

NATIONAL BUREAU OF STANDARDS REACTOR

Docket #50-184

Facility License No. TR-5

Operations Report

--- #36 ---

July 1983 - December 1983

This report contains a summary of activities connected with the operations of the NBSR. It is submitted in fulfillment of section 7.8d of the NBSR Technical Specifications and covers the period from July 1, 1983 to December 31, 1983.

Section number in the report (such as, 7.8d(1)) correspond to those used in the Technical Specifications.

March 20, 1984

Robert S. Carter

ROBERT S. CARTER
Chief, Reactor Radiation Division

8404040063 831231
PDR ADDCK 05000184
R PDR

A020
111

TABLE OF CONTENTS

- 7.8d(1) Summary of Plant Operations
- 7.8d(2) Unscheduled Shutdowns
- 7.8d(3) Tabulation of Major Items of Plant Maintenance
- 7.8d(4) Tabulation of Major Changes in the Facility and Procedures, and the Test and Experiments, Carried Out Without Prior Approval by the U. S. AEC (10 CFR 50.59)
- 7.8d(5) Summary of Radioactive Material Released and Results of Environmental Surveys Performed
- 7.8d(6) Summary of Significant Exposures Received by Facility Personnel and Visitors

7.8d(1) Summary of Plant Operations

During the period July 1, 1983 through December 31, 1983, the reactor was critical for 2989 hours and the energy generated was 28492 MWH.

During this period a comprehensive program of testing and overhaul of the thermal shield cooling system was initiated to identify sources of small leaks that have developed and to isolate suspect coils. The thermal shield cooling system was designed with many spare coils for this purpose. All the valve seats in the ring header were replaced. Cooling coils in the ring header were individually tested and a few out of approximately 200 were found to be suspect leakers and were isolated. Approximately 1/3 of the coils in the floor header were also tested and no leakers were found. At this point only a small leak remained which is likely traceable to a riser that will be replaced. Other items of interest during this period were:

- a. Water was discovered on the floor of the emergency and storage pit. The source of the water was traced to a potable water dillution valve which had inadvertantly been opened. The pit is checked daily during reactor operations. The reactor was shut down briefly and the pit pumped out. The water was tested and found to be well below the limits for environmental release. None of the reactor controls were affected.
- b. A small amount of contamination was found in an area adjacent to the building during surveys. A (~ 3 μ Ci) particle of Co⁶⁰ was found approximately 1 ft. below ground across the road from the building. A more comprehensive survey of the general

area identified a second (.2 μCi) particle of Co^{60} . Neither of these particles was related to the water overflow described in (a) above.

- c. A small leak was detected in the mechanical seal of shim arm no. 1 shaft. The leak is estimated to be less than 1 ml per hour. These types of minor leaks are not uncommon in heavy water reactors. The leak is considered to be of no consequence but is being monitored periodically.

7.8d(2) Unscheduled Shutdowns

7-14-83 The reactor was shut down when water was discovered in the hot-waste pit. RWV-54 at hot waste transfer panel had been left open which allowed the 5000 gal. retention tank to overflow into the pit. The water was tested and cleared before dumping. Rad waste pumps and motors were dried and cleaned and the reactor was returned to full power.

7-20-83 Scram due to commercial electrical power dip. The reactor was returned to power at once.

8-11-83 Scram due to commercial electrical power dip. The reactor was returned to power at once.

8-17-83 Scram due to commercial electrical power dip. The reactor was returned to power at once.

11-16-83 Scram due to commercial electrical power dip. The reactor was returned to power at once.

11-24-83 Scram due to commercial electrical power dip. The reactor was returned to power at once.

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

1. Inspected and cleaned #1 Shim Arm drive unit.
2. Replaced upper bearing on transfer arms D-5, G-6, J-3, and J-5.
3. Replaced DWV-184 valve body and diaphragm.
4. Cleaned Cooling Tower basin.
5. Reset vibration switches on Cooling Tower fan motors.
6. Replaced one blade on #2 Cooling Tower fan.
7. Replaced shaft seal on #1 Exp. Demin. Water pump.
8. Repaired pin-hole leak in DCV-1 spool piece.
9. Replaced valve seats in all thermal shield ring header valves and tested tubes for leaks.
10. Inspected valve seats in thermal shield floor header beneath BT-1.
11. Repaired leak in bulk CO₂ tank piping.
12. Replaced RT-4 sensor bulb.
13. Repaired D-3 damper.
14. Replaced door seal on north personnel door.
15. Repaired SF-2 steam control valve.
16. Replaced dust filters on EF-5 and 6.
17. Replaced air regulator for control to SCV-1, 2, and 3.
18. Replaced air regulator downstream of CAV-93.
19. Cleaned Rad. Waste 1000 gal. hold-up tank and 5000 gal. retention tank.
20. Replaced solenoid on RWV-13 air operator.
21. Cleaned Rad. Waste pumps and drive motors.
22. Replaced Storage Pool prefilters and afterfilters.
23. Replaced cell #19 in Station Battery.
24. Replaced Inverter-Diverter speed regulator

25. Replaced relays in SB-1.
26. Calibration check on recombiner inlet and outlet pressure PIA-3,4.
27. Replaced console meter on NC8.
28. Replaced outer plenum flow (FRC-3) transmitter FT-3 and performed calibration check.
29. Readjusted 115% rundown card on NC7.
30. Readjusted upper set point alarm on FIA-15 thermal shield flow from 550 to 500 GPM.
31. Replaced GM tube in fission products monitor.
32. Cleaned shunt connections for NC7 remote console meter.
33. Replaced outer plenum flow (FRC-3) transmitter and performed calibration.
34. Replaced C.I.C. Detector on NC-5 Automatic Control System. Completed NC-5 calibration.
35. Adjusted NC6 and 7 high level scram trip to 125%. Tested for correct operation.
36. The following Instrument Procedures were performed:

NC-3	Intermediate Power Range
LRC-1	Reactor Vessel Level
RM3-5	Building Exhaust Air Monitor
SPS-150	Emerg. Standby Fan Controller
SPS-151	Vacuum Breaker Controller
PC-27	Process Room Pressure Controller
PC-3	Normal Exhaust System Pressure Controller
SPC-150	Emerg. Fan Controller
NC-9	Safety Interlock Procedure
NC-1	Startup Channel
NC-2	Startup Channel
TIA-40B	Reactor ΔT
RM3-2	Fission Products Monitor
FIA-40	Reactor Outlet Flow
K103	Relay Contact Verification

- 7.8d(4) Tabulation of Major Changes in the Facility and Procedures, and the Test and Experiments, Carried out Without Prior Approval by the U. S. AEC (10 CFR 50.59)

Moved the Helium Bottle Station from B-2 to the Receiving Room Area.

- 7.8d(5) Summary of Radioactive Material Released and Results of Environmental Surveys Performed.

433 curies of tritium and 216 curies of Argon-41 were released as gaseous waste, while 1942 millicuries of tritium and 115 millicuries of other β - γ emitters were released into the sanitary sewer.

Environmental samples of the streams, wells, vegetation, and/or soil, and air showed no significant changes.

- 7.8d(6) Summary of Significant Exposures Received by Facility Personnel and Visitors

1. No significant exposures were received by any visitors.
2. Dosimetry results for this reporting period have not been received at the time of this report.



UNITED STATES DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

March 20, 1984

Mr. Cecil O. Thomas
Chief, Standardization and Special
Projects Branch
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Thomas:

Subject: Re-Docket No. 50-184

Transmitted herewith is Operations Report No. 36 for the National Bureau of Standards Reactor. The report covers the period July 1, 1983 to December 31, 1983.

Very truly yours,

A handwritten signature in cursive script, reading "Robert S. Carter".

Robert S. Carter
Chief, Reactor Radiation Division

A020
11