

March 7, 2000

MEMORANDUM TO: Farouk Eltawila, Chief
Safety Margins and Systems Analysis Branch
Division of Systems Analysis
and Regulatory Effectiveness
Office of Nuclear Regulatory Research

FROM: James E. Lyons, Acting Deputy Director */RA/*
Technical Review Directorate
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

SUBJECT: REVIEW OF REPORTS ON BURNUP CREDIT

This is in response to your memorandum dated February 17, 2000, requesting comments on two reports performed for the Office of Nuclear Regulatory Research (RES) on burnup credit. It is good to see that we are making much needed progress in addressing the topic of burnup credit and we continue to support the RES program to resolve the many associated issues. Our comments are given for each report in return.

A. Review and Prioritization of Technical Issues Related to Burnup Credit for LWR Fuel

1. This report represents the first real effort in the United States to develop a comprehensive list of the issues related to burnup credit, identify the areas where additional information is needed, and prioritize the areas of future study.
2. In the report, measures such as fixed and integral burnable absorbers are characterized as not allowed or not acceptable in Interim Staff Guidance (ISG) - 8, Rev. 1. These measures are not prohibited by the ISG but were not studied at the time because of their complexity and the need to issue the ISG quickly. The measures may be included in a burnup credit analysis when supporting justification is provided.
3. ISG-8, Rev.1, specifies a cooling time of 5 years because this is the point that most current analyses and information best represent. An analysis at some cooling time other than 5 years is possible when supported by appropriate justification.
4. The determination of limiting parameters for the depletion calculations and identification of bounding axial profiles (Sections 4.2 and 4.4) should include an assessment of the frequency and effects of partial or full control rod insertion and rodged load-following during pressurized water reactor operations.

5. Any consideration of using reactor critical configurations for benchmarking should address the fact that all actinides and fission products present in the reactor need to be included in the calculated estimates. For a benchmark to be useful, the calculation must include all effects known to exist. This will limit the applicability of the reactor data for partial burnup credit policies such as actinide only or limited inclusion of fission products.
6. The low-priority research in Section 6.3 should include an item to identify any conditions under which validation measurements of burnup may be reduced to a sampling program or stopped altogether.

B. Potential Sources of Experimental Validation for Burnup Credit

1. The information in the last column in Table 1 needs to be clarified. Some of the categories are hard to interpret. Also, it would be helpful to expand the information presented to identify other factors such as the presence of fixed poison rods or control rods and any extreme operating conditions during irradiation of the fuel assemblies.
2. The symbols in the legend for Figures 1 and 2 are hard to identify in the full assembly map.
3. The applicability of the note above the title in Figure 3 is not clear.

More detailed and editorial comments on the reports will be provided by the SFPO staff in the RES-contractor meeting on March 8, 2000.

If you need clarification of any of the above comments please contact Carl Withee of my staff. He may be reached at (301) 415-8534.

cc: C. Nilsen
D. Carlson

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