UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-8931

August 14, 2000

EA-00-184

South Carolina Electric & Gas Company
ATTN: Mr. Steven A. Byrne
Vice President, Nuclear Operations
Virgil C. Summer Nuclear Station
P. O. Box 88
Jenkinsville, SC 29065

Dear Mr. Byrne:

SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 50-395/00-02

Thank you for your response of May 30, 2000, to our non-cited violation (NCV) identified in NRC Integrated Inspection Report No. 50-395/00-02, concerning activities conducted at your facility. In your response, you denied NCV 50-395/00002-01, "Inadequate Surveillance Procedure for Verification that the ECCS Discharge Piping Is Full of Water."

After careful consideration of the basis for your denial of NCV 50-395/00002-01, we have concluded, for the reasons presented in the enclosure to this letter, that the NCV occurred as stated in NRC Integrated Inspection Report No. 50-395/00-02.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Public Available Records (PARS) components of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

We appreciate your cooperation in this matter.

Sincerely,

/RA/

Victor M. McCree, Deputy Director
Division of Reactor Projects

Docket No.: 50-395
License No.: NPF-12

Enclosure: Evaluation and Conclusion (NCV 50-395/00002-01)
cc w/encl:
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EVALUATION AND CONCLUSION (NCV 50-395/00002-01)

During a routine NRC inspection, a non-cited violation (NCV) was identified for an inadequate surveillance procedure for verification that the emergency core cooling system (ECCS) discharge piping is full of water, in accordance with Technical Specification (TS) surveillance requirement 4.5.2. South Carolina Electric & Gas Company responded to the NCV by letter dated May 30, 2000. The licensee contends that the elimination of the monthly venting of valve XVT00071-SI was based on the valve being inaccessible due to ALARA (As Low As Reasonably Achievable) considerations. The NRC's evaluation and conclusion regarding the licensee's position are as follows:

Restatement of NCV 50-395/00002-01

TS surveillance requirement 4.5.2, "Emergency Core Cooling," requires that each emergency core cooling system (ECCS) subsystem shall be demonstrated operable. Specifically, TS 4.5.2.b.2 requires at least once per 31 days that ECCS piping is verified to be full of water by venting the ECCS pump casings and accessible discharge piping high points. The licensee accomplishes this in accordance with surveillance test procedure STP-105.006, "Safety Injection/Residual Heat Removal Monthly Flowpath Verification Test," Revision 9F. Based on observations made during performance of the venting activity, the inspectors questioned the adequacy of the procedure.

There are six high points vents in the ECCS discharge piping (excluding the two RHR pump casing vents). Issues with pump casing vents were previously reviewed and dispositioned as a NCV in NRC Inspection Report No. 50-395/99-03, Section M8.1 and therefore, will not be discussed further in this writeup. At the time of the inspectors' observations, three of the available six high point vents were being utilized. The inspectors questioned whether the use of three high points was sufficient to ensure that the piping was full of water. The three high point vents used are: XVT00033-SI, Refuel Water Storage Tank Outlet Header Vent Valve; XVT00007A-RH, RHR Heat Exchanger A Tube Side Vent Valve; and XVT00007B-RH, RHR Heat Exchanger B Tube Side Vent Valve. After discussions with the licensee, the inspectors learned that originally six high point vents were used in performance of STP-105.006. However, a procedure change was initiated in July 1993, (Revision 8B) which eliminated three of the high point vents. A contingency requirement remained in the STP to vent the three high points which were removed if gas is discovered during the monthly venting of the remaining high points. The three high point vents eliminated were: XVT00071-SI, Hot Leg Injection Header Vent Valve; XVT00006A-RH, RHR Header A Vent Valve; and XVT00006B-RH, RHR Header B Vent Valve. The licensee documented the reason for the permanent procedure change as physical inaccessibility of the valves and ALARA (As Low As Reasonably Achievable) concerns. The licensee had Westinghouse perform analyses in September and October 1993, which concluded the system integrity would be maintained in the event of a water hammer caused by formation of a large gas bubble in the ECCS discharge piping. In the licensee's view, these analyses further justified

elimination of the three vent points from performance of the monthly surveillance. Final approval and issuance of the procedure occurred in November 1993.

The inspectors reviewed the procedure change package and the specific radiological conditions that existed during the time the change was being processed. Based on observation the inspector determined that the valves located in the RHR heat exchanger rooms, XVT00006A-RH and XVT00006B-RH, were physically inaccessible, however, there was no physical limitation in accessing XVT00071-SI. The inspectors reviewed monthly radiation surveys taken around the July 1993 time frame for high point vent valve, XVT00071-SI. The inspectors also reviewed a sample of surveys from several years preceding and subsequent to the procedure change. The inspector noted that radiological conditions have remained similar from 1993 through the present day. Specifically, dose rates measured on March 10, 2000, when STP-105.006 was performed and valve XVT00071-SI was vented, were approximately the same as those measured in 1993; 100 mrem contact and 50 mrem at one foot. Total dose for the operator and support personnel venting valve XVT00071-SI on March 10 was eight mrem. While the west penetration room (location of XVT00071-SI) at times in the past has been posted as a high radiation area, the inspector noted that neither access to nor the actual location of XVT00071-SI involved personnel being in a high radiation dose field.

Based on the radiological surveys at the time the procedure was changed and typical radiation worker dose received when performing the venting evolution, the inspectors concluded that the dose rate measurements did not support the licensee's determination that high point vent valve XVT00071-SI was inaccessible based on ALARA considerations. As a result of the change in November 1993, the STP used to accomplish TS surveillance requirement 4.5.2 was inadequate, in that, all accessible high point vent valves were not used to verify that ECCS piping is full of water. TS 6.8.1.c, requires that written procedures shall be established, implemented, and maintained for surveillance and test activities of safety-related equipment. The failure to establish an adequate procedure is a violation of TS 6.8.1.c. This Severity Level IV violation is being treated as an NCV, consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is identified as NCV 50-395/00002-01 and has been placed in the licensee's corrective action program as PIP 0-C-00-0267.

Since STP-105.006 contained instructions to vent the high points in question if gas was discovered during the monthly venting of the remaining high points, there was reasonable assurance that the ECCS subsystem was not adversely affected and therefore, the safety significance is low. This is based, in part, on the physical locations of the high point vent valves (elevation differences and distances between the valves) and when gas has been discovered during the monthly vent of the three valves, no additional gas was noted when venting the three remaining valves.

Summary of Licensee's Response to NCV 50-395/00002-01

The licensee contends the following:

The surveillance requirements of Technical Specification 4.5.2.b.2 state:

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

b. At least once per 31 days by:

2. Verifying that the ECCS piping is full of water by venting the ECCS pump casings and accessible discharge piping high points.

The purpose of surveillance requirement 4.5.2 is to ensure that the assumptions made in the safety analysis are met and that ECCS subsystem OPERABILITY is maintained.

The monthly venting of valve XVT00071-SI was eliminated from Surveillance Test Procedure STP-105.006, "Safety Injection/Residual Heat Removal Monthly Flowpath Verification Test," based on the valve being inaccessible due to ALARA (As Low As Reasonably Achievable) considerations. The ALARA concept has no published threshold limits. The basis for the ALARA requirements of 10 CFR Part 20 is the assumption that there is no threshold for deleterious effects from radiation exposure.

The Code of Federal Regulations (10 CFR 20.1003) states:

ALARA (acronym for "as low as is reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

It is important to note the words, "*making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken*." The language of 10 CFR Part 20 does not give prescriptive limits, below which ALARA considerations are not valid or warranted. Instead, the regulations state that every reasonable effort be made to keep exposure as far below the 10 CFR Part 20 limits as possible while remaining consistent with the licensed activity, in this case, ensuring the OPERABILITY of the ECCS. Stated in succinct terms, all activities conducted in the course of performing ECCS surveillance testing should be scrutinized and changed or eliminated for dose reduction so long as the end purpose of the activity is accomplished.

The NRC has issued SCE&G a non-cited violation of Technical Specification 6.8.1.c for failure to establish, implement, and maintain adequate procedures for surveillances and test activities of safety-related equipment. The NRC reviewed the radiological surveys at the time the procedure was changed. Additionally, the NRC observed a venting

evolution for XVT00071-SI and noted that the total dose received was eight millirem. The NRC concluded that the dose rate measurements and the dose received by the personnel who performed the venting evolution did not support SCE&G's determination that high point vent valve XVT00071-SI was inaccessible because of radiation dose considerations.

Exposure records for 1999 show that the average dose received by Plant Operators was approximately six millirem per month. Exposure records for the observed venting evolution show that the Operators received 6 millirem and the HP technician received four millirem (a slight difference from the HP Technician's dose stated in the inspection report).

The dose received while venting XVT00071-SI is approximately equal to an operator's dose for one month of normal operation. The dose saved by declaring valve XVT00071-SI inaccessible and venting only when gas is observed at the other specified vent points, when compared to the small magnitude of the monthly average dose received by Operators, meets the definition of ALARA from 10 CFR Part 20.

NRC Evaluation of Licensee's Response

The NRC staff has carefully reviewed your response and considered the following items:

Technical Specification (TS) 4.5.2.b.2 requires at least once per 31 days that ECCS piping is verified to be full of water by venting the ECCS pump casings and accessible discharge piping high points.

You stated that the monthly venting of valve XVT00071-SI was eliminated from Surveillance Test Procedure STP-105.006, "Safety Injection/Residual Heat Removal Monthly Flowpath Verification Test," based on the valve being inaccessible due to ALARA considerations. The documented reason for the procedure change that eliminated venting of three valves was physical inaccessibility of the valves and ALARA considerations. Based on observation, the NRC determined that the valves located in the RHR heat exchanger rooms, XVT00006A-RH and XVT00006B-RH, were physically inaccessible without scaffolding being built, however, there was no physical limitation in accessing valve XVT00071-SI.

Regarding your position that valve XVT00071-SI was eliminated from TS surveillance requirements due to ALARA considerations, your response of May 30, 2000, referenced 10 CFR Part 20, which states, in part, that *"ALARA means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken*." In addition, your response stated that the language of 10 CFR Part 20 does not give prescriptive limits, and provided significant detail regarding radiation exposure history to support your position that valve XVT00071-SI was appropriately removed from TS 4.5.2.b.2 activities because of ALARA considerations. The NRC agrees that the language of 10 CFR Part 20 gives licensees much latitude in deciding how to minimize radiation exposures. However, ALARA considerations do not relieve a licensee from the responsibility of complying with the licensed activity undertaken, in this case TS 4.5.2.b.2. Licensees should implement ALARA practices to maintain exposures to

radiation as far below the dose limits of 10 CFR Part 20 as is practical, however, ALARA cannot be used as the basis to not perform a required activity. Licensees desiring to discontinue performance of certain licensed activities, such as TS surveillance requirements, must pursue removal of these requirements through the license amendment process. In reviewing an amendment request, the NRC considers the various factors presented by the licensee in support of its request, including ALARA considerations.

NRC Conclusion

For the above reasons, the NRC staff concludes that NCV 50-395/00002-01, "Inadequate Surveillance Procedure for Verification that the ECCS Discharge Piping Is Full of Water," occurred as stated.