HLWYM HEmails

From: Hakan Basagaoglu
Sent: Wednesday, February 27, 2008 1:33 PM
To: David Pickett
Subject: RE: SER Outline Section 3.7.1 and 3.7.2

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David,

Yes, these two items below are correct (and DOE implemented them as they were described below- p. 47 -48 and p. 116 of their SNL, 2007))

> Stainless steels do
> not corrode fast compared with carbon steel, and the corrosion
> products of stainless steels may not be porous for creating large
> surface area as those from carbon steels.
>
> - confirm that the sorption properties of radionuclides on corrosion
> products of stainless steels were properly assessed. The chemical
> properties of corrosion products of stainless are not the same as
> those from carbon steels in radionuclide sorption characteristics.

David, I have a few minor suggestions below. You may want to include them if you think they are appropriate. Thanks, Hakan

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3.2.3 Colloid abstractions through the system
. DOE models for colloid availability are consistent throughout the engineered barrier system, unsaturated zone, and saturated zone
o Groundwater colloid MASS concentrations are consistent THROUHOUT THE SYSTEM
o MASS Concentration and stability of colloids generated in the engineered barrier system are treated consistently
o REVERSIBLE and IRREVERSIBLE radionuclide association with colloids is treated consistently

Quick comments on minor revisions above:
1) MASS concentration is easier to keep track. Moreover, mass-balance check is the requirement for the model validation (p. 7.1 og the SNL, 2007)
2) same as above
3) Just to be more explicit

3.6.1 The abstractions of colloid-associated release and transport processes should be
clearly and consistently linked throughout TSPA.

"I would consider adding the following statement

- Confirm that DOE has demonstrated the "relative" importance of sorption of radionuclides onto stationary corrosion products in the EBS and/or in porous and fractured domain) vs. irreversible and reversible association of radionuclides with the colloids.

Quick comments on that:
(1) - reversible sorption of RN onto stationary corrosion product in the EBS could slow down the RN transport (and hence increase their residence time).
On the other hand, reversible sorption of RN onto mobile colloidal particle enhance the RN transport and reduce their reaction (decay) times in the fractured domain
(2) - if the advective flow is very small and colloids are unstable, TSPA-LA could allow irreversible sorption of Pu and Am onto stationary corrosion products in the EBS, and about 1-10% of Pu and Am irreversibly attached onto mobile colloids will remain in the EBS and the remanining 890-99% of irreversible attached RNs will leave the EBS. If I understand correctly, TSPA-LA allows filitration of irreversible colloids at the interface of saturated and unsaturated zones. How significant such trapping (or irreverible attachment of RNs) on stationary surfaces in dose calculations when compared to reversible and irreversible RN transport with mobile colloids or in a dissolved phase?

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