

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-166/84-02

Docket No. 50-166

License No. R-70 Priority -- Category G

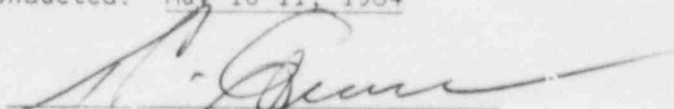
Licensee: University of Maryland
College Park, Maryland 20742

Facility Name: Maryland University Training Reactor

Inspection At: College Park, Maryland 20742


Inspection Conducted: May 10-11, 1984

Inspectors:


T. C. Elsasser, Chief, Reactor
Projects Section 1B

6/13/84

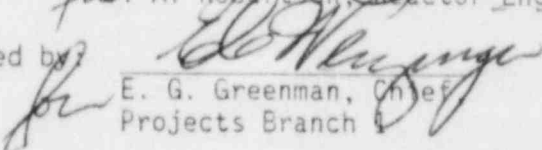
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for A. Robertson, Reactor Engineer

6/13/84

date

Approved by:


for E. G. Greenman, Chief
Projects Branch

6/18/84

date

Inspection Summary: Inspection on May 10-11, 1984 (Report No. 50-166/84-02)

Areas Inspected: Routine, unannounced inspection by two region based inspectors (24 hours) of: licensee action on previous inspection findings; logs and records; procedures; requalification training; surveillance activities; experiments; health physics; audit and committee activities.

Results: One violation was identified relating to procedural compliance during the conduct of experiments (paragraph 8). Also the inspectors found a lack of attention to detail regarding log and record keeping. Formulation and approval of all surveillance procedures had not been completed. These two problems were identified during the previous inspection.

DETAILS

1. Persons Contacted

Dr. F. J. Munno, Director, Nuclear Engineering Programs
*Dr. R. L. Belcher, Director, Nuclear Reactor
Mr. S. Shanks, Assistant Radiation Safety Officer
*Dr. G. Pertmer, Associate Professor, Nuclear Engineering Department

*Denotes those present at exit interview.

2. Facility Tour

The inspectors toured the Maryland University Training Reactor (MUTR) with the Nuclear Reactor Director immediately after the entrance interview. Housekeeping of the facility was generally good; however, a number of mechanical components (heat exchangers, piping, heaters, etc.) were stored on the floor of the reactor building. The licensee explained that these components were in temporary storage until used for construction of a project in the chemical engineering building. Since the components were of very high value, the licensee explained that the reactor building was the only secure storage location. The licensee indicated the components would be removed no later than the end of June, when the project is scheduled for completion.

3. Licensee Action on Previous Inspection Findings

3.1 83-01-01 (Closed) Separation of Potentially Contaminated Water from Water Supply: The city water supply is connected to the reactor coolant system at two locations: makeup water to the primary coolant water and the open loop secondary water to the two heat exchangers used for cooling the primary coolant water. Although the pressure of the city water supply is greater than the pressure in the primary coolant water system, no positive means previously existed to prevent the backflow of potentially contaminated water into the city water supply. Check valves have been installed at these two city water connections.

3.2 83-01-02 (Open) Logs and Records: The "water room" section of the checklist was often not filled in and the operation of the reactor coolant and purification system was not addressed in the operating procedures.

The inspector discussed with the licensee the need for specific operating procedures for the reactor coolant and purification systems. These systems are simple in nature and in the opinion of the licensee can be safely operated using existing facility operating procedures. After review, the inspector accepted the position of the licensee regarding this portion of the open item.

Startup checklists were reviewed for runs 1429 through 1459. The checklist for Run 1429, performed March 23, 1984, did not have the "Ground Floor" or "Water Room" section filled in. In addition, minor administrative problems were found on approximately 30% of the checklists inspected. Because the checklist is redundant in many areas some of the checks that were missed were performed in another portion of the checklist. For some of the missing checks the inspector verified that the required action was actually performed using other available records. This was not possible for most of the items on the checklist such as "pool level" or "hand held meters present". A signature was present at the end of each checklist, however, the licensee stated that the signature block indicated that the checklist was completed and was not intended to indicate a satisfactory review of the checklist.

Although minor in nature, the number of these deficiencies indicate a general lack of oversight and review of a problem identified by a previous inspection. Licensee action with regard to this matter will be reviewed again during a future inspection.

- 3.3 83-01-05 (Closed) Inoperability of Exhaust Duct Area Radiation Monitor. During the last inspection the exhaust duct monitor was inoperable. This condition has since been corrected. All three area radiation monitors are now in operation.

4. Logs and Records

The inspector reviewed the Control Room Log Book for the period of December 1983, through May 1984. The log contained information and data concerning reactor operations, surveillance activities and equipment status. The operational information included run numbers; personnel on duty, dates, times, channel check data; power levels, purpose of runs and experiments performed. Surveillance activities were logged when performed. There were no items of concern. Startup checklists were also reviewed and are discussed in Section 3.2.

5. Procedures

The inspector reviewed the Control Room Copy of the Operating, Surveillance, Maintenance, and Emergency Procedures. All of the procedures available had been reviewed and recommended for approval by the Nuclear Reactor Director and reviewed and approved by the Reactor Safety Committee. The following surveillance procedures were available in draft form only and were not reviewed and approved:

SP-203	Control Rod Drop Times
SP-204	Area Rad Monitor Calibration
SP-205	Control Rod Calibration
SP-206	Reactor Power Calibration

Surveillance Procedure 202 Control Rod Inspection has not yet been prepared. During the previous inspection of this facility (Inspection Report 83-01), it was noted that the assistant Nuclear Reactor Director is currently revising OP-105, as well as the surveillance procedures for measuring control and drop times, determining the reactivity worth of each control rod, and calibrating each power level monitoring channel. OP-105 is the only procedure completed, reviewed and issued since the previous inspection in May 1983. The licensee has committed to having the remainder of the surveillance procedures properly reviewed and approved by September 15, 1984. This will be reviewed during a future inspection (84-02-01).

6. Requalification Training

The Reactor Operator Requalification Program for Maryland University Training Reactor (Rev. 3, June 1, 1983) requires the following records to be maintained for each licensed operator:

- Current copy of either the licensee's reactor operator or senior reactor operator license.
- Copies of the graded requalification examinations administered.
- The operator's Requalification Program Progress Checklist.
- The summary of training received by the licensee in the accelerated requalification program documented in a memorandum for record and any additional documentation that is pertinent to additional training received by the licensee.

The operator's Requalification Program Progress Checklists have not yet been filled in. The licensee explained that these checklists will be filled in after the next exam. The next exam is scheduled for June 1984. Copies of previous graded requalification exams could not be found during this inspection. These records will be reviewed during a future inspection (84-02-02).

7. Surveillance Activities

The performance of the following surveillance requirements was reviewed:

<u>Procedure</u>	<u>Tech Spec</u>	<u>Description</u>	<u>Frequency</u>
SP-201	4.1.a	Visually inspect four fuel element clusters for damage or deterioration	biannually
SP-202	4.2.a	Determine the reactivity worth of each control rod	annually
SP-203	4.2.b	Determine rod drop times	annually

SP-204	4.2.c	Visually inspect control rods for deterioration	biannually
SP-205	4.2.a	Perform channel test of each reactor instrumentation and safety system channel	prior to each operation
SP-206	4.3.b	Perform calibration of power level monitoring channel	annually
	4.3.c	Perform channel check of power level measuring channels	daily during operation
	4.3.d	Perform channel check of the fuel element temperature measuring channels	daily during operation
	4.4	Verify alarm set points for the radiation monitoring instruments	prior to each operation

Performance of the surveillances were recorded in the control room log book, and were performed within the required periodicity. The inspector reviewed surveillances performed between June, 1983 and April 1984.

8. Experiments

During the inspection, the facility conducted an experiment involving the irradiation of a series of samples using the pneumatic rabbit tube. The experiment consisted of approximately 22 irradiations and counting of short lived silver isotopes. Similar experiments had been conducted before and therefore no special review or authorization was required. Coordination between the research associate conducting the experiment and the reactor operator was generally good throughout the experiment. The provisions of Operating Procedure OP-105, "Installation of Experiments" governed the conduct of the experiment.

During the experiment the inspector noted several deficiencies, all related to the radiation protection practices of the research associate conducting the experiment. These deficiencies violated specific steps in procedure OP-105.

- a. A radiation survey was not performed prior to removing the sample from the pneumatic tube after irradiation.
- b. Gloves were not always worn on both hands while handling the sample. The gloves used were not disposed of at the conclusion of the experiment.
- c. Tongs rather than a carrier were used to transport the sample from the pneumatic tube to the counting room.
- d. In most cases, the glove box containing the pneumatic tube was not secured after the irradiation and removal of each individual sample.

Failure to follow the provisions of procedure OP-105 regarding radiation protection requirements is a violation (84-02-03).

A review of the isotope log following the experiment showed that radiation levels for the experiment in the vicinity of the glove box were recorded on a rough log and then entered into the isotope log. However, for previously conducted experiments the radiation levels associated with sample removal were not always recorded. This was discussed with the licensee who indicated that reactor operators and experimenters would be instructed to insure that the radiation levels would be properly recorded in the future during each experiment. (JFI 84-02-06)

9. Reviews and Audits

The inspector reviewed the minutes of the second quarter 1983 through first quarter of 1984 meetings of the Reactor Safety Committee. The committee met quarterly as required by the Technical Specifications (TS). However, the licensee was unable to find the minutes of the meeting conducted on September 23, 1983. These minutes will be reviewed during a subsequent inspection (IFI 84-02-04). During one meeting, a walk through inspection of the facility was conducted, while at another control room records were reviewed. These activities fulfilled the TS requirement that the committee periodically audit the radiation safety program at the reactor. No abnormal occurrences or design changes occurred during the review period.

10. Radiation Control

a. Area Radiation Monitors

All three radiation monitors (water room, reactor bridge, exhaust fan) were operational during the inspection. The exhaust fan monitor, which was inoperable during the last inspection, had since been repaired.

b. Personnel Radiation Exposure

The inspector examined the 1983 exposure records for personnel associated with the MUTR. Midway through 1983, the licensee changed contractors responsible for exposure monitoring. This action was taken because of the high rate of damaged badges and recording and reporting errors. Since the change in contractors, these errors have reduced substantially. However, a few exposure records from the previous contractor still contain minor discrepancies between the monthly exposure reports and the annual reports. The licensee is aware of these discrepancies and is in the process of correcting them. Resolution will be reviewed during a subsequent inspection (IFI 84-02-05). Exposure of all personnel were well within regulatory requirements.

c. Smear Data

The inspector reviewed the records of all smear samples taken between May 1983 and April 1984. Location, frequency and number of smears was in accordance with current radiation protection practices. No removable radioactivity was detected on any smear.

d. Posting of Radiation Areas

Radiation areas of the MUTR facility were found to be properly posted.

e. Gaseous and Liquid Radioactive Effluents

Records of radioactive effluent monitoring (gaseous and liquid) for the period May 1983 to April 1984 were reviewed. All samples analyzed were below minimum detectable activity. Frequency and location of samples were in accordance with applicable requirements.

11. Exit Interview

The inspectors met with licensee representatives (listed in paragraph 1) at the conclusion of the inspection on May 11, 1984. In addition to the item of non-compliance related to radiation protection practices during the experiment, other areas of facility operation were discussed. The inspectors expressed their concern at the lack of aggressive management attention to correct deficiencies identified during the May 1983 inspection. Lack of attention to detail with regard to log and record keeping as well as failure to have surveillance procedures approved by the reactor safety committee are long standing issues that need to be resolved in the near term. The inspectors indicated that correction of these problems would be examined in a subsequent inspection, possibly conducted at an accelerated interval.