

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 40-3392/85003(DRSS)

Docket No. 40-3392

License No. SUB-526

Licensee: Allied Chemical Company
P.O. Box 430
Metropolis, IL 62960

Facility Name: Metropolis Works

Inspection At: Metropolis, IL

Inspection Conducted: July 29 through August 2, August 7 and 15, 1985

D. E. Miller/for
Inspector: G. M. France, III

8/23/85
Date

D. E. Miller/for
Approved By: L. R. Greger, Chief
Facilities Radiation Protection
Section

8/23/85
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Inspection Summary

Inspection on July 29 through August 2, August 7 and 15, 1985 (Report No. 40-3392/85003(DRSS))

Areas Inspected: Organization; internal reviews and audits; procedure control; operations review; radiation protection program including audits, procedures, instruments and equipment, exposure control, notifications, and reports; and transportation of radioactive waste including records and reports of solid wastes shipped to burial sites. The inspection involved 27 inspector-hours onsite by one NRC inspector.

Results: The licensee was found in compliance of NRC requirements within the areas examined.

DETAILS

1. Persons Contacted

- A. Cipolla, Plant Manager
- B. Dunlevy, Plant Maintenance Engineer
- H. Davis, Plant Engineering Supervisor
- *J. Honey, Operations Officer
- D. Lewis, Foreman, Fluorination Distillation
- C. Rice, Process Engineer
- *H. Roberts, Assistant Health Physicist
- G. Yates, Supervisor-Accounting and Contract Administration
- *R. Yates, Health Physicist

The inspector also contacted other licensee employees including radiation protection technicians, plant operators, and members of the technical staff.

*Denotes those present at the exit meeting on August 2, 1985.

2. General

This inspection, which began at 2:35 p.m. on July 29, 1985, was conducted to review the radiation protection program in accordance with the new license, including operator training, internal audits and reviews, procedure revisions, internal and external exposure controls, ALARA program, and radioactive waste management. The inspector, accompanied by the Assistant Health Physicist, observed licensee activities during UF₆ production operations. During facilities tours, the inspector examined the current state of readiness of the UF₆ emergency kits.

3. Management Organization and Controls

The inspector reviewed the licensee's management organization and controls for radiation protection, operations, and radwaste programs including changes in the organizational structure, procedure revising and card updating, and utilization of audit systems.

a. Organization

There have been no changes in the health physics organization since the previous inspection (40-3392/85002). Notwithstanding the present organization, the new license requires that personnel with appropriate health physics training be present at the plant at all times when operations involving source material are being conducted. The plant Health Physicist noted that at least one person will be added to the present organization in order to meet this license requirement. During the course of this inspection the inspector noted that compliance with this condition must be met on or before September 30, 1985. This license condition was discussed during the exit meeting.

b. Procedure Revising and Updating

The inspector noted that the licensee requires HP approval of major process changes which could impact upon employee radiation exposure. The HP approval is documented in the plant engineering files and is reflected on the procedure and on the radiation work permit.

The inspector reviewed the following procedures:

- . Special Urine Sampling Procedure
- . Policy and Procedure for Contamination Control
- . Release of Articles for Unrestricted Use
- . Radiological Safety Training
- . Shipping Radioactive Materials
- . Radiation Waste Management

The licensee's health and safety procedures are performed by the plant Health Physicist and Assistant Health Physicist in accordance with plant management policy.

c. Internal Reviews and Independent Audits

The inspector verified that the Health Physicist had conducted a quarterly audit of plant operations in compliance with new license condition No. 16. The audit indicated that the UF_6 release procedure is available for employee review and that the last drill simulating the release of UF_6 material was conducted in June 1985. The quarterly audit discussed safety considerations in selected locations of the plant, including the sampling plant, one preparation area, and the UF_4 , green salt production area. The inspector noted that findings of the audit were documented for the Plant Manager's review in accordance with the license condition. The inspector verified that the licensee utilizes independent or corporate audits to report deficiencies to management. The corporate audit disclosed that the radiation protection department had increased its efforts to separate radioactive waste from nonradioactive waste. The audit recommended preparation of an appropriation request for computerization of data storage and retrieval to meet NRC requirements for dose tracking. In addition, the corporate audit recommended professional staff additions to the health physics department.

The inspector concluded that management review of audit findings identified conditions that were scheduled for corrective action.

No violations or deviations were identified.

d. Safety Committee Meetings

According to plant policy, a portion of the safety committee meetings is conducted by radiation protection personnel. Subjects discussed since the last NRC inspection (85002/403392) included: Special Urine Procedure for Employees Performing Baghouse Maintenance, ALARA Concepts, NRC License, and Tank Entry HP Survey Data Card.

e. Quality Assurance Program

The inspector interviewed the Fluorination Distillation Supervisor and several Distillation Operators concerning operator experience in transferring UF_6 to ten- and fourteen-ton cylinders. Each operator indicated that QA checks on cylinder transfer lines or pigtails, which include line pressurization with nitrogen, is adequate to identify faulty line connections. The Distillation Supervisor indicated that QA schedules were used to reduce exposure levels by replacing transfer lines quarterly, and by purchasing standardized lots of teflon gaskets to seal each transfer line connection.

Carbon dioxide (CO_2) is the primary combatant used to solidify any escaping UF_6 or UO_2F_2 .

No violations or deviations were identified.

4. Radiation Protection

The inspector reviewed the licensee's internal and external exposure control programs including the required records, reports and notifications, and the licensee's program for maintaining occupational exposures ALARA.

a. Internal Exposure Control

The inspector reviewed the results of routine urinalyses performed on plant personnel since the last inspection (40-3392/85002).

About five workers were involved in a release of soluble UF_6 material. Although the uranium exposure was in excess of the action level of 30 mg u/l, the 40 MPC-hour intake limit for soluble uranium was not exceeded. Subsequent urinalysis of uranium levels were below the action level. The source of the UF_6 release was a loose flange bolted on the reflux line of the No. 4 low boiler condenser.

b. External Exposure Control

The inspector reviewed the licensee's exposure control program including: adequacy of procedures used to evaluate, control, and minimize exposures; required records, reports, and notifications.

TLD data for the first and second quarter 1985 operating periods disclosed that individual doses were less than 500 mrem. The licensee has implemented a QA program to monitor doses at the nearest residence and at the Metropolis Illinois airport. Four TLD kits are placed in service at each of the above locations. Each quarter one TLD kit is removed and submitted to an independent laboratory for readout. The most recent data collected showed no significant difference in exposure readings at the airport compared to exposure levels determined at the nearest residence. Each location showed less than 2 mrem/week. Calculated dose summary to the nearest

resident for the 1984 operating year was about 11.9 mrem to the bone and 6.8 mrem to the lung. These values represent an increase of 45 and 67 percent respectively over the 1983 operating period, but are significantly less than exposure levels allowed by 40 CFR 190. No problems were noted.

c. Surveys

The inspector reviewed the licensee's program for control of radioactive materials and contamination, including schedules for periodic surveys, and effectiveness of survey methods in controlled areas.

Contamination surveys of floor areas for direct and removable alpha contamination were performed weekly in controlled areas, monthly in uranium recovery locations, and quarterly in the administrative offices. Removable alpha contamination averaged less than 200 dpm/100 cm². The highest level of removable contamination found in the administrative areas was about 80 dpm/100 cm². The inspector concluded that surveys of floor areas for alpha contamination were made at the frequency required by procedure. In order to reduce the potential for trafficking of radioactive material to uncontrolled areas, the licensee plans to install four to six friskers in a designated access area. Personnel exiting the plant will be required to frisk at one of the access stations.

d. Sealed Source Leak Tests

The inspector reviewed records of leak tests made by the licensee on radioactive sealed sources. In compliance with license condition No. 18 the tests revealed that removable contamination was less than 0.005 μ Ci and that the tests were performed within the six month interval.

e. Calibration of Instruments

Records of portable instrument calibrations indicated that portable health physics survey instruments were calibrated quarterly as required.

f. Air Sampling

The inspector reviewed the licensee's program for determining exposure to personnel from airborne radioactivity during baghouse maintenance.

Three workers were performing maintenance in the wet oxide baghouse enclosure. Their residence time in the baghouse ranged from six minutes to one hour. Based on the concentration of airborne radioactivity collected by a sampling device, the workers required a protection factor (PF) of about 840. The workers were appropriately donned in full face respirators with a PF of 2000; the exposures ranged from 0.04 to 0.42 MPC-hours.

Another worker equipped with full face respirator, performing maintenance on the HF reductor used in processing UF_4 or green salt, received an exposure of 0.02 MPC-hours based on the airborne sample data. The licensee noted that engineering controls used to improve ventilation had enabled the radiation protection department to remove the drum dumper operation from respirator control. Periodic airborne monitoring is conducted to assure that airborne concentrations of radioactivity is maintained below levels that require respiratory control.

The HP incident file disclosed that two workers assigned to perform maintenance inside of a baghouse enclosure were cautioned because of improper donning of respirators. In each case the employee began to use improper procedures by attempting to seal a mask over a cloth hood to protect the hair from entanglement in the rubber strap of the mask. The inspector noted that this was an example of proper instruction to workers prior to baghouse entries. No incidents of improper use of respiratory equipment have been identified since the licensee has adopted a new baghouse entry procedure.

g. ALARA Concerns

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA, including worker awareness and involvement in the ALARA program, and engineering controls implemented to reduce exposure levels ALARA.

Modifications to the drum dumper ventilation operation have succeeded in removing the operation from respirator control. Weekly urine samples were taken for a two-week period and results were low in uranium concentration. Concurrently, airborne radioactivity monitoring averaged about 18 percent of MPC. This value appears to agree with other plant averages. Seal adjustments were made on the calciner at various operating temperatures. The tightening of seals with hydraulic pressure prevents the escape of ore from the calciner and reduces the opportunity for inhalation of airborne radioactive particulate matter.

The inspector concluded that the licensee's radiation protection activities appear adequate to protect the health and safety of facility workers and members of the general public.

No violations or deviations were identified.

5. Operations Review

The inspector and the Assistant Health Physicist conducted several facility tours and observed the licensee's conduct of operations, fuel storage and handling, and safety limits in accordance with applicable regulatory guides.

The inspector observed that an operator assigned to change-out a fluoride filter was attired in respiratory gear. The second floor of the process area had been placed on precautionary awareness as a potential respiratory condition. The inspector donned a mask, toured the location, and confirmed that all workers assigned in the area were properly attired in respiratory equipment.

In response to inspector concerns about combating UF_6 releases, providing escape routes for involved workers, and mitigating the effects of a release, the Plant Engineering Supervisor and the Plant Maintenance Engineer described the following:

The licensee is investigating several ways to facilitate the evacuation of a crane operator in the event a cylinder of UF_6 ruptures accidentally. According to procedure, the movement of ten- or fourteen-ton cylinders filled with UF_6 occur in the plants' product loading station. The procedure may require as many as four movements of filled UF_6 cylinders. The crane operator controls movement of UF_6 cylinders from a control booth located more than 12 feet above floor level. The transfer of a filled UF_6 cylinder from load station to weigh station may present an opportunity for the cylinder to drop and possibly rupture, thus making any evacuation maneuver by the crane operator very difficult. In order to mitigate this circumstance the licensee is currently investigating two areas for consideration:

- . Installation of a catwalk that the crane operator could reach from his control booth.
- . Ground level crane remote control, which would enable the operator to control the transfer of cylinders while remaining at ground level.

The licensee noted that minor UF_6 releases are controlled by dispensing CO_2 to freeze UF_6 at the defected location. Carbon dioxide pressure is checked and recorded in the operator shift log at least once each shift. The inspector's observations concerning the state of readiness of UF_6 emergency kits are found in Section 2 (General).

During the review and observation of plant operations, the inspector interviewed the Process Environmental Engineer concerning the storage of radioactively contaminated oil. Waste oil is analyzed for uranium content; containers are inspected to meet storage criteria, and inspections are conducted to assure that filled UF_6 cylinders are not stored in the vicinity of waste oil storage.

The inspector toured the waste oil storage location and confirmed that waste oil containers were stored outside of the production area away from UF_6 cylinders and away from evacuation pathways. No problems were identified during this tour.

No violations or deviations were identified.

6. Emergency Preparedness

The licensee does not presently maintain coordination of emergency planning with offsite agencies. However, the present system of conducting drills and tests specified in the licensee's emergency plan is being reviewed and the current program may be expanded to include the role of offsite agencies such as the local hospital, fire department and other community organizations. The inspector discussed the importance of the state of readiness of all emergency equipment and the frequency of inspection. After examining several of the emergency kits, the inspector reminded the licensee to maintain up to date instructions in order to identify the cognizant on site emergency coordinator and list the appropriate emergency telephone numbers. The inspector noted that several cases used to store emergency kits appear to be deteriorating. This matter was discussed with the licensee. The inspector confirmed that the UF_6 release procedure is available for employee review and the last release drill was conducted in June 1985.

No violations or deviations were identified.

7. Operator Training

The inspector reviewed the radiation protection training provided to plant workers and discussed the program with the Assistant Health Physicist.

Since the last inspection, all plant workers involved in baghouse maintenance operations have participated in training sessions to review the changes to baghouse or tank entry procedures, 1984 exposure data, and the new NRC license.

The inspector observed that new audio-visual health and safety lectures were being screened for use during safety council meetings. The lectures included hazardous material awareness.

No violations or deviations were identified.

8. Waste Generator Requirements 10 CFR 20 and 61

The inspector reviewed waste generation activities to determine whether the licensee has established and is maintaining adequate management controlled procedures which reasonably assure compliance with the requirements of 10 CFR 20 and 10 CFR 61 applicable to low level radwaste form, waste characterization and classification, stabilization and shipment manifests and tracking.

The inspector confirmed that the licensee has formally incorporated existing waste procedures and memoranda (adapted for 10 CFR 61) into a single operating waste management procedure and/or operating manual. The manual has been established and distributed as management approved instructions to the appropriate line/staff organization. The manual consists of an organization chart for radwaste management, waste shipment checklists, driver information packet, and forms and examples from the

Barnwell and Richland disposal sites. The manual also consists of standards for protection against radiation and licenses of source material and licensing requirements for land disposal of radwaste.

No violations or deviations were identified.

9. Transportation

The inspector reviewed transportation activities to determine whether the licensee is maintaining an adequate program to assure radiological safety in the receipt, packaging, and delivery of licensed radioactive materials.

The inspector examined shipping/receipt data for five shipments of UF_6 cylinders and verified that the licensee inspected and surveyed each load. In addition, the inspector observed licensee transport operations for one shipment of low level solid radwaste.

No violations or deviations were noted.

10. Exit Meeting

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the onsite inspection on August 2, 1985, and with Mr. A. J. Cipolla, Plant Manager by telephone on August 15, 1985. The inspector summarized the scope and findings of the inspection. In response to certain items discussed by the inspector, the licensee acknowledged the inspectors comment concerning the desirability to update instructional pamphlets for emergency kits, and increase the inspection frequency of emergency equipment and storage cases. The inspector also reminded the licensee of the September 30, 1985 requirement to provide health physics coverage at the plant at all times when operations involving source material are being conducted.

During the course of the inspection and the exit meeting, the licensee did not identify any documents or inspection statements and reference to specific processes as proprietary.