

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 70-687/82-07

Docket No. 70-687

License No. SNM-639 Priority 1 Category UR

Licensee: Union Carbide Corporation
P. O. Box 324
Tuxedo, New York 10987

Facility Name: Hot Laboratories

Inspection at: Tuxedo, New York

Inspection Conducted: November 2-5, 1982

Inspector:

J. Roth
J. Roth, Project Inspector

11/30/82
date

Approved by:

A. T. Gody
A. T. Gody, Chief, Safeguards and
Fuel Facilities Section, Nuclear
Materials and Safeguards Branch, DETP

11/30/82
date

Inspection Summary: Routine, unannounced inspection by a region-based inspector of: facility changes and modifications; 10 CFR Part 21; internal review and audit; safety committees; procedure control; review of operations; nuclear criticality safety; emergency planning - drills; periodic maintenance of packages; transportation activities; non-routine events; and, licensee action on previously identified enforcement items. The inspection was initiated on the day shift and involved 34 hours of direct inspection time by one NRC inspector.

Results: Of the 12 areas inspected, no violations were identified in 10 areas. Two violations were identified in two areas (Violation - Failure to maintain stored uranium solution in a doubly sealed container (paragraph 3a); Violation - Failure to post the new waste storage facility with Caution - Radioactive Materials signs (paragraph 3b)).

DETAILS

1. Persons Contacted

- *J. J. McGovern, Business Manager, Radiochemicals
- *C. J. Kennerth, Manager, Health, Safety and Environmental Affairs
- *L. C. Thelin, Health and Safety Supervisor
- *D. D. Grogan, Manager, Radiochemical Production

The inspector also interviewed other licensee employees during the inspection.

*denotes those present at the exit interview.

2. Licensee Action on Previously Identified Enforcement Items

(Closed) Inspector Follow Item (687/78-02-07) Refer single parameter limit of 650 grams of U-235, at this facility which has a current license limit of 23 kilograms U-235, to NRC-NMSS for resolution. This nuclear criticality safety question has been referred to NMSS and will be resolved during the facility license renewal review process which is currently in process.

(Closed) Infraction (687/80-03-01) Failed to do bioassay. The licensee was initially cited for failure to do bioassay analysis for uranium on employees for the year 1979. During inspection 70-687/81-01 the inspector determined that the licensee had also not conducted bioassay analyses during the year 1980. During inspection 70-687/82-03 the inspector determined that the licensee had conducted bioassay analyses as required for the year 1981. During this inspection the inspector determined that bioassay samples had been collected from affected personnel and were to be sent out to a vendor for analysis by November 15, 1982 as committed to by the licensee during the exit interview. Corrective actions have been completed.

(Closed) Violation (687/81-06-02) Committee did not review and approve health physics procedures. The inspector verified that the procedures in question were reviewed and approved or deleted by the Nuclear Safeguards Committee.

(Closed) Violation (687-82-03-01) Failed to follow Certificate of Compliance 5957 conditions. The inspector verified that the licensee had requested a modification of the Certificate of Compliance by letter, dated April 30, 1982, to NRC-NMSS. This modification involved a change in the authorized uranium-235 content of the packages. Certificate of Compliance 5957, Revision 8, dated May 19, 1982, authorized U-235 enriched to 93% to be shipped in the Model BMI-1 shipping package.

3. Review of Operations

The inspector examined all areas of the hot laboratory facility to observe

operations and activities in progress, to inspect the general state of cleanliness, housekeeping, and adherence to fire protection rules, and to assure that all areas in which SNM was handled or stored were properly posted with proper radiation safety or criticality safety signs as required by federal regulations or license conditions.

a. Solution Make-Up Area

The inspector noted that a plastic bottle of U-235 in solution was stored in Feed Cabinet No. 2 and was not encapsulated in a sealed plastic bag on November 3, 1982. Storage requirements state that solutions shall be double encapsulated. The plastic bag which surrounded the bottle in storage was not sealed in any manner. This was identified as a violation (82-07-01).

b. New Waste Storage Facility

During examination of the new waste storage facility located at the north end of the Hot Laboratory Building, on November 2, 1982, the inspector observed that several of the storage locations, which were identified as being filled, were not labeled or posted to indicate that they contained radioactive material. In addition all of the doors leading into this facility were not posted to indicate that the area contained radioactive material. This was identified as a violation of the 10 CFR 20.203(e)(1) posting requirements (82-07-02).

c. Housekeeping

The inspector observed that housekeeping within the various areas of the facility was adequate with the exception of the top of the hot cells outside the solution make-up and plating laboratories. This was discussed with licensee representatives during the exit interview. Licensee representatives stated that housekeeping was inadequate in this area because maintenance work on several hot cell manipulators had just been completed. Actions will be taken to improve housekeeping in this area.

No violations were identified.

d. Storage of Chemicals

The inspector noted that at least six cases of formic acid, a poisonous substance, were being stored in an open cabinet located in the facility supply air system room. The inspector state that storage of poisonous materials in this room was a questionable practice because of the potential effect on the entire facility if a bottle of formic acid was inadvertently dropped and broken. Licensee representatives indicated that these storage practices would be re-examined and modified if necessary.

No violations were identified.

e. Hood Airflow

The inspector observed that air flow was not being maintained on a process hood installed in the waste solution laboratory. This hood was being intermittently used to test a new process for depositing U-235 on target walls. Neither the hood nor the room in which the hood was located were being used by licensee personnel at the time of this inspection. Licensee representatives stated that there should have been airflow on this hood and that actions will be taken to assure that adequate airflow is maintained on this hood. This is an inspector follow-up item. (82-07-03)

No violations were identified.

f. Hand and Foot Contamination Monitors

The inspector noted that a hand and foot contamination monitor, located at the exit to the Reactor Building tunnel was not operating properly. The monitoring instrument alarm would not operate when the alarm set point was exceeded during a test. The licensee immediately took action to repair the instrument.

No violations were identified.

g. Unirradiated SNM Onsite

The inspector verified through a review of licensee SNM running balance records and observations that the total quantity of unirradiated SNM at this facility was below the limit specified in the facility license.

No violations were identified.

4. Nuclear Criticality Safetya. Radiation Monitor Calibration

The inspector verified that each monitor had been calibrated between June 10 and June 16, 1982 upon installation into the new criticality monitoring system. The new system was made operational on June 30, 1982 and appeared to be operating properly.

No violations were identified.

b. Radiation Monitor Checks and Tests

The inspector verified that the licensee conducted documented daily operability tests and weekly alarm checks on each radiation/criticality monitor between June 4, 1982 and November 2, 1982. Corrective action was taken and completed when inadequacies were identified.

No violations were identified.

c. Facility Changes and Modifications

The inspector noted that the licensee installed a new pyrolyzer in the northwest corner of the solution make-up laboratory and a new processing hood in the northwest corner of the waste solution laboratory. This equipment is being used to test a new proprietary process for the deposition of uranium on the inside surface of the target tubes.

No violations were identified.

5. Safety Committees

a. Nuclear Safeguards Committee

The inspector examined the records of one formal and three informal meetings of the Nuclear Safeguards Committee held between April 6, 1982 and September 14, 1982. In each case, review actions and recommendations made by the committee were adequately documented. Included in these records were supporting documents used by the committee to develop the recommendations made. In addition, the implementation of these recommendations was adequately documented in the committee minutes.

No violations were identified.

b. General Safety Committee

The licensee has established a management level General Safety Committee to review the general safety and operational radiation safety aspects of the facility. Three meetings of these committee were held between June 22, 1982 and October 7, 1982. Inspections of buildings, outside areas and vehicles were conducted monthly for housekeeping, fire hazards, use of safety glasses and safety shoes. Corrective actions were initiated or completed as required.

No violations were identified.

6. Internal Review and Audit

The inspector examined the records of 3 audits of the facility conducted between February 2, 1982 and October 19, 1982. The audits covered various aspects of the facility operation including: operations, criticality safety, transportation, and actions taken to correct identified deficiencies. The inspector verified that corrective action was initiated or completed on all items identified which required correction.

No violations were identified.

7. Evacuation Drills

The licensee conducted evacuation drills at least twice each year on May 4, 1981, November 5, 1981, February 18, 1982, and October 13, 1982. According to licensee records, the drills were successful and useful in training personnel.

No violations were identified.

8. 10 CFR Part 21

The inspector verified that the licensee posted the notice with the information required by 10 CFR 21.6 and that the licensee developed the procedures required by 10 CFR 21.21 to implement the requirements of 10 CFR Part 21. These procedures are available for use by facility personnel, if required. During inspection 70-687/81-07 the inspector observed that the notice posted by the licensee pursuant to 10 CFR 21.6 identified a corporate officer, who was no longer located at the site, as a contact point. This posting was revised on November 5, 1981 to identify the current Business Manager - Radiochemicals as the contact point.

No violations were identified.

9. Review of Nonroutine Event Reports

The inspector reviewed licensee records and determined that only one non-routine event, within the scope of this inspection, occurred at this facility since the last inspection.

On October 13, 1982, at about 9:30 a.m., an area monitor at the north end of the canal alarmed when mixed fission products inadvertently contaminated the canal water. This activity was released from the contaminated Hot Cell No. 1 elevator when it was lowered into the canal to retrieve an irradiated target capsule. The Hot Laboratory was immediately evacuated and the gate connecting the canal with the reactor pool was closed and sealed. General air samples in the Hot Laboratory indicated a maximum of 50% MPC for I-132. There was no release to unrestricted areas. Personnel returned to the facility when air activity was reduced to ambient levels. The licensee installed portable ion exchange columns into the canal to clean up the water on October 13, 1982 and the columns were still operating during this inspection. Water in the canal was approaching normal activity levels by the end of this inspection.

It was noted by the inspector that the water level had been lowered by about one foot and the north end of the canal (ledge) was posted as a radiation area (6 mR/hr). According to the licensee representatives, the water level was lowered about one hour prior to entry into the area by the inspector. At the request of the inspector additional radiation readings were taken in the area which indicated radiation levels of 15-20 mR/hr gamma and 110-140 mR/hr beta activity. The licensee reposted the area with the new radiation readings and made the use of safety glasses

mandatory when working in the area. The use of safety glasses reduced the level of radiation to the eyes.

No violations were identified.

10. Procedure Control

Procedures are written by members of the staff and submitted to the Nuclear Safeguards Committee for review and approval. This Committee controls the maintenance and issuance of all procedures. The facility Procedure Manual was examined by the inspector. This manual contains procedures relative to operations in both the hot laboratories and the research reactor. Procedure No. AD-01 "Procedures" dated April 12, 1982 is an administrative procedure which specifies the techniques to be used to write, approve, review and modify operational procedures.

The inspector examined the procedures manual and verified that the procedures available to operators were of the same revision and/or implementation date as those contained in the masterfile maintained by the Hot Laboratory secretary as required. However, it was noted that the procedures manual did not cover operations in the hot cell. According to licensee representatives, the hot cell procedures are contained in the "Hot Lab Operations Manual" which will be examined during a subsequent inspection. This is an inspector follow-up item (82-07-04).

No violations were identified.

11. Transportation

a. QA Program for Packages

The licensee conducted the annual audit of Type B packages on May 13, 1982. No problem areas were identified. However, there were two areas of concern, it was felt that a more formal method of recording Specification 2 R containers leak rate data should be devised and many of the welds on the Uranium Waste Fission Product containers had to be rewelded because of leaks identified during QC testing. The inspector verified that records of leak tests on Specification 2R containers had been revised to assure that only those containers which passed the tests were used. The inspector also verified that techniques for welding the Uranium Waste Fission Product containers had been revised and the rejection rate has been reduced to about 20-30%.

No violations were identified.

b. Receiving

The inspector examined the receipt records of SNM for the period June 23, 1982 through October 14, 1982 and determined that the

licensee was maintaining records of monitoring upon receipt of a package of radioactive material as required by 10 CFR 20.205(b)(1).

No violations were identified.

c. Shipping Records

The inspector examined records of waste shipments made during the period September 7, 1982 through October 27, 1982, and determined that radiation surveys were taken and recorded, and all shipments were labeled, marked, placarded, inspected and recorded as required. No waste shipments were made between March 1, 1982 and September 7, 1982.

During the last inspection it was noted that one of the radiation readings recorded on the bill of lading was taken on the surface of the cask and not on the surface of the vehicle as indicated on the form. This form was revised by the licensee to reflect actual practice.

No violations were identified.

d. Periodic Maintenance of Packages

The inspector examined licensee records of periodic maintenance on packages described in Certificate of Compliance Nos. 5957, 6058 and 9098 for Model Nos. BMI-1, B-3 and UCC 20 WC packages.

No violations were identified.

e. Transportation Incident

The inspector was informed by the licensee at about 8:00 a.m. on November 4, 1982 that a transportation incident had occurred about seven miles north of Barnwell, South Carolina. At about 3:00 a.m. two empty Model B-3 casks were being returned to Tuxedo, New York, when the truck driver swerved to miss an automobile, jackknifed and turned over. The truck driver was killed. The two empty casks broke loose from the trailer, however, there was no apparent significant damage to the casks. There was no release of radioactivity. The licensee was notified of this incident by the carrier, Tristate Motor Transit Company. The casks were returned to the Barnwell, South Carolina burial site, examined and released for return to Tuxedo, New York. This incident was reported to the Region I office by the inspector at about 8:30 a.m. on November 4, 1982.

No violations were identified.

12. Off-Site Electrical Power Interruption

At about 3:30 p.m. on November 3, 1982 off-site electrical power to the

facility was shut off so that the power company could repair power lines coming onto the site. This power shutdown was previously announced to facility personnel. The inspector verified that the reactor had been shutdown and that all hot laboratory activities had ceased prior to the shutdown of power. All site emergency generators were operating properly. Ventilation on the hot cells was operating at reduced flow and airflow was observed from areas of no contamination to areas of higher contamination within the facility. Laboratory and processing hoods were closed and all facility alarms (criticality, gas, particulate and I-131) were operable and indicated no significant changes in activity level because of the commercial power shutdown.

No violations were identified.

13. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on November 5, 1982. The inspector summarized the scope and findings of the inspection. Comments made by licensee representatives have been incorporated into the applicable paragraphs of the report details.