University of Wisconsin

NUCLEAR REACTOR LABORATORY
DEPARTMENT OF NUCLEAR ENGINEERING AND ENGINEERING PHYSICS
E-mail: cashwell@engr.wisc.edu
PHONE (608) 262-3392
FAX (608) 262-6707

ADDRESS:
130 MECHANICAL ENGINEERING BUILDING
1513 UNIVERSITY AVENUE
MADISON, 53706-1572

April 8, 1994 RSC 574

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

RE: Docket 50-156; 10 CFR Part 50.64C

Dear Sirs:

We informed you by a letter dated August 20, 1993, that the Department of Energy had not funded continuation of the safety analysis phase of conversion of the University of Wisconsin Nuclear Reactor core to LEU. We estimated this would extend the time for completion of the safety analysis by at least 4 months.

DOE has not yet funded the continuation of the project. Further, the results of our analysis of the characteristics of the low enrichment fuel that we were told was previously approved by NRC indicate core excess reactivities that are 60% higher than in the equivalent cores fueled with FLIP or standard fuel. Calculations done at Oregon State University appear to agree with our calculations.

The higher reactivity values for the LEU fuel will not allow adequate shutdown margin for our standard operational cores (23-25 bundles centered in the grid box and coupled to the thermal column, pneumatic tube, and two beam ports via graphite reflectors on two sides). Use of smaller cores (to maintain shutdown margin) will substantially reduce the neutron flux in our pneumatic tube, thermal column (where our neutron measuring channel detectors are loaded), and beam ports. Further, we expect flux peaking problems in a smaller core will impact safety analysis for the smaller cores.

In our report to DOE we concurred with the questions in Oregon State University's letter to DOE (A. G. Johnson, January 31, 1994) concerning resolution of the problem. We do not wish to continue computations until the acceptability of a LEU fuel with and increased erbium concentration is established by NRC. We believe a parametric study of the amount of erbium needed for each of the types of TRIGA or TRIGA conversion reactors should be done to establish the concentration for our type of fuel. Since this study would be of importance to several different facilities, we do not believe it appropriate for us to do the parametric study.

A020
1/0

In addition, it has come to our attention that there would be a diameter change in the individual LEU fuel rods for 4 element bundles for use in our cores, and it is not known if NRC will accept the thermal-hydraulic and material stability presentments in the GA safety analysis for the fuel we would use (smaller diameter, higher erbium loading).

Our conclusion is that, even if DOE restores funding for our safety analysis preparation, completion of the analysis will be delayed for a considerable time while these issues are resolved.

Very truly yours,

R. J. Cashwell
Reactor Director