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March 23, 2004

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

Gentlemen:

Transmitted herewith is Operations Report No. 56 for the NBSR. The report covers the period January 1, 2003 to December 31, 2003.

Sincerely,

P.D. 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

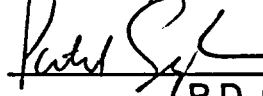
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January 1, 2003 - December 31, 2003

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, 2003 to December 31, 2003.

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

March 23, 2004



P.D. Gallagher

Director, NIST Center for Neutron Research

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7.8(3)(a) Summary of Plant Operations

During the period January 1, 2003 through December 31, 2003 the reactor was critical for 5891 hours with an energy output of 117,472 MWH. Major activities during this period included: replacement and testing of a new station battery; shipment of spent fuel; and maintaining the Thermal Shield Cooling System.

7.8(3)(b) Unscheduled Shutdowns

1. There were 5 scrams due to commercial power interruptions. After 4 of those scrams, a return to 20 MW occurred within an hour. For the other scram, a restart to 20 MW occurred within 50 hours.
2. There were 2 shutdowns due to a stuck sample capsule in pneumatic sample tube RT-4. The first shutdown was due to the use of the wrong capsule and after investigating and then correcting the problem, a return to 20 MW occurred within 40 hours. The second shutdown was due to the RT-4 tube. The capsule was removed, the tube was placed out-of-service, and a return to 20 MW occurred within 60 hours.
3. There was 1 shutdown due to a failure of a cooling tower breaker, which caused a loss of secondary cooling. Corrective action was taken and a return to 20 MW occurred within 45 hours.

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

Note: Several of these items are covered by an Engineering Change Notice (ECN).

1. Installed, tested, and placed into service a second pump in the thermal column flow system.
2. Installed, tested, and placed into service an IX column in the thermal column flow system.
3. Replaced heat exchanger plates in the thermal column flow system.
Replaced the station battery.
4. Cut 32 spent fuel elements.
5. Shipped spent fuel pieces from facility.
6. Replaced motors of #1, #2, #3, and #4 secondary main pumps.
7. Replaced soft start controllers of all secondary main pumps.
8. Replaced and moved C-100 experimental chill water header.
9. Replaced supply and return chill water isolation valves to confinement building.
10. Continued with thermal shield tube sealing as necessary
11. Performed regularly scheduled Technical Specification Surveillance tests and plant preventative maintenance.

- 12. Replaced NC-5.
- 13. Instrument calibration surveillance tests were performed for the following:

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

- 14. Twenty-eight instrument service requests (ISR) were completed, including:

ISR # ACTION

- 1647 Replaced #1 Shim Arm position indicator
- 1650 Replaced failed detector for Process Room Area Radiation Monitor
- 1654 Replaced Area Radiation Monitor detector in Process Room
- 1656 Replaced GM tube for Fission Product Monitor (RM3-2)
- 1657A Replaced failed 15 VDC power supply in reg rod automatic control system (NC-5)
- 1658 Tritium Monitor - Replaced 90 Volt batteries with 90 VDC power supply
- 1659 Repaired electrometer for reg rod automatic control system (NC-5)

7.8(3)(d) Tabulation of Major Changes in the Facility and Procedures, and the Test 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.

- ECN 467 Replacement and relocation of Experimental Chilled Water Header
- ECN 468 Replace Nuclear Wide Range Linear Control Channel (NC-5)

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

Gaseous releases consisted of 1031 curies of tritium, 1078 curies of Argon-41, 0.03 curies of Br-82, and 0.02 curies of other beta-gamma emitters. There were 4.61 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 significant exposures.