses; and we have not reviewed the licensee's use and application of computer codes for performing these analyses. Consequently, these areas could be the subject of future NRC audit or inspection activities. The GL 96-06 issue concerning thermal over pressurization was reviewed by the Mechanical Engineering Branch and documented in a letter to you dated January 21, 1999.

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