U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-113/81-01

Docket No. 50-113 License No. R-52 Safeguards Group ____

Licensee: University of Arizona
College of Engineering
Tuscon, Arizona 85721

Facility Name: University of Arizona, Nuclear Reactor Laboratory

Inspection at: Tuscon, Arizona

Inspection conducted: January 19-22, 1981

Inspectors: J R Curtis — Feb 3 1981
J. R. Curtis, Radiation Specialist — Date Signed

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Approved by: F A Wenslawski — 2/3/81
F. A. Wenslawski, Chief, Reactor Radiation Safety Section — Date Signed

Approved by: H. E. Book — 2/4/81
H. E. Book, Chief, Fuel Facility and Materials Safety Branch — Date Signed

Summary:

Inspection on January 19-22, 1981 (Report No. 50-113/81-01)

Areas Inspected: Routine unannounced inspection of the radiation protection, environmental controls and emergency response planning programs. The inspection involved a tour of the facility; observation of a radiological safety orientation class; examination of records and logs of operations, radiation surveys, personnel monitoring results, material transfer and emergency response procedures; and interviews with various members of the reactor operations and radiological safety staff. The inspection involved 21 hours by one NRC inspector.

Results: There were no items of noncompliance identified in this inspection.

DETAILS

1. Persons Contacted

Mr. H. Doane, Reactor Supervisor
Mr. R. Wells, Associate Reactor Supervisor
*Dr. R. L. Seale, Head Nuclear Engineering Department
*Dr. G. Nelson, Head, Nuclear Reactor Laboratory
*Mr. Carl Irwin, University Radiation Control Officer
*Dr. B. Westerman, Director, Radiation Control Department
Dr. M. Young, University Radiation Control Health Physicist
*Dr. R. Gallagher, Dean, College of Engineering

*Indicates presence at the exit interview.

2. General Operations - Tour

The inspector toured the reactor facility and adjacent facilities, observed reactor staff conducting a reactor orientation and training class, and interviewed principal reactor operators. Access control, personnel dosimetry issuance, general radiological conditions and posting and labeling practices were observed.

No items of noncompliance or deviations were identified.

3. Licensee Response to IE Bulletins, Circulars, etc.

The licensee representatives received and responded to IE Bulletin 79-19. The response was adequate and timely. The licensee's program for solid waste transport and transfer appeared adequate for the nature and quantities of waste generated.

The licensee received and evaluated the information in IE Circular 80-14 regarding de-ionized water systems. No action was considered necessary and none was taken.

No items of noncompliance or deviations were identified.

4. Organization

Professor G. Nelson, Head, Nuclear Reactor Laboratory, returned from sabbatical leave in September 1980, and resumed his position as Head of the Nuclear Reactor Laboratory. Messrs. H. Doane and R. Wells continue their duties as principal reactor staff members.

The Radiation Control Office of the Health Sciences Department continues to provide surveillance of the radiation control and environmental protection programs at the University of Arizona Reactor. The Health Sciences Department is responsible for emergency response planning and support in emergency situations involving radioactive materials and has incorporated the reactor into their Emergency Response Plan.

No items of noncompliance or deviations were identified.

5. Examination of Records

Personnel monitoring, access control, sample irradiation and monitoring records, material release records and various logs, memos and procedures related to radiation and environmental protection and emergency response planning were examined. Results of surveys, monitoring records and personnel monitoring results were all acceptably low and within the expected range. Radiation levels associated with irradiated sample handling were generally in the zero to 100 mrem/hour range. Personnel doses reported for those persons who regularly have access to the reactor were in the range of zero to 250 mrem/year. Most of the reported exposures were zero. There are projects within the Nuclear Engineering Department that also utilize state licensed radiation sources and radiation producing machines. Radiation exposures associated with these projects are also low.

No areas of noncompliance or deviations were identified.

6. Radiological Protection - Procedures and Practices

The inspector toured the facility, observed limited activity at the reactor facility and reviewed the procedures used to establish the radiological protection program at the reactor.

The principal document containing operating procedures is UARR 100. Other procedures are written for calibration of specific instrumentation such as the water, area and air particulate monitors. These are used in the requalification training program and are periodically reviewed for appropriate revisions by the reactor staff and the head of the reactor laboratory.

Access control, personnel dosimetry, user training and orientation, and posting and labeling practices were observed and were found to be consistent with the facility procedures and license requirements.

No items of noncompliance or deviations were identified.

7. Emergency Response Planning

The Nuclear Engineering Department has an Emergency Response Plan for events that might occur at the facility or impact on the safety of operations. Planned response actions are appropriate for the emergencies envisioned, and coordination with support elements within the University of Arizona Emergency/Incident Response organization has been incorporated in their existing plan. Emergency exercises and walk thru drills have been conducted as part of operator requalification and other training efforts.

The licensee management is presently reviewing their plan in connection with the requirements proposed for research reactors in revisions of 10 CFR 50 on Emergency Response Planning.

No items of noncompliance or deviations were identified.

8. Environmental Monitoring - Effluents

The University's environmental monitoring program at present consists of routine exchange of 14 sensitive TLD dosimeters located on buildings at various distances from the building that houses the reactor. The results of the TLD monitoring program are reviewed by members of the Radiation Control Office and continue to indicate levels in the general background range.

The Radiation Control Office has initiated additional studies in the environmental monitoring area. Samples of soil and vegetation have been collected quarterly and treated prior to analysis for radioactivity. Evaluation of the available data collected for the four quarters of 1980 show no unusual activity that can be attributed to university or reactor associated operations. The air sample from the reactor room Constant Air Monitor is changed routinely and the sample is analyzed by the Radiation Control Office. Again no significant activity above background has been detected in the analysis.

The reactor staff has designed a sequence of studies to measure production and evolution rates of activated Argon and Nitrogen during reactor operation. Radioactivity levels measured to date have confirmed that the gaseous effluents released from the facility are within the limits of 10 CFR 20 requirements and calculated concentrations are below unrestricted area release limits. Additional studies to refine measurements of argon-41 production and evolution have been planned.

No items of noncompliance or deviations were identified.

9. Radioactive Waste

A small volume of contaminated or potentially contaminated solid waste, in the form of plastic bags, gloves, kimwipes and used laboratory equipment is generated at the reactor. The waste is collected monthly by the Radiation Control Office staff and the small amount of activity involved, 50 to 150 microcuries in volumes of 10 to 15 cubic feet per year, is incorporated into waste from other university programs and disposed of under terms of the University of Arizona state license for radioactive materials use.

The university is licensed by the State of Arizona to use and maintain a low-level burial site for specified quantities of radioactive wastes, primarily from medical and biological research projects. Miscellaneous dry waste from the reactor facility has been incorporated into the burial program. The inspector visited the burial site with licensee representatives, toured the grounds and performed a radiation level survey using an NRC GM type survey meter, Xetex Model 305B Serial #8212, due for its next calibration February 12, 1981. General levels measured at distances of one to three feet above ground level were 0.0 to 0.2 mr/hr, which was consistent with background level measurements taken at a location away from the burial site.

No items of noncompliance or deviations were identified.

10. Exit Interview

The inspector met with licensee representatives, including the Dean of the College of Engineering, at the conclusion of the inspection on January 22, 1981, and summarized the purpose and scope of the inspection and discussed the findings. There were no items of noncompliance.