

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

Region I

Report No. 79-03

Docket No. 70-687

License No. SNM-639

Priority: 1

Category: A

Licensee: Union Carbide Corp.
P.O. Box 234
Tuxedo, New York 10987

Facility Name: Union Carbide

Inspection at: Tuxedo, New York

Inspection conducted: July 11-13, 1979

Inspectors: P. E. Clemons
P. E. Clemons, Radiation Specialist

8/27/79
date signed

Approved by: J. P. Stohr
J. P. Stohr, Chief, Radiation
Support Section, FF&MS Branch

8/27/79
date signed

Inspection Summary:

Inspection on July 11-13, 1979 (Report No. 70-687/79-03)

Areas Inspected: Routine, unannounced inspection by a regional based inspector of the Radiation Protection Program including outstanding items, dosimetry, leak test, bioassay, posting, records, labelling, ventilation, smears, annual report, stack samples, liquid waste, instrument calibration, Form 4 and air samples. Shortly after arrival, areas where work was being conducted were examined to review radiation control procedures and practices. The inspection involved 19 inspector-hours onsite by one regional based NRC inspector.

Results: Of the 15 areas inspected, no items of noncompliance were identified in 10 areas. Seven apparent items of noncompliance were identified in 5 areas (infraction - failure to post criticality sign, paragraph 3; infraction - failure to complete Form 4, paragraph 4; infraction - failure to perform bioassay, paragraph 5; infraction - failure to provide alpha monitor, paragraph 6; deficiency - failure to post area or room, paragraph 7; deficiency - failure to label container, paragraph 8, deficiency - failure to maintain records in same units as used in Part 20, paragraph 9.)

DETAILS

1. - Persons Contacted

Mr. James Ditton, Pollution Control and Health Physics
*Mr. James McGovern, Manager, Radiochemical Products
*Mr. Donald Scott, Health Physics Technician
*Mr. Mark Voth, Manager, Nuclear Operations

The inspector also interviewed several other licensee employees including Health Physics Technicians and the Quality Assurance Assistant.

* denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (687/78-02-01) Failure to post the notice required by 10 CFR 21.6. The inspector observed during this inspection that the licensee had posted the documents required by 10 CFR 21.6.

(Closed) Noncompliance (687/78-02-03) Failure to post a radiation area, and the use of improper signs. The inspector observed that the area on top of Cell 1 on the second floor of the Hot Lab Building was posted with the proper signs.

3. Criticality Safety Sign

As the inspector toured the Plating Area of the Hot Lab Building, he was informed that Uranium-235 was stored in fuel storage cabinets. The inspector observed one of the storage cabinets and he noted a sign indicating the amount of Uranium-235 permitted in the cabinet either as a solid or a solution. The inspector also noted that there was no indication of the amount of uranium stored in the fuel storage cabinet. The inspector asked a licensee representative if they were required to post the contents on the container. The inspector was informed that there was no requirement to post the contents on the storage container.

Item 14 of Amendment 1 to Special Nuclear Material License No. SNM-639 states, "...the licensee shall post all storage and use locations with criticality safety signs which indicate the maximum quantity of special nuclear material that is authorized at each location and the actual amount that is present at each location".

A licensee representative informed the inspector that approximately 85 grams of Uranium-235 was stored in the container.

On July 12, 1979, the inspector entered the Solution Lab in the Plating Area on the second floor of the Hot Lab Building to perform velocity measurements on the hoods. He noted that the criticality safety sign posted at the door indicated zero grams of uranium present at this location. The inspector observed an individual working in the Lab, and the inspector asked a licensee representative what operations were being performed, and he was told that the individual was in the process of dissolving uranium. The inspector asked how much uranium was being processed and he was told that the individual was working with 324 grams of uranium. The inspector informed the licensee representative that the Lab was not properly posted.

The inspector noted that failure to comply with a license condition represents noncompliance (79-03-01).

4. Form NRC-4

As the inspector reviewed dosimetry records, he observed that during the first quarter of 1978, an employee exceeded the whole body dose limit of 1250 millirem as permitted by 10 CFR 20.101. According to the records, the employee received 1750 millirem during the period. The inspector asked a licensee representative if the Form NRC-4 had been completed as required before the exposure was permitted.

The licensee representative gave the inspector the individual's exposure records, which contained a Form NRC-4, but the form was not complete. It did not contain the following information:

- a. Previous employment involving radiation exposure.
- b. Permissible accumulated dose.
- c. Total exposure to date.
- d. Unused part of permissible accumulated dose.

10 CFR 20.102(b) states "Before permitting any individual in a restricted area to receive exposure to radiation in excess of the limits specified in paragraph (a) of 20.101, each licensee shall:

- (1) Obtain a certificate on Form NRC-4, or on a clear and legible record containing all the information required in that form, signed by the individual showing each period of time after the individual attained the age of 18 in which the individual received an occupational dose of radiation; and

- (2) Calculate on Form NRC-4 in accordance with the instructions appearing therein, or on a clear and legible record containing all the information required in that form, the previously accumulated occupational dose received by the individual and the additional dose allowed for that individual under 10 CFR 20.101(b)".

The inspector stated that failure to adhere to regulations represents noncompliance (79-03-02).

5. Bioassay

Condition 9 of Special Nuclear Material License No. SNM-639 incorporates a letter dated June 13, 1973. On Page 1, Item 2, Personnel Monitoring, of the June 13, 1973 letter, it states, "Urinalyses...on all personnel working with radioactive materials are made on a routine basis at least once each year".

The inspector requested to see the bioassay data for individuals working with uranium during 1978. The inspector was given a log book, which indicated that bottles for the collection of urine were issued July 24, 1978, and the urine samples were collected during the period of August to December, 1978. According to the log book, twelve samples were designated to be analyzed for Uranium.

The inspector was given raw data which indicated that approximately fifty urine samples were apparently analyzed for gross beta-gamma. The inspector again requested the uranium analytical results, and he was informed that the twelve samples had not been analyzed for uranium.

Further investigation by the inspector revealed that uranium bioassay analyses had not been performed in 1977 either (79-03-03).

The inspector stated that failure to comply with the license conditions represents noncompliance.

6. Instruments

As the inspector toured the Plating Area, a major uranium activity area, on the second floor of the Hot Lab Building, on July 11, 1979, he observed individuals working in the Solution Lab and the Plating Lab. These individuals wore protective clothing (lab coats, gloves and shoe covers) as they performed the various operations involving uranium. As the inspector exited the area, he noted that a fixed hand and foot monitor was available to monitor for alpha contamination, but a portable alpha radiation detector was not available to monitor personal clothing.

Condition 9 of Special Nuclear Material License No. SNM-639 incorporates a letter dated June 13, 1973. On Page 1, Item 3, Radiation detection and monitoring, of the June 13, 1973 letter, it states, "Portable radiation detection equipment such as cutie-pies and G-M survey meters and alpha detectors are located at various points in the area and a Hand and Foot Counter is near the main exit from the Hot Lab. It is used by visitors and personnel before going to lunch or leaving the building."

The inspector also noted that alpha monitoring capability was not available near the main exit from the Hot Lab.

The inspector stated that failure to have portable alpha monitors at various places in the facility represents noncompliance with the license conditions (79-03-04). A portable alpha detector was placed at the exit to the Plating Area prior to the conclusion of the inspection.

7. Posting

On July 11, 1979, as the inspector toured the Plating Area, he observed that the criticality safety sign posted at the entrance into the Old Solution Make-Up Lab indicated that 200 grams of Uranium-235 was contained within the area.

10 CFR 20.203(e) states, "each area or room in which licensed material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in an amount exceeding 10 times the quantity of such material specified in Appendix C of this part shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words: "Caution - Radioactive Material(s)".

The inspector noted that the 200 grams of Uranium exceeded the Appendix C limits and the area was not posted as required.

The inspector stated that failure to comply with the regulations represents noncompliance (79-03-05).

The area was posted prior to the conclusion of the inspection.

8. Labelling

In Paragraph 3 above, it was stated that approximately 85 grams of Uranium-235 was stored in the fuel storage container.

10 CFR 20.203(f) states "each container of licensed material shall bear a durable, clearly visible label identifying the radioactive contents." A label required pursuant to the above shall bear the radiation caution symbol and the words "CAUTION, Radioactive Material" or "Danger, Radioactive Material".

The inspector observed that the fuel storage container was not posted as required.

The inspector stated that failure to label the container as required by the regulations represents noncompliance (79-03-06).

9. Records

10 CFR 20.401(b) states, "Each licensee shall maintain records in the same units used in this part, showing the results of surveys required by 10 CFR 20.201(b). 10 CFR 20.201(b) requires the licensee to perform such surveys as may be necessary to comply with the regulations.

The licensee surveys his exhaust stack to evaluate the release of radioactive effluents to the environment in accordance with 10 CFR 20.106, but the results of the evaluations are not maintained in microcuries per milliliter of air as required by the regulations. The licensee has maintained his stack sample results in counts per minute during the period March 30, 1979 through June 1979 as observed by the inspector.

The inspector stated that failure to comply with the regulatory requirements represents noncompliance (79-03-07).

10. Dosimetry

The inspector reviewed dosimetry records for the period January 1978 - June 1979 for approximately ten employees associated with SNM-639 to determine that the licensee was in compliance with the regulatory requirements. With the one exception cited in Item 4 above, the requirements were adhered to.

No items of noncompliance were identified.

11. Leak Test

The licensee has a license condition for leak testing sealed plutonium sources. The condition states that "each plutonium source shall be tested for leakage at intervals not to exceed six (6) months".

The inspector reviewed leak test records which indicate that the licensee has one sealed plutonium source and this source is being leak tested at three (3) month intervals.

No items of noncompliance were identified.

12. Ventilation

Condition 9 of SNM-639 incorporates a letter dated April 28, 1969. On Page 10, Item 1, Ventilation System, of the April 28, 1969 letter, it states "...ventilation system is pressure regulated to insure a continuous, positive flow of air from nonradioactive areas to contaminated or radiation areas." At the inspector's request, a licensee representative performed velometer measurements on all hoods in which uranium is processed in the Plating Area, to determine that the flow of air was in the proper direction.

No items of noncompliance were identified.

13. Smears

On Page 3 of the April 28, 1969 letter, the licensee states that floor wipes shall be counted for alpha activity. According to a licensee representative, wipes are taken from certain areas daily, and other areas monthly.

The inspector reviewed smear survey records for the period January through June 1979 to assure that the licensee was in compliance with the license condition.

No items of noncompliance were identified.

14. Annual Report

10 CFR 20.407 requires that appropriate licensees submit, within the first quarter of each calendar year, to the Director of Management and Program Analysis personnel monitoring information recorded by the licensee for individuals for whom personnel monitoring was either required or provided during the previous calendar year.

The inspector reviewed a statistical summary report, dated March 29, 1979, that the licensee had submitted. The report indicated that 29 individuals were monitored during 1978, with the maximum exposure being 5,120 millirem received by one employee.

No items of noncompliance were identified with regard to the report.

15. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 13, 1978. The inspector summarized the purpose and the scope of the inspection and the findings as presented in this report.

Union Carbide/SNM-639

1. Procedures - Pg. 3 4/28/69, Pg. 1, Item b, 11/5/70
2. Air samples - Pg. 3 4/28/69
3. Smears - Pg. 3 4/28/69
4. Records of Nuclear Safeguards Committee - Pg. 3 4/28/69
5. Ventilation - Pg. 10 4/28/69
6. Stack Samples - Pg. 17 4/28/69
7. Air Samples - Pg. 17 4/28/69
8. Smears (daily) - Pg. 17 4/28/69
9. Liquid Waste
10. Solid Waste
11. 10 CFR 71.51
12. Supplemental Training - Pg. 15 4/28/69 (New Manual)
13. Shipping Radioactive Material
14. Receiving Radioactive Material
15. Bioassay - Pg. 1 6/13/73 At least once per year
16. Source inventory and leak tests (Pu)
17. Instruments and calibration - Pg. 16 4/28/69
18. Audits - Pg. 3 8/12/76
19. Storage of Uranium
20. Outstanding Items
21. Dosimetry

- 22. Annual Report
- 23. Termination Report
- 24. Forms
- 25. Respiratory Protection
- 26. Whole Body Count
- 27. Trash Compactor