UNITED STATES



NUCLEAR REGULATORY COMMISSION

REGION IV

ARLINGTON, TEXAS 7001 4004 ARLINGTON, TEXAS 7001 4004 AUG 2 3 1994

Docket: 50-284 License: R-110

Idaho State University ATTN: Michael Gallagher Vice President Academic Affairs Box 8063 Pocatello, Idaho 83209

SUBJECT: NRC INSPECTION REPORT 50-284/94-01

This refers to the inspection conducted by Mr. L. R. Norderhaug of this office on July 18-22, 1994. The inspection included a review of activities authorized for the Idaho State University Reactor Laboratory. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements.

Based on the results of this inspection, certain of your activities appeared to be in violation of NRC requirements. However, this violation, involving a late surveillance test required by the reactor technical specifications, is not being cited because the criteria in paragraph VII.B.1, Appendix C, 10 CFR Part 2 of the NRC's "Rules of Practice," were satisfied. This violation had been corrected and measures to preclude recurrence were implemented prior to the inspector leaving the site.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosed inspection report will be placed in the NRC Public Document Room. However, in accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, information concerning your physical protection or material control and accounting programs for special nuclear material are exempt from public disclosure; therefore, Enclosure 3 (Attachment 2 to the inspection report) will receive limited distribution.

> DOCUMENT CONTAINS PROPRIETARY INFORMATION DECONTROLLED WHEN SEPARATED FROM ATTACHMENT 2

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Should you have any questions concerning this letter, we will be pleased to discuss them with you.

Sincerely,

Johns, Director Division of Radiation Safety and Safeguards

Enclosures: 1. NRC Inspection Report 50-284/94-01 2. Attachment 1 - Persons Contacted and Exit Meeting 3. Attachment 2 - PROPRIETARY INFORMATION Sensitive Security Inspection Information cc w/enclosures including Attachment 2 (PROPRIETARY INFORMATION): Idaho State University ATTN: Dr. A. Stephens Director of Nuclear Engineering Pocatello, Idaho 83209 Idaho State University ATTN: Mr. R. D. Clovis Reactor Supervisor College of Engineering Box 8060 Pocatello, Idaho 83209 cc w/enclosures w/o Attachment 2 (PROPRIETARY INFORMATION): Idaho State University ATTN: Mr. Tom Gessell Radiation Safety Officer Physics Department Box 8106 Pocatello, Idaho 83209 Radiation Control Program Director Division of Environment 450 West State, 3rd Floor Boise. Idaho 83720

DOCUMENT CONTAINS PROPRIETARY INFORMATION DECONTROLLED WHEN SEPARATED FROM ATTACHMENT 2

Idaho State University

bcc to DMB (IE01) without Attachment 2 (PROPRIETARY INFORMATION)

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bcc with copy of entire report:
L. J. Callan, RA
*L. R. Norderhaug, DRSS/RIB
*RIV File
*DRSS/RIB File (Hodges)
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bcc without Attachment 2 (PROPRIETARY INFORMATION):
*MIS System (Original IFS)
Lisa A. Shea, OC/LFDCB (MS 4503)
M. Mendonca, NRR Project Manager (MS 11 B20)
J. L. Caldwell, NRR (MS 10 D22)
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Idaho State University -3pcc to DMB (IE01) without Attachment 2 (PROPRIETARY INFORMATION) bcc with copy of entire report: L. J. Callan, RA *L. R. Norderhaug, DRSS/RIB *RIV File *DRSS/RIB File (Hodges) bcc without Attachment 2 (PROPRIETARY INFORMATION): *MIS System (Original IFS) Lisa A. Shea, OC/LFDCB (MS 4503) M. Mendonca, NRR Project Manager (MS 11 B20) J. L. Caldwell, NRR (MS 10 D22)

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APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION **REGION IV**

Inspection Report: 50-284/94-01

License: R-110

Licensee: Idaho State University Pocatello, Idaho 83209

Facility Name: Lillibridge Engineering Laboratory

Inspection At: Idaho State University Campus Pocatello, Idaho

Inspection Conducted: July 18-22, 1994

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

Approved:

1CU Blaine Murray, Acting Chief Reactor Inspection Branch

Inspection Summary

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Areas Inspected: Routine, announced inspection of the licensee's organization and management controls, training and qualifications, reactor operations and maintenance, procedures, experiments, surveillances, internal audit and review program, radiation protection program, emergency preparedness, special nuclear material accountability, and physical security.

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 consistent with regulatory requirements . (Section 1.3).
- The operator requalification program was properly implemented ٠ (Section 1.4).

- The surveillance requirements and limiting conditions of operation were generally maintained in accordance with technical specifications. However, a noncited violation was identified concerning a late surveillance test on the seismic displacement interlock (Section 1.5).
- Reactor experiments had been reviewed and authorized in accordance with technical specification requirements (Section 1.6).
- A good radiation protection program had been 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).
- Emergency planning procedures involving onsite and offsite support organizations had been aggressively implemented and exercised (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).
- The physical security and material accountability systems provided protection for reactor fuel and control of special nuclear material which was consistent with regulatory requirements (Section 2).
- No shipments of radioactive material had been made under the authority of the NRC license (Section 3).

Summary of Inspection Findings:

- Violation 284/9301-01 was closed (Section 4.1).
- Violation 284/9301-02 was closed (Section 4.2).
- Violation 284/9301-04 was closed (Section 4.4).
- Violation 284/9301-05 was closed (Section 4.5).
- Violation 284/9301-06 was closed (Section 4.6).
- Violation 284/9301-08 was closed (Section 4.8).

- Violation 284/9301-09 was closed (Section 4.9).
- Deviation 284/9301-10 was closed (Section 4.10).
- Inspection Followup Item 284/9301-03 was closed (Section 4.3).
- Inspection Followup Item 284/9301-07 was closed (Section 4.7).

Attachments:

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

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 noncited violation identified in this area is discussed in Section 1.5.

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 consistent with the requirements of their technical specifications.

1.2 Operations Logs and Records

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

The inspector reviewed logs and records to determine compliance with License Condition 2.C and Technical Specifications 2.0 and 3.0.

The reactor was operated 147 hours in 1992 and 134 hours in 1993. It was used for reactor demonstrations and the conducting of laboratory experiments, including sample irradiations. At the time of the inspection, electronic noise in Channel 2 of the period scram circuit had rendered the reactor temporarily inoperable as of July 7, 1994. Although the inspector could not observe reactor operations, the circumstances and actions taken following the discovery of the instrument malfunction were reviewed and found consistent with the licensee's procedures.

1.3 Procedures

The inspector determined that the administrative control and operations procedures were consistent with technical specifications, license requirements, and licensee commitments and that the procedures contained sufficient information for the user to perform the required function.

The inspector reviewed the licensee's procedures for operating and maintaining the reactor, conducting surveillances and calibrations, and conducting experiments to determine compliance with the requirements of Technical Specifications 4.1 through 4.3.

The procedures used by the licensed operator and other reactor personnel had been reviewed and approved in accordance with the requirements of the licensee's administrative control procedures, were current, and were being properly implemented.

1.4 Operator Regualification Training

The inspector determined that the requalification records for licensed operators were maintained as required by the operator Requalification Plan.

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 inspector determined that the Operator Requalification Plan was properly implemented.

The inspector verified that instructions concerning radiologica¹ hazards were given to all individuals working in or frequenting the reactor facility that satisfied 10 CFR 19.12 requirements. The inspector noted that the radiation safety office had implemented a training program for selected personnel. Appropriate training records were maintained in the personnel files.

1.5 Surveillance and Limiting Conditions for Operation

The inspector determined that the limiting conditions of operation were maintained in accordance with the licensee's procedural requirements, and all but one of the surveillance activities required by technical specifications had been met.

The inspector reviewed a licensee-identified violation of regulatory requirements. Technical Specification 4.2.d specifies that "a channel test of the seismic displacement interlock shall be conducted semiannually." The channel test was completed in November of 1993 and, thus due in May of 1994, but was not completed again until June 15, 1994. The cause for this failure was the similarity of the calibration procedure (which includes a test suitable for TS 4.2.d) as required by Technical Specification 4.2.h. The had anticipated meeting both requirements at the same time but, utilizing the window of opportunity, postponed the calibration, resulting in the failure to complete the channel test as required.

The inspector noted that appropriate corrective actions had been implemented regarding the above violation. The licensee modified their tracking system to clarify the characterization of this, as well as other periodic commitments and immediately incorporated a overview function for the Reactor Administrator. Based upon the adequacy of the corrective action implemented prior to the completion of the inspection, this event was identified in the exit meeting as a noncited violation.

1.6 Experiments

The inspector determined that no new experiments had been identified since the last inspection. A random review of past experiments determined that none of the experiments represented an unreviewed safety question or required a

technical specifications change. The licensee had identified hazards that could be associated with experiments and had accounted for and controlled irradiated items as required by the regulations and licensee procedures.

1.7 <u>Health Physics</u>

The inspector reviewed the licensee's radiation protection program to determine compliance with the requirements of the new 10 CFR Part 20 and Technical Specifications 3.4, 4.2.i, and 4.4.

The periodic radiation surveys, contamination checks, and radiation postings had been performed in accordance with the regulatory requirements and the licensee's procedures.

The calibration of radiological survey, sampling, and monitoring instruments had been performed in accordance with the Technical Specification 4.4 and the licensee's procedures.

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 to include special instructions as regards radiation exposure received by declared pregnant women and the potential doses to the embryo/fetus. The principles of as low as reasonably achievable (ALARA) were being implemented.

Although the reactor was inoperable at the time of the inspection and no radiation surveys could be conducted at power operation, the inspector performed independent contamination surveys of the reactor area. The results of the inspector's surveys were in good agreement with the licensee.

Portable survey instrumentation was available in the reactor room, and reactor operators were qualified in the use of the instruments. Radiation surveys were performed on samples taken from the reactor to determine radiation levels and to identify removable contamination.

Personnel monitoring was provided to all persons working in the reactor facility. Pocket dosimeters were issued to visitors. The inspector reviewed radiation exposure records and determined that personnel had not exceeded 10 CFR 20.1502 limits.

There have been no measurable radioactive effluents released as a result of the operation of the reactor, and no radioactive material has been transferred from the campus of the university since the last inspection.

1.8 Design Changes

The inspector determined that no design changes had been made since the last inspection. The licensee affirmed that such changes, the performance of any modified equipment, and procedures related to the modified system are, and

would be, reviewed and approved in accordance with 10 CFR 50.59, the technical specifications, and the licensee's administrative procedures. The licensee further affirmed 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 examined the licensee's audits and activities of the Reactor Safety Committee to determine compliance with the requirements of Technical Specifications 6.4, and 6.5.

The inspector reviewed the Reactor Safety Committee minutes and determined that the meeting frequency complied with the yearly requirement of Technical Specification 6.4.1.

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 specific response training and had held exercises and drills in 1992 and 1993 for fire and police departments, respectively. The licensee is anticipating a drill of offsite medical support in late 1994. The inspector reviewed the facilities and procedures of the Bannock County Medical Facility and noted the importance of the upcoming exercise to demonstrate that key emergency response personnel can acceptably respond to emergency conditions in accordance with the Emergency Plan.

The inspector verified that current notification rosters were maintained by the reactor supervisor and campus security. Radiation detection and personnel monitoring devices were available, as described. Emergency supplies were maintained and inventoried as required.

1.11 Maintenance Logs and Records

The inspector determined that maintenance logs and records were maintained as required, no significant problems and events had been identified, and maintenance had been performed consistent with the technical specifications.

1.12 Fuel Handling Logs and Records

The inspector determined that no fuel components had been handled in the period since the last inspection. Ambiguous labelling on certain small pieces of fuel material held for experiment use prompted the licensee to remeasure selected items. This effort, conducted in the course of the inspection, is discussed further in the following section of this report.

2 PHYSICAL SECURITY/SAFEGUARDS EVENTS/MATERIAL CONTROL AND ACCOUNTING (81401, 81402, 81403, 81431, 81810, 85102)

The inspector examined the implementation of the Physical Security Plan, "rvision 3, dated February 23, 1990, to determine compliance with the requirements of Section 2.C(3) of the Facility Operating License and the requirements of 10 CFR 50.54(p).

The inspector verified that the site and facilities were as described in the Physical Security Plan.

Keys to access doors were held only by persons designated in the Security Plan. The facility was patrolled by campus security, as required.

The inspector verified that there had been no safequards events.

Material was stored only in controlled access areas. Continued normal reactor operation assured no change in the core fuel loading. This assurance coupled with an inventory of miscellaneous fuel pieces, performed every 6 months, ensured that all material remained in the licensee's possession. The amount of material possessed by the licensee did not exceed the amount authorized.

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. 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). Material Balance Reports (NRC/DOE Form 742) had been completed as required.

SNM verification activities conducted by the licensee in the course of the inspection are discussed in Attachment 2 to this inspection report. Since information concerning the licensee's material control and accounting program for special nuclear material is exempt from public disclosure pursuant to 10 CFR 2.790(d), Attachment 2 will receive limited distribution.

3 TRANSPORTATION ACTIVITIES (86740)

The inspector verified through discussions with facility personnel that no shipments of radioactive materials were conducted under authority of the NRC reactor license. The last shipment, on November 22, 1988, had been performed under the authority of their State of Idaho license. Since the State of Idaho has terminated their material licensing program with NRC, the licensee has applied for an NRC license under the provisions of "timely renewal." The licensee is currently holding approximately 16 waste items (less than half of a single 55-gallon drum) pending accumulation and consolidation with future items into a practical waste shipment.

4 LICENSEE ACTIONS ON FOLLOWUP ITEMS

4.1 (Closed) Violation 284/9301-01: Failure of the Reactor Safety Committee to Administer Annual Examinations to Operators

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that the licensee's Reactor Safety Committee had not administered the required annual written examination to a senior operator and two operators in 1992 and that the Committee had not observed the operation of the reactor by two senior operators and two operators during 1992.

The licensee's reply dated December 3, 1993, noted that the new reactor supervisor had developed a tracking system for periodic requirements of their reactor technical specifications; operator requalification, emergency, and security plans; radiation protection program; and administrative procedures. Using that system, the reply continues, the Reactor Supervisor notes and assures that operator requalification training is completed as required.

The inspector reviewed the licensee's corrective actions and related requalification records, and identified no overdue training for reactor operators.

4.2 (Closed) Violation 284/9301-02: Failure of Licensee to Ensure that a Senior Reactor Operator Receive His Biennial Medical Examination

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that one senior reactor operator did not have a medical examination by a physician between April 24, 1990, and January 21, 1993.

The licensee's reply dated December 3, 1993, noted that, using the tracking system discussed in Section 4.1 of this report, the Reactor Supervisor notes and assures that reactor operator medical examinations are completed as required.

The inspector reviewed the licensee's corrective actions and related medical records, and identified no overdue medical examinations for reactor operators.

4.3 <u>(Closed) Inspection Followup Item 284/9301-03: Failure to Review a</u> <u>Previously Installed and Subsequently Removed "Experiment" Prior to Later</u> <u>Reinstallation</u>

During the previous inspection, the inspectors determined that a system referred to as "Experiment Procedure 21" and designed to automatically compensate for reactivity changes had been installed and used in 1983-1984 and then removed. The licensee had acknowledged that a new formal review had not been conducted in 1989 when the system was reinstalled for use in 1991 and 1992.

The inspector reviewed the licensee's program for the review of experiments and reactor design modification and identified no further problem areas.

4.4 <u>(Closed) Violation 284/9301-04: Failure to Keep Records Showing the Receipt, Transfer and Disposal of Byproduct Material</u>

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that receipt records for all byproduct material transferred from the reactor licensee were not kept.

The licensee's reply dated December 3, 1993, noted that the Reactor Supervisor is preparing an improved record system for byproduct material produced by the reactor.

The inspector reviewed the licensee's corrective actions and related isotope tracking records and identified no further problem areas.

4.5 (<u>Closed</u>) Violation 284/9301-05: Failure to Verify that Persons Receiving Byproduct Material were Authorized to Receive such Material

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that byproduct material was transforred from the reactor licensee to individuals in the physics department and the school of pharmacy who were not authorized to receive such byproduct material.

The licensee's reply dated December 3, 1993, noted that the Reactor Supervisor is preparing an improved record system for byproduct material produced by the reactor.

The inspector reviewed the licensee's corrective actions and related isotope transfer records and identified no further problem areas.

4.6 (Closed) Violation 284/9301-06: Failure to Maintain Radiation Survey Results

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that records had not been maintained for surveys that evaluated the extent of radiation hazards present for certain activated samples removed from the reactor.

The licensee's reply dated December 3, 1993, noted that the Reactor Supervisor is preparing an improved record system for byproduct material produced by the reactor.

The inspector reviewed the licensee's corrective actions and related isotope survey records and identified no further problem areas.

4.7 <u>(Closed) Inspection Followup Item 284/9301-07: Failure to Survey</u> <u>Radiation Detector Upon Removal from the Reactor</u>

During the previous inspection, the inspectors determined that a radiation detector used in association with Experiment 21 (discussed in Section 4.3) had

been placed in the thermal column of the reactor, but not surveyed when removed.

The inspector reviewed the licensee's radiation protection program to include surveys of materials removed from the reactor and identified no further problem areas.

4.8 (Closed) Violation 284/9301-08: Failure of the Radiation Safety Officer to Provide Training to the Reactor Administrator

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that the Radiation Safety Officer had not provided the required training of other university personnel who may be called upon to assist in the event of a nuclear incident.

The licensee's reply dated December 3, 1993, noted that, using the tracking system discussed in Section 4.1 of this report, the Reactor Supervisor notes and assures that emergency preparedness training for university personnel is given as required.

The inspector reviewed the licensee's corrective actions and related emergency preparedness training records and identified no further problem areas.

4.9 <u>(Closed) Violation 284/9301-09: Failure of the Reactor Safeguards</u> <u>Committee to Conduct Audits</u>

By letter dated November 4, 1993, the NRC issued a Notice of Violation which stated that audits of the conformance of facility operations to the Technical Specifications and applicable license conditions, the performance, training, and qualifications of the entire facility staff, the results of all actions taken to correct deficiencies occurring in facility equipment, structures, systems or method of operation, and the Facility Security Plan and implementing procedures had not been completed as required.

The licensee's reply dated December 3, 1993, noted that using the tracking system discussed in Section 4.1 of this report, the Reactor Supervisor notes and assures that the Reactor Safety Committee performs program audits as required.

The inspector reviewed the licensee's corrective actions and related audit records and identified no further problem areas.

4.10 (Closed) Deviation 284/9301-10: Failure to Establish Letters of Agreement with Off-site emergency Response Agencies

By letter dated November 4, 1993, the NRC issued a Notice of Deviation which stated that, contrary to a commitment made at an inspection exit meeting on December 12, 1991, formal letters of agreement had not been established with the Bannock Regional Medical Center, the Pocatello Regional Medical Center,

the Idaho State Police, and the Pocatello City Attorney (for the purposes of city fire and police support).

The inspector reviewed the status of the letters of agreement and determined that with the last agreement with the Bannock Medical Center finalized on August 4, 1994, all promised agreements had been completed.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- R. Boston, Health Physicist, Technical Safety Office
- *R. Wabrek, Interim Dean, College of Engineering
- *R. Clovis, Reactor Supervisor
- M. Gallagher, Vice President
- T. Gessell, Radiation Safety Officer
- *A. Stephens, Reactor Administrator and Director of Nuclear Engineering

1.2 Others

- S. Chatterton, Captair, Campus Security
- D. Grey, Safety Coordinator, Bannock Regional Medical Center
- S. Gaffney, Patient Services Director, Bannock Regional Medical Center M. Davidson, Medical Physicist, Bannock Regional Medical Center

*Denotes personnel that attended the exit meeting. In addition to the personnel listed, the inspector contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on July 22, 1994, with R. Wabrek to discuss the findings of the inspection. During this meeting, the inspector reviewed the scope and findings of the report. The licensee acknowledged that, in accordance with 10 CFR 2.790(d)(1), information related to the licensee's physical protection or material control and accounting program for special nuclear material is considered proprietary information.