HLWYM HEmails

From: David Pickett
Sent: Friday, January 07, 2005 12:50 PM
To: Richard Codell; David Brooks; John Bradbury
Cc: Gregory Hatchett
Subject: RE: tbd8 review draft

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Dick,

Sorry for not responding sooner, but I'm waiting for other opinions on timing of (i) stainless steel corrosion and (ii) iron phase evolution to more crystalline phases. But you make a good point, and it's something we'll need to consider as we review the EBS transport abstraction (which is now available). And we need to think separately of the consequences for in-package sorption and colloid formation.

David

> -----Original Message-----
> From: Richard Codell [mailto:RBC@nrc.gov]
> Sent: Wednesday, January 05, 2005 2:37 PM
> To: DPICKETT@cnwra.swri.edu; David Brooks; John Bradbury
> Cc: Gregory Hatchett
> Subject: tbd8 review draft
>
>
> David:
> I have one comment concerning GEN 1.01 comment 38 response and
> elsewhere on the discussion of the new DOE approach to sorption onto
> corroding iron products inside the waste package. I read DOE's
> description in "Waste form indrift colloids-associated radionuclide
> concentrations: abstraction and summary". While I feel the phenomenon
> is real, I think it efficacy would depend on the timing of the
> sequence of WP failure and steel corrosion. For example, given that
> the WP fails and water gets inside, the non-stainless steel would
> certainly start to corrode, first to ferrihydrite, but then progress
> to more crystalline forms like goethite and hard flaky rust. The
> surface area and sorption of ferrihydrite is well known to be large,
> but the crystalline forms much less so. Its possible that the
> ferrihydrite would sorb a lot of Pu and Am, but I am not so sure that
> it would do the job in the rust form. The whole rusting process is
> likely to occur quickly, hundreds of years, but its likely that the Pu
> and Am would not be available before all the soft steel has corroded
> to hard rust. Cladding is likely to protect most of the spent fuel for
> many years following WP failure, and even when the cladding has
> failed, the low solubility and long half life of the Pu would assure a
> supply of dissolving radionuclides long past the period of steel
> corrosion. Corrosion of the stainless steel in the WP is another
> matter, but I don't think it would corrode fast enough to supply iron
> colloids of any consequence. What do you think? Dick
>
> Richard B. Codell, Ph.D.
> Senior Hydraulic Engineer

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From: David Pickett

Created By: dpickett@cnwra.swri.edu

Recipients:
"Gregory Hatchett" <Gregory.Hatchett@nrc.gov>
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