HLWYM HEmails

From: Goodluck Ofoegbu
Sent: Thursday, February 16, 2006 5:01 PM
To: Osvaldo Pensado; Xihua He
Cc: Luis Ibarra
Subject: RE: Localized Corrosion, Drift Degradation, and RDTME Agrement Closure

I believe everything you said, but …

DOE considers the effect of drift degradation on temperature as part of the seismic scenario only. It is not included in the base case model. If our conclusion still is that the only effect of drift degradation on corrosion is through its effect on temperature and that the temperature effect is unimportant because of the nature of localized corrosion and its rates, then the document still stands. If on the other hand it is important to consider the effects of increasing the length of time for LC-favorable temperature conditions, then the basis for closing this aspect of the drift degradation agreement may be in geopardy.

> -----Original Message-----
> **From:** Osvaldo Pensado [mailto:opensado@cnwra.swri.edu]
> **Sent:** Thursday, February 16, 2006 3:18 PM
> **To:** xhe@cnwra.swri.edu; ofoegbu@cnwra.swri.edu
> **Cc:** 'Luis Ibarra'
> **Subject:** RE: Localized Corrosion, Drift Degradation, and RDTME Agrement Closure
>
> I offer another perspective.
>
> I think that a wrong argument was put in the letter. For example, the effect of drift degradation on localized corrosion is accounted for via changes in the temperature and chemistry. DOE is investigating the high temperature deliquescence systems, under which apparently high corrosion rates can be exhibited. The range of conditions under which localized corrosion could be exhibited has been investigated by the DOE. In other words, DOE is doing its job. To the best of my knowledge, DOE will disregard localized corrosion in the performance assessment based on chemistry considerations.
>
> If drift degradation happens, it would raise the temperature, change the relative humidity, possibly change the chemistry (but possibly not). The dependence of corrosion on chemistry and temperature must be known to assess possible consequences. We will review whether DOE has offered enough description and consideration of uncertainty in the corrosion processes, and whether that characterization applies to the high-temperature system associated to the drift degradation case.
>
> Drift degradation by itself does not make corrosion worse. The effect of drift degradation on corrosion is indirect, through changes to the temperature and chemistry. The temperature and chemistry ranges considered must be consistent with the likely scenarios.
>
> Xihua's results indicate that LC rates are very low, so that damage by LC is comparable to damage by passive corrosion. We still need studies to determined the dependence of LC rates on temperature (waters above 100 °C could contact the WP).
>
> Xihua, are there any plans to characterize the temperature dependence of LC rates?
>
> I have the feeling that at higher temperatures, LC is more difficult to be sustained due to limited water volumes. I would guess that LC is not a relevant concern under any scenario, including drift degradation.
>
> > -----Original Message-----
> > **From:** Xihua He [mailto:xhe@cnwra.swri.edu]
> > **Sent:** Thursday, February 16, 2006 2:35 PM
> > **To:** ofoegbu@cnwra.swri.edu; 'Osvaldo Pensado'

Cc: 'Luis Ibarra'
Subject: RE: Localized Corrosion, Drift Degradation, and RDTME Agrement Closure

Compared to uniform corrosion rates localized corrosion penetration rates are much higher, but it is slower that what we assumed in TPA code. The localized corrosion penetration rates are temperature dependent. Typically we say that localized corrosion will not occur when the temperature is below 80°C. If the drift degradation can lead to temperature > 80°C, that might have an effect on localized corrosion penetration rates. But if localized corrosion also stifles and repassivates at higher temperature resulting limited penetration, the effect wouldn't be significant.

Xihua

-----Original Message-----
From: Goodluck Ofoegbu [mailto:ofoegbu@cnwra.swri.edu]
Sent: Thursday, February 16, 2006 2:06 PM
To: 'Osvaldo Pensado'; Xihua He
Cc: 'Luis Ibarra'
Subject: Localized Corrosion, Drift Degradation, and RDTME Agrement Closure

Please examine the last two sentences of the second paragraph on page 6 of the attached document. The point of the two sentences appears to be that the effect of drift degradation on localized corrosion need not be considered because the increased exposure time to conditions favorable to localized corrosion would likely not be of any effect since the penetration rate is already very fast (without drift degradation effects). So if your current data indicates a longer penetration time: (1) would it mean that the effects of drift degradation could be important, and (2) should we not then insist on DOE accounting for the effects of drift degradation on localized corrosion?

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From: Goodluck Ofoegbu

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