August 6, 2004

Mr. Ward L. Rigot
Reactor Supervisor
DOW Chemical Company
1602 Building
Midland, MI 48667

SUBJECT: NRC INSPECTION REPORT NO. 50-264/2004-201

Dear Mr. Rigot:

This letter refers to the inspection conducted on June 22-24, 2004, at the DOW Nuclear Research Reactor. 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 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 concern or noncompliance of NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," 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 (PARS) component of NRC's document 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 Mr. Stephen Holmes at 301-415-8583.

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-264
License No. R-108

Enclosure: NRC Inspection Report No. 50-264/2004-201

cc w/enclosure: Please 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

Stan Dombrowski
Chair, Radiation Safety Committee
Dow North America
1803 Building
Midland, MI 48667

Mr. Richard A. Wagner,
Level 1 Manager
The Dow Chemical Company
TRIGA Nuclear Reactor
1602 Building
Midland, MI 48674

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

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Sincerely,
/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-274
License No. R-113
Enclosure: NRC Inspection Report No. 50-274/2004-201
cc w/enclosure: Please see next page

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

Docket No:	50-264
License No:	R-108
Report No:	50-264/2004-201
Licensee:	DOW Chemical Company
Facility:	DOW Nuclear Research Reactor
Location:	1602 Building Midland, Michigan
Dates:	June 22-24, 2004
Inspector:	Stephen W. Holmes, Reactor Inspector
Approved by:	Patrick M. Madden, Section Chief Research and Test Reactors Section New, Research and Test Reactors Program Division of Regulatory Improvement Programs Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

DOW Chemical Company
Report No. 50-264/2004-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the licensee's Class II research reactor programs including: organizational structure and staffing, design change and review and audit functions, procedures, radiation protection, environmental protection, transportation of radioactive material, reactor operations, fuel handling, operator requalification, surveillance, maintenance, procedures, and emergency preparedness since the last NRC inspection of these areas. The licensee's programs were acceptably directed toward ensuring the protection of public health and safety, and in compliance with NRC requirements.

Organizational Structure and Staffing

- The organizational structure and functions were consistent with the requirements specified in Section 6 of the Technical Specifications and DOW Nuclear Research Reactor procedures.

Reactor Operations

- Operational activities were consistent with applicable Technical Specification and procedural requirements.

Procedures

- The procedural control and implementation program was acceptably maintained.

Operator Requalification

- The Requalification program was being acceptably implemented, the program was up-to-date, and plan requirements were met.

Surveillance

- The licensee's program for completing surveillance inspections and Limiting Conditions for Operation confirmations satisfied Technical Specification and licensee administrative requirements.

Experiments

- The approval and control of experiments met Technical Specification and licensee procedural requirements.

Radiation Protection

- Periodic surveys were completed and documented as required by procedure.

- Postings and signs met regulatory requirements.

- Personnel dosimetry was being worn as required and recorded doses were within the NRC's regulatory limits.

- Radiation survey and monitoring equipment was being maintained and calibrated as required.

- The Radiation Protection and ALARA Programs met regulatory requirements.

- Radiation protection training was acceptable.

Effluent Releases

- Effluent monitoring in accordance with license and regulatory requirements and releases were within the specified regulatory and Technical Specification limits.

Transportation of Radioactive Material

- Radioactive materials were transferred to the licensee's Byproduct Materials license for shipment and/or disposal.

Review, Audit, and Design Change Functions

- Reviews and audits were being conducted by the Reactor Operations Committee in accordance with the requirements specified in Technical Specification Sections 6.2, 6.3, and 6.4 and licensee procedures.

- No design changes had been processed since the last inspection.

Emergency Preparedness

- The emergency preparedness program was conducted in accordance with the requirements stipulated in the Emergency Plan.

Maintenance

- Maintenance logs, records, and performance satisfied Technical Specification and procedure requirements.

Fuel Handling

- Fuel handling and inspection activities were being completed and documented in accordance with the requirements specified in the Technical Specification and facility procedures.

REPORT DETAILS

Summary of Plant Status

The licensee's 300 kilowatt Research Reactor continues to be operated in support of DOW programs, sample irradiations, operator training and requalification, and surveillance activities. During the inspection the reactor was operated at 250 kilowatts in support of on-going work and operator training.

1. Organizational Structure and Staffing

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

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Technical Specifications (TS) Section 6, "Administrative Controls," were being met:

- TS for the DOW TRIGA Research Reactor, Amendment No. 7, dated August 1997
- DOW Nuclear Research Reactor (DNRR) organizational structure and staffing
- management responsibilities and staff qualifications
- staffing requirements for the safe operation of the facility
- Reactor Logbooks Nos. 82 to 90 covering operations from June 22, 2001 to present
- DNRR Procedure (DNRRP) No. 3, "Administrative Procedures," dated 1967

b. Observations and Findings

Although the Segment Leader had changed, the licensee's organizational structure and the responsibilities of the reactor management and staff had not functionally changed since the last inspection (refer to NRC Inspection Report No. 50-264/2001-201, ADAMS Accession No. ML012830431).

The organizational structure and staffing at the facility was as required by TS Section 6.1.1. Qualifications of the staff met TS Section 6.1.4 requirements. Review of records verified that management responsibilities were administered as required by TS and administrative procedures. The operations log and associated records confirmed that shift staffing met the TS minimum requirements for duty personnel.

c. Conclusions

The licensee's organization and staffing were in compliance with the facility TS Section 6 and DNRR procedures.

2. Reactor Operations

a. Inspection Scope (IP 69001)

To verify that the licensee was operating the reactor and conducting operations in accordance with TS Section 3 and procedural requirements, the inspector reviewed the following:

- Reactor Logbooks Nos. 82 to 90 covering operations from June 22, 2001 to present
- DNRR Annual Reports for the periods from July 1, 2000 - June 30, 2001; July 1, 2001 - June 30, 2002; and July 1, 2002 - June 30, 2003
- DNRRP No. 3, “Administrative Procedures,” dated 1967
- DNRRP No. 4.11, “Daily Prestart Checkout,” Revision 2, dated September 20, 1995
- DNRRP No. 4.1.2, “Daily Startup/Shutdown (checklist),” Revision 5, dated February 22, 1999
- DNRRP No. 4.6.1, “Procedure for Startup, Operation, and Shutdown of the DOW TRIGA Research Reactor,” Revision 2, dated January 2, 1991
- DNRRP No. 4.6.2, “Samples in the Lazy Susan - Placement ad Retrieval,” dated June 12, 1992
- DNRRP No. 3.4, “Procedural and Administrative Limitations (for reactor operations),” dated 1967
- DNRRP No. 3.5, “Reactor Operations Log Book,” dated 1967
- DNRR Daily Prestart Checkout, Startup, and Shutdown Checklists from July 2001 to present 2003

The inspector also observed reactor operations, including reactor start-up, irradiation, and shutdown, on Tuesday and Wednesday during the week of the inspection.

b. Observations and Findings

Reactor operations were carried out following written procedures and TS requirements. Significant problems and events, including unanticipated reactor scrams, were identified in the logs and records, and were reported and resolved as required before the resumption of operations under the authorization of an SRO. The inspector verified that these items, and other TS and procedure required entries, were logged in the Operating Log and cross-referenced with other logs and checklists as required. A review of the logs and records indicated that TS operational limits had not been exceeded. Operations records confirmed that shift staffing met the minimum requirements for duty personnel.

c. Conclusions

Operational activities were consistent with applicable TS and procedural requirements.

3. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that safety standards and written instructions for those activities specified in TS Sections 6.3 and 6.4 were in effect:

- DNRRP No. 3.2.2, “Reactor Operations Committee (ROC) - DOW TRIGA Reactor,” dated 1967
- selected administrative and operations procedures
- records of changes and temporary deviations to procedures
- observation of procedural implementation
- ROC meeting minutes documenting procedure change reviews and approvals

- administrative controls
- procedural implementation

b. Observations and Findings

The inspector determined that written procedures were available for the activities delineated in TS Section 6.3. These procedures provided guidance for the administrative, operations, and health physics (HP) functions of the facility. During the inspector's tours of the facilities, the inspector noted that personnel performing reactor operations, conducting various checks, and performing maintenance were doing so in accordance with applicable procedures. The inspector also observed a number of reactor irradiation runs. The procedures were followed methodically and were found to be acceptable for the current facilities' status and staffing level.

The procedures were routinely updated as needed. Changes to the procedures were reviewed by the Reactor Operations Committee as required by TS Section 6.3. Temporary deviations could be made by a Senior Reactor Operator (SRO) or higher level individual to deal with special or unusual circumstances.

c. Conclusions

Based on the procedures and records reviewed and observations of staff during the inspection, the inspector determined that the procedural control and implementation program was acceptably maintained.

4. Operator Requalification

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the requirements of the DOW TRIGA Research Reactor Requalification Program (RRP), dated August 14, 1987, were being met:

- RRP, dated August 14, 1987
- status of operator licenses
- operator active duty confirmation
- operator training and examination records since July 2001
- operator physical examination records since July 2001
- Reactor Logbooks Nos. 82 to 90 covering operations from June 22, 2001 to present
- radiation protection training since October 2002

b. Observations and Findings

The inspector verified that the currently licensed operators were successfully completing the emergency procedure and abnormal events training, reactivity manipulations, and participating in the ongoing training as required by the NRC-approved Requalification Plan. Lectures were conducted as required and the lecture outlines for the program included appropriate subject material. Training records

contained the documentation required by the program and indicated that requirements for completion of an annual operating test, a biennial written examination, and participation in the annual emergency drill were being fulfilled. Required quarterly operating hours, as an SRO, were being tracked and completed. Biennial medical exams had been conducted as required. Checklists used for tracking requalification requirements were up-to-date and ensured that the plan elements were accomplished.

c. Conclusions

The Requalification Program was being acceptably implemented, the program was up-to-date, and plan requirements were met.

5. Surveillance

a. Inspection Scope (IP 69001)

To verify that the licensee was meeting the requirements of TS Section 4, the inspector reviewed :

- surveillance, calibration, and test data sheets and records
- Reactor Logbooks Nos. 82 to 90 covering operations from June 22, 2001 to present
- DNRR Annual Reports for the periods from July 1, 2000 - June 30, 2001; July 1, 2001 - June 30 2002; and, July 1, 2002 - June 30, 2003
- DNRRP No. 4.11, “Daily Prestart Checkout,” Revision 2, dated September 20, 1995
- DNRRP No. 4.1.2, “Daily Startup/Shutdown (checklist),” Revision 5, dated February 22, 1999
- DNRRP No. 4.1.3, “Monthly Checklist,” Revision 2, dated March 5, 1998
- DNRRP No. 4.1.4, “Semi-Annual Checkout,” Revision 1, dated April 9, 1992
- DNRRP No. 4.1.5, “Annual Checkout,” Revision 2, dated December 18, 1992
- DNRRP No. 4.1.2.1, “Thermal Calibration,” Revision 1, dated January 31, 1991
- DNRRP No. 4.2.2, “Area Monitor Calibration,” Revision 1, dated August 7, 1991
- DNRRP No. 4.2.4, “Continuous Air Monitor Calibration,” dated August 7, 1991
- DNRRP No. 4.2.5, “Control Rod Calibration,” dated August 7, 1991
- DNRRP No. 4.4.1, “Procedure for the Control Rod Removal and Inspection,” Revision 4, dated December 18, 1992
- DNRRP No. 4.4.2, “Rod Drop Time,” dated January 22, 1991

b. Observations and Findings

The licensee used various checklists to track daily, monthly, and other periodic checks, audits, drills, training, and inspections, as well as verifications for TS required Limiting Conditions for Operation (LCO). The checklists included the date the surveillance, check, or test was performed and information on where the data was documented, and by whom. These checklists provided clear and concise documentation and control of reactor operational tests and surveillances.

The inspector reviewed selected records of all TS required surveillances and LCO verifications performed since July 2001. All data reviewed, including surveillance inspections and LCO verifications showed that the periodic checks, tests, and verifications were completed in accordance with and at the intervals defined in TS Section 4 and licensee procedures. The results of these surveillances and LCOs were within prescribed TS Sections 2.0, 3.0, 4.0, and licensee procedural limits and were consistent with the previous surveillance results.

c. Conclusions

The licensee's program for completing surveillance inspections and LCO confirmations satisfied TS and licensee administrative controls.

6. Experiments

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with TS Sections 3.7 and 6.8:

- experimental program requirements
- experimental administrative controls and precautions
- approved reactor experiments documentation
- ROC meeting minutes since July 2001
- TRIGA Activation Request Forms (Version 7, January 1997) since July 2001
- Reactor Logbooks Nos. 82 to 90 covering operations from June 22, 2001 to present
- DNRRP No. 3, “Administrative Procedures,” dated 1967
- DNRRP No 3.3,”Rules Governing Experiments, storage and Handling of, and Accountability for Nuclear and Radioactive Material,” dated 1967
- DNRRP No. 3.4, “Procedural and Administrative Limitations (for reactor operations),” dated 1967
- DNRRP No. 3.5, “Reactor Operations Log Book,” dated 1967
- DNRRP No. 4.6.2, “Samples in the Lazy Susan - Placement and Retrieval,” dated June 12, 1992

b. Observations and Findings

The inspector noted that all the experiments conducted at the facility were well-established procedures that had been in place for several years. The ROC approved all experiments involving fissionable material, changes in core configuration or equipment/apparatus associated with the core or irradiation facilities, new equipment being mounted in the reactor well, and any experiment type not previously approved by them.

The inspector reviewed selected experiment and irradiation request forms and approved experiments and confirmed that they were reviewed and approved by the RROC or reactor staff as required by TS Sections 6.2.2 and 6.4 and DNRRP No. 3.3.5.2. The inspector also verified that approved experiments complied with TS Section 3.7 and DNRRP No. 3.4 limitations. The inspector’s review of current

experiment, activation, and irradiation authorizations, procedures, and related reactor log book and sample irradiation log entries confirmed that experiments were installed, performed, and removed as outlined in the approved experiment authorizations, and DNRRP Nos. 3.4 and 4.6.2. No significantly different untried experiments were approved since the last inspection.

c. Conclusions

The approval and control of experiments met TS and licensee procedural requirements.

7. Radiation Protection

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Parts 19 and 20 and TS Section F requirements:

- radiological signs and posting in various areas of the facility
- area and personnel dosimetry results for 2003 and 2004
- facility and equipment during tours
- facility monthly, annual, and other periodic contamination and area radiation surveys since July 2001
- monthly pool water Tritium analyses since July 2001
- annual RAM calibrations since July 2001
- periodic checks, quality control, and test source certification documentation since July 2001
- selected individual training histories since July 2001
- annual radiation protection training rosters since July 2001
- dosimetry/exposure records July 2001
- maintenance and calibration records of radiation monitoring equipment July 2001
- Reactor Logbooks Nos. 82 to 90 covering operations from June 22, 2001 to present
- DNRRP No. 4.7.1, “Wipe Tests and Radiation Surveys,” dated April 24, 1989
- DOW Michigan Operations ALARA Program, revised March 5, 2004
- DOW Michigan Operations Loose Isotope Radiation Safety Program document 06.05.C.18, “Michigan Operations Ionizing Radiation Safety Program,” revised June 2, 2004
- 2003-2004 Laboratory Approval - 1602 Building, revised February 5, 2004
- Beckman 6000 Series Liquid Scintillation Counter Annual Maintenance Contract

b. Observations and Findings

(1) Surveys

Selected monthly and annual radiation and contamination surveys were reviewed by the inspector. The surveys had been completed by the reactor or HP staff members as required by DNRRP Nos. 4.7.1 and 06.05.C.18. Any contamination detected in concentrations above established action levels of 50 cpm was noted and the area decontaminated. Results of the surveys were documented so that facility personnel would be knowledgeable of the radiological conditions that

existed in the controlled areas of the facility. The inspector noted that contamination was infrequent. The inspector determined that the survey program satisfied 10 CFR 20.1501(a) requirements.

(2) Postings and Notices

Copies of current notices to workers were posted in appropriate areas in the facility. Radiological signs were typically posted at the entrances to controlled areas. Other postings also showed the industrial hygiene hazards that were present in the areas as well. Copies of NRC Form-3, “Notice to Employees,” noted at the facility were the latest issue, as required by 10 CFR Part 19.11, and were posted in various areas throughout the facility.

During tours, the inspector observed that caution signs, postings, and controls were acceptable for the hazards involving radiation and contaminated areas and were implemented as required by 0 6.05.C.18 and 10 CFR 20, Subpart J. Through observations of and interviews with licensee and Environmental Health and Safety (EH&S) staff the inspector confirmed that personnel complied with the signs, postings, and controls. No unmarked radioactive material was detected in the facility.

(3) Dosimetry

The inspector determined that the licensee used thermoluminescent dosimeters (TLDs) for whole body monitoring of beta and gamma radiation exposure with an additional component to measure neutron radiation. The licensee used TLD finger rings for extremity monitoring. The dosimetry was supplied and processed by a National Voluntary Laboratory Accreditation Program accredited vendor. An examination of the TLD results indicating exposures to radiation at the facility for the past two years showed that the highest occupational doses, as well as doses to the public, were within 10 CFR Part 20 limitations. The records showed that the annual whole body exposures received by the reactor staff over the past two years were less that 50 millirem deep dose equivalent. This dose is significantly lower than the 10 CFR 20.1201 limit of 5,000 millirem.

Through direct observation the inspector determined that dosimetry was acceptably used by facility personnel.

(4) Radiation Monitoring Equipment

Examination of selected radiation monitoring equipment indicated that the instruments had the acceptable up-to-date calibration sticker attached. The instrument calibration records indicated that calibration of portable survey meters were performed by licensed vendors. Calibration frequency met procedural requirements and records were maintained as required. Area Radiation and Constant Air monitors were also being calibrated as required. These monitors were calibrated by licensee staff personnel.

The liquid scintillation counter “self calibrated” during each use using manufacture supplied check sources. The unit was serviced under an annual maintenance

contract. The inspector verified that the “self calibration” and maintenance contract met the manufacture’s calibration recommendations.

(5) Radiation Protection Program

The licensee’s Radiation Protection and ALARA programs were established and described in Dow’s Michigan Operations program documents, the 2003-2004 Laboratory Approval for Building 1602, and associated DNRRPs. The programs contained instructions concerning organization, training, monitoring, personnel responsibilities, audits, record keeping, and reports. The ALARA program provided guidance for keeping doses as low as reasonably achievable which was consistent with the guidance in 10 CFR Part 20. The programs, as established, appeared to be acceptable.

The inspector also determined that the licensee had completed an annual review of the radiation protection program for 2002 and 2003 in accordance with 10 CFR 20.1101(c).

(6) Radiation Protection Training

The inspector reviewed the radiation worker (radiation safety) training given to staff members, to those who are not on staff but who are authorized to use the experimental facilities of the reactor. Training, and refresher training, for reactor staff and others was given annually.

The initial and refresher training covered the topics specified in 10 CFR Part 19 as required. Training records showed that personnel were acceptably trained in radiation protection practices. The training program was acceptable.

(7) Facility Tours

The inspector toured the Reactor Control Room, the Reactor Room, and selected support laboratories and rooms with licensee representatives on various occasions. No unmarked radioactive material was noted. Radiation and Radioactive Material Storage Areas were posted as required.

c. Conclusions

The inspector determined that the Radiation Protection and ALARA Programs, as implemented by the licensee, was in accordance with regulatory requirements because: 1) surveys were completed and documented acceptably to permit evaluation of the radiation hazards present; 2) postings met regulatory requirements; 3) personnel dosimetry was being worn as required and recorded doses were within the NRC’s regulatory limits; 4) radiation survey and monitoring equipment was being maintained and calibrated as required; and 5) the radiation protection training program was acceptable.

8. Effluent Releases

a. Inspection Scope (IP 69001)

To determine that the licensee was complying with the requirements of 10 CFR Part 20 and licensee procedures, the inspector reviewed the following:

- U.S. Geological Survey TRIGA Reactor Annual Reports for 2002 and 2003
- DNRRP No. 3.3.3, “Handling, Storage, and Disposal of Radioactive Material,” dated 1967
- DNRRP No. 4.7.2, “Procedure for the Disposal of Waste Generated in the Neutron Activation Analysis Group,” dated 1997
- waste transfer records since June 2001
- DOW Michigan Operations ALARA Program, revised March 5, 2004
- DOW Michigan Operations Loose Isotope Radiation Safety Program document 06.05.C.18, “Michigan Operations Ionizing Radiation Safety Program,” revised June 2, 2004
- calibration records for the radiation area monitor and the Continuous Air Monitor since June 2001

b. Observations and Findings

The inspector determined that gaseous releases continued to be monitored as required, were acceptably documented, and were within the annual 10 millirem dose constraints of 10 CFR 20.1101 (d), Appendix B concentrations, and TS limits. Observation of the facility by the inspector found no new potential release paths.

The program for the monitoring, storage, or transferring of radioactive liquid and solids was consistent with applicable regulatory requirements. No liquid discharges had been made during calendar year 2003. Radioactive material was monitored and released when below acceptable limits or was acceptably transferred to DOW’s Byproduct Materials license for disposition. The principles of ALARA were acceptably implemented to minimize radioactive releases. Monitoring equipment was acceptably maintained and calibrated. Records were current and acceptably maintained.

c. Conclusions

Effluent releases were within the specified regulatory and TS limits.

9. Transportation

a. Inspection Scope (IP 86740)

To verify compliance with regulatory and procedural requirements for the transfer or shipment of licensed radioactive material, the inspector reviewed the following:

- training records of staff members responsible for shipping licensed radioactive material
- DNRRP No. 4.7.2, “Procedure for the Disposal of Waste Generated in the Neutron Activation Analysis Group,” dated 1997
- radioactive material transfer forms since June 2001
- material transfer paperwork for shipment August 12, 2003, Manifest No. AL-2003-110

b. Observations and Findings

Records showed that no radioactive material was shipped under the reactor license, R-108. All radioactive material was transferred to DOW's Byproduct Materials license for packaging, shipment, and/or disposal in accordance with licensee requirements. This was documented on radioactive material transfer forms as required.

The training of the staff members responsible for shipping the material was reviewed. Training had been completed during June 2002 and was renewed every three years.

c. Conclusions

Radioactive materials were transferred to the licensee's Byproduct Materials License for shipment and/or disposal.

10. Review, Audit, and Design Change Functions

a. Inspection Scope (IP 69001)

In order to verify that the licensee had established and conducted reviews and audits as required by TS Sections 6.2, 6.3, and 6.4 and licensee procedures, the inspector reviewed the following :

- ROC meeting minutes since July 2001
- safety review records and audit reports since June 2001
- responses to the review and audit reports
- DNRRP No. 3, "Administrative Procedures," dated 1967
- DNRRP No. 3.2.2, "Reactor Operations Committee - DOW TRIGA Reactor," dated 1967
- DNRRP No 3.3,"Rules Governing Experiments, storage and Handling of, and Accountability for Nuclear and Radioactive Material," dated 1967
- DNRRP No. 3.4, "Procedural and Administrative Limitations (for reactor operations)," dated 1967
- facility design change records for the past two years

b. Observations and Findings

The inspector verified that the ROC quarterly meeting schedule and membership met TS Section 6.2.1.c and ROC charter requirements. Review of the meeting minutes since July 2001 indicated that the committee provided guidance, direction, and oversight for the reactor and ensured suitable and safe reactor operations. The inspector also verified that the ROC reported to the Dow Radiation Safety Committee twice a year as required by TS Section 6.2.1.f.

The ROC minutes and audit records showed that safety reviews and individual audits had been completed for the functional areas specified by TS Sections 6.2.2 and 6.2.3, and at the frequencies specified therein. The inspector noted that the licensee conducted an audit of reactor operations, maintenance and operations logs, fuel movement, facility procedures, the operator requalification program, and various aspects of the Radiation Protection Program. The results of the audits were documented in individual reports submitted to the ROC within three months of the

audit's end as required by TS Section 6.2.3. The inspector determined that the audit findings and licensee actions taken in response to the findings were acceptable.

The Inspector determined that design changes at the DNRR required ROC review and subsequent approval. No design changes had been processed since the last inspection.

c. Conclusions

Audits and reviews conducted by the ROC were in accordance with the requirements specified in TS Sections 6.2, 6.3, and 6.4 and licensee procedures. No design changes under 50.59 had been made since the last inspection.

11. Emergency Preparedness

a. Inspection Scope (IP 69001)

The inspector reviewed the following :

- DOW TRIGA Research Reactor Emergency Plan, dated October 8, 1998
- documentation of the emergency drills held in 2001, 2002, and 2003 and the follow-up critiques
- DNRR 3.2.4, “Emergency Services and Security,” dated 1967
- DNRRP No. 4.8.1, “Emergencies,” Revision 1, dated September 22, 1992

b. Observations and Findings

The inspector reviewed the Emergency Plan (E-Plan) in use at the DNRR and verified that the ROC directed a review of the E-Plan annually as required by TS Section 6.2.3.b. The Emergency Procedures were reviewed and revised as needed to ensure effective implementation of the E-Plan.

Through direct observation, records review, and interviews with emergency organization personnel (i.e., emergency responders), the inspector determined that they were capable to respond, and knowledgeable of the proper actions to take, in case of an emergency. Training for DNRR staff and EH&S personnel had been conducted annually as required. The DOW Michigan Division Medical, Security, and Fire Departments also received annual training on radiation fundamentals and specific radiation hazards likely to be encountered in an emergency. The inspector also noted that communication capabilities with these support groups were acceptable and had been periodically tested.

The inspector reviewed the annual emergency drills that had been conducted for the past three years. It was noted that off-site support organization notification and/or participation was as required by the E-Plan. The drill scenarios included a solvent fire in a locker located underneath a radioactive material use hood, a spill of radioactive liquid with subsequent contamination of rooms and, personnel and a first responder, and a fire in a sample storage area. A critique was held following each drill to discuss the strengths and weaknesses noted during the exercise and to develop possible solutions to the problems identified.

The inspector verified that, as required by E-Plans Section IX.B, emergency procedures were tested quarterly in the form of building and facility evacuations and that one drill a year included a medical or contamination scenario to test the on-site personnel. Additionally the inspector confirmed that in alternate years this drill included coordination with off-site emergency personnel as required.

c. Conclusions

The emergency preparedness program was conducted in accordance with the requirements stipulated in the Emergency Plan

12. Maintenance

a. Inspection Scope (IP 69001)

To verify that the licensee was meeting the requirements of their Preventive Maintenance Program and complying with TS Section 5, the inspector reviewed the following :

- Maintenance log 1991 entries from August 13, 2001 to April 6, 2004
- DNRRP No. 4.5.3, “Maintenance,” Revision 1, dated December 18, 1992
- DNRRP No. 3, “Administrative Procedures,” dated 1967
- equipment maintenance sheets since June 2001

b. Observations and Findings

Routine/preventive maintenance was controlled and documented in the Reactor Operations and Maintenance logbooks consistent with the TS and DNRRP No. 4.5.3 Section 2. Unscheduled maintenance or repairs were reviewed to determine if they required a 50.59 evaluation. Following maintenance and/or repair, equipment verifications and operational systems checks were performed to ensure system operability before being returned to service. This included a signature by the RS on the maintenance check sheet verifying that the system had been tested for operation and that the reactor was approved for operation.

During a facility tour, the inspector noted that Control Room and Reactor Room equipment was operational. No missing or malfunctioning equipment was noted. Equipment, and the facility in generally, appeared to be well maintained.

c. Conclusions

Maintenance logs, records, and performance satisfied TS and procedure requirements.

13. Fuel Handling

a. Inspection Scope (IP 69001)

To verify that TS Section 4.1 and procedural requirements were being met, the inspector reviewed the following :

- Fuel Logbook
- DNRRP No. 3.4, “Procedural and Administrative Limitations (for reactor operations),” dated 1967
- DNRRP No. 3.5, “Reactor Operations Log Book,” dated 1967
- DNRRP No. 4.3.2, “Movement of Fuel - General Requirements,” Revision 4, dated November 20, 1997
- DNRRP No. 4.3.3, “Movement of Fuel - Approach to Criticality,” Revision 4, dated November 20, 1997
- DNRRP No. 4.3.4, “Procedure for the Performance of the Annual Fuel Inventory,” Revision 4, dated November 20, 1997
- DNRRP No. 4.4.1, “Procedure for the Control Rod Removal and Inspection,” Revision 4, dated December 18, 1992

- Control Rod Removal and Installation Check List since June 2001
- DNRRP No. 4.5.3, “Maintenance,” Revision 1, dated December 18, 1992
- fuel handling equipment and instrumentation
- fuel movement and inspection records

b. Observations and Findings

Procedures for refueling, fuel movement, and TS required inspections/surveillances had been reviewed and approved as required and were available to ensure controlled operations. Fuel movement, log keeping, and data recording was being completed as directed by the procedures. Data recorded for fuel handling was clear and cross-referenced in fuel and operations logs. Log entries clearly identified, as required by procedure, that a minimum of two persons were present when fuel was being moved.

c. Conclusions

Fuel handling and inspection activities were completed and documented as required by TS and facility procedures.

14. Follow-up on Previously Identified Issues

a. Inspection Scope

The inspector followed up on one Inspection Follow-up Item (IFI) identified and documented in Inspection Report 50-264/2001-201. The inspector reviewed the issue with the licensee to determine what actions, if any, had been taken.

b. Observations and Findings

IFI 50-264/2001-201-01 - The licensee would contact the facility program manager to determine if a change would be necessary to Section 4 of the TS regarding deferred surveillances.

The facility Director contacted the facility program manager and was informed that, provided they did not defer surveillances that could be performed while the reactor was shutdown, a TS change request would be necessary at this time.

The inspector confirmed with the facility program manager that a TS change was not required at this time and verified that licensee understood that surveillances that could be performed while the reactor was shut down are not to be deferred. IFI 50-264/2001-201-01 is closed.

c. Conclusion

One Inspection Follow-up Item as identified during the previous inspection was reviewed and closed during this inspection.

15. Exit Meeting Summary

The inspector reviewed the inspection results with members of licensee management at the conclusion of the inspection on June 22-24, 2004. 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

W. Rigot	Facility Director and Reactor Supervisor
T. Quin	Senior Reactor Operator
J. Weldy	Radiation Safety Officer
S. Yusuf	Senior Reactor Operator

Other Personnel

A. Dobos	Activity Coordinator, DOW Security Department
M. Ecicher	Dispatch and Training Officer, Dow Security Department
P. Kirk	Security Technician, DOW Security Department
A. Smith	Dispatcher, DOW Security Department

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Closed

IFI 50-264/2001-201-01 - The licensee would contact the facility program manager to determine if a TS change would be necessary to Section 4 of the TS regarding deferred surveillances.

LIST OF ACRONYMS USED

ALARA	as Low as Reasonably Achievable
CFR	Code of Federal Regulations
DNRR	DOW Nuclear Research Reactor
DNRRP	DOW Nuclear Research Reactor Procedure
E-Plan	Emergency Plan
EH&S	Environmental Health and Safety
HP	Health physics
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LCO	Limiting Conditions for Operation
mr	Millirem
NRC	Nuclear Regulatory Commission
PSP	Physical Security Plan
ROC	Reactor Operations Committee
RRP	Reactor Requalification Program
RSO	Radiation Safety Officer
SNM	Special Nuclear Material
SRO	Senior Reactor Operator
TLD	Thermoluminescent dosimeter

TS Technical Specifications