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POOR ORIGINAL

MEMORANDUM FOR: J. J. Watt, Task Manager, Task Action Plan A-43, NRR

FROM: D. V. Pickett, Containment Systems Branch, DSS

THRU: W. R. Butler, Chief, Containment Systems Branch, DSS WB

SUBJECT: PROPOSED MODIFICATION TO TASK ACTION PLAN A-43, "CONTAINMENT EMERGENCY SUMP PERFORMANCE"

Task 2 of the current draft of TAP A-43 calls for estimating the amount and nature of thermal insulation that may be displaced from the breaking pipe by fracture, pipe whip and hydraulic forces. As currently written in the draft task action plan, Task 2 calls for an initial bounding value of the amount and nature of displaced insulation. If the early results show the bounding analysis to be overly conservative, more refined analysis and/or experiments may be conducted to provide more definitive characteristics.

The CSB requests that certain modifications be made to Task 2 to resolve the following concern that has been identified in both TAP A-2, "Asymmetric LOCA Loads" and TAP C-3, "Insulation Usage Within Containment."

Subcompartment analyses, particularly the reactor cavity analyses are affected by the assumed behavior of insulation following a pipe rupture. Asymmetric subcompartment pressure transients resulting from postulated pipe ruptures can be affected if displaced insulation causes any significant blockage of vent paths which are essential for relieving pressure buildups. Such blockage would not only affect peak calculated pressures, but also the loads and moments acting across the component supports. However, current analyses by applicants typically do not assume blockage of vent paths by insulation; i.e., insulation remains in place and uncrushed. Therefore, it is important that the insulation behavior typically assumed in subcompartment analyses be verified.

The bounding analysis currently called for in Task 2 of TAP A-43 would not resolve this concern. Therefore, the CSB proposes that the bounding approach be eliminated and that a more refined analysis be performed to determine the amount, nature and travel direction of insulation pieces as they are blown off of pipes as a function of time. Since subcompartment analyses are only concerned with pressure transients occurring over short periods of time; i.e., milliseconds, a bounding analysis could be used for any insulation displaced after the first full second. CSB would then use this information in future contract work to determine the sensitivity of insulation behavior on subcompartment analyses.

Therefore, we recommend that the Task 2 description under 2.d of the draft TAP be revised to read as follows.

Task 2: Insulation Debris From Postulated Pipe Breaks

A means will be developed to estimate the amount, nature and direction of travel for insulation pieces displaced as a function of time from the breaking pipe by fracture, pipe whip and hydraulic forces. If justified, experiments will be designed and conducted to provide more definitive characteristics. Considerations for the determinations of the displacement of a given type of insulation material would include the nature of the initial break, pipe whip, jet effects, and subsequent environment.

The displacement of insulation material from components surrounding each postulated pipe break will be determined. Experiments confirming the amount and character of insulation debris will be performed if required.

The MEB responsibility under 4-3 of the draft TAP should also be revised as follows:

4.3 Task 2 - Insulation Debris from Postulated Pipe Breaks

MEB is the lead branch for this effort. The MEB will identify the location of all postulated pipe breaks for each plant; Determine the type of break which would be expected to result in the largest separation of insulation; Identify the amount, nature and direction of travel for debris as a function of time from the breaking pipe; and Identify the amount, nature and direction of insulation debris separated as a function of time from components surrounding the break or influenced by the water and steam from the break. The product of this task will be a tabulation for each break in each plant which identifies the quantity and direction of travel as functions of time, type, and character of insulation debris. Character in this case referring to a description of the debris such as sheet sizes, blankets, granules, etc. The task report will provide an assessment of the potential for insulation debris problems in each plant. A principal product will be documentation of the breaks and resulting debris required as input to Task 3.

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