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MIDDLE SOUTH UTILITIES SYSTEM

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Mr. George W. Knighton, Director
PWR Project Directorate No. 7
Division of PWR Licensing-B
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

SUBJECT: Waterford SES Unit 3
Docket No. 50-382
Effect of Lower BAM Tank Boron
Concentrations on FSAR Section 9.3.4

REFERENCE: W3P86-2358 dated August 20, 1986

Dear Mr. Knighton:

By the referenced letter LP&L submitted four Technical Specification change requests (NPF-38-29, 30, 31, 32) with the combined effect of reducing the boric acid makeup tank (BAMT) boron concentration to below 3.5 weight percent. The purpose of the change was to obviate the need for heat tracing the BAMTs and associated flow paths. In subsequent conversations, you requested additional information concerning the effect of the proposed changes on the FSAR, particularly Section 9.3.4 - the Chemical and Volume Control System (CVCS). The information you requested is discussed below.

When the Waterford 3 design was begun in the 1970s, heat tracing the boron flow paths was a standard practice arising from the need (on other plants) to occasionally credit a high boron concentration in the BAMTs in mitigating the steam line break (SLB) event. While CE knew that Waterford 3 would not need the heat tracing for the Cycle 1 safety evaluations (including SLB), it was included in the Waterford 3 design as a standard component.

When the Cycle 1 safety analyses were performed it was confirmed that relatively high concentrations of boron in the BAMTs (and the associated heat tracing) did not need to be credited for any scenario in Chapter 15. However, the Branch Technical Position (BTP) RSB 5-1 cooldown scenario (which did not exist at the time of the Waterford 3 design) did require credit for borated water in the BAMTs in order to maintain shutdown margin. Because heat tracing

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was available in the plant, the safety analysts arbitrarily chose a BAMT boron concentration for Cycle 1 which was easy to analyze.

For Cycle 1 and Cycle 2 two borated water sources are credited in the cooldown analysis. For both Cycles the BAMT contents are first injected into the RCS. As the cooldown continues, the RCS water volume shrinks and must be made up by refueling water storage pool (RWSP) borated water in order to maintain the shutdown margin during the cooldown. The major differences between Cycle 1 and Cycle 2 are:

1. Cycle 1 assumes that the BAMT contents are injected into the RCS prior to initiating a cooldown, while Cycle 2 assumes boron injection as a function of cooldown temperature, and

2. Cycle 1 requires a larger volume of RWSP water to be injected into the RCS during the cooldown because of the higher BAMT boron concentrations (i.e. lower BAMT water volume).

By varying the BAMT boron concentrations and correspondingly decreasing/increasing the RWSP water added during the cooldown, the analyst has a wide range of boron concentrations to choose from in performing the BTP RSB 5-1 analysis. While the choice of the concentration range was a convenience for Cycle 1, in Cycle 2 the intent was to maintain concentrations below 3.5 weight percent to avoid the maintenance and other problems associated with heat tracing.

The Waterford 3 FSAR currently reflects the safety analyst's choices for Cycle 1 operation. In accordance with 10CFR50.71(e) the FSAR will be updated to reflect the Cycle 2 Technical Specifications once the Technical Specification change requests are approved and implemented. The key FSAR changes that will be needed for Cycle 2, include the following:

1. Section 9.3.4.2.2h and others discuss the BAMTs. The present value of the minimum boron concentration (7.5 weight percent) would be changed to be consistent with Cycle 2.

   Presently this Section indicates that "each tank contains a sufficient volume to perform a safe shutdown..." (assuming RWSP water is used to fill the remaining shrinkage volume) and that "the total volume of both tanks is sufficient to bring the RCS to refueling concentration... before initiation of a cooldown...". The FSAR will be changed during Cycle 2 to clarify (for Cycle 1 and Cycle 2) that the combination of the BAMT(s) and RWSP supply is sufficient to perform a safe shutdown. Additionally, the procedure change from injecting BAMT contents prior to initiating the cooldown (Cycle 1) to injecting borated water as a function of cooldown temperature (Cycle 2) will be included.

2. Section 9.3.4.3.1 and others discuss the heat tracing present on the BAMTs and flow paths. The FSAR will be updated to reflect that heat tracing will be in use when boron concentration levels exceed 3.5 weight percent.

Should you require further information in this matter, please feel free to contact Mike Meisner at (504) 595-2832.

Yours very truly,

KW Cook

K.W. Cook
Nuclear Support & Licensing Manager

KWC/MJM/plm

cc: B.W. Churchill, W.M. Stevenson, R.D. Martin, J.H. Wilson,
NRC Resident Inspector's Office (W3)