

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Report: 50-112/82-01

Docket: 50-112

License: R-53

Licensee: The University of Oklahoma
College of Engineering
Norman, Oklahoma 73019

Facility Name: AGN-211 Research Reactor (15 watts)

Inspection At: Norman, Oklahoma

Inspection Conducted: September 13-15, and October 6, 1982

Inspectors: *W. S. Schum* 10/5/82
W. S. Schum, Reactor Inspector
Reactor Project Section B
(Pars. 1, 2, 3, 4, 8, 9, 10, 15, 16) Date

for *D. M. Hunnicutt* 10/5/82
M. E. Murphy, Reactor Inspector
Reactor Project Section C (Pars. 11, 12, 13) Date

R. T. Redano 10-5-82
R. T. Redano, Reactor Inspector
Reactor Project Section A (Pars. 5, 6, 7, 14) Date

Reviewed: *T. F. Westerman* 10/14/82
T. F. Westerman, Chief
Reactor Project Section A Date

D. M. Hunnicutt 10/5/82
D. M. Hunnicutt, Acting Chief
Reactor Project Section C Date

Approved:

W. A. Crossman
W. A. Crossman, Chief
Reactor Project Section B

11/5/82
Date

Inspection Summary

Inspection Conducted on September 13-15, 1982, (Report 50-112/82-01)

Areas Inspected: Routine, unannounced inspection of the licensee's organization; operations and maintenance logs; Reactor Safety Committee (RSC) activities; operator requalification program; operating procedures; surveillance requirements; experiments; radiation protection; environmental protection; and emergency planning. The inspection involved 50 inspector-hours by four NRC inspectors.

Results: Of the ten areas inspected, no apparent violations or deviations were identified in five areas; four violations were identified in four areas, and one new open item was identified. Three items and two violations remain open from NRC Inspection Report 81-01. Violations and open items are in the following areas: 8201-01 Review and Audit; 8201-02 Surveillance; 8201-03 Design Changes; 8201-04 Operating Procedures; 8201-05 Operator Requalification.

Details1. Persons Contacted

- *Dr. C. W. Terrell, Reactor Director
- *Dr. E. H. Klehr, Chairman, Reactor Safety Committee
- *P. Skierkowski, Radiation Safety Officer
- *J. James, Reactor Supervisor
- N. Stone, Captain University Police Department

*Denotes those present at the exit meeting.

2. Status of Facility

The reactor was shut down during the entire inspection. The AGN-211 is normally operated 50-70 times per year for experiments and demonstrations. The licensee's license renewal is still under review. During the inspection, the first four fuel assemblies from the West Virginia University reactor arrived. The NRC inspectors observed the initial opening of the shipping container and preliminary fuel inspection.

3. Organization

The NRC inspector reviewed the organization of the facility to ensure it meets Technical Specifications and that minimum manning requirements were satisfied.

At present, there are two senior reactor operators (SRO's) that operate the unit; the reactor director, who performs this function on a part-time basis with his other duties as a professor; and the reactor supervisor, who is also part-time. The staff may not be functioning well together; nor interfacing well with the RSC as evidenced by the findings of this inspection and previous inspection reports.

A review of the RSC activities reveals an inability to get prompt and effective corrective action taken in response to negative audit findings; e.g., requalification of reactor operators. The minutes of the RSC show repeated concerns regarding requalification of operators as documented in the minutes of September 10, 1981, and September 26, 1980 meetings; attachment to minutes of May 29, 1981, dated July 1, 1981, as well as minutes themselves; and the audit conducted by D. W. Anderson, PhD, of May 4, 1982.

This failure to take corrective action is of serious concern to the NRC inspectors.

4. Log and Records

The NRC inspector reviewed the master maintenance log book (MMLB) and operators' log for compliance with Technical Specifications and procedures. No significant problems were identified and maintenance activities were generally consistent with requirements. Some items were noted that were not in full compliance and these are addressed in other areas of this report.

No items of violation or deviation were identified.

5. Review and Audit

The NRC inspector reviewed the licensee's audit and review program to determine compliance with Technical Specifications and procedures. The audit reports that were examined were thorough and complete in scope; however, one area required by Technical Specifications has not been audited since 1978. This area is identified in the Technical Specifications as equipment performance. This failure to perform the required audit is a violation. (8201-01)

Two complete audits were reviewed.

<u>Date</u>	<u>Report Author</u>	<u>Subject</u>	<u>Receptor</u>
10/5/81	E. H. Klehr	Master Maintenance Log Book	RSC
5/4/82	D. W. Anderson	Master Maintenance Log Book	RSC

Both the above reports point out that there are date discrepancies between record cards and record charts. The recurrences of this problem signify an inadequate response to the RSC to prevent the error from recurring. The NRC inspector pointed out to the licensee that he perceived a weakness in the RSC's effectiveness.

6. Surveillance Tests

The NRC inspector examined the MMLB and the equipment maintenance logs to ascertain whether the licensee was adhering to the Technical Specifications and surveillance procedures. After examining all entries in the MMLB made after September 1, 1981, the NRC inspectors found the following failures to meet procedural and regulatory requirements:

- a. The "Security Alarm System Test," approved by the RSC on June 29, 1981, requires weekly testing of the security alarm. During the time periods listed below, the alarm system was not tested.

10/16/81 to 10/29/81
11/25/81 to 12/6/81
6/8/82 to 6/21/82

11/6/81 to 11/15/81
12/23/81 to 1/3/82
8/3/82 to 8/17/82

All of the above time periods exceed 1 week in duration and constitute a violation of the licensee's procedure entitled "Security Alarm System Test." In some instances the reactor supervisor had made explanatory log entries stating that the security alarm test had not been performed during a given week because he was away on vacation. The NRC inspector explained to the licensee that procedural and regulatory requirements remain in effect during licensee staff vacation periods.

- b. The "Calibration Procedure for the Air Monitor of the AGN-211-102 Nuclear Reactor," approved by the RSC on June 20, 1975, requires that entries documenting test completion be entered in the MMLB and the air monitor maintenance log book. The September 18, 1981, test performed on the air monitor was not logged into the MMLB. This constitutes a violation of the calibration procedure.
- c. The "Procedure for the Calibration and Operational Check of the Reactor Console Recorder of the AGN-211-102 Nuclear Reactor" requires that record of semiannual calibration be entered in the MMLB and the recorder maintenance log. The July 23, 1982, test performed on the console recorder was not logged into the recorder maintenance log.

The preceding items present multiple examples of failure to properly conduct surveillance.

This constitutes a violation of the calibration procedure. (8201-02)

7. Design Changes

The NRC inspector examined all documentation pertaining to the change of the safety rod drive motor sprocket to evaluate the licensee's compliance with procedural and regulatory requirements in the area of design changes. This design change was the subject of violation (8101-01). The only documentation addressing functional testing of the completed modification was an entry in the MMLB stating that the test was satisfactorily completed. There were no records of test procedure or documented test results. Technical Specification 4e and 4f require records to be kept of "maintenance operations involving substitution or replacement of reactor equipment or components" and "tests and measurements performed pursuant to the Technical Specifications." The lack of a documented functional test procedure for the safety rod drive motor sprocket is a violation. (8201-03)

8. Operating Procedure

A review of the various procedures used revealed the following items.

- a. Procedure for operational check of radiation survey meters - annotated "out of date do not use precision G. M. Tube anymore - November 2, 1981 J. Jones."

- b. Procedure to calibrate pool activity monitor-procedure has been in question for over a year as has the procedure "Step-by-Step Procedure for Normal Reactor Startup and Operation of AGN-211." This problem stems from inconclusive definition of "Normal Background" for pool water.

These findings show lack of a clear, responsive method of keeping operating procedures up-to-date and technically correct. This item will remain open for future review. (8201-04)

9. Experiments

The NRC inspector reviewed the response to Violation 8101-03 and found the response to be inadequate. In response to the violation, it was stated "an administrative policy has been established whereby the reactor will not go to power unless the sample irradiation form is fully filled in." In fact, to fully fill in and sign the form, the experiment needs to have been completed. In addition, it was noted on some forms, specifically sample form dated September 9, 1982, that Items 11 and 15 were not completed, and on several other forms estimates were not made for reactivity worth of samples.

This item will remain open pending adequate response and corrective action. (8101-03)

10. Requalification

The NRC inspector reviewed the records of requalification for the licensee and found that the operator requalification program has not been conducted in accordance with 10 CFR 50, 50.54, nor the procedure for requalification of the facility, even though a violation was issued after the last inspection in this area. In response to Violation 8101-02, the licensee submitted a new proposed requalification program on May 1, 1982.

By letter dated February 8, 1982, the licensee was reminded of the requirements to adhere to the existing requalification program and that 10 CFR 50.54 requires authorization to change the program. A review showed no performance evaluation has been conducted and recorded since 1978. The RSC, several times in its minutes, has addressed proper requalification of operators. This is a repetitive violation. (8201-05)

11. Radiation Control

The NRC inspector reviewed records and inspected the facility to determine compliance with 10 CFR Parts 19 and 20 requirements. Posting and labeling were satisfactory. Restricted areas were identified and properly marked as "radiation," "high radiation," and "radioactive material" working areas. General access control was adequate.

A calibration program for the radiation dosimetry and survey instruments has been established and is being implemented. The NRC inspector checked five instruments in use and determined they had been properly calibrated.

Personnel exposure records for the past year were reviewed and no exposure limits were exceeded.

No violations or deviations were identified in this area of inspection.

12. Environmental

The licensee does not maintain a detailed environmental surveillance program; e.g., collection and analysis of water, soil, vegetation samples. There are no specific license requirements that such a program be maintained. Waste disposal is properly handled and documented.

No violations or deviations were identified in this area of the inspection.

13. Emergency Planning

The NRC inspector reviewed the emergency procedure and noted that an up-to-date emergency call list was prominently posted. Adequacy of refresher training for security personnel was discussed with the licensee's police department representatives and found satisfactory. Periodic drills are held and documented.

No violations or deviations were identified in this area of inspection.

14. Renewal of SRO Licenses

The NRC inspectors interviewed C. W. Terrell and J. D. James in regard to the reactor operator requalification program. Specifically, the discussion was in regard to correspondence by the individuals with the NRC Operator Licensing Branch.

A letter from C. W. Terrell, PhD., to the NRC Operator Licensing Branch, dated April 8, 1982, concerning the requalification training of J. D. James contained the statement following: "Mr. James has satisfactorily completed the requalification program for which the senior operator license renewal is sought during the effective term of his current license." The statement was of concern to the NRC inspectors because they had determined from the most recent inspection that the licensee's requalification program was not being fully implemented and the May 4, 1982, audit report by D. W. Anderson to the RSC explicitly pointed out that the requalification training had not been completed (see paragraph 10).

It was also noted by the NRC inspectors that the April 14, 1982, letter from J. D. James to the Operator Licensing Branch concerning the requalification training of C. W. Terrell contained no statement to the effect that C. W. Terrell had completed the requalification program. In response to

inquiries from the NRC inspectors as to why there was no mention of requalification training in his letter, Mr. James explained that he did not feel he could accurately state that C. W. Terrell had satisfactorily completed the requalification program and that he felt liable to the NRC for the statements that he made in the April 14, 1982, letter.

The NRC inspectors explained their concerns to C. W. Terrell and asked him to expound upon his reasoning and basis for making the statement at issue. Dr. Terrell explained that although he now realizes that the degree of informality and lack of documentation concerning the practical portion of the requalification training were unacceptable, he felt that the frequency with which he and J. D. James operated the reactor and discussed emergency procedures was sufficient to fulfill the intent of the practical portion of the requalification program at the time he wrote the April 8, 1982, letter. Dr. Terrell emphasized that he made the statement at issue with "intellectual integrity" and had no intent to mislead the NRC.

15. Open Items

(Open) 8101-01, Paragraph 5: The RSC should develop methods to implement timely corrective action to audit findings. This remains an item of concern, see paragraph 3 of this report.

(Open) 8101-02, Paragraph 7: Technical Specification 2.4 states, "the radioactivity contained in the pool water shall be such that it is less than twice normal background." Normal operation causes pool water activity to exceed two times the shutdown activity after about 20 minutes of operation. This issue has been discussed with NRC headquarter's personnel and will be resolved as part of the ongoing license renewal process. Due to low levels of activity involved, there appears to be no significant safety issue involved in this item.

(Open) 8101-03, Paragraph 8: Inadequate Surveillance Procedure. The procedure for the check of the operation and response of the water activity monitor for the AGN-211 remains open as the new procedure has not been developed or implemented as yet.

(Closed) 8101-01 Failure to Conduct a Safety Review. A review of corrective action showed adequate response to this violation. No further violations of this nature should occur if the administration procedure is followed.

(Open) 8101-02 Failure to Fully Implement Operator Requalification. This is a recurring problem, see paragraph 10 of this report.

(Open) 8101-03 Failure to Properly Complete Sample Irradiation Forms. The response to this violation was inadequate, see paragraph 9 of this report.

(Closed) 8101-04 Failure to Wear Ring Badges While Handling and Inspecting Fuel Elements. Review of response to this item is satisfactory. In addition, a full time radiation safety officer has been added to the staff and this should also reduce chances of recurrence.

16. Exit Interview

The NRC inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection. The inspectors summarized the scope of the inspection and the findings as detailed in this report.

17. Enforcement Conference

On October 7, 1982, an enforcement conference was held at the University of Oklahoma to discuss NRC concerns with the inspection findings. The following individuals attended the meeting:

NRC Region IV

J. E. Gagliardo, Director, Division of Resident, Reactor Project & Engineering Program, RIV
R. T. Redano, Reactor Inspector, Reactor Project Section A

University of Oklahoma

Dr. Jischke, Dean of Engineering
Dr. G. Walker, Associate Dean of Engineering
Dr. E. Klehr, Chairman, Reactor Safety Committee
Dr. P. Skierkowski, Radiation Safety Officer
J. James, Reactor Supervisor
Dr. C. Terrell, Reactor Director

SCHUM William S

INSPECTOR'S REPORT

Office of Inspection and Enforcement

REVIEWER

W.C. CROSSMAN

INSPECTORS
RT Redano
ME. MURPHY

LICENSEE/VENDOR	TRANSACTION TYPE	DOCKET NO (8 digits) OR LICENSE NO (BY PRODUCT) (13 digits)	REPORT		NEXT INSP DATE	
			NO	SEQ	MO	YR
UNIVERSITY of OKLAHOMA	<input checked="" type="checkbox"/> I - INSERT M - MODIFY D - DELETE R - REPLACE	05000112	8201	A	09	84

PERIOD OF INVESTIGATION/INSPECTION					INSPECTION PERFORMED BY					ORGANIZATION CODE OF REGION/HQ CONDUCTING ACTIVITY (See IEMC 0530 "Manpower Reporting—Weekly Manpower Reporting" for code)				
FROM		TO			<input checked="" type="checkbox"/> 1 - REGIONAL OFFICE STAFF		OTHER			REGION		DIVISION		BRANCH
MO	DAY	YR	MO	DAY	YR	2 - RESIDENT INSPECTOR								
09	13	82	09	15	82	3 - PERFORMANCE APPRAISAL TEAM								
20	25	28	31											

REGIONAL ACTION (Check one box only)		TYPE OF ACTIVITY CONDUCTED (Check one box only)													
<input type="checkbox"/> 1 - NRC FORM 591	<input type="checkbox"/> 2 - REGIONAL OFFICE LETTER	<input checked="" type="checkbox"/> 02 - SAFETY	<input type="checkbox"/> 03 - INCIDENT	<input type="checkbox"/> 04 - ENFORCEMENT	<input type="checkbox"/> 05 - MGMT AUDIT	<input type="checkbox"/> 06 - MGMT VISIT	<input type="checkbox"/> 07 - SPECIAL	<input type="checkbox"/> 08 - VENDOR	<input type="checkbox"/> 09 - MAT ACCT.	<input type="checkbox"/> 10 - PLANT SEC.	<input type="checkbox"/> 11 - INVENT. VER.	<input type="checkbox"/> 12 - SHIPMENT/EXPORT	<input type="checkbox"/> 13 - IMPORT	<input type="checkbox"/> 14 - INQUIRY	<input type="checkbox"/> 15 - INVESTIGATION

INSPECTION/INVESTIGATION FINDINGS (Check one box only)				TOTAL NUMBER OF VIOLATIONS AND DEVIATIONS				ENFORCEMENT CONFERENCE HELD				REPORT CONTAIN 2.790 INFORMATION				LETTER OR REPORT TRANSMITTAL DATE									
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	MO	DAY	YR	MO	DAY	YR
1 - CLEAR				04				1				1 - YES				NOV 11 1982									
2 - VIOLATION																									
3 - DEVIATION																									
4 - VIOLATION & DEVIATION																									

MODULE INFORMATION												MODULE INFORMATION											
REC. NO.	MODULE NUMBER	INSP.	PRIORITY	DIRECT INSPECTION EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	REC. NO.	MODULE NUMBER	INSP.	PRIORITY	DIRECT INSPECTION EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL		
B	3,07,0,3B		A	5							B			A									
B	6,97,4,7B		A	4,5							B			A									
B			A								B			A									
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* CIRCLE SEQUENCE IF VIOLATION OR DEVIATION