March 10, 2005

Mr. Warren Day, Reactor Administrator
United States Department of the Interior
Geological Survey
Box 25046, MS 974
Denver Federal Center
Denver, CO 80225-0046

SUBJECT: UNITED STATES GEOLOGICAL SURVEY — REQUEST FOR ADDITIONAL INFORMATION RE: USE OF ALUMINUM CLAD FUEL (TAC NO. MC5120)

Dear Mr. Day:

We are continuing our review of changes to the technical specifications (TSs) for the United States Geological Survey TRIGA Research Reactor which you submitted on November 16, 2004, as supplemented on December 3, 2004, and February 8, 2005. During our review of your TSs changes, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information within 60 days of the date of this letter. In accordance with 10 CFR 50.30(b), your response must be executed in a signed original under oath or affirmation. Following receipt of the additional information, we will continue our evaluation of your TSs changes.

If you have any questions regarding this review, please contact me at (301) 415-1127.

Sincerely,

/RA/

Alexander Adams, Jr., Senior Project Manager
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-274

Enclosure: As stated

cc w/enclosure: See next page

cc:

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Denver, CO 80202

Mr. Eugene W. Potter
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HMWM-RM-B2
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Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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REQUEST FOR ADDITIONAL INFORMATION
UNITED STATES GEOLOGICAL SURVEY
DOCKET NO. 50-264

1. Your answer to question 3 of our request for additional information (RAI) dated December 7, 2004, discussed fuel temperatures in the F and G rings when limiting the measured temperature of a stainless steel clad fuel element to 800EC in the B ring. Technical Specification (TS) D.3. also allows the instrumented fuel element to be placed in the C ring, where fuel temperatures could be lower than in the B ring. Limiting the measured fuel temperature to 800EC in the C ring could result in higher temperatures in the F and G rings than would result from limiting measured temperature to 800EC in the B ring. Please provide maximum fuel temperatures in the F and G rings if the measured temperature of 800EC is taken from an instrumented fuel element in the C ring. (Note that your answer to question 9 below may change the 800EC temperature in this question.)

2. The instrumented fuel element contains multiple thermocouples at different locations in the fuel element. Because of this, the temperature reading from the element may not be the true maximum temperature of the fuel in the element. Discuss the accuracy of your measured temperatures as compared to true temperature and the impact this has on the various temperatures given in your RAI request responses.

3. What was the wt% of the fuel in the instrumented fuel element used to measure the fuel temperatures given in your responses to our RAI? If the fuel wt% of the instrumented fuel element is different than the fuel wt% of the aluminum clad fuel, explain what effect the difference in fuel wt% has on the conclusions presented in your RAI response.

4. Your answer to question 3 of our RAI contains fuel temperature data based on a coolant temperature of 50 EC. However, your TSs allow a bulk pool temperature up to 60 EC. Please present the data on fuel temperature assuming a coolant temperature of 60 EC.

5. Your original application contained a table with a set of temperature measurements. For the 1 MW steady state measurement taken in March of 2002, where was the instrumented fuel element located in the core?

6. Discuss maximum fuel temperatures in the aluminum clad fuel at the reactor high power set point of 1.1 MW.

7. Your answer to our RAI question 10 was based on a coolant temperature of 50 EC. However, your TSs allow a bulk pool temperature up to 60 EC. Please present the data on fuel temperature assuming a coolant temperature of 60 EC.

8. You have proposed changes to TS D.7. It appears that your proposed wording would remove the flexibility to have a core with less than 100 fuel elements operate with a power level greater than 100 kW. Please provide a justification for your proposed change to the TS.

9. TS D.3. contains a fuel temperature limit of 800EC for fuel temperature. However, General Atomics in report E-117-833, "The U-ZrH_x Alloy: Its Properties and Use in TRIGA Fuel," discusses a steady-state operational fuel temperature design limit of 750EC based on consideration of irradiation- and fission-product-induced fuel growth and deformation. Please discuss.