



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 29 1980

MEMORANDUM FOR: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

FROM: Carlyle Michelson, Director
Office for Analysis and Evaluation of
Operational Data

SUBJECT: CONCERNS RELATING TO THE INTEGRITY OF A
POLYMER COATING FOR SURFACES INSIDE CON-
TAINMENT (IE DRAFT BULLETIN NO. 80-21)

We recently reviewed a draft IE bulletin which indicated that various batches of a polymer coating manufactured by CON-CHEM, Inc. for use inside containment could fail when subjected to Design Basis Accident conditions. The draft IE bulletin requested licensees, in part, to evaluate and reply as to "...what engineered safety systems, e.g., clogged sump, could be affected in the event the polymer lost its bonding characteristics in a post-accident period." AEOD recommended to IE that this particular item be expanded as follows:

Include all plant systems which take suction from the containment sump during accident mitigation and whose components might be adversely affected by the presence of unbonded polymer coating flakes which can pass through the sump screen. Of particular interest are the pump seal water systems, including filters or cyclone separators and the pump seals which might become clogged by paint flakes. Consideration should also be given to adverse effects of paint flakes on instrumentation such as flow meters which might lead to incorrect operating decisions or automatic control malfunction.

The general concern, as noted above, is associated with paint flakes, fibrous insulation, or other debris which can pass through the sump screen, yet will not pass through the more restrictive clearances present in the systems taking suction from the sump during the recirculation phase of accident mitigation. Since there may be a need for long-term reliability for these systems, such as RHR, it becomes necessary to develop confidence that existing components and instrumentation will function routinely and reliably in the presence of such debris.

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Of particular concern to AEOD is the prevalent use of cyclone separators as filters in the seal water systems associated with pumps which can take suction from the containment sump. In a typical arrangement, the cyclone separator is attached to the pump discharge nozzle by a 3/4 inch pipe nipple. The clean water discharge from the separator is routed through pipes or tubes to the pump shaft seals. The dirty water discharge is returned to the pump suction. The jet nozzle in the separator has a 1/8 inch diameter throat. The seal water is typically injected at the midpoint of the shaft seal with a portion of the flow passing inward and the remainder outward. The seal clearances are almost nil. Water-lubricated pump bearings may use similar arrangements.

Since the sump screens may have a very coarse mesh compared to the 1/8 inch jet nozzle in the separator, it is apparent that the sump water must not contain any debris which could clog the jet. In addition, if the density of the debris is even close to that of water, or if it has a propensity to be carried by the flow, the debris which passes through the jet may not be separated by the centrifugal action of the separator. In this case, the debris will pass on to the pump seals and become lodged in the seal clearances. This could greatly reduce the seal water flow and lead to seal failure. This becomes a potential common mode failure for all systems which use pumps having such an arrangement and which take suction from the sump during accident mitigation.

We are bringing this situation to NRR's attention because of its applicability to the ongoing work on "unresolved safety issues." However, a review of available information did not confirm that this concern was being specifically addressed by an established issue, such as A-43 (Containment Emergency Sump Performance), yet we believe that it warrants careful review and resolution.

In view of the close relationship of this concern to the NRR unresolved safety issues and to the proposed IE bulletin, we anticipate that NRR will be working closely with IE on the evaluation of the responses to Bulletin 80-21. Following completion of this evaluation, we would appreciate knowing NRR's views regarding the seriousness of this concern and whether it will be specifically addressed and resolved as part of an ongoing activity, such as a specific unresolved safety issue.

Please let me know should you require clarification or additional information.

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