

August 15, 2014

Dr. Jay F. Kunze  
Reactor Administrator  
Idaho State University  
P.O. Box 8060  
Pocatello, ID 83209-8060

SUBJECT: IDAHO STATE UNIVERSITY - NRC INSPECTION REPORT NO.  
50-284/2014-202

Dear Dr. Kunze:

On July 21-24, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Idaho State University AGN-201M Research Reactor Facility. The enclosed report documents the inspection results, which were discussed on July 24, 2014, with you, members of your staff, and members of the Reactor Safety Committee.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified.

In accordance with Title 10 of the *Code of Federal Regulations*, Section 2.390 "Exemptions, inspections, requests for withholding" a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Ossy Font at 301-415-2490 or by electronic mail at [Ossy.Font@nrc.gov](mailto:Ossy.Font@nrc.gov).

Sincerely,

/RA/

Kevin Hsueh, Chief  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-284  
License No. R-110

Enclosure:  
NRC Inspection Report No. 50-284/2014-202

cc w/encl.: See next page

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**OFFICIAL RECORD COPY**

Idaho State University

Docket No. 50-284

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**U. S. NUCLEAR REGULATORY COMMISSION**  
**OFFICE OF NUCLEAR REACTOR REGULATION**

Docket No: 50-284

License No: R-110

Report No: 50-284/2014-202

Licensee: Idaho State University

Facility: AGN-201M Reactor Facility

Location: Pocatello, Idaho

Dates: July 21-24, 2014

Inspector: Ossy Font

Approved by: Kevin Hsueh, Chief  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

Idaho State University  
AGN-201M Research Reactor Facility  
NRC Inspection Report No.: 50-284/2014-202

The primary focus of this routine, announced inspection included onsite review of selected aspects of Idaho State University (the licensee's) Class II research reactor safety program including: procedures, experiments, health physics, design changes, committees, audits and reviews, and transportation of radioactive materials since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's programs were acceptably directed toward the protection of public health and safety and in compliance with NRC requirements.

### Procedures

- Facility procedural review, revision, control, and implementation satisfied technical specification (TS) requirements.

### Experiments

- Experiments were being reviewed in accordance with procedures and standard practice.

### Health Physics

- Surveys were being completed and the results documented acceptably.
- Postings met the regulatory requirements.
- Personnel dosimetry was being worn as required and doses were well within NRC regulatory limits.
- Radiation monitoring equipment was being maintained and calibrated as required.
- Acceptable radiation protection training was being provided to staff members.
- The Radiation Protection and As Low As Reasonably Achievable Programs were being acceptably implemented.
- Effluent monitoring satisfied license and NRC regulatory requirements.
- Releases were within the specified NRC regulatory and TS limits.

### Design Changes

- Licensee's design change program was being implemented as required.

Committees, Audits and Reviews

- The review and audit program was being conducted acceptably by the Reactor Safety Committee.

Transportation of Radioactive Materials

- No radioactive material had been shipped from the reactor facility under the reactor license during the past several years.

Follow-up

- Two IFIs and a violation have been closed.

## REPORT DETAILS

### Summary of Plant Status

The Idaho State University (ISU, the licensee) Aerojet General Nucleonics-201M (AGN-201M) Research Reactor Facility, licensed to operate at a maximum steady-state thermal power of 5 Watts, continued to be operated in support of operator training, surveillance, experiments, and laboratory work. During the inspection the reactor was not operational.

### 1. Procedures

#### a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify that the licensee was complying with technical specification (TS) requirements:

- Selected forms and checklists
- ISU AGN-201M Reactor Facility Master Log
- AGN-201 Operating Procedure (OP) #1, Rev. 4, dated April 30, 2014
- Selected AGN-201 Experimental Procedures (EP), Maintenance and Surveillance Procedures (MP and SP), and Radiation Protection Procedures
- ISU AGN-201M General Rules, Rev. 4, dated September 19, 1994

#### b. Observations and Findings

The licensee's procedures were found to be acceptable for current facility operations and the current staffing level. The inspector determined that the various facility procedures were being updated as needed and that substantive revisions to procedures, checklists, and forms were presented to the Reactor Safety Committee (RSC) for review and approval as required by TS. The inspector noted that there have been no new operating and surveillance procedures developed in the past few years.

#### c. Conclusion

Procedural review, revision, control, and implementation satisfied TS requirements.

### 2. Experiments

#### a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following in order to verify that experiments were being conducted within approved guidelines:

- Selected AGN-201 Experimental Procedures (EP)
- AGN-201 Operations Logs from January 2012 to Present
- ISU AGN-201M Reactor Facility Master Log

b. Observations and Findings

Experiments are typically used for classwork and training. During the inspection, the inspector noted no new experiments since the last inspection. The inspector reviewed the experimental procedures and found no issues. The operations logs appropriately record experiments performed.

c. Conclusion

Experiments were being implemented in accordance with licensee procedures and standard practice.

**3. Health Physics**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Parts 19 and 20, and TS:

- Radiological signs and postings
- ISU AGN-201M Reactor Facility Master Log
- Dosimetry records for 2012 to present
- Contamination and radiation survey records for reactor from 2012 to present
- Records documenting the maintenance and calibration of radiation monitoring equipment from 2012 to present
- Annual Report for calendar years 2012 and 2013
- Operations Logs from 2012 to present documenting Pre-Start checks, surveys, and reactor operations
- ISU AGN-201M Visitor Log and Register for Organized Groups and Tours
- ISU AGN-201M Experimental Plan No. 8, "Health Physics Survey," Rev. 1, dated May 3, 1979

The inspector toured the licensee's facility, observed the use of dosimetry and radiation monitoring equipment, and interviewed licensee personnel.

b. Observations and Findings

(1) Surveys

Through records reviews and interviews with reactor and Technical Safety Office (TSO) staff members, the inspector determined that the periodic and prestart-up contamination and radiation surveys were performed as required by TS and procedures.



(2) Postings and Notices

The inspector toured the facility and observed postings and controls for areas with radioactive material and contamination as well as notices to employees as required by 10 CFR Part 19 and 20 and found them acceptable.

(3) Dosimetry

The TSO issued thermoluminescence dosimetry (TLD) dosimeters to facility personnel and used a National Voluntary Laboratory Accreditation Program accredited vendor, Landauer, to process the whole body TLDs. Through direct observation, the inspector determined that the dosimeters were acceptably used. The inspector reviewed TLD dosimeter results from 2012 to YTD 2014 and found that the doses were well within the 10 CFR Part 20 limits.

(4) Radiation Monitoring Equipment

Calibration of portable survey meters was typically completed by TSO personnel. The inspector reviewed selected records and verified that selected survey meters' calibration were up-to-date. The inspector also observed the calibration process and found it to be acceptable. On occasion, survey meters were sent to a contractor for calibration. Calibration frequency met the specified TS requirements and records were maintained as required.

(5) Radiation Protection Program

The licensee's Radiation Protection Program was established in the Idaho State University Radiation Safety Policy Manual with approval from the Radiation Safety Committee. The program included requirements that all personnel who worked with radioactive materials receive training in radiation protection, policies, procedures, requirements, and facilities. Completion of this training was verified by each person's supervisor and by TSO personnel. The program appeared to be acceptable and was being reviewed annually as required by the Radiation Safety Officer.

(6) As Low As Reasonably Achievable (ALARA) Program

The ALARA Program was outlined and established in Radiation Safety Policy Manual. The ALARA program provided guidance for keeping doses as low as reasonably achievable and was consistent with the guidance in 10 CFR Part 20.

(7) Radiation Protection Training

The inspector reviewed the radiation worker training program, which is administered online, and verified that the training was given upon initial employment and that the refresher training was required annually. The inspector determined that the training program was acceptable.

(8) Facility Tours

The inspector toured the Reactor Room, adjacent laboratories, and support areas. Control of radioactive material and control of access to radiation areas was acceptable.

(9) Effluent and Environmental Monitoring

The inspector reviewed area TLD dosimeter results from 2012 to YTD 2014 and found that the doses were well within the 10 CFR Part 20 limits. Additionally, environmental radiation surveys, performed at the facility boundary at 100% power, were below the limit to the public.

The only gaseous waste of concern is Ar-41, which is calculated based on the reactor operation time for the year and a conservative power level approximation, and the inspector found that for the past two years it was well below the Part 20 limit. The inspector confirmed that there had been no liquid or solid radioactive waste releases from the reactor facility during the past two years. Through observation of the facility, the inspector found no new potential release paths.

c. Conclusion

The inspector determined that the Radiation Protection and ALARA Programs satisfied NRC regulatory requirements. Surveys were being completed and documented acceptably. Postings met NRC regulatory requirements. Personnel dosimetry was being worn as required and doses were well within the NRC's regulatory limits. Radiation monitoring equipment was being maintained and calibrated as required. Acceptable radiation protection training was being provided. Effluent monitoring satisfied license conditions and NRC regulatory requirements, and releases were within the specified NRC regulatory and TS limits.

**4. Design Changes**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with the requirements of 10 CFR 50.59:

- Procedures OP-1 and MP-1
- 10 CFR 50.59 Analysis

- Annual Report for calendar years 2012 and 2013
- Reactor Safety Committee (RSC) meeting minutes since February 2012

b. Observations and Findings

The facility only changed procedures within the last two years including OP-1 (additional information in the Follow Up section below). Additionally, the licensee modified the method for determining Rod Drop Times (MP-1) and added a digital chart recorder. The inspector reviewed the 50.59 screening analysis. The screening process and administrative process that the facility uses to review and approve changes in accordance with 10 CFR 50.59 is acceptable.

The licensee is developing a 50.59 process. One area the inspector discussed with the licensee is changes approvals. The licensee plans on seeking approval from the RSC for certain changes and rely on the Reactor Administrator (RA) for the others. If the licensee chooses to rely on the RA for approvals, they may need to submit a TS license amendment. In order to track this progress, the inspector opened an Inspector Follow-Up Item (IFI) 50-284/2014-201-01.

c. Conclusion

Licensee's design change program was being implemented as required.

**5. Committees, Audits and Reviews**

a. Inspection Scope (IP 69001)

To verify that the licensee had established and conducted reviews and audits as required in TS and to verify that modifications to the facility were being reviewed in accordance with the stipulations in 10 CFR 50.59 and approved as required by TS, the inspector reviewed:

- ISU AGN-201M Reactor Facility Master Log
- Completed audits and reviews
- Annual Report for calendar years 2012 and 2013
- Reactor Safety Committee (RSC) meeting minutes since 2012

b. Observations and Findings

The inspector reviewed the RSC meeting minutes from 2012 to the present. The minutes showed the committee met at least once per calendar year and that a quorum was present as required by TS. The topics considered during the meetings were appropriate.

The inspector noted that members of the safety committee had completed the audits required by TS at the required periodicity. The inspector noted that the audit findings were acceptable and that the licensee responded and took corrective actions as needed.

c. Conclusion

The review and audit program was being conducted acceptably by the RSC.

**6. Transportation**

a. Inspection Scope (IP 86740)

The inspector reviewed the following to verify compliance with NRC regulatory and licensee procedural requirements for shipping or transferring licensed material:

- Annual Report for calendar years 2012 and 2013

b. Observations and Findings

Through records review and discussions with licensee personnel, the inspector determined that the licensee had not shipped any radioactive material from the facility under the reactor license in recent years. It was noted that radioactive material produced in the reactor was either transferred to the campus broadscope license and shipped under that license, or transferred to other authorized users on campus, or maintained at the reactor facility for use in laboratories in accordance with procedure.

The inspector also verified that staff authorized to ship material had been certified within the past three years.

c. Conclusion

No radioactive material had been shipped from the reactor facility under the reactor license during the past several years.

**7. Follow-up on Previously Identified Issue**

a. Inspection Scope (IP 92701)

The inspector followed up on the Unresolved Item (URI) 50-284/2010-202-01 to follow-up on the termination of the two operator licenses that were in non-compliance with 10 CFR 55.53(h) and IFI 50-284/2011-201-04 to follow-up on the licensee's requalification program. The inspector also reviewed and discussed with the licensee the following IFIs: IFI 50-284/2010-202-01 and IFI 50-284/2010-202-03, and the IFI 50-284/2011-202-01.

b. Observations and Findings

- (1) IFI 50-284/2010-202-02 - Follow-up to the licensee's commitments made to revise and properly review and approve Operating Procedure #1.

In August 2010, it was noted that there was no step in procedure OP-1 which indicated when the reactor source should be withdrawn from the glory hole and where it was to be placed afterwards. Also, it was noted that there were no precautions specified for this operation. During the November 2013 inspection, the inspector noted that the licensee had revised the procedure, but it had not yet been presented to the RSC for approval. During the current inspection, the inspector verified that the RSC had reviewed and approved the procedure. Therefore, this IFI is closed.

- (2) IFI 50-284/2011-201-02 - Follow-up on previous issues discussed from the non-routine inspection (Inspection Report No. 50-284/2010-201) and commitments made to revise and properly review and approve Operating Procedure #1.

In July 2011, an inspector followed-up on an issue originally identified during a non-routine inspection conducted during the period of February 23–24, 2010 (Inspection Report No. 50-284/2010-201). Specifically, during that inspection the licensee indicated that they intended to revise the procedures that identify the proper storage location of the startup source. Additionally, the inspector followed-up on logging requirements of the startup source per the current operating procedure. At the time of the July 2011 inspection, OP-1 had not yet been revised to indicate the point in the procedure where the startup source was to be removed, nor did it address where the startup source was to be stored after it was removed. The inspector noted that the reactor logs, in some instances, did not indicate the position of the source as required by OP-1.

As previously mentioned, during the November 2013 inspection, the inspector noted that OP-1 had been revised but had yet to be reviewed and approved by the RSC. As mentioned above, the inspector verified that the RSC had reviewed and approved the procedure. Therefore, this IFI is closed.

- (3) VIO 50-284/2013-201-01 - Failure of two operators to have a required console examination during 2011 and failure of one operator to have a required console examination during 2012 was a violation of Paragraph V.B of the facility Operator Requalification Program.

On December 18, 2013, the licensee sent the NRC a response to the violation discussing the corrective actions. During the inspection, the inspector verified completion of the corrective actions. Therefore, this violation is closed.

c. Conclusion

Two IFIs and a violation have been closed.

**8. Exit Meeting Summary**

The inspection scope and results were summarized on July 24, 2014, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the results of the inspection and did not identify any information as proprietary.

## **PARTIAL LIST OF PERSONS CONTACTED**

A. Mallicoat	Reactor Supervisor
J. Kunze	Reactor Administrator, Nuclear Engineering Department
M. Daniel	Authorized Operator
P. Farina	Radiation Safety Officer, TSO, ISU

## **INSPECTION PROCEDURES USED**

IP 69001	Class II Research and Test Reactors
IP 86740	Inspection of Transportation Activities

## **ITEMS OPENED, CLOSED, AND DISCUSSED**

### OPENED:

IFI 50-284/2014-201-01	Follow-up on the licensee's 50.59 approval process.
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### CLOSED:

IFI 50-284/2010-202-02	Follow-up to the licensee's commitments made to revise and properly review and approve Operating Procedure #1.
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IFI 50-284/2011-201-02	Follow-up on previous issues discussed from the non-routine inspection (Inspection Report No. 50-284/2010-201) and commitments made to revise and properly review and approve Operating Procedure #1.
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VIO 50-284/2013-201-01	Failure of two operators to have a required console examination during 2011 and failure of one operator to have a required console examination during 2012 was a violation of Paragraph V.B of the facility Operator Requalification Program.
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### DISCUSSED

IFI 50-284/2012-201-01	Follow-up on the licensee's commitment of performing a new 10 CFR 50.59 review of the proposed digital reactor console.
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## LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
AGN-201M	Aerojet General Nucleonics-201M
ALARA	As Low As Reasonably Achievable
FSAR	Final Safety Analysis Report
IFI	Inspection Follow-up Item
IP	Inspection Procedure
ISU	Idaho State University
NRC	U.S. Nuclear Regulatory Commission
NCV	Non-cited Violation
OP	Operating Procedure
OSL	Optically Stimulated Thermoluminescent
RA	Reactor Administrator
Rev.	Revision
RPM	Radiation Procedures Manual
RO	Reactor Operator
RSP	Radiation Safety Procedure
RSC	Reactor Safety Committee
RSO	Radiation Safety Officer
SRO	Senior Reactor Operator
TLD	Thermoluminescent Dosimeter
TS	Technical Specification
TSO	Technical Safety Office
URI	Unresolved Item