DOW

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Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington DC 20555

DOW TRIGA RESEARCH REACTOR DOCKET 50-264

Amendment 5 of the Facility Operating License R-108 (8 May 1989) authorized the Dow TRIGA Research Reactor facility to operate at power levels up to 300 kilowatts, an increase from the previously authorized maximum power level of 100 kilowatts.

The power level increase portion of this amendment was delayed until the realization of long-range plans to upgrade the control system for the reactor. That upgrade is well in hand and the power level increase has been implemented.

This report is intended to satisfy the requirements of item 6.6.2.c of the Technical Specifications for this facility (report within 60 days of criticality).

Two new standard TRIGA fuel elements were inserted into the core of the reactor, replacing two graphite-filled dummy elements in the outer (F) ring of the core, on January 29, 1991. Special Experiment #93, approved January 22, 1991, by the Reactor Operations Committee, authorized this modification of the core. This resulted in an increase of the core excess from about $1.80 to about $2.25, conservatively lower than the Technical Specifications maximum core excess limit of $3.00.

The neutron detectors near the core of the reactor were moved to reflect the higher maximum power level and the reactor was operated at a nominal power level of 200 kilowatts January 31, 1991, for a thermal calibration. The nominal calibration was conservative; the actual thermal power was found to be 182 kilowatts. The neutron detectors were moved to reflect this calibration. This work was authorized by Special Experiment #95, approved by the Reactor Operations Committee January 30, 1991.

During this operation the radiation level at the level of the grid, directly over the core of the reactor, was evaluated using an ion-chamber survey instrument. The radiation dose rate was found to be increased in proportion to the increased power level, as expected. On February 8, 1991, the facility Radiation Safety Officer performed a survey of the facility while the reactor was operating at 250 kilowatts. Radiation levels within the reactor room, at the control console, outside the confines of the reactor room, and on the roof of the building over the reactor were found to be lower than the limits established for the respective areas, and in line with the power level increase.

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Special Experiment #94, approved by the Reactor Operations Committee January 22, 1991, authorized the irradiation of samples in the lazy susan facility for periods of up to 30 minutes at power levels of up to 300 kilowatts. This authorization has been used a number of times to irradiate samples at power levels of up to 270 kilowatts for the purpose of documenting the safety of this procedure. This is similar to the experiments that were performed during the first operation of the reactor in 1967, at power levels of up to 100 kilowatts, and is based on previous measurements made at the GA 250-kilowatt TRIGA reactor earlier. Review of the results of this series of experiments will allow the Reactor Operations Committee to rule that any further similar irradiations are to be considered routine experiments, with the hazards of the procedures well-studied and understood. The results of these experiments indicate that such usage produces effects similar to those at lower operating power, and that the samples and operating conditions are not significantly more hazardous than observed under the lower operating power.

Other Special Experiments will be used to evaluate the operation of the reactor at the higher power levels for other experiments already approved for the 100-kilowatt level: use of the pneumatic-tube system for delivery of single samples to a core position for irradiation, and for use of the central thimble as a beam tube for neutron radiography in the reactor room.

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