



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

AUG 13 1985

Report No.: 50-62/85-01 (University of VA Reactor)

Licensee: University of Virginia
Charlottesville, VA 22901

Docket No.: 50-62 (University of VA Reactor)

License Nos.: R-66

Facility Name: University of Virginia

Inspection Conducted: July 22-26, 1985

Inspector: *C. M. Hosey* 8/7/85
B. K. Revsin Date Signed

Approved by: *C. M. Hosey* 8/7/85
C. M. Hosey, Section Chief Date Signed
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, unannounced inspection entailed 19 inspector-hours onsite in the areas of radiation control, environmental protection, transportation and follow-up of licensee action on previous enforcement matters.

Results: One violation was identified - Failure to establish and adhere to radiation control procedures. A deviation from a commitment to the NRC to replace a survey instrument with an audible rate indicating survey meter was identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. U. Mulder, Director, Reactor Facility
B. Copcutt, Radiation Safety Officer
R. Allen, Chairman, Radiation Safety Committee
J. E. Henderson, Reactor Health Physicist
J. P. Farrar, Reactor Supervisor
P. E. Benneche, Senior Reactor Operator/Research Engineer
J. R. Gilchrist, Radiation Safety Specialist
A. A. Turley, Health Physics Technician

2. Exit Interview

The inspection scope and findings were summarized on July 24, 1985, with those persons indicated in paragraph 1 above. An apparent violation for failure to establish and adhere to radiation control procedures (paragraph 4.b) and an unresolved item* (URI) concerning calibration of instrumentation used to perform surveys (paragraph 4.g) were discussed in detail. The inspector described the areas inspected and discussed in detail the inspection findings. Licensee management acknowledged the inspection findings, taking exception only with the URI to which the licensee expressed the opinion that their instrument calibration techniques were consistent with applicable codes and standards. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

Licensee management was notified in a telephone conversation on July 26, 1985, between D. M. Collins of the NRC Region II staff and R. U. Mulder, Director of the University of Virginia Reactor Facility that the URI would be considered closed. The licensee was also informed that their calibration practices were contrary to accepted industry practices and did not encompass the parameters described by ANSI N323-1978.

During the above conversation the licensee was informed that failure to fulfill their commitment in response to Violation 50-62/84-01-01 (paragraphs 3 and 4.a) would be considered a deviation from a written commitment made to the NRC.

*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

3. Licensee Action on Previous Enforcement Matters

(Closed) Violation 84-01-01 Radiation surveys. The inspector reviewed the licensee's response dated February 20, 1985, and verified that the corrective action specified in the response had been taken with the exception of replacing the previous survey meter with an audible rate indicating survey meter. This will be considered a deviation from a written commitment to the NRC (paragraph 4.a).

(Closed) Violation 84-01-02 Placarding yellow label III shipments. The inspector reviewed the licensee's response dated February 20, 1985, and verified that the corrective action specified had been implemented.

(Closed) Violation 84-01-03 Adherence to procedures. The inspector reviewed the licensee's response dated February 20, 1985, and verified that the corrective actions had been implemented.

(Closed) Violation 84-01-04 Posting of radioactive material areas. The inspector reviewed the licensee's response dated February 20, 1985, and verified that the corrective actions had been implemented.

(Closed) Deviation 84-01-05 Maintenance of records. The inspector reviewed the licensee's response dated February 20, 1985, and verified that the corrective actions had been implemented.

4. Radiation Control (83743)

- a. 10 CFR 20.201(b) required that the licensee perform such surveys as may be necessary and are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

The inspector reviewed the following records of licensee surveys for the periods indicated:

Daily Contamination Survey, January 1 through June 30, 1985

Weekly Contamination and Radiation Survey, January 1 through June 30, 1985

The inspector accompanied the facility health physics (HP) technician on a weekly radiation and contamination survey. The inspector performed independent radiation surveys and compared readings using NRC equipment with readings obtained by the licensee. No significant difference between the licensee and the inspector results were noted.

The licensee had committed in a letter to Region II on February 20, 1985, in response to Notice of Violation issued with Inspection Report 50-62/85-01 that an audible rate indicating survey meter would be purchased to replace the original instrument used for performing surveys. Examination of survey records revealed that the original survey instrument was still in use. Although an audible rate

indicating meter had been purchased, it had not be placed in service. Conversation with licensee representatives revealed that the audible rate instrument had been found difficult to use and its suitability for performing surveys questioned. Consequently, the instrument had never been put into use. The licensee committed to the inspector to have the audible rate instrument operational and in use by September 1, 1985.

In a telephone conversation (paragraph 2) the licensee was informed that failure to use the audible rate indicating survey meter would be considered a deviation from a written commitment to the NRC (50-62/85-01-01).

No violations or deviations were identified.

- b. Technical Specification 6.3 required that radiation control procedures be maintained.
- (1) University of Virginia Reactor (UVAR) Standard Operating Procedure (SOP), "Radiation Control Procedure," paragraph 10.4.B.3 stated that due to the possibility of the spread of contamination, the uncontrolled areas in the UVAR Room shall be surveyed daily by the Reactor Health Physicist or his designee to determine the contamination and exposure levels present.

The inspector was informed by the Reactor Health Physicist that while daily contamination surveys had been performed as required, daily radiation surveys to determine exposure levels had not been performed. A review of survey records from January to June 30, 1985, confirmed the Reactor Health Physicist's statement. Failure to perform radiation surveys in the uncontrolled areas of the UVAR Room was identified as an apparent violation of Technical Specification 6.3. (50-62/85-01-02).

- (2) On a tour of the facility, the inspector observed that a portion of the UVAR Room was maintained as a contamination controlled area. The method used to evaluate the release of materials and personnel from the controlled UVAR Room was discussed with licensee representatives.

The licensee informed the inspector that the Reactor Facility informally endorsed the release criteria elaborated by the Radiation Safety Guide, 1971, a manual promulgated by the University Radiation Safety Committee. The Reactor Facility is exempt from the requirements of this guide. The inspector observed the monitoring equipment used for release of material and personnel from the UVAR Room and informed licensee representatives that detection of personnel release values stated in the Radiation Safety Guide would not be probable, i.e., the personnel frisker at the exit point would not be capable of detecting 500 disintegrations per minute (dpm) in a general background of approximately 1000 counts per minute (cpm) for the frisker. The

inspector stated that present SOPs had not addressed criteria for release of material and equipment from controlled areas and that failure to establish a procedure for the release of material and personnel from the controlled area would be considered a second example of an apparent violation of Technical Specification 6.3 (50-62/85-01-02).

- (3) UVAR (SP) SOP 10.5.A.1 dealing with radioactive waste required that each area in the Facility in which radioactive wastes are routinely generated shall have a dry waste container which shall be conspicuously marked as "Radioactive Waste" and shall have an attached report form on which depositions above minimum levels (as specified on the form) are recorded.

On tours of the UVAR Room, the inspector noted that three of four waste containers did not have an attached report form. Failure to attach a form for recording the deposition of material on the waste containers as required by SOP 10.5.A.1 was identified as a third example of an apparent violation of Technical Specification 6.3 (50-62/85-01-02).

- c. 10 CFR 20.202 required that appropriate personnel monitoring devices be worn by personnel likely to receive exposures in excess of 25 percent of the limits specified in 10 CFR 20.101 or who enter a high radiation area.

During tours of the facility, the inspector observed personnel monitoring devices being worn.

No violations or deviations were identified.

- d. 10 CFR 20.101 stated the quarterly radiation exposure limits to the whole body, skin of the whole body and extremities.

The inspector verified by examination of selected exposure records from January 1 to May 31, 1985, and through discussions with licensee representatives that exposures were being maintained below applicable limits. For 1984, the highest whole body exposure was 420 mrem and for 1985, the highest whole body exposure through the month of May was 300 mrem.

No violations or deviations were identified.

- e. 10 CFR 19.12 requires that each employee who works in or frequents the licensee restricted area be given instruction in radiation protection commensurate with their duties and potential hazard.

The inspector reviewed the radiation worker course outline and lesson plan. Selected records of personnel training were also reviewed.

No violations or deviations were identified.

- f. 10 CFR 20.203 stated the requirements for posting radiation areas, high radiation areas and radioactive materials area.

During tours of the facility, the inspector noted the posting of radiological areas and material and verified by independent survey that such areas were adequately posted.

No violations or deviations were identified.

- g. UVAR (SP) SOP 10.6.A stated that portable radiation monitoring instruments required for reactor operations and surveys at the facility shall be calibrated by the Reactor Health Physicist or his designee at least quarterly or whenever maintenance is performed on the instrument.

The licensee informed the inspector that portable instruments were calibrated against a National Bureau of Standards traceable 104 mCi Cs-137 source. When calibration was due, the instrument was brought to the Health Physics laboratory and exposed to the source at four or five points on each scale of the instrument. The instrument was considered calibrated if the reading, when exposed to the source, had an error factor no greater than ± 20 percent of the full scale reading. The inspector stated that such a wide acceptance range was not consistent with the recommendation of ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration" which specified that instrument readings shall be within ± 10 percent of known radiation values or that $\pm 20\%$ of the known radiation value shall be acceptable if a calibration chart or graph is prepared and made available with the instrument. The inspector stated to the licensee that such a practice constituted an instrument source check rather than a calibration.

A licensee representative stated that when an instrument was found to be out of calibration on one scale, rather than perform internal adjustments to bring the instrument back into calibration on that scale, the instrument was affixed with a sticker limiting its use on that scale. In examining calibration records for two Keithley Model 36100 ionization chambers, and observing the of the two instruments themselves, it was noted that neither instrument had been calibrated for use on the highest (20 R/hr) scale, that the middle scale (2 R/hr) for both instruments exceeded a ± 20 percent error from known radiation values, while only the lowest (200 mR/hr) scale exhibited a less than a ± 20 percent error for all values tested on that scale. Radiation survey records examined by the inspector showed that all surveys performed by these instruments had been on the 200 mR/hr scale and consequently, it would appear that these instruments were adequately calibrated for performing low level radiation surveys.

At the exit interview the instrument calibration issue was left as an URI pending further study by the NRC technical staff.

No violations or deviations were identified.

5. Transportation (86740)

- a. 10 CFR 71.5 required that each licensee who transports licensed material outside of the confines of its plant or other place of use shall comply with the applicable requirements of the regulations of DOT in 49 CFR, Parts 170 through 189.

The inspector reviewed the waste manifests for shipment #51872, May 26, 1985, and shipment #51872, June 27, 1985. The material shipped was low specific activity waste and was transferred in a university owned vehicle to a control area on the campus for transfer to a disposal site by a private contractor. It was determined that the contractor did not repackage waste received from the reactor facility. For these intra-university shipments, copies of a shipping manifest form had been reproduced and was being used by the reactor facility. Although, the required information was present on the manifests, the inspector noted that the shipping number was not unique for each shipment.

- b. 10 CFR 20.3011(d) required that any waste generating licensee who transfers radioactive waste to a land disposal facility or a licensed waste collector shall comply with requirements concerning waste classification according to 10 CFR 61.55 and waste and characterization according to 10 CFR 61.56.

The inspector reviewed the two waste shipments described in paragraph 5.a for classification and characterization compliance and determined that the appropriate information had been obtained and presented on the shipping manifest. It was also determined that the licensee shipped only class A waste.

- c. 10 CFR 20.311(d)(3) required the licensee to conduct a quality control program to assure compliance with 10 CFR 61.55 and 61.56 and that this program must include management evaluation of audits.

The inspector determined that at least once per calendar year, the University Radiation Safety Officer or other member of the University Radiation Safety Committee performs an audit of the university waste management program. The December 7, 1984, audit report was reviewed by the inspector.

No violations or deviations were identified.

6. Environmental Protection (80745)

Technical Specification 3.4.2 required that the activity of liquids released beyond the site boundary shall not exceed 10 CFR 20 limits.

For the months of January - March, 1985 and for June 1985, the inspector reviewed the holding pond monthly sampling and analysis program and verified that samples required by UVAR SOP 10.5.B.2 had been obtained and processed as required and that the average activity of three pre-release pond samples

did not exceed specified limits for additional analyses. Records for holding tank and pond releases for the first quarter of 1985 were reviewed and found to contain all the data required by SOP 10.5.B.2.

No violations or deviations were identified.