

Doyle, Daniel

From: Doyle, Daniel
Sent: Thursday, February 10, 2011 11:13 AM
To: Wentzel, Michael
Cc: Perkins, Leslie
Subject: FW: Basemat and containment question

Categories: Salem Hope Creek

Mike,

I think the responses below will work.

Dan

Response to comment 1: *At Salem there are several safety systems designed to maintain the containment post-accident pressure below the design pressure. Per Salem's UFSAR Section 6.2.2, the Containment Fan Cooling System and the Containment Spray System maintain the post-accident containment pressure and temperature below design values. These systems are designed to address pressure and temperature spikes after a LOCA; however, they would operate the same way if there were spikes due to steam related to core melt. All reactor containment designs both PWR and BWR, are supported by systems to suppress the pressure of a postulated LOCA, and to remove the heat from the containment safely, such that reactor vessel breach is highly unlikely.*

Response to comment 2: *In licensing to the plant design basis, the core melt is arrested in the vessel, and is not postulated to continue to the spaces below the vessel. The BWR Mark I containment at Hope Creek Generating Station is a different design, but it also has concrete below the vessel as part of the reactor building. Breaches of the reactor vessel are considered beyond the design basis, but the potential consequences are examined in the Severe Accident Program. All reactor containment designs both PWR and BWR, are supported by systems to suppress the pressure of a postulated LOCA, and to remove the heat from the containment safely, such that reactor vessel breach is highly unlikely.*

From: Dennig, Robert
Sent: Thursday, February 10, 2011 11:03 AM
To: Doyle, Daniel; Harrison, Donnie; Lehman, Bryce
Cc: Wentzel, Michael; Perkins, Leslie
Subject: RE: Basemat and containment question

You can add to both answers that all reactor containment designs both PWR and BWR, are supported by systems to suppress the pressure of a postulated LOCA, and to remove the heat from the containment safely, such that reactor vessel breach is highly unlikely.

From: Doyle, Daniel
Sent: Thursday, February 10, 2011 10:52 AM
To: Dennig, Robert; Harrison, Donnie; Lehman, Bryce
Cc: Wentzel, Michael; Perkins, Leslie
Subject: RE: Basemat and containment question

Thanks, Robert. DRA/APLA was the first branch that we contacted about these comments but they recommended we talk to a technical branch that is familiar with the containment design and could provide a basic explanation of how it would handle a pressure/temperature spike due to flashing steam (as a result of a

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core melt or anything else). We got that response to comment 1 from Bryce (DLR/RASB), but he recommended we run it by your branch. I think what you provided in your e-mail below answers the second comment, with a minor edit by me in red to tie the response back to the question.

So, unless Robert, Donnie, or Bryce have any revisions, here are the responses we will go with. Thanks for your help!

Response to comment 1: At Salem there are several safety systems designed to maintain the containment post-accident pressure below the design pressure. Per Salem's UFSAR Section 6.2.2, the Containment Fan Cooling System and the Containment Spray System maintain the post-accident containment pressure and temperature below design values. These systems are designed to address pressure and temperature spikes after a LOCA; however, they would operate the same way if there were spikes due to steam related to core melt.

Response to comment 2: In licensing to the plant design basis, the core melt is arrested in the vessel, and is not postulated to continue to the spaces below the vessel. The BWR Mark I containment at Hope Creek Generating Station is a different design, but it also has concrete below the vessel as part of the reactor building. Breaches of the reactor vessel are considered beyond the design basis, but the potential consequences are examined in the Severe Accident Program.

Dan Doyle

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From: Dennig, Robert
Sent: Thursday, February 10, 2011 9:45 AM
To: Doyle, Daniel
Cc: Wentzel, Michael; Perkins, Leslie; Lehman, Bryce; Harrison, Donnie
Subject: RE: Basemat and containment question

In licensing to the plant design basis, the core melt is arrested in the vessel, and is not postulated to continue to the spaces below the vessel. The BWR Mark I containment is a different design, but it also has concrete below the vessel as part of the reactor building. Breaches of the reactor vessel are considered beyond the design basis, but the potential consequences are examined in the Severe Accident Program. Donnie Harrison of NRR/DRA deals with severe accident consequences and can provide further information.

From: Doyle, Daniel
Sent: Wednesday, February 09, 2011 10:51 AM
To: Dennig, Robert
Cc: Wentzel, Michael; Perkins, Leslie; Lehman, Bryce
Subject: Basemat and containment question

Robert,

I am coordinating the NRC response to two public comments received on the Salem/Hope Creek draft SEIS for license renewal. The two comments are below. I checked with RASB in DLR and they provided a draft response to the first comment but recommended that I check with your branch to review the draft response and provide the response to the second comment.

Can you help me with this or point me in the right direction? Thanks for your time.

Comment SHC-W-14: SAMA – Breakdown of Population Dose by Containment Release Mode for Salem Generating Station / Table 5-4 / Page 5-6 / Line 10.

For the “Basemat Melt Through (BMT)”, population dose is considered negligible. The BMT is a protection system for the basemat of reactor containment buildings in nuclear power stations. The system comprises a structure located in a cavity below the reactor vessel and submerged in water. The structure comprises staggered layers of stainless steel beams for intercepting molten material escaping from the reactor vessel during meltdown of the reactor core. The system is designed so that the molten material is distributed in thin layers over wings of the beams and transfers its heat to the surrounding water thus affording a rapid quenching of the molten core and safeguarding the integrity of the basemat.

Would there be any chance, even within the basemat system of staggered layers of steel beams, of a flash to steam of the molten material and potential release to the atmosphere augmenting/ causing a potential contribution to population dose? Have there been model studies done to confirm the report’s claims of negligible contribution to population dose? The steam generated during this core melt must be relieved somewhere.

Response (draft): *At Salem there are several safety systems designed to maintain the containment post-accident pressure below the design pressure. Per Salem’s UFSAR Section 6.2.2, the Containment Fan Cooling System and the Containment Spray System maintain the post-accident containment pressure and temperature below design values. These systems are designed to address pressure and temperature spikes after a LOCA; however, they would operate the same way if there were spikes due to steam related to core melt.*

Comment SHC-W-15: Why is there no basemat system present at Hope Creek Generating Station? Is it related to the design of the HCGS BWR?

Response: *(insert response)*

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