

SOUTH CAROLINA ELECTRIC & GAS COMPANY

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

March 6, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission (NRC)
Washington, D.C. 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
Shutdown Margin-Modes 3, 4 and 5

Dear Mr. Denton:

South Carolina Electric and Gas Company (SCE&G) hereby requests an amendment to Section 3/4.1.1.2, "Reactivity Control System," of the Virgil C. Summer Nuclear Station Technical Specifications. The proposed change, as shown on the attached marked-up Technical Specification pages, defines the required shutdown margin in terms of Reactor Coolant System (RCS) boron concentration. This amendment is requested for use in Cycle 3 to ensure that operators will have at least fifteen (15) minutes to terminate an inadvertent boron dilution in Modes 3, 4, and 5 following receipt of a high flux at shutdown alarm.

During NRC review of the plant Final Safety Analysis Report (FSAR), SCE&G was requested by the Staff to address the boron dilution event, considering Regulatory Guide 1.70, Revision 2 guidelines. This guidance stated that the dilution event should be addressed in all shutdown modes, and that operator action time to prevent loss of shutdown margin should start from receipt of a signal alerting him to the event. Therefore, SCE&G provided an analysis for the dilution event for Cycle 1 conditions and included the results in Section 15.2.4 of the FSAR. With an increase in the shutdown margin to 2% for Modes 3, 4, and 5, this analysis showed that at least 13.4 minutes existed for the operator to take action to halt the dilution. These results were used to form the licensing basis for the plant for Cycle 1.

A detailed cycle specific analysis for the boron dilution event was performed for Cycle 2. The method of analysis was based on that used for Cycle 1, and the dilution flowrates and RCS volumes assumed in the analysis were the same as those found in the FSAR. The high flux at shutdown alarm was again assumed to be set at twice background. This analysis confirmed that the Cycle 1 analysis presented in the FSAR was conservative for Cycle 2 and ensured that the operator had sufficient time to terminate an inadvertent boron dilution before the shutdown margin was lost.

In Cycle 3, SCE&G plans to begin transition to an 18 month low-leakage fuel management scheme. Accordingly, a bounding analysis of the dilution event has been performed for all operating modes using conservative assumptions based on

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18 month low-leakage core designs. An important factor in the analysis is the initial boron concentration because higher boron concentrations can be more easily diluted, resulting in a more rapid loss of shutdown margin. Therefore, as the initial boron concentration increases, the shutdown margin required to preserve a fixed operator action time also increases.

The required shutdown margin is also shown to vary with operating mode making the transient more limiting in some modes than others. The results of the bounding analysis show that Technical Specification changes are not required in Modes 1, 2 and 6 because at all times sufficient time exists for the operator to locate the source of and terminate a dilution before shutdown margin is lost. However, for modes 3, 4 and 5, revisions are necessary in order to allow the operator 15 minutes from the time of the alarm until the margin is lost to take any necessary actions. Therefore, SCE&G is making the proposed Technical Specification change defining the required shutdown margin as a function of the RCS boron concentration for Modes 3, 4 and 5. By comparing the actual RCS boron concentration to the figure, the operator can determine what shutdown margin is required in order to be within the bounds of the safety analysis. The lowest values of the shutdown margin contained in the Technical Specification are consistent with those in the current Westinghouse Standard Technical Specifications for three loop plants. This approach is being proposed based on the factors of the analysis as noted above.

SCE&G has determined that a finding of no significant hazards is appropriate because of the following:

The amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated because the high flux at shutdown alarm continues to be set at twice background, and Regulatory Guide 1.70, Revision 2 requirements and the design basis continue to be met.

The amendment does not create the possibility of a new or different kind of accident because the physical plant design is not being changed.

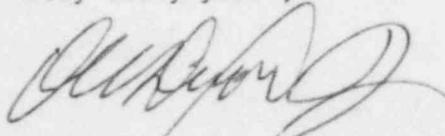
The amendment does not involve a significant reduction in a margin of safety. To the contrary, the amendment is being requested to maintain the margin of safety during the transition to 18 month cycles by holding the time for operator action in the event of an inadvertent boron dilution at or in excess of that stated in the FSAR.

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This revision has been reviewed and approved by both the Plant Safety Review Committee and the Nuclear Safety Review Committee. Please find enclosed the application fee of one hundred fifty dollars (\$150.00) required by Title 10 of the Code of Federal Regulations, Part 170.

If you have any questions, please advise.

Very truly yours,



O. W. Dixon, Jr.

AMM/OWD/gj
Attachment:

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