## HLWYM HEmails

**From:** Randall Fedors
**Sent:** Monday, October 02, 2006 9:40 AM
**To:** Thomas Matula
**Cc:** Jack Guttmann; Aladar Csontos
**Subject:** AOI-OAR-05-05-01

Tom
(and Al, this counts as returning your call),

Here are some comments from previous NRC letters to DOE (Technical Agreement responses) and some comments on field and laboratory test observations. Note that DOE is effectively relying on modeling exercises to support their contention for thermal seepage.

As a background, there are some relevant comments made in NRC responses to Technical Agreements:

1. TEF.2.01 Heat and Mass Loss out the bulkhead of DST
2. TEF.2.08 and GEN.1.01 (15) Preferential flow breaching the dryout zone & factoring in changes to water properties such as increased boiling temperatures of concentrated solutions

NRC was rather explicit in the their responses to DOE in stating that no conclustions or inferences on water flow could be derived from the DST (Drift-Scale Heater Test) because most (estimated at ~70%) of the evaporated water in the test, escaped out the bulkhead and into the ventilation system of the ESF (the ventilation intake was 2-3 meters from the bulkhead). Validating their TH or THC model in regards to potential for water flow needs to look at other tests (of which there are no other tests to support their position).

The response for Technical Agreement TEF.2.08, while noting that DOE was considering 2 options for the TSPA abstraction, specifically states that if Option 1 is used, NRC will have more questions. Option 1 is the cessation of dripping when the ceiling temperature is 100 C. Whereas as Figure 6.2-2 noted at the end of AOI-OAR-05-05-01 is interesting, we should also note that disequilibrium between the matrix and fracture is conceptualized for UZ flow. Furthermose, inherent in the O.M. Phillips solution (and the DOE's modification thereof) is the presumption of heterogeneity of the porous media.

The NRC response for Technical Agreement GEN.101 (15) closed the agreement because the DOE "considered" saline solutions. DOE considered saline solutions by noting that all water collected from the DST was too dilute to trigger a significant increase in boiling temperature. The NRC response noted that the collection may have been biased by collection of condensation occurring in boreholes, not the collection of water seeping down fractures. The agreement response left the door open on the effect of saline solutions.

While not included in the NRC responses, there are now several relevant points of observation made at DST: (i) local DST temperature signals could be interpreted to be episodic preferential flow in dryout zone; (ii) corrosion of wire casings in DST (DST opening April 2006) suggest the possible presence of corrosive dripping into the drift (on the other hand, iron-stained streaks on waste packages and floor may indicate less corrosive water, ?condensate?); (iii) presence of

sludge/crust in DST, partially solidified in ceiling (espically at rock bolt locations) may be due to non-Newtonian fluids seeping down to drift, or due to high evaporation rate caused by mass loss out bulkhead.

Point of observation made at CNWRA laboratory experiment: Sludge dripped into drift opening and corroded the sensors during the experiment (not once the heat was turned off and the experiment was being shut down).

I'd also like to note that the cited documents are not yet available for NRC review, specifically ones dealing with the 100 C temperature threshold. I checked the DOE web site and the LSO list from the end of last week.

Don't know if this is where you wanted me to go with comments on the AOI, so let me know....

--Randy

**Hearing Identifier:** HLW_YuccaMountain_Hold_EX
**Email Number:** 127

**Mail Envelope Properties** (Randall.Fedors@nrc.gov20061002094006)

**Subject:** AOI-OAR-05-05-01
**Sent Date:** 10/2/2006 9:40:06 AM
**Received Date:** 10/2/2006 9:40:06 AM
**From:** Randall Fedors

**Created By:** Randall.Fedors@nrc.gov

**Recipients:**
"Jack Guttmann" <Jack.Guttmann@nrc.gov>
Tracking Status: None
"Aladar Csontos" <Aladar.Csontos@nrc.gov>
Tracking Status: None
"Thomas Matula" <Thomas.Matula@nrc.gov>
Tracking Status: None

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**Sensitivity:** Normal
**Expiration Date:**
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