PMSTPCOL PEmails

From: Joseph, Stacy
Sent: Friday, December 03, 2010 4:51 PM
To: 'Tomkins, James'
Subject: Preliminary Questions for Fuel Audit
Attachments: Questions on New Support Info.docx

Jim,

Please see the attached questions to be used in preparation for the fuel audit on Tuesday.

Thank you,
Stacy Joseph

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Recipients:
"'Tomkins, James'" <jetomkins@STPEGS.COM>
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Questions on New 'Downstream Effects' Calculation supporting information

1. The text states that blockage begins at 850 seconds, and is at maximum blockage at 910 seconds. Figure 2 shows significant oscillations in both the hot and the average channel flow rates beginning at ~700 seconds. Explain the cause of this oscillation, since blockage has not begun at that time and there is no apparent change in ECCS flow.
2. The text refers to 99 percent blockage of core inlet flow area. Is this intended to mean 99 percent of the hot channel inlet flow area or 99 percent of <u>all</u> fuel bundles? If bypass flow area is credited, explain why different from the audit presentation slides. Also, provide justification for the assumption. If 99 percent of the bundle flow area is blocked, it is likely that a significant portion of the bypass area will be blocked also.
3. It is stated in the text that the significant parameter is downcomer level, because it provides driving head for flow through the core. Figures 4 and 5 show downcomer level well after maximum blockage is reached at 910 seconds. What is the transient level prior to 1000 seconds?
4. In Figure 5, Downcomer water level, what causes the oscillations to reduce in amplitude starting at ~ 1600 seconds?
5. In Figure 2, the initial flow rate appears to be ~ 8 kg/sec. In past audit discussions, a value of 3.3 kg/sec was mentioned. Explain the reasons for the difference. Also, WCAP-17116-P lists a FW flow rate of 2911 kg/sec, which, would be 3.34 kg/bundle, assuming all of the flow passes through the 872 bundles, and none bypasses the bundles. If bypass flow is considered, the flow rate per bundle at time t = 0 seconds (Break initiation) would be considerably less than 3.3 kg/sec.

Additional Question on Test Plan:

The test plan describes the partial-height mock fuel bundle and debris loading, etc., but there is no mention of a simulated core support plate. Since the License Condition calculation apparently considers bypass flow, how would the tests demonstrate that the bypass paths would not be blocked by some percentage? The ABWR core support plate incorporates many tortuous paths and small holes, so there is a fairly high probability of at least some blockage.