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

Gentlemen:

Transmitted herewith is Operations Report No. 63 for the NBSR. The report covers the period January 1, 2010 to December 31, 2010.

Sincerely,

Robert M. Dimeo
Director, NIST Center for Neutron Research

Enclosure

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ADD
NRR

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

Docket #50-184

Facility License No. TR-5

Operations Report

-- #63 --

January 1, 2010 - December 31, 2010

This report contains a summary of activities connected with the operations of the NBSR. This report fulfills the requirements of section 6.7.1 of the NBSR Technical Specifications for the period January 1, 2010 to December 31, 2010.

The section numbers in the report (such as 6.7.1(1)) correspond to the sections in the Technical Specifications.

March 25, 2011



Robert Dimeo
Director, NIST Center for Neutron Research

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6.7.1(1) Summary of plant operations including the energy produced by the reactor and the hours the reactor was critical

During the period January 1, 2010 through December 31, 2010 the reactor was critical for 6,461 hours with an energy output of 128,991 MWH. Major activities during this period included; cutting spent fuel elements for eventual shipment; cutting used control rods; moving used control rods to storage; replacing motor controller for the switchboard breaker for one diesel generator; and licensing two senior reactor operators.

6.7.1(2) Unscheduled shutdowns, including reasons therefore

1. There was a shutdown due to a loss of local uninterruptible power to the Cold Source turbine, which led to a high hydrogen pressure rundown, followed by an expected spike in Xenon. Approximately 40 hours after Xenon decayed and after the UPS problem was corrected, the reactor was returned to 20 MW.
2. There was a shutdown due to the failure of the Cold Source turbine controller, which led to a high hydrogen pressure rundown, which could not be corrected before the Xenon-induced shutdown. Approximately 38 hours after Xenon decayed and after the controller problem was corrected, the reactor was returned to 20 MW.
3. The reactor was shut down because of excessive thermal shield water leakage. After Xenon decayed and after the excessive leakage was reduced, the reactor was returned to 20 MW approximately 41 hours later.
4. There were two scrams from low flow conditions caused by loss of normal main pump flow after commercial power dips on different dates. The reactor was returned to 20 MW within one hour of each scram.

6.7.1(3) Tabulation of major preventative and corrective maintenance operations having safety significance

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

1. Replaced solenoid valve for DWV-8.
2. Refurbished/replaced helium regulator HEV-127.
3. Replaced shutter on BT-5.
4. Repaired/replaced air solenoid valve for DWV-3.
5. Removed functionality of C100 manual scram buttons.
6. Replaced regulating rod drive 'A' with drive 'B'.

7. Cut spent fuel elements for eventual shipment.
8. Replaced motor controller for diesel generator breaker (#3) on MCC-B6.
9. Replaced north and south truck door air regulators.
10. Replaced M-coil for ventilation fan EF-4.
11. Instrument calibration surveillance tests were performed for the following:
 - a. Three Wide-range Nuclear Power Channels
 - b. Reactor Vessel Flow and Level Recorders and Indicators
 - c. Two Reactor Differential Temperature Channels
 - d. Confinement Building Area Radiation Monitors
 - e. Fission Product Monitor and Secondary Cooling N¹⁶ Monitors
 - f. Three Confinement Building Effluent Monitors
 - g. Emergency Ventilation System Controllers
12. Eighteen instrument service requests (ISR) were completed. The following were the most significant:

ISR # ACTION

- 1894 Replaced failed area radiation monitor on Process Room west wall.
- 1897 Period Bypass alarm relays replaced.
- 1898 Irradiated air monitor RM3-4 repaired.
- 1901 Purification bypass valve DWV-22 adjusted.
- 1904 Area Radiation Monitor points 7, 8, 9 IO board repaired.
- 1905 Area Radiation Monitor point 1 adjusted by repairing check source.
- 1908 Verified TR-4, TR-5, and reactor outlet temperature within acceptable ranges.
- 1911 Thermal Column flow valve DWV-23 controller replaced.

6.7.1(4) A brief description, including a summary of the safety evaluations, of changes in the facility or in procedures and of test and experiments carried out 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. The applicability determination of each of these changes determined that further evaluation under section 10 CFR 50.59 was not needed.

- ECN 564 C100 Crane Refurbishment-Trolley Trailer
- ECN 572 Revision to SAR Chapter 4
- ECN 573 Revision to SAR Chapter 13

- ECN 574 Removal of C200 Shadow Shield and Associated Equipment
- ECN 576 Make Front Plate of Underwater Saw Transparent
- ECN 557 Secondary Cooling Pump Building Design Requirement Document Rev. 5
- ECN 584 Engineering Change Guidelines and Forms
- ECN 589 Revision to SAR Chapter 2
- ECN 591 Revision to SAR Chapter 5
- ECN 593 Revision to SAR Chapter 7
- ECN 594 Revision to SAR Chapter 6
- ECN 585 Revision to SAR Chapter 9
- ECN 596 Revision to SAR Chapter 10
- ECN 598 Revision to SAR Chapter 11
- ECN 602 Disable C100 Scram Buttons

6.7.1(5) Summary of the nature and amount of radioactive effluents released or discharged to the environs and the sewer beyond the effective control of the licensee as measured at or prior to the point of such release or discharge

Gaseous releases to the environs consisted of 1234 curies of Tritium, 1280 curies of Argon-41, and 0.531 curies of other beta-gamma emitters. There were 4.83 curies of Tritium and 548 microcuries of beta-gamma emitters released to the sanitary sewer.

6.7.1(6) Summary of environmental surveys performed outside the facility

Environmental samples of the water, grass, and/or soil showed no licensed radioactive material. Results from thermoluminescent dosimeters located at the NIST fence line showed no statistically significant dose above background levels.

6.7.1(7) Summaries of significant exposures received by facility personnel and visitors

Dosimetry results:

1. There were no significant exposures to visitors for this reporting period.
2. There were no significant exposures to facility personnel for this reporting period.