Damage Pressures for BWR Evaluations – Staff Response to BWROG Presentation on 3-28-12

Nukon – Has been discussed at length. Staff position is that BWROG should justify the assertion that only a 2% increase in Nukon small fine generation would occur by increasing the ZOI appropriately (about 30%) and then showing how such an increase would only result in a 2% increase in small fines at the strainer when the BWR URG methodology for overall debris generation and transport is applied.

Diamond Power Mirror with Standard Bands – 4 psi was used for both BWRs and PWRs. There is no discrepancy, so 4 psi is a good destruction value to use.

Calcium Silicate – Jacketed – The BWR ZOI is already larger than the PWR ZOI, so it is acceptable to use the BWR value. For higher destruction pressures the BWROG model is conservative compared to the ANSI model. Taking the overall ZOI model and destruction pressure range into account indicates that using the BWR ZOI is acceptable and possibly conservative.

Min-K – Unjacketed – Min-K was assigned the largest possible ZOI due to the large amount of damage (70% small and fine) that occurred at 4 psi and a lack of testing at lower pressures. Additionally, the BWR model is not conservative compared to the ANSI model at low destruction pressures. An increase in ZOI from 11.7 to 12.8D based on a destruction pressure change from 4 to 2.4 psi would result in an increase in ZOI volume of about 31%. Licensees that have Min-K should demonstrate that their debris loads would not be increased based on a decrease in destruction pressure. This may be relatively easy to do since there are few BWRs with Min-K and most do not have a large amount. However, Min-K has been determined to be extremely effective in causing strainer head loss. Therefore ensuring that it is treated realistically or conservatively is important.

Knauf – Unjacketed – Knauf has a response similar to that of Nukon except that the destruction amount at 10 psi is significantly greater than that of Nukon (37% vs. 6% small fines). At 6 psi Knauf had 0.4% small fines at 6 psi while Nukon had 2%. It is appropriate to treat Knauf similarly to Nukon and use the lower destruction pressure of 6 psi based on the large amount of small fines generated at 10 psi and the lack of testing between 10 and 6 psi to determine a reasonable destruction threshold.

Koolphen – Unjacketed – Since Koolphen floats and does not contribute to head loss there is no need to include it in debris generation evaluations. However, at 6 psi it generated 32% small fines indicating that a lower destruction pressure is appropriate. The staff approved 4 psi in the URG SE and 3.6 psi in the NEI 04-07 SE. These pressures are probably close enough in magnitude that any difference in debris generation would be within the uncertainties associated with the analysis.