

Draft Response to 2<sup>nd</sup> RAI for Beaver Valley Unit 2 Fresh Fuel Rack Study

The method bias and uncertainty documented in WCAP-14416-P-A were developed based on modeling 32 low enriched benchmark experiments with KENO-Va, with enrichments only up to 4.31%. However, additional highly enriched benchmark experiments were modeled with the same code and methodology as well. The results from these high enriched benchmarks can be used to demonstrate (based on trends in the  $\Delta K$  bias with enrichment) that the inclusion of a set of ~5% enriched benchmark results is not required in order to perform a conservative analysis.

The following table demonstrates how the average delta K-effective (i.e., KENO-Va calculated K-effective minus measured K-effective) changes with enrichment for all of the cases that Westinghouse has used to benchmark KENO-Va to date:

<u>Enrichment</u>	<u># of experiments</u>	<u>Average <math>\Delta K</math></u>
2.35%	6	-0.0075
2.46%	21	-0.0087
4.31%	5	-0.0036
93.2%	12	-0.0011

The data in the above table is supported in Westinghouse verified calc-notes, which are not affected by the axial burnup bias issue that led the NRC to conclude that WCAP-14416-NP-A was no longer a suitable reference to support license amendments.

In fact, WCAP-14416-NP-A Table 1 does include the KENO-Va results for the 12 high enriched experiments that were analyzed. However, the high enriched KENO-Va results were not included in development of the 0.0077 method bias, because the enrichment was well above any encountered in commercial power applications, and because using only the low enriched experiments resulted in a more conservative bias. The reason for the apparent trend in  $\Delta K$  with enrichment is related to an over-estimation of the resonance absorption in U-238.

Westinghouse currently adds 0.0077 for method bias to all KENO-Va K-effective results based on the average of the 32 low enriched experiments. Based on the trend demonstrated in the table above, Westinghouse believes that adding more experiments at or about 5% enrichment to the original 32 experiments would only tend to reduce the  $\Delta K$  bias. This would be less conservative than using the 0.0077  $\Delta K$  bias from WCAP-14416-NP-A in demonstrating that the 10CFR 50.68 K-effective acceptance criteria is met.