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O. W. DIXON, JR.
VICE PRESIDENT
NUCLEAR OPERATIONS

September 25, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
Containment Isolation Valves

Dear Mr. Denton:

South Carolina Electric and Gas Company (SCE&G) submitted a request to revise Table 3.6-1, "Containment Isolation Valves," in a letter from Mr. O. W. Dixon, Jr., to Mr. H. R. Denton dated August 2, 1985. In discussions with the NRC Staff, additional information was requested in order to complete the review. This letter is being provided in response to that request. Please note that the questions are answered in two separate attachments to this letter; Attachment A contains discussion on the six seal injection valves in question and Attachment B includes the requested information on the two valves in the Residual Heat Removal (RHR) system. Attachment C contains the marked-up portion of the basis section to the Technical Specifications in support of the information contained in Attachments A and B.

If you should have any questions, please advise.

Yours very truly,

O. W. Dixon, Jr.

AMM/tdh
Attachment

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ATTACHMENT A

Valves XVT-8102 A, B and C-CS
XVC-8368 A, B and C-CS

Valves 8102 A, B, and C are reactor coolant pump seal injection line globe valves located outside of containment. Valves 8368 A, B, and C are seal injection line check valves located inside containment on the same lines as the 8102 valves. These lines are filled with water from the charging system via the charging pumps. These lines sense a pump discharge pressure of 2700 psig.

The seal injection system is normally in service and in operation at all times, except when the plant is in cold shutdown and reactor coolant pump seal maintenance is required. During an accident condition, for example, a large break LOCA, the seal injection system remains in operation receiving water from the charging pumps and injecting into the Reactor Coolant pump seals. This total flow is limited to less than 33 gpm per Technical Specification 3.4.6.2. During all phases of the accident (injection - cold leg recirculation - hot leg recirculation), the seal injection system continues to inject water into the Reactor Coolant pump seals to ensure the pump seals remain cooled. If closed during an accident condition, such as for a suspected seal injection line break, the charging pumps will maintain pump discharge pressure against the outside containment side of the valve. In addition, valve leakage through the valve leakoffs would come from the higher pressure side of the valves. This would be the charging pump side (outboard) of the 8201 valves. The 8368 valves do not have valve leakoffs. There are no plant procedures which require closure of the seal injection valves during the first 30 days after onset of the accident.

During a safety injection and subsequent containment isolation, charging pump suction water is provided by the refueling water storage tank (RWST). Once this supply is exhausted, suction is automatically switched to the reactor building sump. Therefore, a 30 day inventory is always assured. Valves 8102 A, B, C and 8368 A, B, C are part of the seal water injection portion of the Safety Injection System B Train. Due to normally open cross-tie valves, the Safety Injection System A and B Trains are designed to operate with a single failure of any active component. Operability of the containment isolation valves is not required to maintain a water seal. Therefore, with the exception of "Loss of Offsite Power," at least one charging pump is maintaining pressure in both trains (A and B) for all accident scenarios involving a containment isolation signal. During "Loss of Offsite Power," the charging pumps will lose power for approximately 10 seconds while the diesel generators are starting. Since the lines remain filled with water during this period there would not be leakage of containment atmosphere through these lines. All piping and components required to maintain the water seal are ASME safety class 2 or better and seismic Category I. In addition, charging pump discharge piping is designed for High Energy Line Break (HELB). All components which must operate (charging pumps, valves, etc.) in order to maintain the water seal were designed and purchased as active components.

ATTACHMENT B

Valves XVG-8701 A and B-RH

Valves 8701 A and B provide containment isolation for the Residual Heat Removal (RHR) system pump suctions for the reactor coolant system. They are gate valves located just inside containment. For these valves, the water seal consists of water filled piping that rises from the inboard side of these valves. For purposes of this analysis, it is assumed that the accident initiating event will break the suction lines just inside the missile barrier. Piping outside the missile barrier is not subject to pipe break as a result of the accident initiating event. Since the 8701 valves are inside containment, valve leakage from valve leakoffs remains inside the containment. Therefore, the water seal is bounded by the containment isolation valve and a point level with the bottom of the horizontal run penetrating the missile barrier. The water volume in the piping bounded by these two points is the thirty day inventory. Water leakage from the valve over thirty days must be less than that volume and is to be verified by a leak rate test performed in accordance with station procedures. These valves are motor operated but have no automatic function to change position under signals such as safety injection or Phase A or B isolation. The valves require operator action to open or close. They also have interlocks to prevent inadvertent operator opening during Modes 1, 2 and 3.

In Mode 4 these valves are opened to initiate RHR. In all modes of operation, the RHR piping down stream of 8701 A and B is moderate energy. This moderate energy piping is subjected by definition to thru-wall leakage cracks as opposed to guillotine ruptures. In the event of a thru-wall leakage crack in Mode 4, the RCS system and refueling water storage tank provide inventory for seal source.

Valves 8701 A and B fail as-is and therefore are considered for the Appendix J analysis to be passive valves. Therefore, there are no active components whose failure would affect the water seal. All piping and components required to maintain the water seal including the vertical riser on the outboard of the valves are ASME safety class 2 or better and seismic Category I. It is noted that the piping between 8701 and 8702 is designed as high energy piping. 8702 A and B are normally closed valves which also fail in the "as-is" condition. There is not enough energy in the lines between valves 8701 and 8702 to cause a phase A or B isolation. Therefore, failure of the water seal piping would not be an accident initiating event.

Attachment C

3/4.6 CONTAINMENT SYSTEMS

BASES

3/4.6.1 PRIMARY CONTAINMENT

3/4.6.1.1 CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR 100 during accident conditions.

3/4.6.1.2 CONTAINMENT LEAKAGE

The limitations on containment leakage rates (including those used in demonstrating a 30 day water seal) ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure, P_a. As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to 0.75 L_a or 0.75 L_t, as applicable, during performance of the periodic test to account for possible degradation of the containment leakage barriers between leakage tests.

The surveillance testing for measuring leakage rates are consistent with the requirements of Appendix "J" of 10 CFR 50.

3/4.6.1.3 REACTOR BUILDING AIR LOCKS

The limitations on closure and leak rate for the reactor building air locks are required to meet the restrictions on CONTAINMENT INTEGRITY and containment leak rate. Surveillance testing of the air lock seals provide assurance that the overall air lock leakage will not become excessive due to seal damage during the intervals between air lock leakage tests.