

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION

REGION IV

Inspection Report: 50-252/94-01

Operating License: R-102

Licensee: The University of New Mexico
Chemical and Nuclear Engineering
Department
209 Farris Engineering Center
Albuquerque, New Mexico 87131-1341

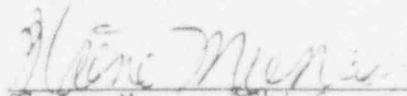
Facility Name: AGN-201M Reactor (5 Watts)

Inspection At: Chemical and Nuclear Engineering Department
Albuquerque, New Mexico

Inspection Conducted: May 2-5, 1994

Inspector: L. R. Norderhaug
Senior Material Control Analyst
Reactor Inspection Branch

Approved:


Blaine Murray, Chief
Reactor Inspection Branch


Date Signed

Inspection Summary

Areas Inspected: Routine, announced, inspection of organization and staffing, operations logs and records, procedures, licensed operator requalification training, surveillance and limiting conditions for operation, experiments, radiation protection, design changes, committee activities, audits and reviews, emergency planning, maintenance logs and records, and fuel handling logs and records.

Also reviewed were programs for radioactive materials transportation, special nuclear material accountability and physical security, including: plans, procedures and reviews; reports of safeguards events; receipt of new fuel at reactor facilities and fixed site physical protection of special nuclear material of low strategic significance.

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Results:

- The licensee's organization satisfied technical specifications requirements (Section 1.1).
- Reactor operations logs and records were maintained as required (Section 1.2).
- Operating procedures were followed consistent with regulatory requirements (Section 1.3).
- The operator requalification program was properly implemented (Section 1.4).
- The surveillance requirements and limiting conditions of operation were maintained in accordance with technical specifications (Section 1.5).
- Reactor experiments had been reviewed and authorized in accordance with technical specification requirements (Section 1.6),
- A good radiation protection program was effectively implemented (Section 1.7),
- Reactor design changes, the performance of any modified equipment, and procedures related to the modified system were reviewed and approved in accordance with 10 CFR 50.59, the technical specifications, and administrative procedures (Section 1.8).
- Comprehensive audits were performed by oversight committees (Section 1.9).
- A violation was identified involving the failure to make the required reports to NRC of changes made to the approved Emergency Plan (Section 1.10).
- Maintenance logs and records were maintained as required by the technical specifications and administrative procedures (Section 1.11).
- Reactor fuel material had been handled and recorded in a manner consistent with the requirements of the technical specifications and procedures (Section 1.12).
- A violation was identified involving the failure to make the required reports to NRC of changes made to the Security Plan (Section 2).
- No safeguards events had occurred for which a report is required by 10 CFR 73.71 (Section 3).

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- The physical protection system provided proper protection for reactor fuel (Section 4).
- A noncited violation was identified concerning the intrusion detection system (Section 5).
- Inventory and control of special nuclear material was consistent with regulatory requirements (Section 6).
- No shipments of radioactive material had been made under the authority of the NRC license (Section 7).
- The licensee had received, reviewed and evaluated their operations in accordance with Information Notices and Generic Letters issued by the NRC since the last inspection (Section 8).

Summary of Inspection Findings:

- Violation 252/9401-01 was opened (Section 1.10).
- Violation 252/9401-02 was opened (Section 2.1).
- Noncited Violation was identified (Section 5.2).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - **PROPRIETARY INFORMATION**
Sensitive Security Inspection Information

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DETAILS

1 CLASS II RESEARCH AND TEST REACTOR OPERATIONS (40750)

The inspector reviewed the operations, health physics, emergency preparedness, and requalification training for the Aerojet General Nuclear AGN-201M reactor. The items reviewed are discussed in the following subsections. A violation identified in this area is discussed in Section 1.10, below.

1.1 Organization and Staffing

The inspector determined that the licensee's organization and minimum shift staffing composition for operation, including on-call personnel, were as described in their technical specifications.

1.2 Operations Logs and Records

The inspector determined that the licensee's operation logs and records were maintained as required by the licensee's administrative procedures, no significant problems or events had been identified. The recorders required by the technical specifications were properly maintained.

1.3 Procedures

The inspector determined that:

- The licensee's administrative control procedures were consistent with technical specifications, license requirements, and licensee commitments.
- The procedures used by the licensed operator had been reviewed and approved in accordance with the requirements of the licensee administrative control procedures. The latest revisions were available and used.
- The procedures required by the technical specification contained sufficient information for the user to perform the required function.
- Reactor personnel adhered to the facility procedures requirements.

1.4 Operator Requalification Training

The inspector determined that:

- The requalification records for licensed operators were maintained as required by the requalification plan.

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- Although no operators had been disqualified, the licensee understood the required actions for any disqualified individual not meeting the requirements of 10 CFR 55.53 (e) or the requalification plan.
- The licensee had implemented the following items, consistent with the Requalification Plan approved by the Office of Nuclear Reactor Regulation:
 - Discussion and review of changes in the facility, procedures, and license.
 - Review and simulation of abnormal and emergency procedures.
 - Assurance that the operators maintain an active duty status in accordance with 10 CFR Part 55.53(e).
 - The conduct of formal training.

1.5 Surveillance and Limiting Conditions for Operation

The inspector determined that:

- The surveillance requirements of the technical specifications were conducted.
- The Limiting Conditions of Operation were maintained in accordance with the licensee's procedural requirements.

1.6 Experiments

The inspector determined that:

- Although no new experiments had been developed since the last inspection, the licensee understood the requirement to review and approve any new experiments or any changes to existing experiments in accordance with the requirements in their technical specifications and procedures.
- None of the experiments represented an unreviewed safety question or require a technical specifications change as delineated in 10 CFR 50.59.
- The licensee had identified hazards that could be associated with experiments and remedial actions as appropriate.
- The licensee had accounted for and controlled irradiated items as required by the regulations and licensee procedures.

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- The experiments were controlled as required by the technical specifications and the licensee's procedures.
- The experiments were installed and removed from the reactor in accordance with experiment authorizations and procedures.
- The reactivity worth of experiments had been evaluated and verified by measurements in accordance with the technical specifications and the licensee's procedures.
- Engineering controls had been established to limit radiation exposures as required by the applicable experiment protocol and authorization, procedures, and technical specifications.

1.7 Health Physics

The inspector determined that:

- The exposure limits in 10 CFR Part 20 were not exceeded.
- The required radiation survey, sampling, and monitoring had been performed in accordance with the regulatory requirements and the licensee's procedures.
- The required calibration of radiological survey, sampling, or monitoring instruments had been performed in accordance with the technical specifications and the licensee's procedures.
- The required personnel dosimetry program was conducted in accordance with licensee procedures and 10 CFR 20.1501 and 20.1502.
- The licensee had satisfied the requirements for radiological effluent releases in 10 CFR 20.1302; 10 CFR Part 20, Appendix B, Table 2; and the technical specifications.
- The use and calibration for instruments to monitor gaseous or liquid effluent releases were commensurate with the requirements in 10 CFR 20.1501, the technical specifications, and the licensee's procedures.
- Notices to workers were posted in accordance with 10 CFR 19.11 and the licensee's procedural requirements.
- Restricted areas, as defined in 10 CFR 20.1003, were posted in accordance with the requirements in 10 CFR 20.1902 and 20.1903 and the licensee's procedures.

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- Appropriate contamination control protective clothing was being used in accordance with the licensee's procedural requirements.
- Personnel working around radioactive material had been instructed in radiation safety as required by the licensee's procedures and by 10 CFR 19.12.
- The principles of As Low^{As} Reasonably Achievable (ALARA) had been implemented to include the location of remote measurement readouts for radiation field measurements in the vicinity of the reactor faces.
- The licensee's Radiation Safety Officer (or equivalent) had reviewed and approved radiation protection program changes, experiments, and radiation protection related events and conditions in accordance with licensee procedures and the technical specifications.
- Although no planned special exposures had been conducted, the licensee understood requirements related to such activities.
- Although no doses had been received by declared pregnant women, the licensee understood the requirements related to potential doses to the embryo/fetus.
- The licensee had developed, documented, and implemented a radiation protection program in accordance with new 10 CFR Part 20.

1.8 Design Changes

The inspector determined that, although no design changes had been made, the licensee understood that such changes, the performance of any modified equipment, and procedures related to the modified system must be reviewed and approved in accordance with 10 CFR 50.59, the technical specifications, and the licensee's administrative procedures. The licensee further understood that the as-built drawings must reflect the actual modified design required by the licensee's procedures and the design change package.

1.9 Committees, Audits and Reviews

The inspector determined that:

- The safety review committee had met in accordance with the technical specifications requirements.
- Independent audits had been conducted in accordance with the technical specifications requirements and the licensee's procedures.

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- Although no significant problems had been identified by the reviews, the licensee understood that any, so identified, must be resolved in accordance with the technical specifications requirements and the licensee's procedures.

1.10 Emergency Planning

The inspector determined that:

- Procedures required by the emergency plan were current and readily available to users as required by the plan.
- The licensee had conducted exercises and drills as required by the emergency plan.
- The licensee had conducted training for emergency response personnel in accordance with the emergency plan.
- Key emergency response personnel can acceptably respond to emergency conditions in accordance with the Emergency Plan and implementing procedures.

10 CFR 50.54(q) requires that the licensee shall submit a report to NRC of each change made to the emergency plan within 30 days after the change is made. The inspector determined that, although the licensee understood the evaluation criteria of 50.54(q) and the reporting and record keeping requirements related to such changes, the changes implemented in October of 1992 had not been reported to NRC. The failure to report emergency plan changes was identified as a violation of 10 CFR 50.54(q) (252/94-01-01).

Since the above emergency plan changes relate to information concerning the physical protection of special nuclear material, the details are discussed in the Attachment 2 to this inspection report. The Attachment is exempt from public disclosure and will receive limited distribution.

1.11 Maintenance Logs and Records

The inspector determined that:

- Maintenance logs and records were maintained as required by the licensee's administrative procedures.
- Although no significant problems and events had been identified by review of the maintenance logs and records, the licensee understood that, if identified, they must be reported and resolved in accordance with the requirements in the technical specifications and the licensee's administrative procedures.

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- Maintenance had been performed consistent with the technical specifications and the licensee's procedures that govern maintenance activities.

1.12 Fuel Handling Logs and Records

The inspector determined that, except for the long established "Approach to Criticality" instruction project (experiment), no fuel material had been handled in the period since the last inspection. As with the Approach to Criticality, the licensee understood that any such activities must be recorded to satisfy the requirements in the technical specifications and the licensee's procedures.

2 SECURITY PLANS, PROCEDURES, AND REVIEWS (81401)

The licensee maintained good performance this area. A violation identified in this area is discussed in Section 2.1, below.

2.1 Plan Revisions

The inspector determined that the Physical Security Plan had been revised since the last inspection. 10 CFR 50.54(p)(2) requires that the licensee shall submit a report to NRC containing a description of each change made to the security plan within 2 months after the change is made. The inspector also determined that, although the licensee understood the evaluation criteria of 50.54(p) and the reporting and record keeping requirements related to such changes, the changes implemented in October of 1992 had not been reported to the NRC nor had subsequent changes made in January of 1993. The failure to report security plan changes was identified as a violation of 10 CFR 50.54(p) (252/94-01-02).

Since the changes related to information concerning the physical protection for special nuclear material, the details are discussed in Attachment 2 to this inspection report. Attachment 2 is exempt from public disclosure and will receive limited distribution.

2.2 Procedures

The inspector determined that the licensee had structured the security plan and detailed appendixes to preclude the need for additional descriptive procedures.

2.3 Security Program Review

The inspector verified that the licensee periodically reviews and audits security program.

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3 REPORTS OF SAFEGUARDS EVENTS (81402)

Although no events, reportable under 10 CFR 73.71 had occurred, the licensee demonstrated a knowledge of the reporting requirements.

4 RECEIPT OF NEW FUEL AT REACTOR FACILITIES (81403)

Although no special nuclear material had been received since the last inspection, the licensee demonstrated an understanding of the need to check the integrity of the container and tamper-indicating seal and to immediately notify the shipper and initiate an investigation if any discrepancy is noted.

5 FIXED SITE PHYSICAL PROTECTION OF LOW STRATEGIC QUANTITY OF NUCLEAR MATERIAL (81431)

The licensee maintained good performance in this area. A noncited violation identified in this area is discussed in Section 5.2, below.

5.1 Use and Storage

The inspector verified that the licensee store or use the material only within a controlled access area and that proper placement and transfer of custody of special nuclear material is maintained.

5.2 Detection and Surveillance

The inspector determined that the licensee's safeguards system:

- Provides early detection and assessment of unauthorized access or activities with the controlled access area.
- Provides early detection of removal of special nuclear material from the controlled access area.

The inspector also verified that:

- The detection and assessment of unauthorized access and/or activities, and of the unauthorized removal of special nuclear material were sufficiently prompt that a response could facilitate the location and recovery of missing special nuclear material,
- The licensee monitors the controlled access area with an intrusion alarm or other device or procedures to detect unauthorized penetrations or activities.
- All individuals whose duties include the use of these procedures are knowledgeable in their execution.

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The inspector's review of the alarms, devices, or procedures used to monitor the controlled access area, determined that one of the intrusion detection sensors not to be functioning as required. Prior to the completion of the inspection, the licensee had fixed the defective sensor. The licensee further noted that, in the future, a periodic field testing program would be implemented to detect and evaluate future potential degradations of performance of the intrusion detection systems. Considering other security measures in place, the licensee's prompt correction of the problem prior to the inspector leaving the site, and the measures implemented to preclude recurrence, this finding was found to satisfy the criteria in paragraph VII.B.1, Appendix C, to 10 CFR Part 2 as a noncited violation.

Further information concerning the physical protection for special nuclear material are discussed in Attachment 2 to this inspection report. Attachment 2 is exempt from public disclosure and will receive limited distribution.

5.3 Access Control

The inspector verified that:

- All controlled access areas were clearly demarcated.
- Access to the room containing the reactor vessel was controlled, and the room was designated a controlled access area.

The inspector also determined that the licensee's access control procedures and mechanisms are capable of preventing the unauthorized entry of individuals or materials.

5.4 Response

The inspector verified that:

- A watch person or offsite response force was available to respond to all unauthorized penetrations or activities.
- The licensee had established and maintains response procedures for dealing with threats of theft and theft of special nuclear material.
- The licensee responds to indications of unauthorized removal of special nuclear material.
- All individuals with duties for responding to security emergencies were trained, equipped, and qualified to perform the response procedures as appropriate.

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5.5 Testing and Maintenance

The inspector determined that the licensee's periodic tests of security related devices and equipment had been limited to electronic communication continuity checks which allowed the problem discussed in Section 5.2 to go undetected. As noted in Section 5.2, the licensee is implementing a program of frequent field tests to assure that any future sensor degradation will be discovered and fixed promptly.

6 MATERIAL CONTROL AND ACCOUNTING, REACTORS (85102)

The licensee maintained a proper level of performance in this area.

6.1 Possession and Use of Special Nuclear Material

The inspector determined that The University of New Mexico is licensed to possess, use, and operate an AGN-201M reactor and to receive, use, and possess a quantity of Special Nuclear Material (special nuclear material) of less than or equal to 700 grams of U-235. The inspector further determined that, as of reporting period ending March 31, 1994, the licensee possesses 666 grams of U-235 contained in 3.379 kg of uranium in the inaccessible core and one spare fuel piece referred to as a fission plate and verified by the inspector as stated to contain 28.89 grams of U-235 contained in 146 grams of uranium. The licensee also possesses 170 grams of plutonium in the form of PuBe sources held under the authority of the State of New Mexico license.

The reactor core contains 14 standard AGN-201M, fuel bearing, core pieces of various size and special nuclear material loading. These include nine fuel pieces, the core fuse, two safety rods, and coarse and fine control rods. The one additional unirradiated core piece (fission plate) was stored in a locked container in the reactor laboratory. The existence of selected core pieces was verified to be in agreement with fuel handling records maintained in the reactor operating log.

6.2 Control and Accounting of Special Nuclear Material

The inspector determined that the licensee had prepared, maintained, and implemented an adequate and effective program to control and account for the special nuclear material in his possession. During the period since the last inspection, no material transactions (receipts, shipments, or burnup) occurred which would have required the filing of Nuclear Material Transaction Report (NRC/DOE Form 741).

7 TRANSPORTATION ACTIVITIES (86740)

The inspector verified through discussions with facility personnel that no shipments of radioactive materials were conducted under authority of the NRC

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reactor license. All such shipments were performed under the authority of the State of New Mexico licenses.

8 LICENSEE ACTIONS

8.1 Information Notice (IN-90-81): Fitness-for-Duty

This information notice dated December 24, 1990, was issued to inform licensees not currently subject to NRC-required fitness-for-duty programs of the importance the NRC places on the drug-free work place concept in all aspects of nuclear material usage, management and, handling.

The inspector determined that the information notice had been received and reviewed by the licensee's staff with no followup actions identified.

8.2 Generic Letter (GL-91-16): Licensed Operators and Other Nuclear Facility Personnel Fitness-for-Duty

This generic letter dated October 3, 1991, was issued to describe Federal legislation regarding fitness-for-duty issues and to describe recent rule changes to Part 2, Appendix C, "General Statement of Policy and Procedure for NRC Enforcement Actions," and Part 55, "Operators' Licenses," of Title 10 of the Code of Federal Regulations.

The inspector determined that the information notice had been received and reviewed by the licensee's staff with no followup actions identified.

8.3 Information Notice (IN-93-57): Software Problems Involving Digital Control Console Systems at Non-power Reactors

This information notice dated July 23, 1993, was issued to alert licensees to software problems involving digital control console systems at two non-power reactors.

The inspector determined that the information notice had been received and reviewed by the licensee's staff with no followup actions identified.

8.4 Information Notice (IN-93-86): Identification of Isotopes in the Production and Shipment of Byproduct Material at Non-power Reactors

This information notice dated October 29, 1993, was issued to alert licensees to a problem with the identification of isotopes in byproduct material produced and shipped at a non-power reactor.

The inspector determined that the information notice had been received and reviewed by the licensee's staff with no followup actions identified.

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ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- R. Busch, Chief Reactor Supervisor
- *K. Carpenter, Reactor Supervisor
- D. Grady, Chief, U of NM Police Department
- *J. Graham, Radiation Safety Officer
- C. Landgraf, Network Services Manager
- *N. Roderick, Reactor Administrator
- M. Valteirra, Locksmith, U of NM Lock Shop

*Denotes those in attendance at the exit meeting.

The inspector also contacted members of the licensee's security, administrative and technical staff during the course of this inspection.

2 EXIT MEETING

An exit meeting was conducted on May 5, 1994. During this meeting, the inspector reviewed the scope and findings of the inspection. The licensee identified the physical security plan as proprietary information.

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