

September 22, 2008

Mr. Jeffrey B. Archie
Vice President, Nuclear Plant Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - RESPONSE TO GENERIC LETTER 96-06, "ASSURANCE OF EQUIPMENT OPERABILITY AND CONTAINMENT INTEGRITY DURING DESIGN-BASIS ACCIDENT CONDITIONS" (TAC NO. M96872)

Dear Mr. Archie:

On September 30, 1996, the U. S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," (Agencywide Documents Access and Management System (ADAMS) Accession No. 9609250096). In GL 96-06, the NRC staff (the staff) expressed concerns that cooling water systems serving the containment air coolers may (1) be exposed to the hydrodynamic effects of waterhammer during either a loss-of-coolant accident or a main steamline break, or (2) experience two-phase flow conditions during these postulated accidents. The staff also expressed concern that thermally-induced overpressurization of isolated water-filled piping sections in containment could jeopardize the ability of accident mitigating systems to perform their safety functions and could also lead to a breach of containment integrity via bypass leakage. The staff requested that the licensees assess these concerns, take actions as appropriate, and provide information to the staff. The South Carolina Electric and Gas Company (SCE&G) provided responses for the Virgil C. Summer Nuclear Station (VCSNS) for GL 96-06 and subsequent NRC requests for additional information in a series of letters dating from October 30, 1996 to December 21, 2007.

Waterhammer and Two Phase Flow

Based upon a review of the licensee's responses, the staff has determined that the evaluation and resolution of the GL 96-06 waterhammer issue for VCSNS is acceptable. In particular, the staff agrees that the column-closure waterhammer is bounding for VCSNS and is consistent with the criteria that was established by the Electric Power Research Institute (EPRI) methodology described 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. Also, the licensee has confirmed that the GL 96-06 risk perspective for VCSNS is consistent with the risk assessment that was completed as part of the justification for allowing the use of the EPRI methodology. While the NRC has not specifically reviewed and approved the SCE&G application of RELAP5 for VCSNS for evaluating the impact of waterhammer events, SCE&G indicated that the GL 96-06 RELAP5 analyses are more conservative than the EPRI methodology for single column-collapse scenarios and additionally, numerous column-closure waterhammer tests simulating worst-case conditions for VCSNS have been performed by SCE&G that support the conclusion that the use of RELAP5 for this particular application is conservative. Other important factors in the staff's determination include SCE&G actions to:

- Implement plant modifications and/or administrative controls as described in the letters dated November 11, 2006, and October 25, 2007, and upgrades to two pipe supports described in the letter dated August 4, 2004, pages 2 and 3 of the attachment;
- Make changes to plant documentation that are necessary for resolving the GL 96-06 waterhammer issue as described in the letter dated December 21, 2007.

The plant modifications and administrative changes referred to above were verified as completed by the NRC Resident Inspector Staff at VCSNS. A list of actions completed and verified by the NRC Resident Inspectors may be viewed at ADAMS Accession No. ML082560816. Outstanding SCE&G commitments remain to: update the VCSNS Final Safety Analysis Report (FSAR) and change the technical specification bases.

Thermal Overpressurization

In letters dated January 28, 1997, and May 6, 1999, SCE&G provided responses to the issue of thermally-induced pressurization of piping runs penetrating the containment for VCSNS. In the January 28, 1997 letter, SCE&G identified five penetrations potentially vulnerable to a water solid volume that may be subjected to an increase in pressure due to heating of the trapped fluid. SCE&G determined that the penetrations are in portions of systems that are used only during a refueling outage, are normally water-filled when isolated prior to startup, and are subject to leak testing with known leakages for the associated Containment Isolation Valves. SCE&G concluded that the penetrations are operable. SCE&G further determined that one of the penetrations is isolated by a valve that is not required to be closed and stated that the valve has been opened and the potential for overpressurization has been eliminated.

In a letter dated May 6, 1999, SCE&G committed to drain the remaining four penetrations and periodically verify that they are drained. This continuing activity was verified by the NRC Resident Inspectors.

Based on this information, the staff has concluded that the corrective actions provide an acceptable resolution for the issue of thermally-induced pressurization of piping runs penetrating the containment for VCSNS.

J. Archie

- 3 -

Conclusion

Based on the information discussed above and your commitment to update the VCSNS UFSAR and Technical Specifications Bases, the staff considers the response to GL 96-06 for VCSNS to be complete.

This completes our activity on TAC No. M96872. If you have questions regarding this letter, please contact me at (301) 415-1493.

Sincerely,

/RA/

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395

cc: See next page

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