September 22, 2005

Dr. Jay F. Kunze, Ph.D., P.E., CHP
Dean, Professor, and Reactor Administrator
Idaho State University
Campus Box 8060
Pocatello, ID 83209-8060

SUBJECT: IDAHO STATE UNIVERSITY - AMENDMENT 2 - APPROVAL OF EMERGENCY PLAN AND EXEMPTION FOR IDAHO ACCELERATOR CENTER (TAC L31892)

Dear Dr. Kunze:

In accordance with your application dated June 17, 2005, and the supplement dated August 24, 2005, and pursuant to Part 70 to Title 10 of the Code of Federal Regulations (10 CFR Part 70), Materials License SNM-1373 is hereby amended to approve the emergency plan for the Idaho Accelerator Center. In addition, pursuant to your application dated July 15, 2005, and the supplement dated August 24, 2005, and pursuant to 10 CFR Part 70, Materials License SNM-1373 is hereby amended to approve an exemption from the criticality monitor requirements in 10 CFR Part 70.24. Accordingly, Condition 9 has been revised, Condition 12 has been deleted, and new Conditions 13 and 14 have been added as follows:

9. Authorized use: For use in accordance with the statements, representations, and conditions specified in the application dated July 24, 1998; and supplements dated August 21, 2004, September 25, 2004, February 28, 2005, June 17, 2005, July 15, 2005, August 24, 2005 (emergency plan), and August 24, 2005 (exemption).

12. Deleted by Amendment 2, September 2005.

13. Notwithstanding Section 9 of the license dated April 14, 2005, the licensee will abide by the safety criteria, and practices for conducting subcritical experiments given in ANSI/ANS-8.6, "Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ," during the conduct of the subcritical experiments at the Idaho Accelerator Center.

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~~May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552)~~

~~Exemption number 2~~
~~Nuclear Regulatory Commission review required before public release.~~
~~Gary S. Janosko, Chief, NMSS/FCSS /RA by W. Schwink acting for/~~
~~Name and organization of person making determination~~

~~Date of Determination 09/20/05~~

14. Notwithstanding the provisions of 10 CFR Part 70.24, the licensee is authorized to [redacted] at the Idaho Accelerator Center while the subcritical assembly is being pulsed with an accelerator if:

    a. All fuel movements and neutron multiplication measurements have been completed;

    b. All personnel have left the [redacted] and the [redacted] has been locked;

    c. The door has been posted with re-entry requirements, including [redacted]; and

    d. Written procedures require two, independent, verification signatures that the re-entry requirements have been met before personnel re-enter the [redacted].

Enclosed are copies of the amended Materials License SNM-1373, and the Safety Evaluation Report. If you have any questions, please contact me at (301) 415-7887 or via email to kmr@nrc.gov.

This letter contains sensitive, unclassified information, and is therefore deemed Official Use Only. It will not be placed in the Public Document Room, nor will it be publicly available in the NRC Agencywide Document Access and Management System (ADAMS).

Sincerely,

/RA/

Robert C. Pierson, Director
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No.: 70-1374
License No.: SNM-1373
Amendment 2

Enclosure: 1. Materials License SNM-1373
2. Safety Evaluation Report

cc: Dr. John S. Bennion, P.E., CHP, DEE
Associate Professor and Reactor Supervisor
Idaho State University

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    b. All personnel have left the [redacted] and the [redacted] has been locked;

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Associate Professor and Reactor Supervisor
Idaho State University

Closes TAC L31892

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DOCKET: 70-1374

LICENSEE: Idaho State University
Pocatello, Idaho

SUBJECT: SAFETY EVALUATION REPORT: AMENDMENT 2 - APPROVAL OF EMERGENCY PLAN AND EXEMPTION FOR IDAHO ACCELERATOR CENTER (TAC L31892)

BACKGROUND:

Idaho State University (ISU) uses special nuclear material (SNM) under U.S. Nuclear Regulatory Commission (NRC) Materials License SNM-1373 for research and educational purposes to strengthen undergraduate and graduate programs in the areas of nuclear science and engineering. The license was issued on September 16, 1998, and expires on September 30, 2008. Currently, ISU is authorized to possess uranium enriched in the U-235 isotope for experiments and research involving a Subcritical Assembly (SCA). All the licensed material may be used and stored in the [redacted], and a limited amount of licensed material may be used at the Idaho Accelerator Center (IAC). Pending approval of an emergency plan, all licensed material may be used and stored at the IAC.

On May 7, 2005, ISU submitted an emergency plan for the IAC for approval. On June 7, 2005, the NRC staff informed ISU of major deficiencies that must be addressed before the application could be accepted for detailed review. On June 17, 2005, ISU submitted a revised emergency plan that was accepted for review. On July 19, 2005, the NRC staff issued a request for additional information. On August 24, 2005, ISU provided the additional information.

On July 15, 2005, ISU requested an exemption from the criticality monitoring requirements in 10 CFR 70.24. The request was related to the proposed activities in the IAC. On August 24, 2005, a conference call was conducted with the licensee, when additional information and commitments were provided.

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~~Exemption number 2~~
~~Nuclear Regulatory Commission review required before public release:~~
~~Gary S. Janosko, NMSS/FCSS~~
~~Name and organization of person making determination~~

~~Date of Determination~~

Enclosure 2

DISCUSSION:

Emergency Plan

The requirements in 10 CFR 70.22(i) state that each application to possess enriched uranium for which a criticality accident alarm system is required, must contain either an emergency plan or an evaluation showing that a release of radioactive material will not exceed the dose thresholds specified in the regulation. The staff has evaluated the emergency plan submitted for the IAC and made the following findings:

1. The plan provides an adequate description of the licensee's facility and the area near the site.

2. The plan adequately identifies each type of radioactive materials accident for which protective actions may be needed.

3. The plan provides an adequate system for classifying accidents as Alerts or Site Area Emergencies.

4. The plan identifies an adequate means of detecting each type of accident in a timely manner.

5. The plan provides an adequate description of the means and equipment for mitigating the consequences for each type of accident.

6. The plan provides an adequate description of the methods and equipment for assessing releases of radioactive material.

7. The plan provides an adequate description of the responsibilities of licensee personnel.

8. The plan provides an adequate commitment to and description of the means to promptly notify offsite response organizations and request assistance.

9. The plan provides an adequate description of the types of information and recommended protective actions to be given to offsite response organizations.

10. The plan provides an adequate description of the training to be provided to workers on how to respond to an emergency.

11. The plan provides an adequate description of the means of restoring the facility to a safe condition after an accident.

12. The plan provides adequate provisions for quarterly communications checks and biennial exercises.

13. The plan contains a certification that the licensee has met its responsibilities under the Emergency Planning and Community Right-to-Know Act of 1986.

14. The licensee has allowed offsite response organizations to review and comment on the emergency plan.

The NRC staff has determined that the emergency plan for the IAC is adequate to demonstrate compliance with 10 CFR 70.22(i). The requirements of the emergency plan are implemented through approved emergency procedures. Changes that decrease the effectiveness of the emergency plan may not be made without NRC approval. The NRC will be notified of other changes that do not decrease the effectiveness of the emergency plan within 6 months of making the changes.

Accordingly, the NRC staff recommends adding the application dates to Condition 9 and deleting the restriction in Condition 12 limiting operations until an emergency plan is approved.

Exemption from 10 CFR Part 70.24

On April 14, 2005, the NRC issued Amendment 1 to Materials License SNM-1373, which authorized the operation of the SCA in the [redacted] of the IAC. In a letter dated May 7, 2005, responding to a new license condition in Amendment 1, ISU submitted an emergency plan for SCA operation at the IAC. In a letter dated June 17, 2005, ISU responded to a June 7, 2005, NRC request for additional information by transmitting a revised emergency plan for the IAC. The NRC review of the June 17, 2005, submittal determined that the revised emergency plan allowed for the criticality monitor to be disabled while conducting experiments using the linear accelerator to pulse the SCA at the IAC (due to the radiation fields produced by the accelerator itself possibly exceeding the alarm actuation set point). During a conference call with ISU representatives on June 29, 2005, the NRC stated that ISU would need to apply for an exemption to 10 CFR 70.24 in order to disable the criticality monitor. In a letter dated July 15, 2005, ISU responded to the June 29, 2005, conference call by formally requesting an exemption to 10 CFR 70.24 while conducting experiments using the linear accelerator to pulse the SCA at the IAC. The NRC's current license review addresses the July 15, 2005, ISU amendment request to grant an exemption to 10 CFR 70.24 while pulsing the SCA at the IAC.

The NRC staff reviewed the amendment request dated July 15, 2005, and the Safety Evaluation Report (SER) for Amendment 1 granted on April 14, 2005.

In the amendment request, ISU stated that it will only be turning off the criticality monitors while pulsing the SCA with the accelerator in the [redacted] of the IAC). At all other times, such as when conducting inverse multiplication (1/M) measurements, the criticality monitors will be activated. While pulsing the SCA, no personnel will be in the [redacted], and the criticality monitor will be turned back on before personnel may

re-enter. Personnel will also carry portable monitors to verify that radiation levels are acceptable upon re-entry.

As stated in the SER for Amendment 1, the SCA will be safely subcritical due to: (1) verifying the overall reactivity status of the core configuration with MCNPX (a general-purpose Monte Carlo radiation transport code); (2) adding fuel to the core only after verification through 1/M measurements; (3) limiting superior moderating or reflector materials from the IAC; and (4) administratively limiting k_{eff} to 0.94 for assembling core configurations.

During a conference call with an ISU representative on August 24, 2005, the NRC asked: (1) what controls ensure that personnel do not enter the [redacted] while the criticality monitor is disabled; and (2) if ISU commits to follow ANSI/ANS-8.6, "Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ," the standard that directly applies to the criticality safety of the pulsing operations. In this call, ISU committed to: (1) post the door [redacted] with re-entry requirements; (2) lock the door; and (3) require two, independent, verification signatures that the re-entry requirements have been met before workers re-enter the [redacted]. ISU also committed during this conference call to follow ANSI/ANS-8.6 while conducting inverse multiplication measurements in the [redacted] of the IAC.

Therefore, based on the above, the risk from a criticality is remote. In addition, even if a criticality did occur, personnel would be outside of the [redacted] and thus be unharmed.

Based on the information in the submittal and the August 24, 2005, conference call, the NRC determined with reasonable assurance, that granting an exemption to 10 CFR 70.24 while pulsing the SCA at the IAC will not decrease public health and safety, security, or protection of the environment. Any future proposed new activities or facilities that may impact the use of this exemption will need to be evaluated for licensing actions on their own merits, including any need for modified or enhanced safety programs. Accordingly, the NRC staff recommends adding the application dates to Condition 9 and adding the following new license conditions:

13. Notwithstanding Section 9 of the license dated April 14, 2005, the licensee will abide by the safety criteria and practices for conducting subcritical experiments given in ANSI/ANS-8.6, "Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ," during the conduct of the subcritical experiments at the Idaho Accelerator Center.

14. Notwithstanding the provisions of 10 CFR 70.24, the licensee is authorized to de-activate the criticality monitor in the [redacted] at the Idaho Accelerator Center while the subcritical assembly is being pulsed with an accelerator if:

a. All fuel movements and neutron multiplication measurements have been completed;

b. All personnel have left the [redacted] and the [redacted] has been locked;
c. The door has been posted with re-entry requirements, including re-activation of the criticality monitor; and

d. Written procedures require two, independent, verification signatures that the re-entry requirements have been met before personnel re-enter the [redacted].

ENVIRONMENTAL REVIEW

The staff has determined that the proposed activities do not adversely affect public health and safety, or the environment because the activities involve the use of licensed material for research and educational purposes. Such activities are categorically excluded from the requirement to perform an environmental review. Therefore, in accordance with 10 CFR 51.22(c)(14)(v), neither an environmental assessment nor an environmental impact statement is warranted for this action.

CONCLUSION/RECOMMENDATION

Based on the discussion above, the NRC staff concludes that the licensee has the necessary technical staff to administer an effective radiological safety program. Conformance by the licensee to its commitments and the license conditions developed by the staff provides reasonable assurance that the licensed activities will not constitute an undue risk to the health and safety of the public or the environment.

Region IV inspection staff has no objection to this action.

Approval of the amendment application is recommended.

Principal Contributors:
Kevin Ramsey
Craig Hrabal
Mark Shaffer