



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

VOICE (301) 975-6210
FAX (301) 975-9427

March 24, 2003

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Docket #50-184

Gentlemen:

Transmitted herewith is Operations Report No. 55 for the NBSR. The report covers the period January 1, 2002 to December 31, 2002.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Michael Rowe', written over a horizontal line.

J. Michael Rowe
Director, NIST Center for Neutron Research

Enclosure

cc: C. Bassett, Non-Power Reactor Inspector
U.S. Nuclear Regulatory Commission
61 Forsyth St. S.W.
23T85
Atlanta, GA 30303

U.S. Nuclear Regulatory Commission
Attn: Marvin Mendonca, O12-G13
Washington, DC 20555-0001

A020

NIST

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

Docket #50-184

Facility License No. TR-5

Operations Report

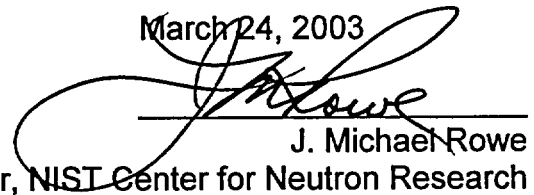
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January 1, 2002 - December 31, 2002

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, 2002 to December 31, 2002.

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

March 24, 2003



J. Michael Rowe
Director, NIST Center for Neutron Research

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7.8(3)(a) Summary of Plant Operations

During the period January 1, 2002 through December 31, 2002 the reactor was critical for 5102 hours with an energy output of 101,591 MWH. Major activities during this period included testing of and placing into service an advanced cold neutron source; testing of and placing into service a plume-abatement cooling tower; installing pumps and filters for the Thermal Column Tank Cooling System; modifying the Thermal Column cavity and the Thermal Column Tank Cooling System to improve management of the heavy water in the cooling system; replacing the shim arm shaft seal assemblies; completing a remote visual inspection of reactor vessel internals; and maintaining the Thermal Shield Cooling System. While moving a fuel element from the pool to the vessel during core reload, the element pickup head shaft broke when the head struck the top of the pool canal. The element was located in the refueling cylinder in the pool. The element was undamaged and returned to a storage rack. Following an investigation and implementation of corrective actions, the reload of the core was completed without further incident. During a maintenance procedure, an operator inadvertently caused a scram of the reactor. The cause of the scram was corrected and the reactor returned to full power.

7.8(3)(b) Unscheduled Shutdowns

1. There were 8 scrams due to commercial power interruptions. After 6 of those scrams, a return to 20 MW occurred within an hour. After 2 of those scrams, a restart to 20 MW occurred within 48 hours.
2. There were 2 scrams due to malfunctioning instrument channels. After each scram, confirmation of the operability of the required number of channels was made and a return to 20 MW occurred within an hour.
3. There was 1 scram during performance of a maintenance procedure. Corrective action was taken and a return to 20 MW occurred within an hour.

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. Replaced #4 Main D₂O pump mechanical seal.
2. Replaced #4 Main D₂O pump pedestal bearings and seals.
3. Replaced valve diaphragm for #4 Main D₂O pump valve DWV-6.
4. Installed sample chamber in parallel with the heavy water purification system after-filter.
5. Added camera and monitor to refueling system.
6. Replaced vessel helium valve HEV-41.

7. Replaced resin in Thermal Shield Cooling System #1 ion exchanger column.
8. Performed regularly scheduled Technical Specification Surveillance tests and plant preventative maintenance.
9. Installed tritium recorder and control system.
10. Replaced NC-3 and NC-4.
11. Installed cooling tower instrumentation.
12. 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

13. Sixty instrument service requests (ISR) were completed, including:

ISR #	ACTION
1572	Repaired area monitor local alarm.
1573	Repaired erratic power supply card in area radiation monitor system.
1577	Verified operation of NC-4.
1581	Increased input range to tritium recorder to prevent over-ranging recorder.
1606	Corrected flow indication for EF-5 and EF-6.
1620	Restored RM3-4 by replacing high voltage supply.
1623	Calibrated NC-7 to correct spiking on console indication.
1625	Restored RM3-4 by replacing low voltage supply.
1627	Drained water from RM3-2 to correct erratic indication.
1629	Identified and repaired loose connection in rundown circuit during testing.

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 unreviewed

safety questions.

- ECN 459 Plume abatement cooling tower. This change replaces the existing cooling tower with a nearly plume-free and greater capacity cooling tower for the secondary system.
- ECN 460 Shim arm shaft seals. This change replaces material in the seal assemblies with material of superior characteristics.
- ECN 461 Thermal Column Tank Cooling and Cavity Modification. This change provides for an independent tank cooling system and improvements to the Thermal Column cavity.
- ECN 463 Intermediate range channels. This change replaces the old NC-3 and 4 instrument drawers with more robust and newer drawers.
- ECN 464 Reactor delta T, primary flow, and thermal power recorders. This change replaces three paper recorders with a single paperless recorder.
- 7.8(3)(e) Summary of Radioactive Material Released and Results of Environmental Surveys Performed.**

Gaseous releases consisted of 747 curies of tritium, 1171 curies of Argon-41, 0.07 curies of Br-82, and 0.17 curies of other beta-gamma emitters. There were 4.79 curies of tritium and 100 microcuries 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.