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

March 11, 2022

Mr. Carl Willis, Chief Reactor Supervisor
Nuclear Engineering Department
1 University of New Mexico, MSC-01-1120
Albuquerque, NM 87131-0001

SUBJECT: UNIVERSITY OF NEW MEXICO – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 05000252/2022201

Dear Mr. Willis:

From January 31 – February 3, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a routine announced safety inspection at the University of New Mexico Aerojet General Nucleonics-201 Modified Research Reactor facility. The enclosed report presents the results of that inspection.

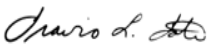
The inspection examined activities conducted under your license as they relate to public health and safety to ensure compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and representative records, observed various activities, and interviewed personnel.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2.a of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, 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 NRC's document system (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 Craig Bassett at (240) 535-1842, or electronic mail at Craig.Bassett@nrc.gov.

Sincerely,


Signed by Tate, Travis
on 03/11/22

Travis L. Tate, Chief
Non-Power Production and Utilization
Facility Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-252
License No. R-102

Enclosure:
As stated

cc: See next page

cc:

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SUBJECT: UNIVERSITY OF NEW MEXICO – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 05000252/2022201 DATED: MARCH 11, 2022

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

Docket No.:	50-252
License No.:	R-102
Report No.:	05000252/2022201
Licensee:	University of New Mexico
Facility:	AGN-201M Reactor Facility
Location:	Albuquerque, New Mexico
Dates:	January 31 – February 3, 2022
Inspector:	Craig Bassett
Approved by:	Travis L. Tate, Chief Non-Power Production and Utilization Facility Oversight Branch Division of Advanced Reactors and Non-Power Production and Utilization Facilities Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

University of New Mexico
AGN-201M Research Reactor Facility
Inspection Report No. 05000252/2022-201

The primary focus of this routine, announced inspection included onsite review of selected aspects of the University of New Mexico (UNM, the licensee) Class II research reactor safety program including: (1) organization and staffing; (2) operations logs and records; (3) requalification training; (4) surveillance and limiting conditions for operations (LCOs); (5) experiments; (6) committees, audits, and reviews; (7) emergency planning; (8) maintenance logs and records; and (9) fuel handling logs and records. The U.S. Nuclear Regulatory Commission (NRC) staff determined that the licensee's program were acceptably directed toward the protection of public health and safety and in compliance with NRC requirements.

Organization and Staffing

- The facility organizational structure and shift staffing satisfied technical specification (TSs) requirements.

Operations Logs and Records

- The facility maintained operations logs and records in accordance with the TSs.

Requalification Training

- The licensee’s NRC approved requalification program was up-to-date and plan requirements were met.

Surveillance and Limiting Condition for Operation

- Surveillances and LCO were performed in accordance with the TSs requirements.

Experiments

- The approval and control of experiments met TS requirements.

Committees, Audits and Reviews

- The Reactor Safety Advisory Committee (RSAC) met as required and provided the review and oversight functions required by the TSs.

Emergency Planning

- The facility emergency preparedness program was implemented as required by the NRC approved Emergency Plan (E-Plan).

Maintenance Logs and Records

- Maintenance activities were performed in accordance with facility procedures.

Fuel Handling Logs and Records

- Fuel Handling operations were performed in accordance with facility protocol and procedures and the TSs.

REPORT DETAILS

Summary of Facility Status

The UNM, Aerojet General Nucleonics-201 Modified (AGN-201M) research reactor continued operation in support of operator training, surveillances, teaching and classroom experiments/demonstrations. During the inspection, the reactor was operated for demonstration purposes.

1. Organization and Staffing

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

The inspector reviewed the following to ensure that the requirements of TS Section 6.0 were met:

- qualifications of facility personnel
- management responsibilities and facility staffing
- selected portions of the "University of New Mexico AGN-201M Reactor Operations Log," forms completed in 2020 and 2021
- 2020 Annual Report for the UNM AGN-201M reactor, for the period from July 1, 2019, to June 30, 2020
- 2021 Annual Report for the UNM AGN-201M reactor, for the period from July 1, 2020, to June 30, 2021

b. Observations and Findings

The inspector confirmed that the facility organization was consistent with that specified in the TS and the organizational structure and the responsibilities of the reactor staff had not changed since the last inspection. The inspector noted that a new person was appointed as Chair of the Nuclear Engineering Department since the last NRC inspection. The licensee notified the NRC of this change as required through the submittal of a letter dated June 22, 2020, and the 2021 annual report.

The inspector found that staffing levels remained consistent with those noted during previous inspections of the facility. Through the review of selected records, the inspector verified that, during operations when the reactor was not secured, the facility met the minimum operating staffing requirements specified in TS Section 6.1.12.

During the inspection, the inspector also noted that the current Chief Reactor Supervisor worked at the reactor facility half-time. This has presented challenges in the area of revising documents (procedures, plans, etc.) and maintaining them current. However, a new Laboratory Supervisor was appointed during the inspection which is expected to address these challenges.

c. Conclusion

The inspector determined that the organizational structure and staffing satisfied TS requirements.

2. Operation Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed administrative procedures and record retention to verify compliance with TS Section 6.10. This included:

- various “University of New Mexico AGN-201M Reactor Operations Log,” forms completed from 2020 through the date of this inspection
- records of various surveillance and LCOs from 2020 through the date of this inspection
- recent “Request for Use of the UNM AGN-201 Reactor,” authorization forms
- “AGN-201M Annual Maintenance,” forms for surveillance activities and maintenance performed during July and October 2020, and during July and August 2021
- recent “Monthly Reactor Inspection AGN-201M, SN-112 Reactor,” forms
- selected maintenance records from 2020 through the date of this inspection
- the two most recent UNM Annual Operating Reports

b. Observations and Findings

The inspector verified that the logs showed the completion of the pre-critical startup checklist, startup, power changes and steady state operation, and shutdown of the reactor. The inspector noted that the logs and records also documented the installation or removal of fuel disks, control rods, or experiments that could affect core reactivity, rod worth measurements and other reactivity measurements. The inspector confirmed that the reactor logs were completed and maintained.

c. Conclusion

The inspector determined that the licensee maintained and retained records in accordance with the TSs.

3. Requalification Training

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with the applicable requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55, “Operators' Licenses,” and the licensee’s requalification program:

- current status of selected qualified operators’ licenses
- medical examination records from 2019 through 2021
- operator training records for the years 2020 and 2021
- “Operator and Senior Operator Requalification Program for the University of New Mexico AGN-201M Reactor Facility,” revised as of March 2019
- various “University of New Mexico AGN-201M Reactor Operations Log,” forms completed from 2020 through the date of this inspection.

b. Observations and Findings

The inspector confirmed that the operations staff consisted of three senior reactor operators and four reactor operators. The inspector reviewed the various training records maintained by the licensee. By cross-referencing the training records with the reactor operations logs and the operator's own records, the inspector was able to confirm that the active NRC-licensed staff at the facility maintained the proper qualifications by successfully completing all aspects of the facility's requalification and training program. The inspector also verified that these operators' licenses were current. In addition, the inspector noted that the operators also received the appropriate biennial medical examinations as required by the regulations.

The inspector noted that the licensee was working to develop a system to more easily track, recall, and verify the various tasks required by the requalification program. The inspector informed the licensee that the NRC would track the development and implementation of this system as an inspector follow-up item (IFI) and would review the issue during a future inspection (IFI 05000252/2022201-01).

c. Conclusion

The inspector determined that the licensee's requalification program was up-to-date, and the applicable requirements were met. The inspector also determined that operators received biennial medical examinations as required by the regulations.

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with TS Sections 3.0 and 4.0:

- "AGN-201M Annual Maintenance," forms for surveillance activities and maintenance performed during July and October 2020, and during July and August 2021
- various "University of New Mexico AGN-201M Reactor Operations Log," forms
- selected "Monthly Reactor Inspection AGN-201M, SN-112 Reactor," forms

b. Observations and Findings

(1) Routine Surveillance

The inspector verified that LCOs for reactor core reactivity conditions; reactor control and safety systems; limitations of experiments; radiation monitoring; control and shielding were met except as noted in the next paragraph. The inspector noted that this was documented through monthly and annual surveillances and the results were maintained within the monthly maintenance logbook. The inspector confirmed that the LCOs were checked and/or completed at the required frequencies and the results were within the specified parameters.

(2) Non-compliance with a Limiting Condition for Operation required by TS 3.2.a

On February 25, 2020, licensee personnel were conducting a pre-operational checkout while the reactor was shutdown. The operators found that, during the manual scram test, only Safety Rod #2 and the Coarse Control Rod scrammed; Safety Rod #1 was still attached to the magnet and did not scram. The operators determined that they were not in compliance with TS Section 3.0, "Limiting Conditions for Operation," TS 3.2, "Reactor Control and Safety Systems," Specification a., which required that "the fine control rod, coarse control rod, and the two safety rods shall be operable, and the carriage position of the fine and coarse control rods shall be displayed at the console whenever any rod is above its lower limit." The licensee notified the NRC of this situation on February 26, 2020, which was recorded as Event Number 54546. The licensee issued a report fourteen days later.

During this inspection, the inspector reviewed this event and the licensee's corrective actions. The inspector noted that, after consulting with another university that has the same type of reactor, checking out all the electronics, and conducting various tests, the licensee identified two potential causes of the problem: 1) residual magnetism on either the fuel rod driver plate or electromagnet, or 2) suction between the driver plate and magnet caused by a foreign substance or air or similar device. The licensee used a de-magnetizer to reduce the "magnetism" on the driver plate and the electromagnet, but this produced no indication of any change in the magnetic field. The licensee sought to address the problem by introducing a small gap between the two surfaces. The inspector confirmed that the licensee completed a 10 CFR 50.59, "Changes, tests and experiment," review and evaluation and installed a mylar spacer between the fuel rod drive plate and the electromagnet. The rod then scrammed within the TS prescribed limits. The inspector found that the licensee's actions were complete and in accordance with the TSs and a temporary facility procedure was developed for this situation.

Contrary to TS 3.2, Safety Rod #1 was found inoperable during the pre-operational checkouts. The licensee was informed that the failure of Safety Rod #1 to operate (scram) with any rod above its lower limit was a Severity Level IV violation of TS 3.2.a. As indicated above, the inspector determined that the problem was identified by the licensee and reported to the NRC. Corrective actions were identified and completed as well. As a result, the licensee was informed that this non-willful, non-repetitive, licensee-identified and licensee-corrected violation would be treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05000252/2022201-02). This issue is considered closed.

c. Conclusion

The inspector determined that the surveillances and LCOs were performed in accordance with facility TSs.

5. Experiments

a. Inspection Scope (IP 69005)

The inspector reviewed selected aspects of the following to verify compliance with TS Sections 3.3, 4.5, and 6.7:

- radioisotope production log.
- various "Request for Use of the UNM AGN-201 Reactor," authorization forms
- various "University of New Mexico AGN-201M Reactor Operations Log," forms

b. Observations and Findings

The inspector noted that the UNM AGN-201M reactor was primarily used as a training reactor for undergraduate and graduate students. The inspector confirmed that the various experiments, and revisions thereto, were reviewed and approved. The inspector noted that no new experiments were proposed in the past several years. The inspector confirmed that experiments were performed as stipulated by the TSs and appropriate protocols, and the results documented. The inspector also verified that experiments were performed under the cognizance of the Chief Reactor Supervisor as required by the TSs.

During the inspection, the inspector observed a portion of an "Approach to Critical" experiment conducted in the reactor laboratory room of the Nuclear Engineering Laboratory building. The inspector verified that the staff and students followed the established experiment procedure. The inspector noted that a health physicist from the UNM Office of Radiation Safety provided radiological support. No problems were noted.

c. Conclusion

The inspector determined that the program for reviewing and conducting experiments satisfied TS and procedural requirements.

6. Committees, Audits and Reviews

a. Inspection Scope (IP 69001)

To verify that TS requirements were met concerning the RSAC, the inspector reviewed selected aspects of:

- RSAC meeting minutes from 2020 through the date of this inspection
- audits completed by the RSAC or a designee during the last 2 years
- the two most recent UNM Annual Operating Reports

b. Observations and Findings

The inspector verified that the RSAC held semiannual meetings and that a quorum was present as required by the TSs. The inspector found that minutes of these meetings indicated the RSAC provided appropriate guidance and direction for reactor operations and ensured suitable use and oversight of the reactor.

The inspector reviewed the RSAC audits required under the TS Section 6.4.3. The inspector verified that the RSAC performed the audits within the periodicity outlined in the TSs and the results were captured in the RSAC meeting minutes. From a review of the minutes, the inspector confirmed that there were no safety significant issues

recorded during the audits.

c. Conclusion

The inspector determined that the RSAC met and provided the review and oversight functions required by the TSs.

7. Emergency Planning

a. Inspection Scope (IP 69001)

To verify compliance with the facility's emergency plan entitled, "Emergency Plan for the UNM AGN-201M Reactor Facility," dated October 24, 2012, the inspector reviewed selected aspects of:

- training records for staff and student personnel
- emergency response supplies, equipment, and instrumentation
- documentation of emergency drills and critiques for 2020 and 2021
- emergency contact lists posted in the nuclear engineering laboratory
- selected emergency procedures contained in the "University of New Mexico AGN-201M Reactor – Reactor Operation and Training Manual"
- letters of agreement between the licensee and the Albuquerque Fire Department, the UNM Hospital, the Department of Radiology, and the Albuquerque Ambulance Service

b. Observations and Findings

The inspector noted that the E-Plan in use at the reactor was the same as the version most recently reviewed and approved by the NRC. The inspector verified that the E-Plan was audited biennially and that the associated implementing procedures were reviewed and revised as needed.

The inspector verified that monthly inventories of various emergency supplies were conducted by UNM Radiation Safety Office personnel and that the supplies and equipment were maintained in the appropriate locations as required in the E-Plan. The inspector also confirmed that emergency training for reactor staff and students was conducted. The inspector noted that the UNM emergency contact list was current and was last updated December 12, 2021.

The inspector confirmed that emergency drills were conducted annually as required in the E-Plan and that critiques for the drills were held and documented. The inspector noted that the drills and critiques were adequate.

The inspector noted that letters of support with various university and offsite response organizations, such as the UNM Hospital and the Department of Radiology, as well as the Albuquerque Fire Department and the Albuquerque Ambulance Service, were maintained and updated.

Due to the continuing effects of the Coronavirus Disease 2019 Public Health Emergency, the inspector did not visit any of the reactor facility's support groups.

c. Conclusion

The inspector determined that the licensee maintained acceptable emergency preparedness in accordance with TS and E-Plan requirements.

8. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To verify that maintenance was performed in accordance with procedures and the TSs, the inspector reviewed the following:

- selected "Monthly Reactor Inspection AGN-201M, SN-112 Reactor," forms
- various "University of New Mexico AGN-201M Reactor Operations Log," forms
- completed "Reactor Maintenance Log Sheet – The University of New Mexico AGN-201M Reactor Facility," forms completed from 2020 through the date of this inspection
- the two most recent UNM Annual Operating Reports
- selected portions of the reactor operations and maintenance logbooks for the last 2 years

b. Observations and Findings

The inspector noted that routine and preventive maintenance was controlled and documented and that all maintenance activities were completed in accordance with the requirements in the appropriate licensee procedures and TS Section 4.0. The inspector verified that post maintenance testing was performed before returning equipment to service.

c. Conclusion

The inspector determined that maintenance activities were performed in accordance with facility procedures and the TSs.

9. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

To verify compliance with licensee procedures for fuel removal and insertion, the inspector interviewed facility staff and reviewed the following:

- various "University of New Mexico AGN-201M Reactor Operations Log," forms
- various licensee procedures including: "AGN-201 Fuel Removal Procedure for Approach to Critical [TS 6.10.1.a.2]," and "UNM AGN-201M Fuel Insertion and Procedure for Re-Assembly of Core Tank [TS 6.6.b]"

b. Observations and Findings

Through discussion with reactor facility staff and personal observation during the "Approach to Critical" experiment, the inspector confirmed that the majority of fuel

handling operations were performed during laboratory experiments or annual surveillances. The inspector found that the fuel movements completed since the last inspection, including those during this inspection, were adequately documented and that fuel accountability and control was maintained at all times.

c. Conclusion

The inspector determined that fuel handling operations were performed in accordance with facility procedures and the TSs.

10. Exit Meeting

The inspection scope and results were summarized on February 3, 2022, with members of licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Busch	NE Faculty (retired) and Senior Reactor Operator (active)
R. Davis	Laboratory Supervisor and Senior Reactor Operator
R. Dwyer	Reactor Operator
C. Willis	Chief Reactor Supervisor and Lecturer II

Other Personnel

M. Eden	Technical Assistant, UNM Radiation Safety Office

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000252/2022201-01	IFI	Follow-up on the development and implementation of a system to facilitate tracking and verifying the various tasks required by the requalification program.
05000252/2022201-02	NCV	Failure of Safety Rod #1 to operate (scram) when requested as required by TS 3.2.a.

Closed

05000252/2022201-02	NCV	Failure of Safety Rod #1 to operate (scram) when requested as required by TS 3.2.a.