Dennig, Robert

From: Dennig, Robert
Sent: Wednesday, May 23, 2012 1:34 PM
To: Dennig, Robert
Subject: DF stuff
Attachments: Suppression Pool Decontamination.pptx

Perhaps I am wrong, but it appeared that the staff did not realize that one of the main purposes of the suppression pool is to trap radionuclides. I recall that there was a request to have more information about the decontamination factor in the pool. EPRI has revisited this subject recently and supplied me with the following reference: A.T. Wassel, J.L. Farr, and M.S. Hoseyni, "SUPRA: A Code for Simulating Removal of Radionuclides by Water Pools Under Severe Accident Conditions", EPRI/NP-3886-CCMP, February 1985. The greater the trapping of radioactive material in the pool, especially cesium-137, the lower the safety significance of other mitigation systems, like the Swedish and Swiss designs.

-----Original Message-----
From: Notafrancesco, Allen
Sent: Wednesday, May 23, 2012 11:03 AM
To: Dennig, Robert; Szabo, Aaron; Basu, Sudhamay; McKirgan, John; Lane, John; Monninger, John; Fretz, Robert; Stutzke, Martin; Lee, Richard; Collins, Timothy
Cc: Ross, Kyle Wayne; Esmaili, Hossein
Subject: RE: containment venting MELCOR runs

Bob,

I am not sure if Richard sent you the attached from D. Powers....but surprisingly it does not show much pool temperature dependencies.

Allen

-----Original Message-----
From: Dennig, Robert
Sent: Wednesday, May 23, 2012 8:36 AM
To: Szabo, Aaron; Notafrancesco, Allen; Basu, Sudhamay; McKirgan, John; Lane, John; Monninger, John; Fretz, Robert; Stutzke, Martin; Lee, Richard; Collins, Timothy
Cc: Ross, Kyle Wayne
Subject: RE: containment venting MELCOR runs

I need to understand the suppression pool DF better (uncertainty?), and how that uncertainty affect assumptions about the DF of the filter. Data I have from NUREG 1150 says lower bound of 1 and a median of 10 for core ex-vessel. Assume if you're unlucky and you get a pool DF of 1, then you get a filter DF of 100 to 1000, whatever the supplier has tested to, because you see the full range of particle sizes. So the filter can be very important or not so important depending on the roll of the dice with the pool And I need to find out more about the external filter testing....but carry on.

-----Original Message-----
From: Szabo, Aaron
Sent: Wednesday, May 23, 2012 8:21 AM
To: Notafrancesco, Allen; Basu, Sudhamay; McKirgan, John; Lane, John; Monninger, John; Dennig, Robert; Fretz, Robert; Stutzke, Martin; Lee, Richard; Collins, Timothy
Cc: Ross, Kyle Wayne
Subject: RE: containment venting MELCOR runs

Here is my plan forward at the moment, but I look forward to another meeting (hopefully, this afternoon or tomorrow morning) to discuss all of this information in detail.
For the consequences:
Use, Case 2 as Status quo.
Use, Case 3 and Case + filters to measure just SAC vents and filtered vents.
Use Case 6 to measure just spray (or whatever we would want to order them to do) Use Case 7 to measure spray + SAC vents Use Case 7+filters to measure spray + filters.

For the probabilities, use the initiating probabilities from Marty and Tim (PRA and Operator Experience) - received Use the probability of flex prevention (Marty) - received Probability of vents or spray failing (Marty) - probably need updated numbers Probability of flex mitigation (Marty) - received (does this need update?) Probability of liner melt when spray and when no spray (Marty) - I know Marty provided me a sequence tree, but I would like to go through it again for each of these scenarios.
All of these probabilities will give me the probabilities of successful mitigation of the accident and that I would use for all cases. When failure it goes to SQ, so ignored.

Filter-based analysis:
Take unfiltered version (Case 3 and 7) and subtract the exposure from filtered version (case 3+filter and case 7+filter) and multiply times the probability of accident information to determine the net benefit from filters.

In relation to your sensitivity analyses you provided in the email, I am not the technical expert in relation to what you think is defensible or the possible sequences. If you believe that these sequences would make the technical basis stronger, then I would suggest adding them. In relation to the RA, we an always provide a high, middle/mean, low sensitivity analysis stating we are not sure how this will work or, if possible, find out which scenario is best and force the licensees to make sure that scenario occurs.

From: Notafrancesco, Allen
Sent: Wednesday, May 23, 2012 6:51 AM
To: Basu, Sudhamay; McKirgan, John; Lane, John; Monninger, John; Dennig, Robert; Fretz, Robert; Szabo, Aaron; Stutzke, Martin; Lee, Richard; Collins, Timothy
Cc: Ross, Kyle Wayne
Subject: RE: containment venting MELCOR runs

All...particularly Aaron if you could clarify how these code sensitivities support your "story-line"....we seem to be putting liner melt and non-liner melt on the same footing even though we want to downplay that outcome based on PRA and Fukushima insights. Clearly before liner melt, the DW will experience excessive leaking, so venting would help to some degree.

Based on Monday's discussions we came away with the cases stated below, case 12 & 13 where case 12 will lead to liner melt and case 13 will DW vent before DW sprays are activated. (I think maybe the sprays should be on before venting)

Based on the Tuesday discussions, I offer the following code sensitivities:

A. Case 6 with cycled venting;

B. Case 2...DW sprays (300 gpm, default droplets) on at 45 psig and vent at 60 psig thru WW (leave open)

C. Case 2...DW sprays (300 gpm, large droplets) on at 45 psig and vent at 60 psig thru WW (leave open)

D. Case 2...DW sprays (300 gpm, default droplets) on at 45 psig and vent at 60 psig thru DW (leave open)

E. Case 2...DW sprays (300 gpm, large droplets) on at 45 psig and vent at 60 psig thru DW (leave open)

Much of this may not go into the reg analysis but would provide a basis to address the industry's focus on sprays and its benefit.

Allen

From: Basu, Sudhamay RES
Sent: Tuesday, May 22, 2012 5:39 PM
To: McKirgan, John; Lane, John; Monninger, John; Dennig, Robert; Fretz, Robert; Szabo, Aaron; Stutzke, Martin; Lee, Richard; Notafrancesco, Allen; Collins, Timothy
Cc: Ross, Kyle Wayne
Subject: containment venting MELCOR runs

Hi All:

Based on yesterday's meeting with NRR/JLD and NRO, we selected the following MELCOR/MACCS runs to provide the technical basis for containment filtered venting issue.

Case 2: Peach Bottom SOARCA run (Case 1) with RCIC battery time 16 hours, no venting Case 3: Case 2 with wetwell venting (vent opens and remains opened) Case 6: Case 2 with core spray after LH failure Case 7: Case 2 with core spray after LH failure and wetwell venting (vent opens and remains opened)

All the above cases, venting is through wetwell. NRR/JLD suggested two additional MELCOR/MACCS runs for venting through drywell. These are:

Case 12: Case 2 with drywell venting (vent opens and remains opened) Case 13: Case 2 with containment spray at 24 hours and drywell venting (vent opens and remains opened)

The stylized sequence representing cases 12 and 13 would be, for example, an MSL rupture type failure as in 1F1, caused by disallowing SRV to not stick open in the MELCOR run. With wetwell vent remaining closed, any venting will be through drywell vent opening. For filtered venting options, a DF of 1000 for aerosols and a DF of 100 for gaseous iodine are to be used in MACCS consequence calculations.

Please confirm your agreement with the two new cases described above or provide appropriate modifications by COB 5/23/2012 so we can activate SNL to proceed with the calculations.

Thank you.

Sud