

October 16, 2012

Dr. Paul O'Connor
Facility Director
Dow Chemical Company
1602 Building
Midland, MI 48674

SUBJECT: DOW CHEMICAL COMPANY - NRC ROUTINE INSPECTION REPORT
NO. 50-264/2012-201

Dear Dr. O'Connor:

The U.S. Nuclear Regulatory Commission (NRC) conducted an inspection from September 17 to 20, 2012, at your Dow TRIGA Research Reactor (Inspection Report No. 50-264/2012-201). The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. Based on the results of this inspection, no safety concerns or noncompliances with NRC requirements were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations*, Section 2.390, "Public inspections, exemptions, and requests for withholding," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (Agencywide Document Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Johnny Eads at 919-219-9128 or electronic mail at Johnny.Eads@nrc.gov.

Sincerely,

/RA/

Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-264

License No. R-108

Enclosure:
As stated

cc w/encl: See next page

cc:

Office of the Mayor
333 West Ellsworth
Midland, MI 48640

Office of the Governor
Room 1 – Capitol Building
Lansing, MI 48913

Ms. Shari Kennett
Environmental Health and Safety Responsible Care Leader
Chair, Radiation Safety Committee
1790 Building
Midland, MI 48674

Dr. Wayde Konze
Global Research and Development Director for Analytical Sciences
Chair, Reactor Operations Committee
The Dow Chemical Company
1897 Building
Midland, MI 48667

Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No: 50-264

License No: R-108

Report No: 50-264/2012-201

Licensee: The Dow Chemical Company

Facility: TRIGA Research Reactor

Location: Midland, Michigan

Dates: September 17-20, 2012

Inspector: Johnny Eads

Approved by: Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

The Dow Chemical Company
TRIGA Research Reactor
Inspection Report No. 50-264/2012-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the Dow Chemical Company (the licensee's) Class II research reactor facility safety programs including organization and staffing; operations logs and records; procedures; requalification training; and committees, audits and reviews. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with the U.S. Nuclear Regulatory Commission requirements.

Organization and Staffing

- The licensee's organization and staffing was in compliance with the requirements specified in the Technical Specifications (TS).

Operations Logs and Records

- Within the scope of this review, the licensee's operations record keeping program conformed to TS requirements.

Procedures

- The inspector found that appropriate procedures were in effect, new procedures were being prepared as needed, and dated procedures were being updated as necessary.

Requalification Training

- Current operator requalification was conducted as required by the Requalification Program.

Committees, Audits, and Reviews

- The Committee on Reactor Operations provided the oversight required by the TS.

REPORT DETAILS

Summary of Facility Status

The Dow Chemical Company's (Dow or the licensee's) 300 kilowatt Training Research Isotope Production General Atomics (TRIGA) Mark I research reactor has been operated in support of experiments, reactor operator training, and periodic equipment surveillances. During the inspection, the reactor was operated in support of on-going work.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69001)

The inspector reviewed the following to verify compliance with the organization and staffing requirements in Technical Specification (TS) Section 6.1:

- Staff qualifications and management responsibilities
- Staffing requirements for the safe operation of the reactor
- Organizational structure and staffing
- Administrative controls
- TS for the Dow TRIGA Research Reactor, Amendment No. 8, dated February 11, 1998
- Reactor Logbooks Nos. 111 to 114, covering operations from April 27, 2011 to present
- Dow Nuclear Research Reactor Procedure (DNRRP) No. 3, "Administrative Procedures," dated September 2006
- DNRRP No. 3.2, "Programmatic and Personnel Responsibility," dated September 2006
- DNRRP No. 3.4, "Procedural and Administrative Limitations," dated September 2006
- Dow TRIGA Research Reactor Annual Reports – 2010 and 2011

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that the management structure at the facility had not changed since the previous U.S. Nuclear Regulatory Commission (NRC) inspection. The reactor staff consisted of three individuals, all of whom maintained NRC senior reactor operator (SRO) licenses. A review of applicable records verified that staffing was as required by TS 6.1 and the licensee's procedures.

c. Conclusion

The licensee's organization and staffing were in compliance with the requirements specified in the TS.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that selected records were maintained as required by TS Section 3 and procedural requirements:

- Reactor Logbooks Nos. 111 to 114 covering operations from April 27, 2011 to present
- Scram Log, dated from September 20, 2011 to present
- Dow TRIGA Research Reactor Annual Report - 2010, dated March 7, 2011
- Dow TRIGA Research Reactor Annual Report - 2011, dated March 2, 2012
- DNRRP No. 3, "Administrative Procedures," dated September 2006
- DNRRP No. 3.3.5, "Authorization for Operation of the Reactor," dated September 2006
- DNRRP No. 3.4, "Procedural and Administrative Limitations," dated July 2008
- DNRRP No. 3.5, "Reactor Operations Log Book," dated September 2006
- DNRRP No. 4.1.1, "Daily Prestart Checkout," Revision 11, dated November, 2006
- DNRRP No. 4.1.2, "Daily Startup/Shutdown," Revision 11, dated November 2006
- DNRRP No. 4.6.1, "Procedure for Startup, Operation, and Shutdown of the Dow TRIGA Research Reactor," Revision 11, dated November 2006
- DNRRP No. 4.6.2, "Samples in the Lazy Susan - Placement and Retrieval," Revision 11, dated November 2006
- Completed "Daily Checklist" forms, dated from September 2009 to present

b. Observations and Findings

The inspector observed a reactor checkout, startup and approach to criticality, escalation to power, and a typical irradiation. The inspector verified that reactor operating characteristics and procedurally required entries were recorded on the operations log. A review of the logs indicated that TS operational limits had not been exceeded. The information required for the startup checkout and the shutdown checklist are included in the operations log. Operations records confirmed that shift staffing met the minimum requirements for duty personnel. The inspector determined that reactor operations were carried out following written procedures and TS requirements.

Unintentional scrams that occurred during reactor operations were recorded in the master log. The inspector noted that there were a number of scrams that have been occurring at the facility and that this number remains high. When a scram occurs, the root cause analysis is completed by the Reactor Supervisor (RS) or the alternate RS before the resumption of operations. The licensee stated that this remains a focus for improvement at the facility.

c. Conclusion

Within the scope of this review, the licensee's operations record keeping program conformed to TS requirements.

3. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the requirements of TS Section 6.3, "Operating Procedures," were being met:

- Administrative controls
- Procedural implementation
- Selected administrative and operations procedures
- Records of changes and temporary deviations to procedures
- Reactor Operations Committee (ROC) meeting minutes, dated January 3, 2011, March 23, 2011, June 22, 2011, September 26, 2011, December 6, 2011, March 13, 2012, and June 6, 2012
- DNRRP No. 3.2.2, "ROC - DOW TRIGA Reactor," dated September 2006
- DNRRP No. 3.3.2, "Review Procedure," dated September 2006
- DNRRP Chapter 4, "Operational Procedures," Revision 11, dated November 2006

b. Observations and Findings

Procedures had been formulated for the safe, routine operation of the reactor. Records showed that procedures for potential malfunctions (e.g., radioactive releases and contaminations and abnormal events) had also been developed and were available to be implemented as required. The inspector noted that procedural changes were being reviewed and approved by the ROC as required by TS. Training of personnel on procedures and changes was acceptable. Through observation of various activities at the facility, including reactor operation, the inspector determined that licensee personnel conducted activities in accordance with applicable procedures.

Review of ROC meeting minutes and discussions with the licensee indicated the request and approval of procedure changes for operating procedures were documented.

c. Conclusion

The inspector determined that the procedural review, revision and implementation program in general satisfied TS requirements.

4. Requalification Training

a. Inspection Scope (IP 69001 and IP 92701)

The inspector reviewed the following to verify compliance with the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55 and the Requalification Program:

- Dow TRIGA Research Reactor Requalification Program, dated June 16, 2011
- Reactor Logbooks Nos. 111 to 114 covering operations from April 27, 2011 to present
- Requalification training records for the last requalification cycle
- Operator active license status
- Operator physical examination records
- Reactivity manipulation records
- Requalification training records for the last requalification cycle
- Operator active license status
- Operator physical examination records
- Reactivity manipulation records

b. Observations and Findings

The licensee's requalification program is described in the program submitted to the NRC and in accordance with 10 CFR 55.59 "Requalification." The inspector reviewed the requalification program records of the three SROs currently employed at the facility. The RS and the alternate RS are responsible for the implementation of the requalification program and administer the written and operating examinations. The inspector verified that physical examinations of the licensed staff were conducted biennially as required. The inspector also verified that all of the licensed operators were reviewing the contents of all abnormal and emergency procedures on an annual basis. The numbers of hours spent by each operator in the facility performing licensed duties were recorded in the reactor logbook. The licensee stated that all of the licensed operators operate the reactor a minimum of 4 hours per quarter. The inspector verified that the average SRO operating hours met 10 CFR 55.59 requirements.

c. Conclusion

The licensee's requalification program was implemented satisfactorily, the program was up-to-date, and plan requirements were met.

5. Committees, Audits, and Reviews

a. The inspector reviewed the following to ensure that the audits and reviews stipulated in TS Section 6.2 were being completed by the ROC.

- ROC meeting minutes, dated January 3, 2011, March 23, 2011, June 22, 2011, September 26, 2011, December 6, 2011, March 13, 2012, and June 6, 2012
- ROC Audit Reports, dated November 17, 2010 and November 22, 2011
- TRIGA Reactor 2010 Annual Report, dated March 7, 2011
- TRIGA Reactor 2011 Annual Report, dated March 2, 2012
- DNRRP No. 3, "Administrative Procedures," dated September 2006
- DNRRP No. 3.2.2, "Reactor Operations Committee - DOW TRIGA Reactor," dated, September 2006
- DNRRP No 3.3, "Rules Governing Experiments, Storage and Handling of and Accountability for Nuclear and Radioactive Material," dated September 2006
- DNRRP No. 3.4, "Procedural and Administrative Limitations," dated July 2, 2008

b. Observations and Findings

The ROC is defined in the TSs and the inspector verified that the committee was following all aspects of the requirements. The ROC had quarterly meetings as required by TS 6.2.1.c and a quorum was always present as required. Review of the minutes indicated the ROC provided guidance, direction and oversight, and ensured suitable use of the reactor. The minutes provided an acceptable record of ROC review functions and of their safety oversight of reactor operations.

Audits of the items required by TS 6.2.3 were completed by individuals appointed by members of the ROC. Additionally, a peer review audit was performed as requested by DNRRP. The inspector noted that the safety reviews and audits, and the associated findings, were acceptably detailed. The licensee immediately responded to all audit findings and ensured that the corrective actions were properly completed.

c. Conclusion

Review and oversight functions required by the TSs were acceptably completed by the ROC.

6. Exit Interview

The inspector presented the inspection results to licensee management at the conclusion of the inspection on September 20, 2012. The inspector described the areas inspected and discussed in detail the inspection observations. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Cassidy	Radiation Safety Officer
B. Haskins	Senior Reactor Operator
P. O'Connor	Facility Director
B. Tomlin	Senior Reactor Operator
S. Yusuf	Reactor Supervisor

INSPECTION PROCEDURES USED

IP 69001	Class II Non-Power Reactors
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ITEMS OPENED, CLOSED, AND DISCUSSED

Opened:

None

Closed:

None

Discussed:

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
DNRRP	Dow Nuclear Research Reactor Procedure
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
ROC	Reactor Operations Committee
RS	Reactor Supervisor
RSO	Radiation Safety Officer
TRIGA	Training Research Isotope Production General Atomics
TS	Technical Specification