U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 70-687/84-02
50-54/84-02

Docket Nos. 70-687
50-54

License Nos. SNM-639 Priorities I Category UR
R-81 - 1

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

Facility Name: Hot Laboratories and Research Reactor

Inspection At: Tuxedo, New York

Inspection Conducted: July 9-11, 1984

Inspectors: J. Roth 8/1/84
J. Roth, Project Engineer date

Approved by: T. C. Elsasser 8/2/84
T. C. Elsasser, Chief, Reactor date
Projects Section 1B, DPRP

Inspection Summary: Inspection on July 9-11, 1984 (Combined Inspection Report Nos. 70-687/84-02; 50-54/84-02)

Areas Inspected: Routine, unannounced inspection by a region-based inspector (26 hours) of: organization, facility changes and modifications, safety committees, review of operations, nuclear criticality safety, radiation protection, transportation activities, nonroutine events, licensee action on previously identified enforcement items and unscheduled reactor maintenance.

Results: No deviations or violations were identified. The licensee committed to include the Fissile Class III shipment notation on the Highway Route Controlled Quantity Description form as well as on the bill of lading which had been the licensee's previous practice (paragraph 9.b).

DETAILS

1. Persons Contacted

*J. J. McGovern, Business Manager, Radiochemicals
*C. J. Konnerth, Manager, Health, Safety and Environmental Affairs
*L. C. Thelin, Health and Safety Supervisor
D. D. Grogan, Manager Radiochemical Production
*W. G. Ruzicka, Manager, Nuclear Operations

*Denotes those present at the exit interview.

2. Licensee Action on Previously Identified Enforcement Items

(Closed) Violation (687/83-04-01) Failure to post two SNM storage locations with nuclear criticality safety signs. The inspector verified that the licensee posted the Waste Storage Facility above the storage pits and File Cabinet No.1 located in the Make-up and Chemical area with nuclear criticality safety signs.

(Closed) Inspector Follow Item (687/83-04-02) Formal review and approval of the Area Criticality Monitor Calibration Procedure. The inspector verified that licensee management and the Nuclear Safeguards Committee formally reviewed and approved this procedure prior to January 1, 1984.

(Open) Inspector Follow Item (687/83-04-02) Establishment of a fixed contamination survey program including criteria and action levels. The inspector verified that the licensee had incorporated a fixed contamination level survey program with criteria and action levels into the revised license renewal application. This program will be implemented upon renewal of the facility SNM License No. SNM-639. The SNM license renewal is expected to be issued by NRC-NMSS by September 30, 1984.

(Closed) Inspector Follow Item (687/83-04-05) Review status of capsule failure corrective actions. During inspection 50-54/84-01, the inspector examined the status of the corrective actions taken by the licensee for the capsule failure which occurred on October 20, 1983 and a second capsule failure which occurred on November 16, 1983. During this inspection, the inspector verified that the failures were not caused as a result of the process by which the capsules were loaded with U-235. In order to resolve the capsule failure problem, the licensee discontinued use of the single pull stringer and reinitiated use of the old box style stringer. The box style stringer had previously been used for years without capsule failures occurring.

3. Review of Operations

The inspector examined all areas of the Hot Laboratory and reactor facilities 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 radiation safety or criticality safety signs as required by federal regulations or license conditions.

a. Hot Laboratory

The inspector noted that housekeeping within the various areas of the facility was adequate and that running balances were maintained in all areas which were posted to contain U-235.

b. Reactor

The inspector observed that housekeeping was adequate.

4. Nuclear Criticality Safety

a. Radiation Monitor Calibration

The inspector verified that the licensee performed the required annual recalibration of each monitor in the Hot Laboratory and the Reactor Building during March 1984.

b. Radiation Monitor Tests and Checks

The inspector verified that the licensee conducted and documented the daily operability tests and weekly alarm checks on each radiation/criticality monitor between May 28, 1984 and July 10, 1984. Corrective actions were taken and completed when inadequacies were identified.

c. SNM Inventory

The inspector examined all areas of the plant and assured that the total inventory of unirradiated U-235 was less than that authorized by the facility licenses.

d. Facility Changes and Modifications

The inspector noted that the licensee had installed a new effluent filter system for the hot cells in the Hot Laboratory. The system consisted of two charcoal beds sandwiched between two absolute "HEPA" filters. The new system will be used only if both the normal and backup hot cell ventilation systems fail. The system is currently operated manually, however, the licensee intends to install pressure sensors and automatic switches to assure continuous operation of a ventilation system on the hot cells.

5. Radiation Protection

a. Air Sampling

The inspector reviewed in-plant air sample data for the period January 2, 1984, to July 10, 1984, and verified that regulatory requirements were satisfied.

The inspector reviewed stack air sample data for the period December 30, 1983, through July 6, 1984. The data indicated that the air concentrations were within the regulatory limits specified in 10 CFR 20, Appendix B.

b. Smear Surveys

The inspector reviewed smear survey records for all areas of the Hot Laboratory and Reactor facilities for the period January 2, 1984, to July 10, 1984. When necessary, corrective actions were taken as required by license conditions. The inspector noted that the licensee established a follow-up program to assure that contamination in excess of license limits was cleaned-up in a timely manner.

c. Portable Instrument Calibration

The inspector reviewed records of portable instrument calibrations conducted between March 1983 and June 1984. All of the instruments were calibrated at the intervals specified by license conditions and regulatory requirements.

d. Source Leak Checks

The inspector verified that the licensee had conducted leak checks on alpha and beta-gamma sources at the intervals required by license conditions between April 1981 and June 1984. Alpha sources included Ra-Be, Pu-Be, Am-241 and Ra-226. Beta-Gamma sources included Co-60, Cs-137, Ru-226, H-3, Ni-63, and Sr-90.

6. Nuclear Safeguards Committee

The inspector examined records of meetings nos. 105 to 112 held between November 17, 1983, and April 24, 1984, of the Nuclear Safeguards Committee. 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. In addition, implementation of these recommendations was adequately documented in the committee minutes.

7. Unscheduled Reactor Shutdown

At about 6:09 a.m. on July 10, 1984, the research reactor went into automatic shutdown when control rods one and three dropped during a momentary loss of onsite power. Restart could not be accomplished because of noise

in the Compensating Ion Chamber No. 2 (Log N) channel. According to licensee representatives, the cable leads to this ion chamber deteriorate with time under high radiation conditions and must be changed about every six months. The decision was made to change the cable at this time. In addition, the licensee also decided to change a pneumatic rabbit tube which extends into the reactor core and had developed a water leak.

The inspector intermittently observed the following shutdown activities: lowering of pool water level to about the 13 foot level; ion chamber assembly removal; lead change and chamber replacement; and rabbit tube removal and replacment. The reactor returned to full power operation by 6:45 p.m. on July 10, 1984.

Tnis work appeared to be well organized, done in a professional manner and was constantly covered by facility radiation protection personnel. There were no releases to the environment and plant operating personnel received negligible radiation doses as a result of this work.

8. Organization

The inspector determined that the vacant position of Facilities Project Engineer has been filled by Mr. J. Franzen. This position was previously filled by Mr. R. Strack who was named Reactor Supervisor effective August 1, 1983.

9. Transportation

a. Low Level Waste Shipments

On July 10, 1984, the inspector observed as 93 drums and 2 boxes of low level waste were loaded onto the transporting vehicle for shipment (No. 683) to the burial site. Each container was checked for damage and proper labeling, and surveyed for radiation and contamination level prior to placement on the vehicle. The load was properly shored and the vehicle was surveyed for radiation prior to leaving the site. The maximum radiation reading was 40 mR/hr on contact with the surface of the closed trailer.

The inspector also reviewed the shipping papers associated with this shipment prior to release of the vehicle and determined that these papers were in order.

b. Shipment of "Highway Route Controlled Quantities" of SNM

The inspector examined records of three shipments of "Highway Route Controlled Quantities" of SNM which were made between October 6, 1983 and July 1, 1984. The records indicated that all USNRC and USDOT requirements were met by the licensee with the exception of information contained on the Highway Route Controlled Quantity Description document. Title 49 CFR 172.202 and 203 requires that this document contain the following notation: "Warning-Fissile Class III Shipment.

Do not load more than (x) packages per vechicle. In Loading and Storage Areas, keep at least 20 feet (6 meters) from other packages bearing Radioactive Labels". Although this notation was not on the description document, it was prominently positioned on the bill of lading for each shipment. Therefore, the information stated in the notation was immediately available for use by applicable shipment carrier personnel if required. This was discussed at the exit interview. Licensee representatives stated that the notation will be placed on the description document as well as the bill of lading for all future similar shipments. (687/84-02-01).

10. Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on July 11, 1984. The inspector summarized the scope and findings of the inspection and informed the licensee that no violations were identified. The licensee stated that the Fissile Class III warning notation would be included on the Highway Route Controlled Quantity Description document as well as elsewhere in the shipping papers associated with appropriate SNM shipments. (Paragraph 9.b).