APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-112/89-01 Operating License: R-53

Docket: 50-112

Licensee: University of Oklahoma
865 Asp Ave., Room 212
Norman, Oklahoma 73019

Facility Name: AGN-211P, Research Reactor (100 KW)

Inspection At: University of Oklahoma, Norman, Oklahoma

Inspection Conducted: May 25-26, 1989

Inspector: for Lorenzo Wilborn, Radiation Specialist — Date 8/17/89
Facilities Radiological Protection Section

Accompanied By: Ronald E. Baer, Chief, Facilities Radiological Protection Section

Approved: for Ronald E. Baer, Chief, Facilities Radiological Protection Section — Date 8/17/89

Inspection Summary

Inspection Conducted May 25-26, 1989 (Report 50-112/89-01)

Areas Inspected: Routine, unannounced inspection of the licensee's management organization, reactor operations and maintenance logs, internal audit and review program, radiological controls, emergency preparedness, physical security, nuclear materials safeguards, and transportation of radioactive materials.

Results: The NRC inspector determined that the licensee had not operated the AGN-211P research reactor during the period covered by this inspection. The licensee had removed fuel from the reactor, shipped the fuel to a Department of Energy facility, and dismantled the reactor.

Within the areas inspected, five violations were identified (failure to properly compose a reactor safety committee, paragraph 4; failure to conduct semiannual reactor safety committee meetings, paragraph 4; failure to provide emergency planning training, paragraph 8; failure to conduct annual audits, paragraph 6; and failure to obtain proper authority to dismantle a facility, paragraph 3. Even though the licensee had dismantled the reactor without receiving NRC approval, it appeared that dismantling activities were conducted in a proper manner with no risk to the public health and safety.

DETAILS

1. Persons Contacted

*G. B. Walker, Associate Dean, College of Engineering
*P. Skierkowski, Radiation Safety Officer
E. N. Stone, Deputy Chief of Operations, University of Oklahoma Police Department
S. Long, Norman Fire Department

*Denotes those present during the exit interview on May 26, 1989.

2. Followup on Previously Identified Inspection Findings (92701)

(Closed) Violation (112/87C1-01): Failure to Record Radioactive Contamination Survey Results in Proper Units - This violation was identified in NRC Inspection Report 50-112/87-01 and involved the failure to record the results of radioactive contamination surveys of the Nuclear Engineering Laboratory in the required terms of disintegrations per unit time or in curies. The licensee had revised the laboratory survey report form to reflect the proper units for the liquid scintillation survey results.

(Closed) Violation (112/8701-02): Failure to Revise/Update the Letter of Agreement - This violation was identified in NRC Inspection Report 50-112/87-01 and involved the failure to have a current letter of agreement between the licensee and the Norman Municipal Hospital required by the licensee's Emergency Preparedness Plan. The NRC inspector noted that the licensee had obtained a letter from the Norman Regional Hospital dated April 7, 1987, renewing the written agreement.

(Open) Violation (112/8701-03): Failure to Provide Emergency Response Training - This violation was identified in NRC Inspection Report 50-112/87-01 and involved the failure to provide training in radiation safety and the facility emergency procedures to individuals from the University Police and Norman Fire Department who would respond to an emergency at the facility. The licensee's response to the violation stated that training would be provided prior to December 31, 1987. The NRC inspector noted from discussions with the University Police and Norman Fire Department personnel that the University Police personnel had been provided training in radiation safety and the facility emergency procedures, but the Norman Fire Department personnel had not been provided with such training. This is considered a repeat violation. (See paragraph 8.)

3. Status of Facility

The AGN-211P research reactor has not been operated since April 24, 1986. The NRC issued Amendment No. 12 to Facility License No. R-53 on March 8, 1988, converting the license to possession-only status and the facility to

a mothball status. The licensee shipped the reactor fuel on April 20, 1988, to a Department of Energy approved recipient and the console and support equipment were dismantled during the period May 18, 1988, through July 13, 1988. The licensee submitted to the NRC on October 25, 1988, an application for a license amendment to approve a Dismantling and Decommissioning Plan for the University of Oklahoma research reactor. The plan had not been approved by the NRC at the time this inspection was conducted.

The licensee's dismantling included such activities as follows:

- Removal of reflector elements.
- Removal of the reactor control rods and drive housing.
- Removal of the fuel element support grid plate.
- Disassembly and removal of the reactor console.
- Removal of the reactor support structure.
- Removal of the demineralizer tank and resin beds.
- Draining of the reactor pool.

10 CFR Part 50.82 states, in part, that a licensee may apply to the Commission for authority to surrender a license voluntarily and to decommission the facility. Each application for termination of the license must be accompanied, or preceded, by a proposed decommissioning plan. If the decommissioning plan demonstrates that the decommissioning will be performed in accordance with the regulations and not inimical to the health the safety of the public, and after notice to interested persons, the Commission will approve the plan and issue an order authorizing the decommissioning.

The licensee's dismantling of the reactor and associated reactor components (decommissioning the facility) prior to submitting a decommissioning plan and receipt of an order issued by the Commission authorizing the decommissioning is considered a violation of 10 CFR Part 50.82. (112/8901-01)

4. Organization and Management Controls

The NRC inspector reviewed the organization and managements controls to determine compliance with Technical Specification (TS) 6.1.

The current organization was verified to be consistent with the current reactor facility status. Although the Dismantling and Decommissioning Plan had not received final NRC approval, the licensee had initiated implementation of the plan to include the administrative organization. The TS Figure 1, "Administrative Organization of the OU Reactor," specified a Reactor Director staff position; however, subsequent to the shipment of the reactor fuel and dismantling of the reactor facility, the position of Reactor Director was abolished. The Radiation Safety Officer had taken over all responsibility of the dismantled reactor facility. After NRC approval of the Dismantling/Decommissioning Plan, the Radiation Safety Officer will maintain responsibility through decommissioning and clean up of the reactor site.

The status of Reactor Supervisor, licensed operators, membership and meetings of the RSC, and other matters concerning supervision of the reactor facility were examined. The minimum staffing requirements were verified to be present during fuel handling operations. Subsequent to the shipment of the reactor fuel, the licensed operators were terminated and the RSC ceased conducting meetings.

The NRC inspector reviewed the minutes of the RSC and verified that the committee had met quarterly and reviewed matters related to the reactor from the previous inspection until March 28, 1988. TS 6.2.1 states, in part, the RSC shall be comprised of not less than four members appointed by the Vice-President for Administrative Affairs, two of whom will be the Radiation Safety Officer and the Reactor Director. Since the abolishment/termination of reactor staff positions, the RSC could not be composed as required by the TS. The licensee's failure to properly compose a RSC during the period from March 28, 1988, to May 25, 1989, is considered a violation of TS 6.2.1 (112/8901-02).

TS 6.2.6, states, in part, the chair shall be appointed by the Vice-President for Administrative Affairs. The chair shall be responsible to call the committee into session at least semiannually and shall make assignments as necessary to the members of the committee. The RSC chair's failure to call the committee into session semiannually during the period March 28, 1988, to May 25, 1989, is considered a violation of TS 6.2.6. (112/8901-03)

No deviations were identified in this area.

5. Operation and Maintenance Logs

The NRC inspector noted that the reactor had not operated during the period covered by this inspection.

The NRC inspector reviewed the reactor maintenance logs to determine compliance with TS 6.21(g) for the period January 31, 1987, to March 28, 1988, and TS 4.2 for the period March 28, 1988, to May 25, 1989.

All maintenance activities appeared to have been conducted in a manner consistent with the TS requirements and administrative procedures.

No violations or deviations were identified.

6. Internal Reviews and Audits

The NRC inspector reviewed the licensee's review and audit program to determine compliance with 10 CFR Part 50, and TS 6.18 for the period January 31, 1987, to March 28, 1988, and TS 6.2 for the period March 28, 1988, to May 25, 1989.

TS 6.2.8 states, in part, that the duties of the RSC shall include an audit performance at least annually of the reactor staff of the areas facilities manual (procedures) maintenance logs and test procedures, surveillance tests, and physical security plan.

The NRC inspector determined that the Reactor Safety Committee had not performed an annual audit of the reactor staff in the areas of the facilities manual (procedures), maintenance logs and test procedures, surveillance tests, and physical security plan during the period March 28, 1988, to May 25, 1989. The licensee's failure to perform such an annual audit is a violation of TS 6.2.8.E (112/8901-04).

7. Radiological Controls

The NRC inspector reviewed the licensee's radiation protection program to determine compliance with 10 CFR Parts 19.11, 19.12, 19.13, 20.101, 20.104, 20.201, 20 202, 20.203, 20.207, 20.401, 20.403, 20.405, 20.408, 20.409, and 50.54(q).

The NRC inspector reviewed records, interviewed personnel, made observations, and performed independent surveys.

a. Personnel Monitoring

The NRC inspector reviewed the licensee's personnel radiation exposure records for the first quarter 1987 through the first quarter 1989, and noted that all neutron exposures were recorded as 0 mrem and the maximum beta/gamma exposure was 125 mrem per quarter, with an average of 18 mrem per quarter. This review included the personnel exposure records for personnel involved in the fuel handling during the fuel transfer and shipment operations. The exposures associated with this operation averaged less than 12 mrem.

No violations or deviations were identified.

b. Radiation Monitoring Instrumentation

The licensee's portable radiation monitoring instrumentation calibration program appeared to satisfy the recommendations of NRC Regulatory Guide 8.21 and ANSI Standard N323-1978. Calibration records were found to be up-to-date and accurate.

The licensee's on-hand stock of portable radiation monitoring instruments appeared adequate to support facility radiological surveys. The licensee's completed facility radiation survey records were reviewed and found to be well documented. The NRC inspector conducted confirmatory measurements (beta-gamma) of radiation and found that the results were in agreement with the licensee's most current results.

No violations or deviations were identified.

c. Radioactive Releases

The NRC inspector reviewed the licensee's analysis of the reactor shield tank water prior to release to the sanitary sewerage system. Samples were taken at various depths in reactor shield tank. The

licensee's analysis for alpha, beta, tritium, and gamma radionuclides indicated concentration levels below the units specified for unrestricted areas in 10 CFR Part 20, Appendix B.

No violations or deviations were identified.

d. Surveys

The NRC inspector reviewed radiation and contamination survey records regarding surveys performed by the licensee's staff to determine compliance with 10 CFR Part 20 and agreement with the licensee's procedures. The licensee's staff had performed a radiation and contamination survey on the reactor shield tank after draining. All surveys were documented according to department procedures. The survey results revealed no areas with radiation levels in excess of the regulatory limits.

The NRC inspector noted that the licensee had used a Geiger-Mueller tube type of laboratory instrument to perform alpha and beta radiation contamination counting. The background count rate was approximately 54 counts per minute and the system efficiency had been determined to be approximately 4.6 percent for alpha radiation. The NRC inspector discussed with licensee representatives that with a release limit of 20 disintegrations per minute (dpm) for alpha radiation and 200 dpm for beta radiation that a more efficient counting system would be desirable. The licensee stated that all material being released for unrestricted usage and the final release survey of the reactor laboratory facility would be swiped for removable radioactivity. These swipes would be counted on a instrument capable of determining separately the alpha and beta radioactivity.

No violations or deviations were identified.

8. Emergency Preparedness

The NRC inspector reviewed the emergency preparedness program to determine agreement with commitments made in the Emergency Preparedness Plan.

10 CFR Part 50.54(q) requires that a licensee authorized to operate a research reactor shall follow and maintain in effect an emergency plan.

The issuance of Amendment No. 12 to Facility License No. R-53, dated March 8, 1989, granted the licensee an exemption from 10 CFR 50.54(q), which required an emergency plan for non-power reactors.

The Emergency Plan had been properly implemented, except during the period from January 31, 1987, to March 8, 1989. Section 10.1 of the Emergency Plan addressed training that would be provided to individuals with emergency response responsibilities and stated that the University Police and Norman Fire Department shall be trained on annual basis in radiation

safety and the Nuclear Engineering Laboratory facility emergency procedures. The NRC inspector's discussions with representatives of the University Police and Norman Fire Department revealed that three role call training sessions had been conducted for the University Police personnel, but there had been no training provided to the Norman Fire Department personnel with emergency response responsibilities.

The failure to provide the required training to all personnel is a violation of 10 CFR Part 50.54(q) (112/8901-05).

Neither the applicable University Police nor the applicable Norman Fire Department personnel had received the required training during the January 26-30, 1987, NRC inspection; therefore, this is considered a repeat violation.

No deviations were identified.

9. Physical Security

The NRC inspector reviewed the implementation of the licensee's physical security program to determine agreement with commitments specified in the Physical Security Plan.

The NRC inspector noted that the Physical Security Plan had been updated on August 31, 1988, to reflect that the nuclear fuel had been shipped from the facility and the console disabled and power removed.

The physical security program appeared to be implemented in accordance with the Physical Security Plan which clearly defined responsibilities and response requirements. Additionally, the required surveillance tests were being performed.

No violations or deviations were identified.

10. Nuclear Materials Safeguards

The NRC inspector reviewed the licensee's special nuclear materials receipt, inventory, and accountability program to determine compliance with 10 CFR 70.53 and the conditions of the facility license. The accountability procedures and practices, records and material status reports were found to be implemented. As noted in paragraph 3, the licensee had transferred all reactor fuel to a Department of Energy approved recipient.

No violations or deviations were identified.

11. Transportation (Fuel Shipments)

The NRC inspector reviewed the licensee's management-controlled program for radiological and nuclear safety in the receipt, packaging, and delivery to a carrier of radioactive materials to determine compliance with 10 CFR Part 71 and 49 CFR Parts 100-177.

The NRC inspector noted from review of appropriate shipping manifests, checklists, radiation survey records, and material accountability forms for a fuel shipment on April 20, 1988, that all requirements had been met.

No violations or deviations were identified.

12. Exit Briefing

The NRC inspector met with the licensee representatives denoted in paragraph 1 of this report at the conclusion of the inspection on May 26, 1989. The NRC inspector summarized the scope and findings of the inspection. The licensee committed to counting contamination smears for alpha and beta, separately, for the final decommissioning plan radioactive contamination surveys.