

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

REGION III

IE Inspection Report No. 050-264/76-03

Licensee: The Dow Chemical Company  
1701 Building  
Midland, Michigan 48640

TRIGA Reactor  
Midland, Michigan

License No. R-108  
Category: F

Type of Licensee: Research Reactor

Type of Inspection: Routine, Unannounced

Date of Inspection: April 7, 1976

Principal Inspector:

*W. L. Fisher for*  
J. A. Finn

4/20/76  
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By:

*W. L. Fisher*  
W. L. Fisher, Chief  
Fuel Facility Projects and  
Radiation Support Section

4/20/76  
(Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection on April 7, 1976, (76-03): Review of radiation protection and radwaste programs, including records, procedures, equipment inventory, and interviews with facility personnel.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Items

None.

Other Significant Items

A. Systems and Components

None.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

None.

Management Interview

A management interview was conducted with Dr. Anders, Reactor Supervisor. The inspector described the scope of the inspection and stated that no items of noncompliance had been identified.

## REPORT DETAILS

### 1. Persons Contacted

O. V. Anders, Reactor Supervisor  
T. J. Quinn, Reactor Operator  
G. W. Engdahl, Health Physicist  
R. A. Olson, Health Physicist

### 2. Personal Monitoring

Film badges are obtained monthly from a commercial supplier. The badges monitor, beta, gamma, and fast neutrons. Visitors are provided badges. Forms NRC-4 are not completed for reactor personnel. The badge suppliers' report is the equivalent of Form NRC-5.

Self-reading dosimeters are used as deemed appropriate. Ranges available include 0 to 200 milliroentgens and 0 to 1 roentgen. Results are recorded in the experimental logbook.

A review of film badge reports for CY1974 and CY1975 showed the maximum annual whole body exposure was 50 millirems. Skin exposures have been minimal. Exposures for CY1976 were "minimal" for the period ending February 14, 1976.

### 3. Surveys and Survey Instruments

The licensee has on hand survey instruments capable of measuring beta, gamma, and neutrons. These are calibrated semiannually.

The reactor room sample storage area is surveyed daily. Surveys made during removal of experiments from the lazy susan or from the rabbit system are recorded in the experimental logbooks.

In addition, Industrial Hygiene (Health Physics) performs audit surveys quarterly.

### 4. Radioactive Waste

No radioactive liquid effluents are released from the reactor. Liquids are collected in plastic containers, which are packaged in 55-gallon drums for shipment to a licensed waste disposal agency. The inner containers are surrounded by enough absorbent material to absorb any leakage.

Solid waste is transferred to a licensed waste disposal agency.

Particulate gaseous effluents are measured by a continuous air monitor located in the reactor room. The readout chart is checked daily when the sample filter is changed. Charts are maintained on file. No particulate activity has been detected above background.

Argon-41 concentration calculations in the SAR, assuming continuous generation of argon in the rabbit system, are below Part 20 limits. However, the rabbit system is used less than five percent of the time.

5. Area Radiation Monitor (Technical Specifications G.1 and G.2)

The area radiation monitor consists of a Geiger tube mounted on the reactor room wall about 13 feet from the reactor, and a meter readout and alarm at the operating panel. The area radiation monitor is calibrated semiannually with a 10 milligram radium source. The alarm is set daily at 0.6 milliroentgens per hour as part of the Daily Startup Checklist.

6. Water Monitor

Pool water is filtered and portions are demineralized. Before filtering, the water passes through a water monitor vessel containing a Geiger tube. The signal is fed to a readout and alarm located at the operation console. The water monitor is calibrated semiannually. The alarm is set daily at 80 counts per second as part of the Daily Startup Checklist.

7. Continuous Air Monitor (Technical Specifications G.2 and G.3)

The continuous air monitor (particulate) is located in the reactor room with readout (chart) and alarm on the monitor itself. The monitor is operated in the fixed air sample mode. Each day as part of the Daily Startup Checklist the chart reading is recorded, the filter is moved and the alarm points are set. The low alarm is set at 1,000 counts per minute (equivalent to about  $2 \times 10^{-11}$  microcuries per milliliter on an eight-hour sample). The high alarm is set at 5,000 counts per minute. The monitor is calibrated weekly with a beta source.

8. Posting

The inspector observed that posting meets the requirements of 10 CFR 20.203 and 10 CFR 19.11.

9. Sample Handling

The licensee described and demonstrated insertion and removal of samples from the lazy susan. A Juno survey meter is positioned to monitor samples as they are removed. Tongs are used to remove samples from capsules. De-encapsulation is done in a radiochemical hood.

10. Records

The following records were reviewed for items concerned with radiation protection and radwaste:

- a. Daily Startup Check List - 7/30/75 to 4/5/76.
- b. Weekly Instrumentation Checklist - 7/30/75 to 4/5/76.
- c. Monthly Checklist - 7/30/75 to 4/5/76.
- d. Semiannual Checklist - spot checked.
- e. Reactor Operating Log - spot checked.
- f. Radiation Monitoring Instruments Calibration Book.
- g. Film Badge Reports - CY1974, CY1975, CY1976.