



The Dow Chemical Company
Midland, Michigan 48667

March 28, 2001

Document Control Desk
United States Nuclear Regulatory Commission
Washington D.C., 20555

Dear Sir;

Enclosed is the annual report for The Dow TRIGA Research Nuclear Reactor, Docket No. 50-264. If you have any questions, please contact me at (517) 636-6584.

A handwritten signature in black ink, reading "Ward L. Rigot". The signature is stylized with a large, sweeping "W" and a cursive "Rigot".

Ward L. Rigot
Facility Director and Reactor Supervisor
Dow TRIGA Research Reactor

Enclosure

CC: Alexander Adams; USNRC
Stephen Holmes, USNRC
Richard Wagner, 1897
Stan Dombrowski, 1803

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There were no US NRC inspections in 2000. The required annual audit was conducted by an outside consultant; recommendations were made and the Reactor Operations Committee has responded to these recommendations. The normal in-house audits of the radiation protection program, safety and housekeeping, and records were also performed and the recommendations acted upon. A significant upgrade to the TRIGA reactor control console was performed. This focussed primarily on replacement of the two networked computers, Input / Output controllers and communication network.

A. Staff, Licenses, and Training

Ward L. Rigot continued serving as reactor supervisor and facility director of The DOW TRIGA Research Reactor. Susan Butts continued her role of first level manager for the facility. Michael E. Buchmann replaced Jay Romick as one of the two designated assistant reactor supervisors. Jay D. Romick chose to allow his license to lapse and will no longer remain on staff beginning January 1, 2001. This is as a consequence of the successful completion of the licensing process for Siaka O. Yusuf, who received notification that he completed the requirements for licensing as a senior reactor operator by the United States Nuclear Regulatory Commission. The staff consists of five Senior Reactor Operators, who are listed below.

W. L. Rigot	Reactor Supervisor and Facility Director
T. J. Quinn	Assistant Reactor Supervisor
M. E. Buchmann	Assistant Reactor Supervisor
J. D. Romick*	Senior Reactor Operator
S.O. Yusuf	Senior Reactor Operator

Licenses are current. Rigot and Quinn licenses were renewed in 1999, while the Buchmann and Romick licenses were renewed in 1997. Siaka O. Yusuf received his Senior Reactor Operator's license in 2000. All operators are current in their required medical examinations; which were taken during 2000.

The current two-year re-qualification program started in the second quarter 2000 and will be completed during 2002. The previous re-qualification program ended in 2000 and was followed by a comprehensive written examination which was successfully completed by all senior reactor operators; This exam was also used to verify our SRO trainee's readiness to take the USNRC license exam. Four quarterly re-qualification sessions were held during 2000; all operators have participated and successfully completed the requirements for these sessions. The SROs are current with operating experience and participation in emergency preparedness drills, Reactor Operation Committee meetings, an annual operating examination, and the annual fuel inventory.

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Operation of the reactor is an important part of the training program, since this reactor is operated on an as-needed basis, which results in numerous operations each involving reactivity manipulations, use of the control console, placement and retrieval of samples and handling of radioactive materials. The minimum experience of an operator during 2000 was 13.8 hours of actual operating time, and the maximum experience was 200.3 hours of actual operating time. Furthermore, each licensed person performed about 1/4 of the daily checkout procedures and at least two monthly checkout procedures.

J. A. Grappin remains the Radiation Safety Officer and sits as a member of the Reactor Operations Committee. Jerry Cassiday continues as the Health Physics Technician for the Midland Area and assists in support of the reactor facility. The entire composition of the Reactor Operations Committee is listed below.

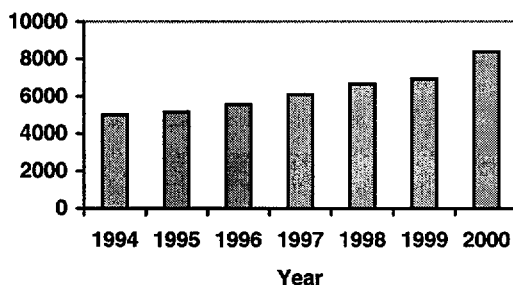
S. B. Butts	Chairman
W. L. Rigot	Reactor Supervisor and Facility Director
J. A. Grappin	Radiation Safety Officer
T. J. Quinn	Assistant Reactor Supervisor
T. D. Lickly	Research Associate

S. B. Butts is the Resource Leader for the Atomic Spectroscopy and Inorganic Analysis (ASIA) Discipline within the Global Analytical Sciences Laboratory (GAS); Rigot and Quinn report administratively to Butts; Grappin is the Dow Midland location Radiation Safety Officer as well as the TRIGA Radiation Safety Officer and reports, as does Lickly, to the Dow Environmental, Health, Safety and Security department.

B. Reactor Operating Experience

The reactor was operated for 1.82 Megawatt-days during 1998 for a total of 362.2 hours. Operational experience is similar to recent years. The main purpose of operations at the Dow facility is to perform neutron activation analysis. The number of experiments introduced into the facility grew from 6925 to 8368, an increase of ~ 21%. The plot below shows the year to year increase in NAA activity.

Reactor Experiments



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C. Major Changes

As described earlier, a modification to the control console was made. The computers used to supply input to the control devices and monitor the safety systems were upgraded. This involved replacement of the '286' computers with those using a Pentium™ processor. In order to utilize the new computers, upgrade to the display monitors and I/O devices were made. Additionally, the software was rewritten in order to support the new hardware. This upgrade was reviewed as described in 10CFR50.59. The review ensured that all safety related equipment functioned as described in the license and technical specifications. All measuring channels were determined to be operable and many performance tests were performed to assure operability. The main point is that all safety related channels are operated independently from the control console and no modifications were made to these systems.

D. Unscheduled Shutdowns

There were 20 unscheduled shutdowns (scrams) during 2000. Prior to the console upgrade, there were 6 scrams, all related to computer failure; either the computers 'locked up' or they initiated a reboot. In each case the reactor scrambled as expected. After the console upgrade, there were 14 scrams in the last 10 months of the year. Each was related to computer and network issues. There were 2 computer lock ups and 12 watchdog scrams. In each case the DAC computer generated the scram. Although inconvenient, these scrams pose no safety issues. One notable point is that there were no scrams initiated due to operator error.

E. Major Preventive and Corrective Maintenance of Safety Significance

There was no maintenance, which had safety significance performed during 2000. Three maintenance items were performed on safety related systems during 2000. The first involved replacement of the hard drive on the DAC computer. The computer failed to recognize the drive and it was replaced. Since the software is preloaded on the drive, only minor modifications to the configuration were needed. This modifications were performed as described by General Atomics. The second item involved the area monitor. The monitor failed to pass the daily channel test. It was determined that the detector had failed. The unit was returned to the vendor for repair. During the repair, a portable ion chamber was used to monitor the area radiation levels. The unit was out of service for approximately 3 weeks. The final significant maintenance item involved the NM-1000 safety channel. There was noise at source level which gave higher than expected shutdown power indication. The BNC connectors were replaced on the signal cable and the shielded cable surrounding the signal cable was reattached after a short section of cable was removed. It was postulated that there may have been a break in the shield which allowed pick up of RF noise by the signal cable. This combination did in fact reduce the noise to the historic level.

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F. Radioactive Effluents

The only radioactive material normally released to the environment from the facility is argon-41, which is produced from activation of the natural argon dissolved in the pool water and subsequently escapes from the pool into the reactor room and from there to the outside of the building, and from the natural argon present in the air used to transport samples from a laboratory into a terminus in the core of the reactor.

G. Radiation Exposures

Radiation exposures received by facility personnel and visitors are monitored using film badges and thermoluminescent detectors. No persons have received exposures approaching 25% of those allowed or recommended in 10CFR20.

W. L. Rigot
Facility Director and Reactor Supervisor
Dow TRIGA Research Reactor
28 March 2001