Circle, Jeff

From: Rex Wescott NRR
Sent: Wednesday, February 25, 2009 12:52 PM
To: Melanie Galloway; Mike Franovich; Jeff Circle; Raman Pichumani; David Skeen; Allen Howe
Cc: Kamal Manoly; Meena Khanna; James Vail; Jeffrey Mitman; Fernando J Ferrante; Walt Rogers
Subject: RE: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

To all,

I agree with what Melanie has provided.

Rex

From: Melanie Galloway NRR
Sent: Wednesday, February 25, 2009 12:10 PM
To: Rex Wescott; Mike Franovich; Jeff Circle; Raman Pichumani; David Skeen; Allen Howe
Cc: Kamal Manoly; Meena Khanna; James Vail; Jeffrey Mitman; Fernando J Ferrante; Walt Rogers
Subject: RE: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

To All:

Rex and I spoke in an effort to ensure that there was a common understanding of the probabilistic analysis that leads NRC to conclude that random dam failures are credible for the Jocassee Dam. I shared with Rex the fact that our calculation took into account that certain dam failures are not applicable to Jocassee Dam and other modern constructed dams and need to be eliminated from the aggregate dam failure data in coming up with a reasonable failure probability. I noted that we eliminated dam failures from infant mortality (failure upon initial filling or in the first year of operation), failures of dams less than 50 feet high, and dams constructed before 1900 (there were actually very few dams constructed between 1900 and 1940). Further, we performed the probability calculation for only rockfill dams in coming up with a failure probability of E-4.

Rex noted that he had not realized that our failure probability calculation was relatively sophisticated in that it did not simply include all dams. On this basis, he has indicated that his last sentence of his previous e-mail has been addressed such that he would agree that our probability calculation is defensible and that it supports needing to consider Jocasseee dam failure.

We also talked about the issues Ken has raised regarding overtopping potential of the dam (failure to consider antecedent precipitation and saturated soil conditions), and Rex agrees that they are key questions that need to be considered to understand whether the dam can be overtopped.

Melanie

From: Rex Wescott
Sent: Wednesday, February 25, 2009 9:34 AM
To: Mike Franovich; Jeff Circle; Melanie Galloway; Raman Pichumani; David Skeen; Allen Howe
Cc: Kamal Manoly; Meena Khanna; James Vail; Jeffrey Mitman; Fernando J Ferrante; Walt Rogers
Subject: RE: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

To all,

I think too much may be being made of my thoughts and opinions. I have no familiarity with Oconee NPS or Jocassee Dam. I assume that Raman and Fernando talked with me because of my past esperience with

B-41

reactor licensing and participation on the ANS 2.8 working group and other flood hydrology committees. In regard to monitoring, I agree with Jeff and Mike, most high hazard earthfill dams are now monitored which probably reduces the failure rate in the statistical population. I was careful to say that monitoring alone does not eliminate the possibility of an internal seepage failure, it should provide warning, however. Depending on the condition observed and characteristics of the dam- reservoir system, warning may allow steps to be taken to eliminate or mitigate the effects of the dam failure such as repairing the problem or lowering the water level. (This is an issue that should be evaluated by a geotechnical engineer, familiar with dam construction and repair) Also, there may be other dam failure or partial failure modes that can not be monitored for, such as a failed spillway gate (if appropriate for J dam). This is another reason I tend to think that a probabilistic analysis of dam failure based on the overall population of dams may be hard to defend.

Rex

From: Mike Franovich
Sent: Wednesday, February 25, 2009 8:35 AM
To: Jeff Circle; Melanie Galloway; Raman Pichumani; David Skeen; Allen Howe
Cc: Kamal Manoly; Meena Khanna; James Vail; Jeffrey Mitman; Fernando J Ferrante; Rex Wescott; Walt Rogers
Subject: RE: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

Melanie,

I concur with Jeff. Other dams have failed that were monitored. This is one of the challenges if assumptions are made that organizations will follow procedures, maintain or have established appropriate leakage detection thresholds, and make proper decisions as a basis to lower risk estimates. It is certainly prudent to have additional monitoring in place, but it is a slipper slope to use it to justify altering the statistics. Once again 1E-4/yr is not a conservative, bounding value. It represents a mean value.

If one tried to use monitoring as a basis for risk reduction, we could go through an exercise to reduce LOCA/pipe break frequencies. As it turns out, one of the reasons the frequencies are low is because there are monitoring programs (ISI, leakage detection) in place already. One would be double counting/double crediting additional detection if trying to apply a fudge factor to reduce the numbers below what operating experience results support. This is why we use the term "90 percent credible interval" in the statistical analysis. A licensee's results outside that range suggests something unusual in the method of calculation chosen, and most likely not justified. Duke Hydro really has not justified that the J-dam is unique or that as an organization the are better than the vast majority of dam operators and hydro station owners. Having worked in the Duke system, there are plenty of myths about their capabilities and examples that demonstrate they are not superior performers in the nuclear arena, and I can't see the hydro part of the company being more robust than its nuclear counterparts.

v/r

Mike

From: Jeff Circle
Sent: Tuesday, February 24, 2009 10:04 PM
To: Melanie Galloway; Raman Pichumani; David Skeen; Allen Howe
Cc: Kamal Manoly; See-Meng Wong; Meena Khanna; James Vail; Jeffrey Mitman; Mike Franovich; Fernando J Ferrante; Rex Wescott
Subject: RE: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

Melanie,

I couldn't get back to you sooner since the Internet connection here is spotty at best.

Points 2 and 3 credit monitoring for reduction of failure rate frequency. This has been done in the past with other systems (such as failure of a 125V dc bus) and seems reasonable on the surface. However, it only works if Jocassee Dam is unique amonst dams. From the evidence that we have, Jocassee does not seem to be any special than any other high hazard classified dam in our database.

Point 7 reiterates what we've been saying, except I would say less than 1E-4 for rockfill dams.

Jeff.

From: Melanie Galloway
Sent: Friday, February 20, 2009 5:42 PM
To: Raman Pichumani; David Skeen; Allen Howe
Cc: Kamal Manoly; See-Meng Wong; Meena Khanna; Jeff Circle; James Vail; Jeffrey Mitman; Mike Franovich; Fernando J Ferrante; Rex Wescott
Subject: RE: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

It's not clear to me how points 2 and 3 are reconciled with point 7. If point 7 is correct (which we and the licensee believe to be true), then the licensee would need to protect the site against that possibility.

But if points 2 and 3 are correct, then the licensee would be demonstrating a failure probability of less than E-7.

Can someone help?

From: Raman Pichumani
Sent: Friday, February 20, 2009 4:24 PM
To: Melanie Galloway; David Skeen; Allen Howe
Cc: Kamal Manoly; See-Meng Wong; Meena Khanna; Jeff Circle; James Vail; Jeffrey Mitman; Mike Franovich; Fernando J Ferrante; Raman Pichumani; Rex Wescott
Subject: Summary of Meeting with Rex Wescott on Oconee Flooding Issue

Dear All,

Please find attached a summary of the meeting with Rex Wescott, myself, and Fernando Ferrante.

Thank you,
Raman, Fernando