

March 14, 2002

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Dr. Travers:

SUBJECT: CONFIRMATORY RESEARCH PROGRAM ON HIGH-BURNUP FUEL

In recent months, the Advisory Committee on Reactor Safeguards (ACRS) has reviewed the proposed power uprates for a variety of boiling water reactors (BWRs) and, recently, the pressurized water reactor (PWR) at Arkansas Nuclear One, Unit 2 (ANO 2). In the course of those reviews, we repeatedly asked the Nuclear Regulatory Commission (NRC) staff whether it thought that nuclear fuel has sufficient integrity for duty under uprated power conditions, especially when taken to elevated levels of burnup (up to 62 GWd/t). The staff has argued (e.g., Reference 1) that the fuel does have sufficient integrity basing its confidence on engineering judgment, and noting that a research program had been instituted to confirm that judgment. We believe this judgment requires a firmer technical basis, in fact, some existing data appear to contradict the staff's judgment regarding fuel that has been exposed to burnups in excess of 55 GWd/t (Reference 2).

We now learn that NRC's Office of Nuclear Reactor Regulation (NRR) has withdrawn its support for the confirmatory research on high-burnup fuel (memorandum from S. J. Collins, NRR, to A. C. Thadani, RES, dated January 31, 2002, entitled, "Update of Active NRR Requests for Assistance"). This decision means that NRR is willing to claim fuel used in PWRs is capable of sustaining energy inputs of up to the regulatory limit of 280 cal/g. There is experimental evidence that high-burnup fuel cladding can be ruptured and fuel dispersed with energy inputs much lower than the regulatory limit. Scant evidence is available to show that high-burnup fuel in BWRs can survive energy inputs produced by power oscillations of an anticipated transient without scram (ATWS) event, even if this event is arrested.

We believe that the licensing office's assertion that the confirmatory research on high burnup issues is no longer relevant adversely impacts developing a strong technical basis for these matters and on gaining public confidence. We would appreciate your reviewing this matter and providing us with the rationale behind this decision.

ACRS Member William J. Shack did not participate in the Committee's deliberations on this matter.

Sincerely,

/RA/

George E. Apostolakis
Chairman

References:

1. Responses from questions at ACRS Subcommittee meeting on February 13, 2002, regarding ANO-2 extended power uprate, NRR Action/Follow-up Items, transmitted March 1, 2002, in e-mail from Thomas Alexion (Internal Use Only).
2. Memorandum dated July 6, 1998, from L. Joseph Callan, Executive Director for Operations, to Commission, Subject: Agency Program Plan for High Burnup Fuel.
3. R.O. Meyer, R.K. McCardell, H.M. Chung, D.J. Diamond, and H.H. Scott, "A Regulatory Assessment of Test Data for Reactivity-Initiated Accidents," Nuclear Safety, Volume 37, Number 4, 1996, pages 271-288 and references therein.