

**IDAHO STATE UNIVERSITY
JULY 9, 2021, LICENSE RENEWAL APPLICATION**

I. Sufficiency of Information Determinations

The U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of Idaho State University's (ISU) license renewal application determined that there is insufficient information for six of the ten technical disciplines for review. These technical areas are:

- Radiation Protection
- Nuclear Criticality Safety
- Physical Security
- Chemical Safety
- Decommissioning
- Environmental Review

The staff determined that there is sufficient information to proceed with detailed technical review for four of the technical disciplines, but that additional information is necessary to make the final regulatory compliance determinations. These technical areas are:

- General Information
- Fire Safety
- Material Control & Accounting (MC&A)
- Emergency Procedures

The table below provides specific information on the deficiencies in the information provided by ISU in their application.

Application Section	Issue	Comments/Notes
Section 2(a): "Principal location of use"	<ul style="list-style-type: none"> • 10 CFR 70.22(a)(7) requires that the licensee provide a description of the facilities where activities will be conducted. The application does not provide sufficient description of the room where principal licensed activities will be conducted. 	Please provide a more detailed description of the facilities where regulated activities will be conducted.
Section 2(b): "Alternate Locations of Use"	<ul style="list-style-type: none"> • 10 CFR 70.22(a)(7) requires that the licensee provide a description of the facilities where activities will be conducted. The application does not provide sufficient description of the following alternate locations of use: <ul style="list-style-type: none"> ○ Nuclear Engineering Counting Lab Room 22 ○ AGN-201 Nuclear Reactor Room 20 	Please provide a more detailed description of the facilities where regulated activities will be conducted.
Section 4: "Specification of the Special Nuclear Material"	<ul style="list-style-type: none"> • 10 CFR Part 70.25 establishes the requirements for decommissioning financial assurance. The form of the SNM determines whether the applicant needs to provide financial assurance for decommissioning. 	Please confirm the form of the SNM (e.g., sealed sources). This information is required to determine whether the applicant needs to comply with the applicable 10 CFR Part 70.25 decommissioning financial assurance requirements.

<p>Section 5: Technical qualifications of the applicant and staff</p>	<ul style="list-style-type: none"> • 10 CFR 70.22(a)(6) requires that the technical qualifications, including training and experience of the applicant and members of the staff to engage in the proposed activities be included in the application. The application states that biographical data listing qualifications for those members of the ISU faculty who have responsibility for the supervision and operation of the uranium are included in Attachment (1). <p>However, Attachment 1 only provides a list of key positions (i.e., name, title, etc...) without any supporting information on technical qualifications.</p>	<p>Please provide a description of the qualifications of the applicant and staff. Note: The NRC staff previously approved some of the ISU staff listed in the application. However, for completeness, please provide the qualifications of the applicant and all key staff.</p>
<p>Section 6: "Equipment and Facilities to Protect Health and Minimize Danger to Life and Property"</p>	<ul style="list-style-type: none"> • Section 6b, "Working Area" <ul style="list-style-type: none"> ○ The section refers the reader to "section 3 above" (i.e., "The Place and Plan for Carrying Out the Activity"). The application is insufficient because it does not provide this information. 	<p>The applicant needs to address Section 6b.</p>
<p>Section 6e: "Storage facilities and security measures"</p>	<ul style="list-style-type: none"> • 10 CFR 73.67 establishes the physical security requirements for ISU. The application does not discuss how ISU will meet these requirements. In addition, the applicant did not provide a copy (or a reference to) the most recent NRC-approved physical security plan. 	<p>Please discuss how ISU intends to meet these requirements (see also section II below).</p> <p>A February 2016 version of a plan (Rev. 7) is located in ADAMS under accession number ML19150A123 (OUO-Security-Related).</p> <ul style="list-style-type: none"> ○ Please confirm that this is the most recent version or provide an updated version of the physical security plan.
<p>Section 9: "Additional Requirements"</p>	<ul style="list-style-type: none"> • Section 9 - Emergency evacuation procedure <ul style="list-style-type: none"> ○ The applicant states that..."Detailed emergency procedures are provided in the approved facility Emergency Plan." ○ A copy of the emergency plan was not provided. ○ This section is insufficient. 	<p>A July 2016 version of an Emergency Plan (Rev 7) is located in ADAMS under accession number ML16285A191 (Non-Public).</p> <ul style="list-style-type: none"> ○ Please confirm that this is the most recent version or provide an updated version of the emergency plan.

II. Additional issues for consideration

During the acceptance review, the staff determined that the applicant should also consider addressing the information discussed below to reduce the potential for requests for additional information (RAIs).

Fire Safety

The applicant did not discuss if the reactor safety committee considers fire safety when it reviews new experiments. In addition, the applicant did not discuss whether there is fire safety expertise within the reactor safety committee or if it is available to the committee.

The applicant did not identify the criteria the committee would apply when approving any experiments involving fire hazards.

The applicant did not discuss its fire detection, alarm, sprinkler, extinguisher, and ventilation systems. The applicant did not discuss the effectiveness of these fire protection systems to prevent, mitigate or suppress a fire. The applicant did not discuss its emergency procedures related to fire safety.

Radiation Protection

The applicant did not provide sufficient information regarding its radiation protection program in accordance with the requirements in 10 CFR 20.2102.

For example, the applicant should provide detailed information on how it intends to comply with the regulatory requirements in Subpart B of 10 CFR 20 which requires, in part:

1. describing its trained and qualified radiation protection organization with independence from the facility's operations, well-defined responsibilities, and sufficient authority to carry out those responsibilities, and
2. an adequate description of its facilities, equipment, and procedures to effectively implement the program

The applicant did not adequately discuss its commitment to provide radiation protection training. In addition, there is no discussion of:

1. The applicant's radiation surveys and monitoring programs necessary to comply with the requirements of 10 CFR Part 20 and to (1) ascertain radiation levels, concentrations of radioactive material, and potential radiological hazards that could be present in the facility and (2) to detect releases of radioactive material from plant equipment and operations.
2. The applicant's program for maintaining records of the radiation protection program (including program provisions, audits, and reviews of the program content and implementation), radiation survey results (air sampling, bioassays, external exposure data from monitoring of individuals).
3. Storage of the SNM.

There is no discussion on how the applicant will establish and implement an access control program that ensures that (1) signs, labels, and other access controls are properly posted and operative, (2) restricted areas are established to prevent the spread of contamination and are identified with appropriate signs, and (3) step-off pads, change facilities, protective clothing facilities, and personnel monitoring instruments are provided in sufficient quantities and locations.

Chemical Safety

Based on a review of the information in the application, the following issues were identified:

1. There is no discussion of chemical safety in the application. The NRC staff questions whether the applicant: (a) has a hazard identification analysis and review process, and, (b) commits to use appropriate expertise for making sure that chemical hazards that would be under NRC jurisdiction are not introduced into the operations without appropriate controls (e.g., chemical hazards derived from material involving licensed material or chemical hazards that could affect the safety of licensed material operations). The ISU application discussed a hazard identification analysis in very general terms, but it did not specifically discuss chemical hazards.
2. The activities discussed in section 2a (principal location of use) appear to be neutron physics experiments. The applicant did not discuss whether a significant potential for chemical hazards (e.g., toxic exposure, energetic reactions) associated with these activities exist.
3. ISU refers to a "Reactor Safety Committee" that "will review additional experiments." The most extensive discussion of the function of the reactor safety committee is in section 8b (administrative controls in support of MC&A). The discussion seems to be in an odd location (MC&A). There is no discussion of the nature of any reactor safety committee review and any criteria that it applies when it approves any additional experiment. Also, there is no discussion of the nature, expertise of the reactor safety committee members.
4. The applicant did not provide evidence that the reactor safety committee considers chemical safety when it reviews new experiments. The applicant should: (1) discuss whether there is chemical safety expertise within the reactor safety committee or available to the committee, and (2) discuss the criteria the committee would apply when approving any experiments involving chemical hazards.

Physical Security

The application does not provide sufficient information to proceed with a detailed technical review. Based on the information provided, this facility would be categorized as Category III and would be subject to the physical protection requirements in 10 CFR 73.67(f).

The applicant does describe locations of use and storage and identifies a storage controlled access area (CAA). However, supplemental information is needed to verify that the applicant meets the requirements in 10 CFR 73.67(f)(1).

The applicant did not address the physical protection requirements in 10 CFR 73.67(f)(2)-(4) [listed below]:

1. Monitor with an intrusion alarm or other device or procedures the CAAs to detect unauthorized penetrations or activities. [10 CFR 73.67(f)(2)]
2. Assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities. [10 CFR 73.67(f)(3)]
3. Establish and maintain response procedures for dealing with threats of thefts or thefts of this material. The licensee shall retain a copy of the current response procedures as a record for 3 years after the close of period for which the licensee possesses the special nuclear material under each license for which the procedures

were established. Copies of superseded material must be retained for 3 years after each change. [10 CFR 73.67(f)(4)]

The staff refers the applicant to Regulatory Guide 5.59, "Standard Format and Content for a Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance," which provides guidance on protection of SNM of low strategic significance (Cat III).

Environmental Protection

The application does not discuss the organization's environmental protection program. In addition, it does not provide references to any previous submittals to support the statements provided within. The applicant should discuss this information in the application to allow the staff to determine whether ISU meets the applicable NRC environmental protection requirements.

Nuclear Criticality Safety

The applicant needs to provide more information regarding its nuclear criticality safety (NCS) program and activities to determine whether a credible risk of criticality is present and if subcriticality has been ensured under normal and all credible abnormal conditions for all activities involving SNM.

For example, the applicant did not provide information outlining its NCS program structure that is consistent with current industry practices, including establishing the roles and responsibilities of key program personnel (e.g., NCS manager, NCS senior engineers, and NCS engineers). While the specific titles and functions of personnel may vary from one applicant to another, specific positions should have responsibility for implementing program objectives, including designation of a program manager who has overall responsibility for implementing the NCS program.

There is no adequate/detailed discussion regarding the applicant's commitment to meet the criticality accident alarm system (CAAS) requirements in 10 CFR 70.24 nor any commitments to follow specific industry practices.

The applicant did not describe the training and qualification of key NCS program personnel. Experience and education levels should be specified commensurate with personnel responsibilities.

The applicant did not discuss its emergency response measures to appropriately protect personnel from the consequences of a criticality accident or, instead, submitted an emergency plan or an evaluation demonstrating that an emergency plan is not required, in accordance with the provisions in 10 CFR 70.22(i)(1)(i) and (ii).

Material Control and Accounting

Section 8 of the application lacks information with respect to the following applicable material control and accounting (MC&A) requirements (general reporting and recordkeeping):

1. 10 CFR 74.11, Reports of loss or theft or attempted theft or unauthorized production of special nuclear material
2. 10 CF 74.13, Material status reports
3. 10 CFR 74.15, Nuclear material transaction reports
4. 10 CFR 74.17, SNM physical inventory summary report
5. 10 CFR 74.19, Recordkeeping

Decommissioning

The applicant should provide a brief discussion of its plans for disposition of the SNM at the time of decommissioning.