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October 25, 2007
RC-07-0143

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTN: Mr. R. E. Martin

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS)
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
RESPONSE TO NRC QUESTIONS REGARDING
RESPONSE TO GENERIC LETTER 96-06 (TAC NO. M96872)

- References:
1. R. E. Martin (NRC) Letter to J. B. Archie (SCE&G), Virgil C. Summer Nuclear Station - Request for Additional Information Regarding Generic Letter 96-06 (TAC NO. M96872), August 1, 2007
 2. J. B. Archie (SCE&G) Letter to Document Control Desk (NRC), Response to NRC Questions Regarding Response to Generic Letter 96-06 (TAC NO. M96872), November 11, 2006

South Carolina Electric & Gas Company (SCE&G) received an NRC letter dated August 1, 2007 (Reference 1), presenting a request for additional information (RAI) regarding the VCSNS response to Generic Letter (GL) 96-06 submitted November 11, 2006 (Reference 2). SCE&G reviewed these questions in consideration of the activities conducted to address the GL 96-06 issues.

SCE&G is providing the attached response to address questions presented in Reference 1.

Summary of Commitments

SCE&G makes the following commitment as further discussed in the attachment to this letter.

SCE&G has expanded the modification (Engineering Change Request ECR-50567) described in Reference 2 to include installation of additional controls for valve 3107A(B) and the service water booster pump (SWBP) that will prevent the possibility of a pipe waterhammer if valve 3107A(B) fails to perform its active function.

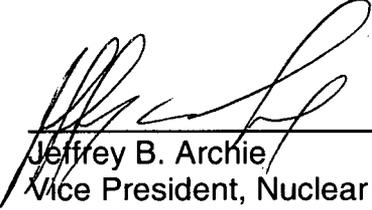
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If you have any questions or require additional information, please contact Mr. Bruce Thompson at (803) 931-5042.

I certify under penalty of perjury that the information contained herein is true and correct.

10/25/07

Executed on



Jeffrey B. Archie
Vice President, Nuclear Operations

JT/JBA/jw
Attachment

- c: K. B. Marsh
S. A. Byrne
N. S. Carns
J. H. Hamilton
R. J. White
W. D. Travers
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NRC Resident Inspector
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CER (CR-02-03455)
File (815.14)
DMS (RC-07-0143)

**South Carolina Electric & Gas Company (SCE&G)
Virgil C. Summer Nuclear Station (VCSNS)
Response to NRC Request for Additional Information (RAI)
Concerning the Resolution of Generic Letter (GL) 96-06**

RAI Response References:

1. J. B. Archie (SCE&G) Letter to Document Control Desk (NRC), Response to NRC Questions Regarding Response to Generic Letter 96-06 (TAC NO. M96872), November 11, 2006
2. G. J. Taylor (SCE&G) Letter to Document Control Desk (NRC), Request for Additional Information Regarding Response for Generic Letter 96-06 (TAC NO. M96872), October 30, 1998
3. J. B. Archie (SCE&G) Letter to Document Control Desk (NRC), Response to NRC Request for Additional Information Regarding SCE&G Response to Generic Letter 96-06, RC-05-0204, December 12, 2005

RAI Question:

1. **South Carolina Electric & Gas Company's (SCE&G's) response to Question 2, as provided in its November 11, 2006, letter to the Nuclear Regulatory Commission (NRC), is incomplete as it does not fully address single active failure considerations. Of particular concern is a single failure of a component in the system that results in excessive system voiding and subsequent waterhammer that could cause a loss of piping and/or valve integrity. Should this occur, the service water being pumped into containment may invalidate the containment analytical assumptions and compromise the service water system flow balance; and a loss of service water pipe and/or valve integrity due to a severe waterhammer event could provide a direct leakage path from the containment to the outside environment, thereby compromising one of three fission product barriers. Please address the issues in the following two paragraphs:**

SCE&G provided a licensee commitment to modify valves 3107A(B) to be fast acting in order to trap water in the high points above these valves and in its letter of October 8, 2006, revised the schedule for implementing that commitment to refueling outage 17 in the spring of 2008. This modification would prevent void formation from gravity drain-down of the water to the service water pond, thereby preventing the consequential rapid void collapse and waterhammer event that would have otherwise occurred upon re-energizing the service water booster pumps (SWBPs) as explained on page 16 of the December 12, 2005 submittal. The scenario detailed on page 15 of the same submittal describes the situation which will occur if a single failure of valve

3107A(B) were to occur, which states: "This will form a large void in the piping. Upon SWBP re-start and the commencing of fluid flow, the void will rapidly collapse creating a significant waterhammer." Because a requirement has not been established to restrict use of the service water system for cooling the reactor building cooling units during normal plant operation, this appears to be the most limiting scenario for GL 96-06 waterhammer considerations.....

.... [a]Therefore, with respect to this scenario, please explain how a failure of fast acting valves 3107A(B) to close is mitigated such that system design limitations will not be exceeded.

Response 1(a):

If there was a loss of offsite power (LOOP) while Service Water (SW) flow is aligned with the Reactor Building Cooling Units (RBCUs) and valve 3107A(B) fails to commence closing upon loss of power to the Service Water Booster Pump (SWBP), there would be a pipe waterhammer when the SWBP starts during the recovery from the LOOP. To mitigate this waterhammer condition, SCE&G will install an interlock within the control circuits of valve 3107A(B) and the SWBP that will prevent the SWBP from starting if valve 3107A(B) is not in the full closed position. The prevention of SWBP startup will avert flow within the piping and consequentially prevent any possibility of a pipe waterhammer. This interlock will be installed along with the modifications to valves 3107A(B) scheduled for refuel outage 17 in the spring of 2008.

Further, if during the LOOP scenario described above, should 3107A(B) close at a later time, the SWBP may start, resulting in a pipe waterhammer. In order to mitigate this waterhammer condition, SCE&G intends to include in the modification one of the following:

1. Installation of additional control circuit interlocks between valve 3107A(B) and the SWBP to prevent the SWBP from starting at a later time.
2. Provide administrative controls through operating procedures. These procedures would require the SWBP control to be placed in pull-to-lock if it did not energize after a LOOP.

It is noted that RBCU cooling is divided into two separate fluid trains. If the SWBP of one train fails to start due to the single active failure of valve 3107A(B) to close, the other fluid train would be relied upon to perform the necessary RBCU cooling.

.... [b]Also, to the extent that additional modifications are necessary to address single failure considerations, an updated response to Question 3 of the NRC staff's RAI dated August 22, 2006, concerning the need for additional Technical Specification requirements is necessary.

Response 1(b):

The additional modifications discussed in Response 1(a) do not create any new or additional TS surveillance activities beyond those previously addressed in response to Question 3 of the RAI response of Reference 1. The response times required by TS Table 3.3-5 still bound the RBCU actuation. SWBPs and the modified valves 3107A/B are tested and inservice inspected in accordance with TS 4.0.5. Therefore, no additional TS changes are required.

The single failure analysis that was discussed in the licensee's response dated October 30, 1998, was performed before the plant modifications referred to in the December 12, 2005 and October 8, 2006, letters were proposed for the service water system. [c]Therefore, please confirm that this comprehensive and bounding set of operational transients and single active failure scenarios continue to be valid and bounding relative to the plant modifications that were described.

Response 1(c):

In addition to the 15 operational transients and single active failure scenarios described in Response 2.d of RAI Response Reference 2, the following have also been considered relative to the current plant design and the planned plant modifications:

16. SW pump and SWBP startup
17. LOOP (with consequential pipe waterhammer) while RBCUs aligned with the Industrial Cooling System
18. LOOP (with consequential pipe waterhammer) while RBCUs aligned with the Service Water System
19. Seismic conditions
20. LOCA conditions
21. Failure of a SWBP discharge check valve to open
22. Failure of one of the RBCU discharge valves to open

- 2. The licensee's resolution of the Generic Letter 96-06 thermal overpressurization issue preceded the plant modifications that are referred to in 1(b). Therefore, please confirm that the thermally induced overpressurization analyses that were previously completed remain valid relative to the plant modifications that were described.**

Response 2:

The thermally induced overpressurization analysis of Reactor Building penetrations assumed a closed loop inside containment (containment isolation valves 3106A/B, 3107A/B closed) which was then heated up by the increasing containment temperature from a LOCA or MSLB. This analysis determined that the closed loop was either open or protected by one or more relief valves through all scenarios with and without a single failure. When the RBCUs are normally aligned with the Industrial Cooling system or are aligned with the SW system, valve 3107A/B is in the closed position or the open position respectively. The described modifications basically provide a delayed opening time and a faster closing time for 3107A/B and do not make any changes to these system valve alignments. Therefore, the previous thermally induced overpressurization analyses, which assumed a closed loop inside containment, remain valid.