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SOUTHERN COMPANY
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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant
Response to Request for Additional Information on a Technical Specifications Revision Request to Revise Standby Liquid Control Figure 3.1.7-1

Ladies and Gentlemen:

Enclosed are SNC Responses to the staff's Request for Additional Information (RAI) concerning the Technical Specifications revision request for Standby Liquid Control Figure 3.1.7-1, "Sodium Pentaborate Solution Volume Versus Concentration Requirements."

The RAI was received via facsimile transmission on March 4, 2005.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

H. L. Sumner, Jr.

HLS/OCV/daj

Enclosure: Response to Request for Additional Information

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. G. R. Frederick, General Manager – Plant Hatch
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. C. Gratton, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

**NRC Request**

In a letter dated November 12, 2004, from H.L. Sumner to the Nuclear Regulatory Commission (NRC), "Technical Specifications [TS] Revision to Standby Liquid Control Figure 3.1.7-1," Southern Nuclear Operating Company submitted TS changes to SLCS Figure 3.1.7-1. The NRC staff reviewed the application and we require the following additional information to complete our review:

**NRC Question #1:**

Confirm the following equation given in NEDO-31096-P, "Anticipated transients Without Scram [ATWS]; Response to NRC ATWS Rule, 10 CFR 50.62,"(86 gpm equivalency) is still satisfied for Hatch after the proposed modifications.

$Q/86 \times M251/M \times C/13 \times E/19.8 \geq 1$

Where:

Q = expected SLCS flow rate (gpm)
M = mass of water in the reactor vessel and recirculation system at hot rated conditions (lbs)
C = sodium pentaborate solution concentration (weight percent)
E = boron enrichment (19.8 % natural boron)
M251 = mass of water in a BWR/6 reactor vessel (lbs)

**SNC response**:

As described in the original SNC submittal referenced above, recent changes such as increased cycle lengths and decreases in outage lengths have required an increase to bundle average enrichments. Consequently, changes in core loads or bundle designs have been required to ensure that there is sufficient shutdown margin in the core to bring the reactor to and maintain it in a cold shutdown state following an ATWS event. SNC's fuel supplier for Plant Hatch, Global Nuclear Fuels (GNF), determined that fuel bundle designs could be optimized if the concentration of Boron-10 atoms injected into the vessel post-ATWS was increased. Therefore, in order to support fuel bundle design optimization, SNC proposes to increase the concentration from its current value of 660 ppm to 800 ppm.

The strategy chosen by SNC to accomplish the post-ATWS increase in Boron-10 is to increase the total amount of sodium pentaborate solution that must be injected into the reactor vessel after the ATWS event. The Boron-10 enrichment of the sodium pentaborate solution is not being changed, and neither is the in-solution concentration of the sodium pentaborate. The Boron-10 enrichment is still 60 atomic percent and the Standby Liquid Control pump characteristics are not being changed. The rated flow for

the pumps, as listed in TS surveillance Requirement (SR) 3.1.7.7 is still 41.2 gpm. Also, in the original submittal, the minimum concentration of 6.9 % was unchanged. Consequently, the equivalency determination of NEDE-31096-P-A, "Anticipated Transients without Scram, Response to NRC ATWS Rule," was not affected by the original SNC proposed TS change.

In reviewing the answer to this question, however, a round off inconsistency was discovered between the existing calculation for the equivalency determination and the translation of the data to the current Figure 3.1.7-1. To avoid the inconsistency in the new figure, SNC plans to submit a change to the proposed revised figure to increase the minimum concentration, which represents the boundary between Region A and Region B, from 6.9% to 7.0%.

The equivalency determination will be met with the minimum concentration of 7.0%.

**NRC Question #2:**

Confirm that the SLCS tank low level alarm set points and the SLCS tank temperature set points are valid with the proposed modifications. Also, confirm that Figure 3.1.7-2 is correct, even though the weight percent sodium pentaborate in solution is changed.

**SNC Response:**

The setpoint calculations for high and low tank level and temperatures are currently being calculated based on the revision to Figure 3.1.7-1 noted in the response to question #1. This proposed figure revision will be submitted separately. Preliminary calculations indicate that the tank low and high level alarms will change. Preliminary calculations also indicate that the temperature alarms will not change.

The tank level and temperature alarm calculations will be completed, and any annunciator setpoints adjusted accordingly, prior to implementation of the Technical Specifications change package.

As described in the response to the previous question, this amendment was proposed to accommodate fuel design changes and increased cycle energy requirements. These changes will require that an additional amount of Boron-10 atoms be injected into the core, post-ATWS, to bring the reactor to and maintain it in a cold shutdown condition. In fact, the post-ATWS concentration of Boron-10 atoms will increase to 800 ppm from the current value of 660 ppm. To accomplish this, SNC-Hatch chose to maintain the Sodium Pentabotrate enrichment in Boron-10 the same, and also to maintain the concentration of Sodium Pentaborate in solution the same. Consequently, the volume of solution injected into the reactor vessel post-ATWS must increase. Strictly speaking therefore, the concentration of sodium pentaborate solution is not changing, in other words, the specifications of the sodium pentaborate solution purchased by Plant Hatch will not

change. The new Figure 3.1.7-1 will reflect that for a particular concentration of solution, there must be more volume in the tank such that more solution will be injected into the reactor post-ATWS. Therefore, the only change necessary to Figure 3.1.7-2 is to indicate that the boundary between Region A and Region B is changing from 6.9% to 7.0%.

**NRC Question #3:**

Information Notice 2001-013, "Inadequate Standby Liquid Control System Relief Valve Margin," was issued on April 10, 2001, informing licensees about NRC staff concerns with regard to relief valve margin. What is the set point margin of the SLCS pump discharge relief valve during ATWS?

**SNC Response:**

The SBLC pump relief valves setpoint is 1400 psig. The ATWS evaluation for the current operating conditions concludes that the maximum reactor lower plenum pressure for SBLC injection is 1147.5 psig after 124 seconds, therefore, the maximum pressure required of the SBLC pump is 1187.5 psig (reactor pressure plus additional system head and resistance). Therefore, the SBLC system pump relief valve simmer margin for ATWS is > 200 psi and the pump relief valves are adequate for the current operating conditions.

The standby liquid control (SBLC) system pump relief valve setpoint margin was evaluated for both the Hatch Measurement Uncertainty Recapture Power Uprate and the 10 psi reactor pressure vessel (RPV) nominal operating pressure increase. For both projects, the two most limiting ATWS transients were evaluated and bound both Unit 1 and Unit 2. The vessel overpressure analysis was performed for the Pressure Regulator Failure Open (PRFO) transient under beginning-of-cycle (BOC) conditions. The long-term suppression pool temperature analysis was performed for the Main-steam Isolation Valve Closure (MSIVC) transient at end-of-cycle (EOC) conditions. Since the long-term vessel pressure response for both the ATWS/PRFO and the ATWS/MSIVC events is similar and the exposure does not impact the peak pressure after the completion of the recirculation pump trip (RPT), the long-term MSIVC event is representative of the vessel pressure profile during the ATWS. Therefore, the long-term result from the MSIVC event was used to evaluate the SBLC relief valve operating conditions.