From: Randall Fedors
Sent: Wednesday, September 27, 2006 3:16 PM
To: Chandrika Manepally
Subject: RE: seepage agenda

Can't answer the second question. But for the first question, consider that there are 2 times when the temperature at the drift wall is 105 C, once pre-peak and once post-peak. The dryout zone thickness is markedly different at these two times. Also, remember that the temperature gradient input to O.M. Phillips is sampled in TPA, i.e., not a function of temperature and rock properties as it should be.

I wasn't trying to discourage Ron's particpation. I am only trying to focus the afternoon discussions, yet still let Ron bring up his ideas.

--Randy

>>> Chandrika Manepally <cmanepally@cnwra.swri.edu> 09/27/2006 12:47 PM >>>
Thanks for sending the documents!
Regarding Ron's involvement for the workshop, it will be rather limited i.e., providing the evidence for thermal seepage and penetration of the boiling isotherm..
Regarding the temp. threshold constraint - OM Phillips already uses the entire dryout zone in its calculations right?

Do you think we can look at distribution of the pressure (Metra model??) in addition to the thermal gradient that could tell us what drives the thermal seepage? Is that something worth looking at ?

-Chandrika

-----Original Message-----
From: Randall Fedors [mailto:RWF@nrc.gov]
Sent: Wednesday, September 27, 2006 11:28 AM
To: Chandrika Manepally
Subject: RE: seepage agenda

Tell Ron to talk to me about the temperature or temperature gradient dependency. Last fall/winter we flushed out ideas on how to put temperature dependency into the O.M. Phillips model (it only has temperature gradient dependency). For expediency, we stuck with letting the temperature threshold constrain the REFLUX3 (O.M. Phillips) results. Thus, both models are required. Previously, REFLUX3 provided the same flux whether the temperature was 98 C or 180 C.

What Ron is suggesting is to go the other way (compared to modifying the O.M. Phillips solution), i.e., constrain the temperature threshold model by adding a temperature gradient dependency. However, part of the problem is defining a relevant temperature gradient to use; e.g., do we use the entire dryout zone, or just use a small zone near the drift or a zone near the boiling isotherm.

As for the general approach we should take to the workshop, you or I should start the discussions so that we can focus the group. I worry about letting Ron lead the discussion on the thermal seepage model because he was not participating fully the past year. I would prefer is input be in terms of being prepared to suggest analyses, including having slides ready as he sees fit.

As for the 100C threshold, see TEF.2.08 response in the attached files (letter and attachment), specifically page 10 of attachment.

--Randy

>>> Chandrika Manepally <cmanepally@cnwra.swri.edu> 09/27/2006 11:55 AM >>>
Randy
will work on the agenda shortly. Just talked to Ron about thermal seepage (Comment 1). I asked him for a 1-2 slides that show that there is penetration of the boiling isotherm (DST, Large Block test, CNWRA expt.???). I also talked to him about the seepage threshold temp. parameter. He says we should do some simple calcs and make it dependent on the temp. gradient (similar to O.M. Phillps) rather than setting fixed values. We can talk about it more in the next couple of days.. Could you give me some more details about the letter to DOE about their 100 C threshold? Need some details before I can search it on ELF/ADAMS..

Thanks!
Chandrika

-----Original Message-----
From: Randall Fedors [mailto:RWF@nrc.gov]
Sent: Wednesday, September 27, 2006 5:45 AM
To: Chandrika Manepally
Subject: RE: seepage agenda

Chandrika,

Go ahead and make the agenda extend to a day and a half for UZ2 topics. I had hoped to cut to discussions quickly, and not have long presentations. I realize we will have to do a little bit of getting everyone up to speed, though past PA meetings should have already served this purpose.

My comments, for your discussion with Osvaldo:

Comment 1. There is no reason for us to use DOE conclusions when we do not believe them. Ron, and probably Jeff, probably think the 105 to 120 C range was not large enough. I pretty much decided myself on that range. That is why we really need to have an agenda item on the threshold range. You can also tell Osvaldo that we wrote in a letter to DOE that we disagreed with their threshold set to 100 C.

Comment 2. It is on the agenda, but you can explicitly add this as a bullet. Though, I think it will be more important to add a bullet to the rubble agenda item "nature and characterization of rubble," because I think some staff believe flow through the rubble will be similar to flow through

classical granular porous media (Andy and Tim subscribed to this, but I have since talked Tim through the reasoning). Note that REFLUX3 applied to the rubble gives a time delay (thermally-based). Ask Osvaldo to pour water on rip-rap and see how much delay occurs (with or without pre-wetting).

Comment 3. The REFLUX3 model gives us rates of thermally modified flow, it is physically more reasonable than assuming ambient percolation, and it doesn't cost much computationally. But, we can still add this question as a bullet to the reflux agenda item so that others can offer opinions.
Comment 4. All four of those parameters are drip shield and waste package breaching parameters. While we can be aware of them, I do not think it prudent for UZ2 to be responsible for coming up with the values. Maybe add just a bullet to the TPA abstraction discussion in the first morning. Technical staff who are responsible for drip shield and waste package integrity have a much better idea of what is going on. If you still want to address those parameters, then we should do it on a second day with a different assemblage of staff. Pavan was the person I thought was addressing those types of issues, and presumably he was doing it in collaboration with Luis. You or I can participate just to make sure we know what is going on.

--Randy

>>> Chandrika Manepally <cmanepally@cnwra.swri.edu> 09/26/2006 7:27 PM >>>
Randy
Osvaldo's presentations had the following questions related to Seepage. I think most of the topics you've outlined address these questions. We may want to add another quick session for Question 4.
I'll talk to Osvaldo tomorrow and get his feedback on the current agenda.

Another comment was the time allotted for each topic.. I think you are being very optimistic!
All TPA related meetings take more time than planned..We may want to have some flexibility in the agenda...

1) DOE assumes no seepage when drift wall temperature is in excess of 100°C.
Is the seepage threshold temperature (ranging from 105 to 120°C) reasonable?

2) Can rubble on top of the drip shield significantly reduce or delay seepage contact with the waste package?

3) Do we need a reflux model?

4) Seepage modelers should help providing technical basis to parameters listed below (some of them are very new!)
InitialSeepageReductionFractionByMechFailedDS
Proposed Uniform[10-3, 0.2]
Overlapping drip shields open up and expose underlying WPs

DSSeepageProtectionDegradationRate[1/yr] (slope)

Proposed 10-5 1/yr
Slope only activated with seismic events

InitialSeepageReductionFractionByMechFailedWP
Proposed Uniform[1.0e-5, 2.0e-3]
Only a small portion of the WP surface is initially breached

WPSeepageProtectionDegradationRate[1/yr]
Proposed 10-6 1/yr
Slope only activated with seismic events

-----Original Message-----
From: Randall Fedors [mailto:RWF@nrc.gov]
Sent: Tuesday, September 26, 2006 7:14 AM
To: Chandrika Manepally
Cc: Jeffrey Pohle; Jack Guttmann; Jin-Ping Gwo; James Rubenstone; Keith Compton
Subject: seepage agenda

Chandrika,

As promised yesterday, here's a draft of an agenda for the seepage workshop, just to let you know what I was envisioning for the 1+ days. Add your thoughts and integrate in the discussions from the recent meeting center PA staff had on the subject.

--Randy

Jack Gwo, Keith,
We're talking about the third week of October, 1 day at San Antonio for the workshop. I asked about Dick Codell joining us, but Andy said it is not possible at this time. Preferences for which day during that week should be conveyed quickly (Oct 16-20). I expect Osvaldo to be a contributor from the center PA, though many other staff will be present.

Hearing Identifier: HLW_YM_NonPublic_EX
Email Number: 114

Mail Envelope Properties (Randall.Fedors@nrc.gov20060927151606)

Subject: RE: seepage agenda
Sent Date: 9/27/2006 3:16:06 PM
Received Date: 9/27/2006 3:16:06 PM
From: Randall Fedors

Created By: Randall.Fedors@nrc.gov

Recipients:
"Chandrika Manepally" <cmanepally@cnwra.swri.edu>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	8561	9/27/2006 3:16:06 PM

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