From: Randall Fedors
Sent: Thursday, July 26, 2007 1:12 PM
To: Christopher Grossman
Subject: Re: TPA Analysis - Bulking Factors

The temporal plot does not seem to be indicative of a linear response (TEDE as a function of bulking factor, no matter what type of equation one would try to use for this relation).
--Randy

>>> Christopher Grossman 07/26/2007 1:07:10 PM >>>
Randy-

Your presumption is correct. REF was the reference input set (i.e., fully stochastic parameterization as supplied by CNWRA with TPA - bulking factors were the beta distributions). For BF case, the only change made was to the bulking factors - switching from beta to uniform[1.5,2.0]. Because this was the only change all other sampled parameters should have been sampled by TPA identically between the two cases indicating that the only change would be from the bulking change. Therefore, there shouldn't have been other confounding factors influencing the results.

Chris

Christopher J. Grossman
System Performance Analyst
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
301-415-7658
cjg2@nrc.gov
>>> Randall Fedors 07/26/07 12:55 PM >>>
Chris,
I presume you ran the basecase stochastic input file with the two different bulking factor distributions?? Meaning, there may be other factors influencing the results. This is what I meant by teasing out conclusions. You could have run the mean case input file with the two different distributions of bulking factor, and plotting bulking factor as a function of TEDE (I don't know the outputs, maybe this has to be done using several deterministic runs).
Also, there is some question of the validity of results at the high end of bulking factors. This is being looked into by the center.
--Randy

>>> Christopher Grossman 07/26/2007 9:14:37 AM >>>
Randy-

I'll try to confirm whether Luis' gut feeling on the BF threshold for creep failure matches my analyses results and get back to you.

Chris

Christopher J. Grossman
System Performance Analyst
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
301-415-7658
cjg2@nrc.gov
>>> Randall Fedors 07/26/07 9:09 AM >>>
Thanks Chris.

I had asked Luis Ibarra to think about developing a plot of bulking factor (Bf) versus drip shield failure. This is an oft-asked question from our management. The answer is not something that can readily be teased out of Chris' plots. Luis' gut feeling was that Bf~1.8 would be a threshold for creep failure.

Disclaimer (for Goodluck): The laboratory estimates are preliminary. Further packing techniques might be implemented to address Goodluck's perspective, and further interpretation of the mining literature values for analogous rock types (original versus residual bulking factors). Bulking factors for analogous rock types range from approximately 1.35 to 2.0 for original to residual values.

--Randy

>>> Christopher Grossman 07/25/2007 10:28:35 AM >>>

As a reminder, the TPA version 5.1 code is currently non-publicly available and any results should remain pre-decisional.

As a result of a discussion at a recent YM Team meeting regarging bulking factors, I ran an analysis with TPA 5.1. Some of you have expressed interest in this work. In the analysis I compare the 1Myr reference case input (REF) for 500 realizations to an alternative input set (BF) in which I reset the rubble bulking factors to uniform distributions from 1.5 to 2.0. Attached are some results - estimated TEDE's and WP Failure comparisons. Attachment 1 is a comparison of estimated TEDE statistics (min, 5%, 25%, 50%, 75%, 95%, max, and mean). The mean is in blue (REF: Solid; BF: Dashed). The peak mean dose reduced 60% from REF and the time of the PMD shifted to 20,000yrs later (from about 75,000 to 95,000 yrs). Attachment 2 is a comparison of estimated mechanical WP failures releasing radionuclides for each subarea. Mechanical WP failures releasing radionuclides in the various subareas exhibited no change to a 35% reduction in the number of mechanically failed WPs.

If you have any questions or would like me to consider some supplemental work, please give me a call.

Chris

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