Request for Additional Information Concerning
the Proposed Amendment to Authorize
Storage and Use of the Sub-Critical Assembly
at the Idaho Accelerator Center
Dated September 25, 2004

1. The second paragraph on page 3 of the application states that no criticality monitors are required at any of the accelerator sites because of the limited quantity of fissile material allowed. However, a statement on page 12 of the application indicates that a criticality alarm system is installed at the Idaho Accelerator Center White Room to comply with 10 CFR 70.24. Please clarify the conflicting statements.

   This information is required to determine compliance with 10 CFR 70.22(a)(2) which requires that the application contain information on the place where the licensed activity will be performed.

2. The third paragraph on page 3 of the application states that the material will not be stored overnight at any Accelerator Center site. It is our understanding that you intend to store the sub-critical assembly at Site 2 overnight while experiments are being conducted. If this is correct, please revise the application to correct the statement on page 3.

   This information is required to determine compliance with 10 CFR 70.22(a)(2) which requires that the application contain information on the place where the licensed activity will be performed.

3. On page 16 of the application, administrative controls are discussed for Room 23 of the Lillibridge Engineering Laboratory Building. These controls include the minimum number of people that must be present during operations involving SNM, and access to keys. Please revise the application to address the applicability of these controls to the other authorized places of use.

   This information is required to determine compliance with 10 CFR 70.22(a)(8) which requires that the application contain information on the procedures to protect health and minimize danger to life and property.

4. On pages 17-19 of the application, emergency response procedures are discussed. However, no formal emergency plan or evaluation of public doses from an accident is included in the application. 10 CFR 70.22(i) states that each application for an activity requiring a criticality alarm must contain either (1) an emergency plan, or (2) an evaluation showing that the maximum dose to a member of the public from an accident would not exceed certain levels. Please revise the application to address how you comply with the requirements in 10 CFR 70.22(i).

5. Figure A5 contains a floor plan for the Idaho Accelerator Center. Please revise the floor plan to identify fire extinguishers, fire control panels, and other safety features similar to the labels on Figure A2.

   This information is required to determine compliance with 10 CFR 70.22(a)(2) which requires that the application contain information on the place where the licensed activity will be performed.

6. Section 7(c) of the application refers to a Byproduct Material License in Reference 2. Section 9(i) of the application refers to an emergency plan in Reference 3. There are no references listed in the amended application. Please revise the application to identify the documents referenced.

   This information is required to determine compliance with 10 CFR 70.22(a)(8) which requires that the application contain information on the procedures to protect health and minimize danger to life and property.

7. The following questions are related to core configuration and overall system reactivity:

   a. The last paragraph on page 11 of the application states that multiple models of the proposed experiments have been developed using MCNPX computer code. However, only one model is described in Attachments (D) and (E). Do the results from the MCNPX model submitted represent the most reactive core configuration expected or the proposed configuration expected to be used for the experiment? Are these the same configurations in terms of overall system k-effective?

   b. Has the core configuration that was modeled in your MCNPX evaluation been used in previous experiments?

   c. Is there data from the 1/M measurements and the measured values of k-effective from previous experiments available for evaluation that are similar to the configuration expected to be used in the proposed experiments?

   d. Does the use of graphite as a core reflector represent a change in configuration from previous experiments? If so, what is the expected impact on the system k-effective versus previous configurations that used water as a reflector?

   e. In Appendix B, “Overview of the AFCI Reactor-Accelerator Coupling Experiments (RACE) Project,” the statement is made (last paragraph of the paper) that “follow-on experiments may include moving fuel trays away from the optimum positions, moving the target away from the center of the core, reducing fuel below 150 plates, moving detectors, and removing or adding reflector elements.” Will assurance of criticality safety for these possible configurations be based on measurement, analysis or both?

   f. The third paragraph on page 12 of the application states that “the accelerator has no impact on the k-effective of the sub-critical assembly.” Please explain the basis for this statement.

This information is required to determine compliance with 10 CFR 70.22(a)(8) which requires that the application contain information on the procedures to protect health and minimize danger to life and property.

8. In Section 10(a) of the application, the first paragraph fails to identify the location of the criticality alarm described. In addition, the second paragraph fails to contain a commitment that the criticality alarm for the Idaho Accelerator Center (IAC) will meet the requirements of 10 CFR 70.24(a)(1) or (a)(2). Please revise the application to address these deficiencies.

   This information is required to determine compliance with 10 CFR 70.22(a)(8) which requires that the application contain information on the procedures to protect health and minimize danger to life and property.

9. Generally, computer codes and the associated data libraries, are verified and validated before they are used to evaluate nuclear criticality safety. Verification shows the code is performing as expected on a particular computer platform and operating system. It is usually performed by comparing the results from test cases performed on a particular computer and the results provided by the code vendor. Once verification is performed and documented, measures are taken to assure that changes to the code, and associated data libraries, are not made. Validation shows that the code can accurately, or conservatively, calculate the value of k-effective for the intended application. It is usually performed by comparing results to critical experiments or measured data applicable to the intended use. Please describe how the MCNPX computer code was verified and validated for the proposed activities at the Idaho Accelerator Center. Discuss any bench marking results for the code versus previous configurations and k-effective measurements if available.

   This information is required to determine compliance with 10 CFR 70.22(a)(8) which requires that the application contain information on the procedures to protect health and minimize danger to life and property.

10. In Section 8(c) of the application, the first paragraph discusses restrictions on the use of graphite in the sub-critical assembly room. In addition, a commitment to post a notice at the entrance of the room is specified. It is unclear whether the restrictions and postings are applicable to proposed activities in the Idaho Accelerator Center, or just the existing activities in the Lillibridge Engineering Laboratory Building. Please revise the application to clarify what restrictions and postings apply to each location.

    This information is required to determine compliance with 10 CFR 70.22(a)(8) which requires that the application contain information on the procedures to protect health and minimize danger to life and property.

11. Please revise the application to address the physical protection and material control issues listed in Enclosure 2.

    This information is required to determine compliance with 10 CFR 73.67 which requires physical protection of special nuclear material of low strategic significance, and 10 CFR Part 74, Subpart B, which requires various status reports for special nuclear material.

Insert Enclosure 2 here.

(Safeguards Information)