

Feedback on TN Americas' proposed resolution to the fuel qualification table (FQT) issue raised in RAI 6-7:

On May 31, 2019, TN Americas (the applicant) provided a draft revised approach to address the staff's concern on the removal of the FQT in the TS. The staff reviewed the revised approach and finds that the approach, in principle, is reasonable. However, there are some specific issues to be resolved for the approach. Specifically, the staff has the following concerns:

1. The applicant referenced the principle of the graded approach as the basis to justify that it is acceptable to use a simplified FQT that envelops 99.5% of the spent fuel population from the EIA spent fuel database GC-859. However, the staff finds that the application for simplifying the TS with the graded approach is still under review. As such, it cannot be used as a basis to justify the proposed approach until the same issue in the graded approach review has been resolved.
2. The applicant proposed to use GWd/FA instead of GWd/MTU as the fuel burnup unit in the proposed FQT. The resulting Table 1 TS FQT in fact locks the BECT to a specific fuel assembly (FA) design, i.e., an FA containing a specific quantity of fuel. The applicant needs to clarify the mechanism for the user to accommodate other fuel designs which may have different (higher or lower) fuel loading per fuel assembly.
3. The applicant states that the fuel assemblies in the periphery loading region dominates the contribution to the radiation outside the cask. While the staff agrees with this conclusion in principle, the applicant needs to provide a quantitative estimate for the contribution to the radiation level outside the canister from the interior loading regions.
4. The applicant provided a detailed step-by-step instruction for loading LEOFs in the proposed resolution to the RAI. These instructions should be added to Chapter 9, "Operating Procedures."
5. In Note (1) to TS Table 7a, the applicant proposed to round the enrichment down to establish the limit for minimum enrichment, for an assembly to not be qualified as an LEOF, for fuel assemblies with burnup in the range of 31 to 62 GWd/MTU range. This would produce a non-conservative result because rounding an enrichment down may produce a source that is much higher than analyzed. Based on the study published in NUREG/CR-6802, the source term is proportional to the inverse of the square of the enrichment. Thus, a rounding down of 1.99 to 1.9 would give a 10% $((1.99/1.9)^2 = 1.10)$ under-estimate of the source term. The applicant needs to justify using this non-conservative approach or adjust it accordingly to round up instead of down.
6. Since the peripheral region is the dominant contributor to dose rates, Table 3. "UFSAR FQT, HLZC 4 or 7 Peripheral Region Only" should be added in the TS to be applicable to fuel loaded in the peripheral locations for HLZC 4 and 7.