



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

**IDAHO STATE UNIVERSITY – REGULATORY AUDIT - LICENSE AMENDMENT REQUEST
REGARDING MODIFICATION TO CHANNEL 2 AND CHANNEL 3 LOW
POWER SCRAMS FOR THE FACILITY OPERATING LICENSE NO. R-110
(EPID: L-2023-NFA-0002)**

LICENSEE INFORMATION

Licensee: Idaho State University
Facility: AGN-201M Research Reactor
License No.: Facility Operating License No. R-110
Docket No.: 50-284

Background

The U.S. Nuclear Regulatory Commission (NRC) staff is continuing its review of the Idaho State University (ISU) AGN-201M Research Reactor license amendment request (LAR) by letter dated February 13, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23074A066), as supplemented by letter dated June 15, 2023, (ADAMS Accession No. ML23174A104), This regulatory audit is intended to assist the NRC staff in its review of the LAR.

Regulatory Bases for the Audit

The purpose of this audit is to determine if ISU's LAR related to low power scrams for nuclear safety Channels 2 and 3 and the replacement of channel 2 and 3 detectors meets all the applicable regulatory requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) and addresses applicable guidance provided in NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," Part 1, "Format and Content," and Part 2, "Standard Review Plan and Acceptance Criteria," (ADAMS Accession Nos.: ML042430055 and ML042430048, respectively).

Regulatory Scope for the Audit

This audit will focus on information provided by ISU, during virtual meetings, and/or during a site visit. This audit will provide the NRC staff with information related to the NRC staff's evaluation of the LAR and allow the NRC staff to effectively gain insights on the LAR. The regulatory audit may identify additional information that will be required to be docketed to support the basis of the NRC staff's licensing decision on the LAR.

To support this audit, the NRC staff will schedule virtual meeting(s) online and may visit the ISU facility in Pocatello, ID, if deemed necessary.

Information Needed for the Audit

ISU should be prepared to provide documents, calculations, and other material, as applicable, supporting the analyses and justifications for the LAR, and the SAR and any procedures supporting the LAR. ISU should also be prepared to discuss the proposed technical specifications (TSs) and their bases with the NRC staff. The NRC staff may request that ISU provide additional information that NRC staff deems necessary to allow the NRC staff to determine the acceptability of the proposed changes.

The NRC requests that ISU make these materials available in an online reference portal for use during the audit and/or during a potential site visit.

During a site visit, in addition to making documents available for review and discussion, ISU should be prepared to support the NRC staff with a comprehensive tour of the facility, as necessary.

Audit Team

The NRC staff performing this audit will be:

- Xiaosong Yin (Project Manager, and Technical Reviewer)
- Duane Hardesty (Senior Project Manager, and Technical Reviewer)
- Joshua Borromeo (Branch Chief)

Audit Team Logistics

Entrance Meeting	October 26, 2023
Exit Meeting	To be determined, at conclusion of Audit.

Audit meetings will be scheduled on an ongoing, as needed basis after the entrance meeting. Audit activities will be conducted via teleconference and video conference supported activities, as appropriate and efficient to the gathering of information by the NRC staff. In addition, to support this audit, the NRC staff may visit the AGN-201M facility in Pocatello. If needed, mutually agreeable dates will be established for the potential site visit, and discussion or review topics provided to ISU in advance. The audit will begin October 26, 2023, and is expected to continue for approximately 3 months, with activities being scheduled as needed during that period. The initial audit topics are included as an enclosure to this letter.

The audit period may be reduced or extended, depending on the NRC staff and ISU progress in addressing the audit questions. Additional audit activities may be planned as necessary to support the NRC staff's understanding of information needed to complete the review of the license amendment.

Online Portal

To improve the efficiency of the audit, it is requested that ISU establish an online reference portal to allow NRC staff limited read-only access to the technical information provided by ISU. Use of the online reference portal is acceptable provided that ISU establishes measures to limit access to specific NRC staff (e.g., based on NRC email addresses or the use of passwords which will only be assigned to NRC staff directly involved in the audit on a need-to-know basis), and to make the documents view-only (i.e., prevent NRC staff from saving, copying, downloading, or printing any documents). The conditions associated with the online reference

portal must be maintained throughout the audit process. The NRC staff who should initially be granted access to the portal are those listed in the “Team Assignments” section above. As needed, the NRC audit project manager may provide ISU with the names of additional NRC staff who are added to the audit team and should subsequently be granted access.

Deliverables

At the completion of the audit, the audit team will issue an audit summary within 30 days after the exit meeting. The audit summary will be declared and entered as an official agency record in ADAMS and be made available for public viewing.

Please contact Xiaosong Yin at 301-415-1404 or by email at Xiaosong.Yin@nrc.gov, or Duane Hardesty at 301-415-3724 or by email at Duane.Hardesty@nrc.gov with any questions related to the conduct of the audit.

Audit Topics and Questions:

The topics and questions for discussion during the regulatory audit are primarily based on the regulatory audit topics enclosed.

Proposed Audit Schedule (Eastern Daylight Time)

Thursday, October 26, 2023

1:00 PM	Entrance meeting and introductions
1:15 PM	Audit discussions
2:15 PM	Break
2:30 PM	Resume Audit
3:30 PM	NRC Staff Caucus
3:45 PM	Summary of meeting
4:00 PM	End audit for the day

Audit Topics

The NRC staff requests the ISU to provide or be prepared to discuss the following during the audit:

1. ISU is requesting a license amendment that involves:
 - Removal of Channel 2 low scram.
 - Removal of Channel 3 5% low scrams for all ranges below and including the range at which the detector output is above noise and indicates neutron detection, the "transition range."
 - Rewording of Technical Specifications Section 3.2 Specification d.
 - Removal of "Unit A" and "Unit B" from Technical Specifications Table 3.1.

However, the submitted request involves quite a few changes made to the TSs, e.g., on page 4, 7, 10, 15, 16, 18, 20, 22, 23, 24, 27, 28, 29, and 32. These changes do not appear to be related to the primary purpose of the LAR. Please provide a justification of the changes.

In addition, all proposed TSs pages marked with

"AGN-201 Technical Specifications, Amendment No. 8

RSC Review: Feb 2023

NRC Approval: xxxx xx, 2023"

will be reformatted to align with the NRC's format.

- 2) Please plan to discuss the justification for the replacement of the BF3 detectors (e.g., why the new detectors will provide adequate protection) and discuss the regulatory approach to their implementation.
- 3) The statement that *"the low power response of the B10 detector will be determined as soon as the detector is available"* appears that justification of safe operation with the new detector will occur only after the detector is installed. Please provide information or discussion (e.g., evaluations, analyses, detector details etc.) to support the safe operation with the B10 detector. This is a similar request to item 2.
- 4) Please plan on discussing the details to the Channel 3 low power scram. For example, explain the intent of the phrase "and the ranges below it."
- 5) Justify why the Unit A vs. Unit B removal is an administrative change. One range refers to a wide range meter that did not require switching during startup or shutdown (full scale covered full range) and the other channel had switching between ranges to cover full range. Additionally, ISU previously identified the switching range as a source of inadvertent scrams due to operators failing to switch ranges to the next scale before reaching the 5% of full-scale trip. Provide a justification and any supporting analysis for the proposed meter/switch changes.
- 6) Provide a more in-depth explanation of the suitability of the B10 detector to replace the existing detector BF3 and how the proposed detector will be tested to verify performance is adequate (i.e., test plan, procedures, and results supporting the methodology in the LAR). This will support items 2 and 3.

Enclosure

- 7) The reference to the University of New Mexico (UNM) change in the request is a useful addition to the SAR, but it does not provide a full justification. NUREG-1537 states “Design features, operations experience, and tests and experiments from similar facilities could be referenced and used to support analyses in appropriate chapters of the SAR. The UNM information is useful, but the safety analysis must include why the change is acceptable for the ISU AGN. Please discuss how ISU ensure sufficient counts are visible for a startup.
- 8) Provide additional information related to the proposed change to TS 3.2.d. NUREG-1537 states “*a continuous indication of the neutron flux density from subcritical multiplication source level through the full licensed power range. If multiple detector channels are used. This continuous indication should overlap a minimum of one decade during detector changeover.*” Explain the purpose for disabling the channel and how the overlap, continuous indication, and scram protections are achieved at low power if channel 1 can be disabled before there is indication on channel 2, especially if the low power scram for Channel 2 is removed.