

November 20, 2000

MEMORANDUM TO: Gary M. Holahan, Director  
Division of Systems Safety and Analysis  
Office of Nuclear Reactor Regulation

FROM: Farouk Eltawila, Acting Director **/RAI/**  
Division of Systems Analysis and Regulatory Effectiveness  
Office of Nuclear Regulatory Research

SUBJECT: SEGMENTED TEST RODS IN LEAD TEST ASSEMBLIES FOR  
EXTENDED BURNUP

RES would like to get prepared to support licensing of burnup extensions beyond the currently approved 62 GWd/t limit, and to provide such support we would like to perform some testing on these extremely high burnup fuel rods. The tests might include cladding mechanical properties for our computer codes, limited testing of LOCA criteria and evaluation models, isotope analysis for burnup credit, creep behavior for dry storage, and fission product release for source terms. Such testing would give us confirmatory and independent data that would be non-proprietary and could be used in our safety analyses and related studies. Because expected burnup extensions in PWRs would be made with advanced cladding alloys, such testing would give us important data on these new materials.

It was recently reported that TVA's Sequoyah-2 plant will load four LTAs in its present outage to achieve burnups greater than 70 GWd/t in support of EPRI's Robust Fuel Program. This fuel will have M5 cladding. Other LTAs would be expected with cladding of ZIRLO and perhaps other zirconium-niobium alloys. In your meeting on December 6 with EPRI, which is leading the industry effort for burnup extensions, it would be appropriate to discuss a need for the industry to make fuel rods available to the NRC from LTAs for testing in our confirmatory research program.

Keeping in mind the excruciating difficulty that we and EPRI have had in our cooperative effort to acquire Zircaloy-clad fuel rods for testing in an NRC program, there would be a major advantage to working with segmented test rods. Such rods could be uncoupled in the spent fuel pool and shipped in a small DOE cask directly to our research laboratory without the need to ship full-length rods in a large commercial cask to an intermediate facility for cutting.

In summary, we would like to ask that this subject be raised at the industry meeting on December 6. Further, we think it would be appropriate for NRR to request that a couple of high-power segmented test rods be made available to NRC from key LTAs that are being designed to support burnup extensions.

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