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NTD-NRC-95-4596
DCP/NRC0430
Docket No.: STN-52-003

November 13, 1995

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: MR. T. R. QUAY

SUBJECT: AP600 WGOthic DECK FLOW AREA SENSITIVITY

Dear Mr. Quay:

During the July 27, 1995, meeting between Westinghouse and the Containment Systems and Severe Accident Branch, Westinghouse took an action to provide a deck flow area sensitivity of the WGOthic containment integrity analysis model. Attachment 1 to this letter provides the requested information.

Please contact John C. Butler on (412) 374-5268 if you have any questions concerning this transmittal.

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/nja

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Attachment to NTD-NRC-95-4596

Summary

During the July 27, 1995, meeting between Westinghouse and the Containment Systems and Severe Accident Branch, Westinghouse took an action to provide a sensitivity calculation to deck flow area for the WGOthic containment integrity analysis model. This comparison was performed and the results show that deck flow area does not significantly affect the containment pressure response because, even with the limited deck flow area in the DBA model, a sufficient amount of steam circulates down below deck and condenses on the heat sinks in the CMT/CVCS volume to cause them to saturate before the peak pressure is reached.

Discussion

Condensation of steam on the internal heat sinks in the AP600 is the dominant containment pressure mitigation process following a LOCA event. The shell is the primary heat sink above the operating deck. Most of the metal heat sinks below the operating deck are contained in the CMT/CVCS room.

The circulation of steam throughout containment is an important factor in being able to effectively use the heat sinks located below the operating deck. To bound the effects of circulation within containment in the containment DBA evaluation model, the flow area through the deck to the CMT/CVCS volume was limited.

The NRC requested that a sensitivity analysis be performed to quantify the effect of limiting the deck flow area. A sensitivity analysis, using the nominal flow area through the operating deck, was performed to determine the effect on the containment pressure. The flow area between the CMT/CVCS room and the dome was increased by a factor of 14 to account for the additional openings through the deck.

As shown in Figure 1, there is essentially no difference in the calculated pressure response after increasing the deck flow area. With the increased deck flow area, steam is better able to circulate through containment. This causes the heat sinks below deck to saturate earlier than in the DBA model. This does not significantly affect the containment pressure response because, even with the limited deck flow area in the DBA model, a sufficient amount of steam is able to circulate down below deck and condense on the heat sinks in the CMT/CVCS volume to cause them to saturate before the peak pressure is reached.

PRELIMINARY

AP600 containment model rev 7 (based on ap6naa4)
Thu Nov 9 15:28:16 1995
GOTHIC Vers 2.1.1.1 - Mon Oct 16 15:04:06 EDT 1995

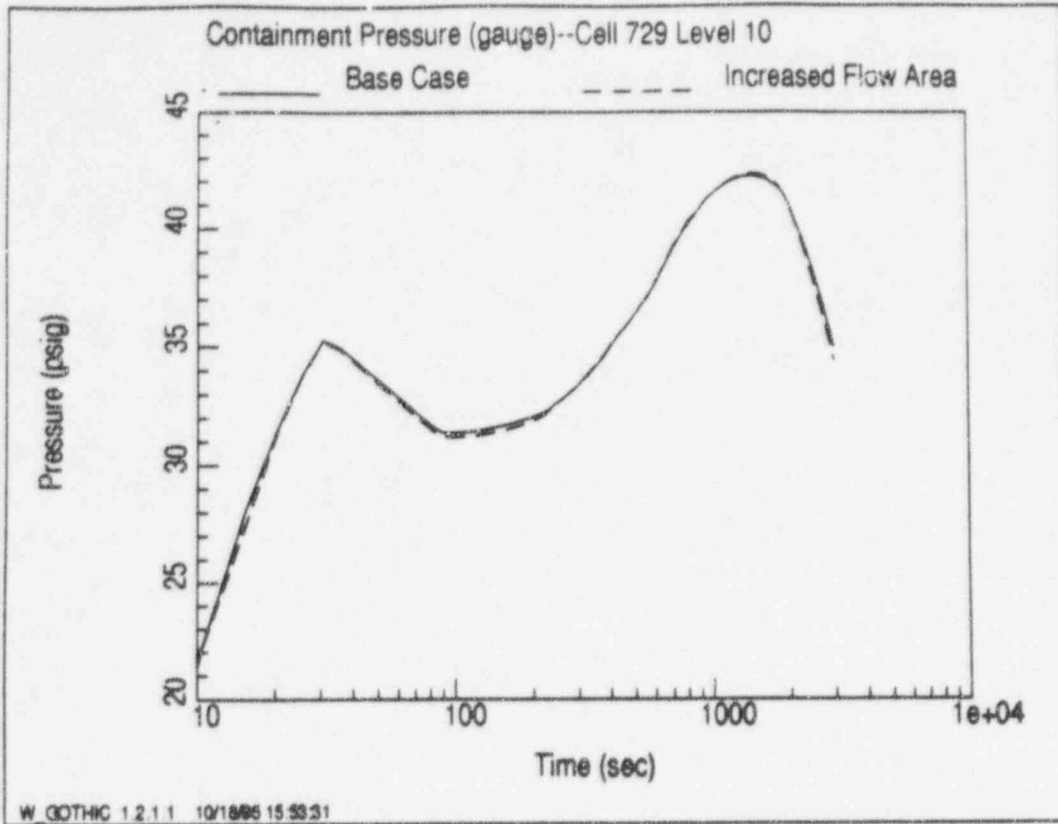


FIGURE 1