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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: MR. T. R. QUAY

SUBJECT: RATIONALE FOR USE OF SATAN COMPUTER CODE FOR AP600

Dear Mr. Quay:

During the August 16, 1995, meeting between Westinghouse and the Containment Systems and Severe Accident Branch, Westinghouse took an action to provide a discussion on the use of the SATAN computer code for the calculation of design basis blowdown mass and energy releases for the AP600. This discussion would include how the application for AP600 differs from the approach currently used for operating plants.

The SATAN VI computer code is used to calculate the design basis blowdown mass and energy releases for the AP600 containment. The SATAN VI code and associated modeling assumptions and noding structure is documented in WCAP-10325-P-A. It has been reviewed and approved by the NRC for use in calculating the design basis blowdown mass and energy releases for Westinghouse PWR containment integrity analyses of sub-atmospheric, ice condenser, and dry containment designs. The blowdown phenomena modeled by the SATAN VI code are the same for all PWRs including the AP600 design.

The variable noding structure of the SATAN model allows the user to simulate advanced reactor system designs as well as the currently operating Westinghouse PWR designs. This allowed the standard noding to be modified to include AP600 specific features (i.e., two cold legs in the broken loop and the direct vessel injection line to the downcomer).

The primary differences between the AP600 design and current operating Westinghouse PWRs are the safety features. The safety features in current operating plants include both passive and active systems. The safety features associated with the AP600 are all passive, and only passive systems are modeled during the blowdown with the approved containment integrity methodology. Therefore, no changes in the conservative design basis methodology or modeling assumptions, as described in WCAP-10325-P-A, have been made to the SATAN VI model.

The behavior of the release of the initial RCS inventory during the initial blowdown for the AP600 is very similar to current operating plants. The flexibility of the noding structure in a SATAN VI model allows for an accurate representation of the AP600 geometry. In addition, the SATAN VI code also has the ability to model the actuation of the passive safety systems that would operate during a large break LOCA blowdown. Therefore, the SATAN VI code is well suited for predicting the mass and energy releases during the blowdown phase for the AP600 design.

We hope that the above discussion fully addresses the questions asked at the August 16, 1995 meeting. Please contact John C. Butler (412-374-5268) if you have any questions concerning this submittal.

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/nja

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