Attachment 3: Proposed changes for EPRI Utilization Report & NEI 12-16, Revision 3.

Upon receiving confirmation from the NRC that the provided numbers are agreed, EPRI Utilization Report (3002010614) will be revised and published as Revision 2. For the EPRI Utilization report, revisions will be limited to the Section 4. ***If the proposed changes are agreed to by the NRC, the same changes will be made in NEI 12-16. Specifically, the text in page A-5 will be replaced with the wording given below, for consistency****.*

The text in Section 4 of Utilization report will be revised as following (revisions are highlighted):

Table 4-1
Depletion Reactivity Worth Uncertainty

Burnup (GWd/MTU)	10	20	30	40	50	60
95/95 Tolerance Limit (pcm)	348	537	654	752	831	888
% of Depletion Worth	3.05	2.66	2.33	2.12	1.95	1.81

The steps for validation are described in the EPRI Depletion Benchmark Report [3], with additional guidance for the determination of biases and uncertainties for use in the end-user's criticality analysis:

1. Lattice depletions are performed with the user's lattice depletion tool to 60 GWd/MTU at the precise physical conditions specified in the benchmarks.

2. Decay calculations for each cooling interval of interest (e.g., 100-hours, 5-years, and 15-years) are performed with the user's lattice depletion tool from each depletion branch (10, 20, 30, 40, 50, 60 GWd/MTU) of Step 1.

3. Fuel number densities at each depletion/cooling branch from Step 2 are transferred to the user's criticality model of the lattice[1], and cold k-infinities are computed for each combination of lattice/burnup/cooling time and lattice conditions.

Note: A criticality analysis methodology may make modeling approximations which involve averaging of fuel pin number densities. In such cases, the averaging must also be performed at this Step of the Benchmark analysis.

4. Construct reactivity decrement tables as a function of lattice type, burnup, and cooling interval from the computed k-infinities.

5. Calculate the difference between the applicants calculated reactivity decrement and measured reactivity decrements (calculated minus measured) for the 11 benchmarks. The experimental reactivity decrement tables are presented in Section 2.2 (Tables 2.2 to 2.4). Using this approach, construct biases for the user's methodology/tools as a function of lattice type, burnup, and cooling interval, per the

[1] Underlined model of the lattice for better clarity

guidance in Section 3. Then, determine **the maximum positive difference to be applied as an additional bias**, defined as the Application Code Bias.

Include the Application Code Bias[2] in the overall calculation of maximum keff.

5.a Apply the following additional bias values as a function of burnup to ensure NRC safety margins[3] [Ref] are incorporated:

Table 4-2 Additional Bias for NRC Safety Margins

Burnup (GWd/MTU)	**10**	**20**	**30**	**40**	**50**	**60**
Additional Bias (%)	0.0	0.0	0.0	0.15	0.35	0.54

6. Reactivity decrement uncertainties are applied for each reactivity decrement used in the criticality analysis.

Evaluate the EPRI depletion uncertainty, **from Table 4-1**, to be statistically combined with other uncertainties for inclusion in the overall calculation of the maximum keff.

Note that linear interpolation between the burnup values, listed in Table 4-1 and Table 4-2, is acceptable to calculate the corresponding EPRI uncertainty and additional NRC bias for specific fuel assembly burnups.

7. Biases and uncertainties are combined with biases and uncertainties arising from other portions of the SFP/cask criticality analysis.

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[2] Replaced “Applicant Depletion Code Bias” with “Application Code Bias” for consistency

[3] Need reference for the agreed upon numbers prior to Utilization report revision. Once this submission is transmitted, perhaps can use the associated ML number?