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March 21, 2006

U.S. Nuclear Regulatory Commission
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Subject: Docket #50-184

Gentlemen:

Transmitted herewith is Operations Report No. 58 for the NBSR. The report covers the period January 1, 2005 to December 31, 2005.

Sincerely,

Patrick Gallagher
Director, NIST Center for Neutron Research

Enclosure

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NIST

**NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY REACTOR
(NBSR)**

Docket #50-184

Facility License No. TR-5

Operations Report

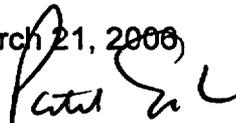
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January 1, 2005 - December 31, 2005

This report contains a summary of activities connected with the operations of the NBSR. It is submitted in fulfillment of section 7.8(3) of the NBSR Technical Specifications and covers the period from January 1, 2005 to December 31, 2005.

Section numbers in the report (such as 7.8(3)(a)) correspond to those used in the Technical Specifications.

March 21, 2006



Patrick Gallagher
Director, NIST Center for Neutron Research

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7.8(3)(a) Summary of Plant Operations

During the period January 1, 2005 through December 31, 2005 the reactor was critical for 5941 hours with an energy output of 118,491 MWH. Major activities during this period included: inspection of electrical switchboards; replacement of D₂O with H₂O in the Thermal Column Tank Cooling System; and licensing of a new senior reactor operator.

7.8(3)(b) Unscheduled Shutdowns

1. There were 2 scrams due to commercial power interruptions. A return to 20 MW was made within an hour of each scram.

2. A scram was caused by excessive vibration of a remote scram button during a maintenance activity. A return to 20 MW was made within an hour of the scram.

3. A reactor shutdown was caused by the faulty performance of a critical power uninterruptible power supply (UPS). A spare UPS was placed into service and a return to 20 MW was made within an hour of the shutdown.

7.8(3)(c) Tabulation of Major Items of Plant Maintenance

Note: Some of these items may be also listed as Engineering Change Notices (ECN).

1. Replaced all D₂O in the Thermal Column Tank Cooling System with H₂O.
2. Replaced three secondary cooling pumps and associated valves.
3. Replaced both fans, controllers, and instrumentation in the confinement building basement ventilation system.
4. Removed RT-2 fast rabbit assembly.
5. Performed a thermographic inspection of electrical switchboards.
6. Instrument calibration surveillance tests were performed for the following:

Three Wide-range Nuclear Power Channels
Reactor Vessel Flow and Level Recorders and Indicators
Two Reactor Differential Temperature Channels
Confinement Building Area Radiation Monitors
Fission Product Monitors and Secondary Cooling N¹⁶ Monitors
Three Confinement Building Effluent Monitors
Emergency Ventilation System Controllers

13. Forty-one instrument service requests (ISR) were completed, including:

ISR # ACTION

- 1687 Replaced detector tube in RM 3-1 Secondary System N¹⁶ monitor.
- 1703 Replaced indicator for Shim 1.
- 1712 Repaired faulty period scram circuit with replacement of relay in NC-7 channel.
- 1716 Replaced detector tube in RM 3-2 Fission Products radiation monitor.
- 1722 Replaced transmitter electronics for FIA-8A/B Cold Source D₂O Flow.

7.8(3)(d) Tabulation of Major Changes in the Facility and Procedures, and Tests and Experiments, Carried Out Without Prior Approval by the NRC pursuant to 10 CFR 50.59.

The following facility changes were completed this year. None required a license amendment or a change to the technical specifications, and there were no changes made pursuant to the applicable criteria of 10 CFR 50.59.

475 Change Thermal Column Tank Heavy Water to Light Water.

7.8(3)(e) Summary of Radioactive Material Released and Results of Environmental Surveys Performed.

Gaseous releases consisted of 787 curies of tritium, 1163 curies of Argon-41, and 0.340 curies of other beta-gamma emitters. There were 4.75 curies of tritium and 1.0 millicuries of other beta-gamma emitters released into the sanitary sewer. Environmental samples of the streams, vegetation, and/or soil, and air showed no significant changes.

7.8(3)(f) Summary of Significant Exposures Received by Facility Personnel and Visitors.

1. None to visitors.
2. Dosimetry results for this reporting period indicated that no facility personnel received any significant exposures.