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 DENTON, H. R. Office of Nuclear Reactor Regulation

SUBJECT: Forwards final rept re recirculation sump under LOCA/Jet
 Impingement conditions completing response to NRC 780801
 request for addl info. Jets from credible breaks in RCS will
 not cause significant air binding of ECCS pumps performance.

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January 28, 1980
AEP:NRC:00355

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
Subject: Request for Additional Information Regarding
Recirculation Sump

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

Dear Mr. Denton:

This letter completes our response to a Request for Additional Information enclosed in Mr. A. Schwencer's letter of August 1, 1979 concerning the performance of the D. C. Cook Plant recirculation sump under LOCA/jet impingement conditions.

In our letter of September 24, 1979 (AEP:NRC:00260) we stated that the final report of our jet impingement testing program would be submitted to you along with replies to the specific concerns identified in the referenced Request for Additional Information. The final report entitled, "Experimental Investigation of Air Entrainment at a Reactor Containment Sump Due to Break and Drain Flows - Donald C. Cook Nuclear Plant," prepared by Alden Research Laboratory (ARL) is enclosed as Attachment A to this letter.*

The report concludes that neither submerged nor unsubmerged jets from credible breaks in the Reactor Coolant System (RCS) will cause significant air binding or other degradation of ECCS pumps performance. The report further concludes that drain flow from the ice condenser generates air entrainment at the impact location; however, most of bubbles are not drawn into the sump under the crane wall. Small quantities of relatively smaller bubbles are pulled down the upstream sump portion into the downstream area, and most of these collect at the top cover in the downstream portion. Some of these

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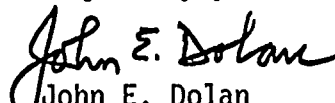
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bubbles accumulate and occasionally a slug of air is drawn into the suction pipe. The report concludes that it would be beneficial to modify the two drains in question to eliminate the drain flow jet impact in front of the sump. It must be pointed out that the entire ice condenser drain flow testing was performed assuming a water level in the containment of 602' -10". This water level is extremely conservative since it does not account for the approximately 1,000,000 lbs. of water from the ice condenser drains prior to switchover of the first ECCS train. Accounting for this quantity of water the revised level would be approximately 607'. Noting the effect of water level on bubble entrainment, the revised water level will eliminate or significantly mitigate this problem.

AEPSC requested that ARL perform testing at higher water levels to confirm that ice condenser drain flow does not cause air entrainment at a water level of approximately 607 feet. These tests will be completed within approximately two weeks of this submittal. If the results indicate that the problem has been eliminated, no further action will be taken. If the tests indicate that the problem persists we will review implementation of the modifications outlined in the subject report.

In addition to the sump model testing we have evaluated the potential structural effects of break flow jets on the sump and have found that jets from credible RCS breaks do not compromise the sump's structural integrity.

Very truly yours,


John E. Dolan
Vice President

JED:em

cc: R. C. Callen
G. Charnoff
R. S. Hunter
R. W. Jurgensen
D. V. Shaller-Bridgman

ATTACHMENT A
TO
AEP:NRC:00355