

SLR Document Changes: Discuss Review Approaches for Extended Beltline and Reactor Vessel Internals Fluence Calculations

Overview of purpose of change: Discuss recent staff review approaches for extended beltline and reactor vessel internals fluence calculations, as RG 1.190 is not applicable and staff continues to develop regulatory guidance for such calculations.

Basis Document Input: Revise NUREG-2221 as follows.

Add the following text to Table 2-28, Entry X.M2, Neutron Fluence Monitoring:

The staff added references to prior review activity in which additional justification had been provided to apply the calculational methods used for traditional reactor vessel beltline fluence calculations to extended beltline or reactor vessel internal components.

References.

Document Changes:

GALL-SLR

Revise X.M2, Section 6 (Acceptance Criteria). Beneath the paragraph concluding with the sentence, “The applicability of existing qualification data may also require additional justification”, insert the following paragraph:

Several examples of approaches used to provide the above-suggested justification are available. Two examples are reviewed in [1]. The authors provide an example of the submittal of additional benchmarking data, and another example of the refinement of nuclear and transport methods. These examples both supported the qualification of different methods to estimate fluence for RVI components. Another example, specific to subsequent license renewal, reflects the NRC staff’s evaluation of both a fluence AMP [2, pp. 3-47 – 3-51] and plant-specific fluence calculations for RVI components to demonstrate the validity of a more generic fluence estimate for downstream consideration in the aging management of the RVI components [2, pp. 3-72 – 3-74]. A final example illustrates the submittal of benchmarking data to qualify a calculational method to predict fluence in the extended beltline (i.e., reactor vessel nozzle) region [3]. Note that this final example was under review and no final determination of acceptability had been made at the time of drafting of this ISG.

Insert the following references and re-number the references list:

1. Patel, A. D., Risner, J. M., Parks, B. T., and Hardgrove, M. T., “Neutron Fluence Monitoring for Subsequent License Renewal,” *Reactor Dosimetry: 16th International Symposium, ASTM STP1608*, M. H. Sparks, K. R. DePriest, and D. W. Vehar, Eds., ASTM International, West Conshohocken, PA, 2018, pp. 152-161, <http://dx.doi.org/10.1520/STP160820170075>
2. NRC, Safety Evaluation Report Related to the Subsequent License Renewal of Turkey Point Generating Units 3 and 4, Dockets 50-250 and 50-251, December 2019, ADAMS Accession No. ML19191A057.
3. Southern Nuclear Operating Company, “Justification for Using RAPTOR-M3G for Reactor Pressure Vessel Extended Beltline Materials,” Enclosure 3 to “Submittal of License Amendment Request for Measurement Uncertainty Recapture Power Uprate,” Dockets 50.348 and 50-364, October 30, 2019, ADAMS Accession No. ML19308A763.