



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING

AMENDMENT NO. 89 TO FACILITY OPERATING LICENSE NO. NPF -12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By letter dated July 21, 1989, South Carolina Electric & Gas Company (SCE&G) proposed a change to Technical Specification (TS) 3/4.5.2, Emergency Core Cooling Systems, of the V. C. Summer Nuclear Station, Unit No. 1 (Summer). The purpose of the TS amendment request was to support the removal of the Residual Heat Removal (RHR) System Autoclosure Interlock (ACI). The licensee requested this change to address concerns regarding the potential loss of RHR capability due to failure of ACI circuitry during cold shutdown and refueling operations. The staff raised this concern when they issued Generic Letter 88-17, "Loss of Decay Heat Removal." Clarifying information in support of the amendment request was submitted on December 11, 1989 and on December 18, 1989.

2.0 EVALUATION

Presently, Summer TS 4.5.2.d.1 requires that the RHR ACI action be verified at least once per eighteen months. During normal and emergency conditions, the low pressure RHR system (normal operating pressure of 600 psig) is isolated from the high pressure reactor coolant system (normal operating pressure of 2235 psig). This isolation is necessary to: (1) avoid damages resulting from overpressurization, and (2) minimize the potential for loss of integrity of the low pressure system and possible radioactive releases to the environment. Because the RHR relief valves have adequate capacity to mitigate transients which occur during the operation of the RHR system, the purpose of the ACI is to provide a second layer of protection between the reactor coolant system and the RHR system during plant startup and normal operations. The ACI function, therefore, is to preclude conditions that could lead to an interfacing system loss-of-coolant accident (LOCA) by ensuring that both suction/isolation valves in each RHR system train are fully closed when the reactor coolant system is pressurized above the RHR design pressure.

Events in the nuclear industry have caused the staff to be concerned with the potential for failure of the ACI circuitry to cause inadvertent RHR capability during cold shutdown and refueling operations. Westinghouse performed a generic evaluation (WCAP-11736) and a plant specific analysis for Summer (WCAP-11835) to study the impact of removing the ACI feature. The results of these evaluations showed that removal of the RHR ACI improves the availability of the RHR system during short-term and long-term cooldown, and also decreases the frequency of an interfacing LOCA. Because the removal of the RHR ACI has a positive impact on safety, the licensee proposed to remove their RHR ACI capability and to modify the TS surveillance requirement associated with TS 4.5.2.d.1 so it would no longer be necessary to verify automatic isolation of the RHR system from the reactor coolant system by determining that the interlocks prevent the valves from opening on a real or simulated reactor coolant system equal to or greater than 425 psig. In addition, the licensee has proposed to delete the requirement that automatic isolation of the RHR system from the reactor coolant system be verified by showing that the interlocks will cause the valves to automatically close with a simulated or actual reactor coolant system pressure signal less than or equal to 750 psig.

The staff has previously approved the removal of the RHR ACI feature at the Diablo Canyon Plant. Therefore, the staff's review focused on ensuring that the changes proposed for Summer met the staff's position on the removal of RHR ACI as set forth in the staff's Safety Evaluation for Diablo Canyon, that was issued on February 17, 1988.

The staff's position taken on the removal of the ACI at Diablo Canyon consisted of hardware changes and procedural enhancement that the staff believed would produce a net safety benefit compared to what existed at the plant. The hardware changes consisted of the addition of an alarm to each RHR suction valve. The alarm actuates if the valve is open and the pressure is greater than the open permissive setpoint and less than the RHR design pressure minus the RHR pump head pressure. The open permissive that prevents these valves from being opened must be left in place and must not be disabled by the addition of the alarm and the removal of the ACI circuitry. The valve position indicator to the alarm must not be affected by power lockout of the valves and a method independent of the alarm for determining valve position should be available in the control room following power lockout of the RHR suction valves. The procedural modifications required are as follows:

1. The alarm response procedure used during plant startup should be modified to reflect alarm recognition responses for the added alarm. The procedure should be revised to direct the operator to take the necessary actions to close the open RHR suction valve(s), if they are not closed following alarm actuation. If this is not possible, the operator should be instructed to not pressurize further and to return to the safe shutdown mode of operation.

2. A surveillance procedure for the RHR suction valve alarms is added to ensure these alarms remain operable.
3. A method independent of the alarm should be used to ensure that these valves are closed when the power to these valves is locked out. For example, the valves could be leak-checked after power lockout.

Beside the hardware and procedural changes described above, Diablo Canyon and Summer were requested to review the sizing of the valve operators on the RHR suction valves to ensure that it would be unlikely that these valves could be opened against full system pressure. This provides still another level of protection to ensure the integrity of the high/low pressure system interface.

The staff has reviewed the Summer submittals and has found that the proposed changes meet the hardware and procedural modifications described above, which have been previously approved by the staff for Diablo Canyon, and are, therefore, acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the Surveillance Requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need to be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Commission has issued a "Notice of Consideration of Issuance of Amendment to Facility Operating License and Propose No Significant Hazards Consideration Determination and Opportunity for Hearing" which was published in the FEDERAL REGISTER on October 18, 1989 (54 FR 42865) and consulted with the State of South Carolina. The additional information provided by the licensee on December 11, 1989 and December 18, 1989 clarified certain matters in response to questions by the staff. This correspondence did not change the substance of the Amendment request. No public comments or request for hearing were received, and the State of South Carolina did not have comments.

The staff has concluded, based upon the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: March 6, 1990