



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

13 JUL 1978

Docket Nos. 50-54
70-687

Union Carbide Corporation
ATTN: Mr. James J. McGovern
Production Manager, Radiochemicals
P. O. Box 324
Tuxedo, New York 10987

Gentlemen:

Subject: Inspection 50-54/78-02 and 70-687/78-01

This refers to the inspection conducted by Mr. E. Woltner of this office on June 6-9, 1978, of activities authorized by NRC License No. R-81 and SNM-639 and to the discussions of our findings held by Mr. Woltner with yourself at the conclusion of the inspection.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. These items of noncompliance have been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to

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be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b)(4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,



Walter G. Martin, Chief
Safeguards Branch

Enclosures:

1. Appendix A, Notice of Violation
2. Office of Inspection and Enforcement Inspection Report
Numbers 50-54/78-02 and 70-687/78-01

cc w/encls:

- D. B. Holzgraf, Nucleonics Manager
- J. W. Paradiso, Reactor Supervisor
- C. Konnerth, Health Physicist
- Dr. D. C. Freeman, Jr., General Manager for Clinical Diagnostics
- R. Ballinger, Vice President, Medical Products Division

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APPENDIX ANOTICE OF VIOLATION

Union Carbide Corporation

Docket No. 70-687

Based on the results of an NRC inspection conducted on June 6-9, 1978, it appears that certain of your activities were not conducted in full compliance with NRC regulations as stated below. Item No. 1 is an infraction and item No. 2 is a deficiency.

1. Section 1.3 of the Union Carbide Fundamental Nuclear Material Control Plan states in part that minimum annual training programs will be as follows:

- a. 16 hours of instruction on the requirements of 10 CFR 70 and SNM License requirements will be given all management and supervisory personnel who have direct responsibility for control and accounting of SNM.
- b. 16 hours of instruction on 10 CFR 70, specific license requirements and operational procedures will be given to all personnel working directly with SNM.
- c. Records of personnel training will be maintained by Health Physics Manager.

Contrary to the above, on June 8, 1978, the inspector determined that the licensee had not completed the required hours of annual training for the period January 1 - December 31, 1977, nor had records been maintained of the personnel training provided.

2. Section 8.2.1 of the Union Carbide Fundamental Nuclear Material Control Plan states in part that at least every 12 months the material control and accounting procedures and records will be reviewed and audited by the Nuclear Safeguards Committee. The results of this review and audit, with recommendations, will be reported in writing.

Contrary to the above, on June 8, 1978, the inspector determined that the last documented report was dated August 17, 1976 with no additional reports since that date.

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

Region I

Report No. 78-02
78-01
50-54
Docket No. 70-687 Safeguards Group 2
R-81
License No. SNM-639 Priority 1 Category F

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

Facility Name: Sterling Forest Research Center

Inspection at: Sterling Forest Research Center

Inspection conducted: June 6-9, 1978

Inspectors: Edward Woltner 6-27-78
E. W. Woltner, Auditor date signed

Robert J. Summers 7-5-78
R. Summers, Auditor date signed

Approved by: J. H. Joyner 7-5-78
J. H. Joyner, Chief, Nuclear Material date signed
Control Support Section, Safeguards
Branch

Inspection Summary:

Inspection on June 6-9, 1978 (Report Nos. 50-54/78-02, 70-687/78-01)

Areas Inspected: Routine, unannounced nuclear material control and accounting including: organization; operations; measurement and statistical controls; shipping and receiving; storage and internal controls; physical inventory; records and reports; management of materials control for both licenses and inventory difference and associated limit of error under License SNM-639. The inspection involved forty-four inspector hours onsite by two NRC inspectors.

Results: Of the nine areas inspected, no apparent items of noncompliance were identified in seven areas; two apparent items of noncompliance were found in two areas (infraction-failure to document training of personnel - Para. 2; deficiency-failure to perform a management review and audit of material control and accounting procedures and records - Para. 10.

DETAILS

1. Persons Contacted

Principal Licensee Employees

- *Mr. J. McGovern, Manager, Radiochemical Production
- *Mr. C. Konnerth, Manager, Health, Safety and Environmental Affairs
- *Mr. L. Thelin, Radiation Health Physicist
- Mr. H. Nass, Manager, Quality Assurance

The inspectors also interviewed other licensee employees during the course of the inspection. They included nuclear material control and process personnel.

* denotes those present at the exit interview.

2. Facility Organization

The inspector determined that the licensee's organizational structure was in accordance with the Fundamental Nuclear Material Control Plan (FNMC). The Nuclear Operations Supervisor (Reactor) position has been vacated with the responsibility being assumed by the Reactor Project Engineer.

The inspector ascertained that the licensee has established, maintained, and is following the FNMC plans and applicable license conditions except as follows. Section 1.3 of the FNMC plan requires recorded training of personnel who have direct responsibility for control and accounting of SNM and all personnel working directly with SNM. The licensee did not have records of personnel training stating which employees should be covered and the number of annual training hours attended. The licensee had provided documentation that training was being conducted, such as the Radiochemical Production Short Range Objectives report issued September 6, 1977, which in part listed training activities for accountability. However, this does not meet the requirements of Section 1.3 of the licensee's FNMC plan and all required training has not been provided. This matter is considered an item of noncompliance at the infraction level. (78-01-01)

3. Facility Operation

The inspectors toured the various areas of the facility to observe operations and activities in progress, and to confirm the licensee's possession and use of SNM to the location and purposes authorized by the licenses.

No items of noncompliance were identified.

4. Measurement and Statistical Controls

a. License No. SNM-639

The inspector ascertained that the licensee has established, maintained, and is following measurements and measurement control programs in conformance with his approved FNMC plan and applicable license conditions.

The licensee is using two basic analytical measurements of SNM: isotopic assay of U-235 (either radiometric or delayed neutron); chemical assay of total uranium.

Initial quantitative measurements are made on the UO₂ feed dissolved in nitric acid. A volume measurement is made on the solution and samples for total uranium and isotopic analyses are removed.

The inspector verified the use of representative standards covering the full range of operation for the barrel scanner used to analyze solid scrap destined for burial.

No items of noncompliance were identified.

b. License No. R-81

The inspector ascertained that the licensee has established, maintained and is utilizing a method of computation for the determination of the total element and isotopic composition of nuclear material in each fuel element.

The inspector audited the thermal power integration records and verified that the licensee has been correctly using this

data to calculate nuclear material depletion. The inspector verified that the licensee has been reporting the depletion data in the material status reports.

The licensee uses a computer code titled UBURN to calculate nuclear material depletion. The calculation method can be found in Section E of the licensee's procedure RM-10. The inspector noted that in the event of computer inoperability a second computer is available to perform the calculation. The inspector independently performed the calculation of total U and U235 burnup for the periods ending September 30, 1977 and March 31, 1978. Excellent agreement was found with the licensee's values as reported on the material status reports.

No items of noncompliance were found.

5. Shipping and Receiving

The inspection verified that the licensee has established and is maintaining a program to assure that all SNM received and/or shipped is accurately accounted for. The results of this inspection determined that:

- a. all receipts of SNM are confirmed promptly by an established system of checks and measurements.
- b. Measurements are made of element/isotopic values. The Jones Reductor method is used for element analysis, and either radiometric or delayed neutron assay is used for isotopic analysis.
- c. Incoming material transfer documents are receipted and returned within 10 days.
- d. Records are established for incoming material which is assigned Feed Numbers as a control.
- e. The licensee has not experienced any significant S/R differences since receipts are of a limited quantity and identical form.
- f. SNM shipments are prepared at the site and consist of waste material resulting from the irradiation and chemical processing enriched uranium to produce radioisotopes. Documentation is furnished to the Accountability Officer and shipping documents are prepared the day of the shipment.

No items of noncompliance were identified.

6. Storage and Internal Control

a. License No. SNM-639

The inspector verified that the licensee has established a system of storage and internal controls for SNM which provides current knowledge of the quantity, identity, and location of all SNM within the facility in accordance with the licensee's FNMC plan and applicable license conditions.

The inspector audited a representative sample of internal transfer documents for correct signatures, posting into MBA logs and the master log, and also against the document control log. The master log was also checked for correct posting of the physical inventories.

No items of noncompliance were identified.

b. License No. R-81

The inspector verified that the licensee has established and is maintaining a system of internal control of SNM which provides knowledge of the quantity, identity, and current location of all fuel elements within the facility.

The licensee maintains a computer Inventory Record which contains the above data. When a fuel transfer is completed the Inventory Record is changed and the Core and Spent Fuel Boards and the Fuel Transfer Sheets are updated. A fuel transfer sheet must be signed by a senior operator. The Inventory Record is used as a physical inventory pre-listing and is reconciled to the physical inventory.

No items of noncompliance were found.

7. Physical Inventory Verification

a. License No. SNM-639

The inspector determined that the licensee has established and follows adequate written physical inventory procedure in accordance with approved physical inventory plans.

The licensee has conducted required physical inventories at frequencies specified in 10 CFR 70 with the most current period ending April 26, 1978. Book balances are reconciled and adjusted to the physical inventory within 30 days.

A verification was performed by the inspectors on material selected at random in all four MBA's and cross checked to book records.

No items of noncompliance were identified.

b. License No. R-81

A piece count was performed on the elements that were in the core and the wall and floor racks in the pool. A total of 74 elements were located. In addition, elements in the vault were verified by serial number. The presence of four fission chambers was also confirmed. The count was verified to the computer inventory record as of May 31, 1978 and updated for activity through June 8, 1978.

No items of noncompliance were identified.

8. Inventory Difference and Associated Limit of Error

The inspectors examined licensee records for the material balance periods October 28, 1977 to December 23, 1977 and February 23, 1978 to April 26, 1978 to assure that the licensee is accurately determining and calculating the inventory difference (ID) quantities and, when necessary, the associated statistical limits of error (LEID). The licensee has been granted relief from calculating LEID whenever the ID is less than 150 grams.

The licensee does perform a continuous statistical evaluation of the measurements performed. A 95% confidence level is assigned to all standard measurements and control charts are maintained on these measurements.

No items of noncompliance were identified.

9. Records and Reports

The inspection covered the period of April 1, 1977 to May 31, 1978. Records and reports were inspected for this period and included an audit of all receipts, shipments, measured discards and inventory difference. The items were schedules from the licensee's records to assure that a valid material balance existed.

The physical inventory listing of April 26, 1978 was checked for accuracy of content and the reconciliation of the inventory results with recorded inventory was audited to assure that the resultant ID was reflected properly.

All nuclear material transfer reports (Form NRC-741), material status reports (Form NRC-742), and measured discard and loss reports were reviewed for proper signatures, timeliness, format, accuracy and proper postings into records. The Forms NRC-742 covered the two six-month periods ending September 30, 1977 and March 31, 1978.

No items of noncompliance were identified.

10. Management of Material Control System

The inspector determined that the licensee has not been following the management control system as found in the licensee's approved FNMC plan in that the annual review of the nuclear material control system was not performed for 1977. The last documented review was performed August 17, 1976. The management control system has remained unchanged since the 1976 review. This is an item of noncompliance at the deficiency level. (Item No. 78-01-02).

The inspector ascertained that the SNM control and accounting procedures and their revisions are prepared by the Health Physics Manager. Review and approval of such procedures and revisions are performed by the Nucleonics Manager, the manager having direct responsibility for carrying out such procedures, and the Nuclear Safeguards Committee. Approval of procedures is in writing.

One item of noncompliance was identified.

11. Exit Interview

The inspectors met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on June 9, 1978. The inspectors summarized the scope and findings of the inspection and the two items of noncompliance were discussed with the licensee.