

October 11, 2001

Dr. J. M. Rowe, Director
Center for Neutron Research
National Institute of Standards and Technology
U. S. Department of Commerce
Gaithersburg, MD 20899

SUBJECT: NRC ANNOUNCED INSPECTION REPORT NO. 50-184/2001-202

Dear Dr. Rowe:

This letter refers to the inspection conducted on August 13-17, 2001, at the National Bureau of Standards Reactor. The enclosed report presents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, no safety concern or noncompliance to NRC requirements was identified. No response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>. Should you have any questions concerning this inspection, please contact Mr. Thomas Dragoun at (610) 337-5373.

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Non-Power Reactors and Financial Section
Operational Experience and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-184
License No. TR-5

Enclosure: NRC Inspection Report No. 50-184/2001-202

cc w/enclosure: Please see next page
National Institute of Standards
and Technology

Docket No. 50-184

cc:

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U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-184
License No: TR-5
Report No: 50-184/2001-202
Licensee: U. S. Department of Commerce
Facility: National Bureau of Standards Reactor
Location: National Institute of Standards and Technology
Gaithersburg, MD 20899
Dates: August 13-17, 2001
Inspector: Thomas F. Dragoun
Approved by: Patrick M. Madden, Section Chief
Non-Power Reactors and Financial Section
Operational Experience and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of selected aspects of the operations program, organizational structure and functions program, review and audit program, operator requalification program, maintenance program, surveillance program, experimental program, procedural control program, and safeguards program since the last NRC inspection of these programs.

ORGANIZATIONAL STRUCTURE AND FUNCTIONS

The organizational structure and functions were consistent with Technical Specification requirements.

OPERATIONS

The operations program satisfied Technical Specification requirements.

REVIEW AND AUDIT

The review and audit program satisfied Technical Specification requirements.

OPERATOR REQUALIFICATION

Operator requalification was conducted as required by the Requalification Program.

SURVEILLANCE

The surveillance program satisfied Technical Specification requirements.

EXPERIMENTS

The experiment program satisfied Technical Specification and procedural requirements.

PROCEDURES

The procedures satisfied Technical Specification requirements.

SAFEGUARDS

Special Nuclear Materials were acceptably controlled and inventoried.

Report Details

Summary of Plant Status

During the inspection, the reactor was operated continuously at full power. Construction of the plume abatement cooling tower was nearing completion. Full scale mockups were made of the piping systems suspected of causing the small water leak in the thermal column. Retirement of several long service members of the operations staff was anticipated.

1. ORGANIZATIONAL STRUCTURE AND FUNCTIONS

a. Scope (Inspection Procedure 39745)

The inspector reviewed selected aspects of:

- organization and staffing
- qualifications
- management responsibilities
- administrative controls

b. Observations and Findings

The organizational structure had not changed since the last inspection. However, the Supervisory Health Physicist (SHP) at the reactor retired and was replaced by promotion of a reactor HP. A second reactor HP will transfer to the NIST Health Physics Group. This transfer was delayed and the SHP retained as a consultant to support the upcoming reactor outage. This outage will include replacement of the cold source and switch over to the new cooling tower.

Succession planning for the senior reactor staff positions to be vacated by retirements was satisfactory. No changes were anticipated until after the reactor outage. The organizational structure and staffing at the facility was as required by Technical Specifications (TS). Qualifications of the staff met TS requirements. Staffing levels were satisfactory to support the reactor operations schedule. Management responsibilities were administered as required by TS and applicable procedures.

c. Conclusions

The organizational structure and functions were consistent with Technical Specification requirements.

2. OPERATIONS

a. Scope (IP 39745)

The inspector reviewed selected aspects of:

- operational logs and records

- staffing for operations
- selected operational, startup, or shutdown activities

b. Observations and Findings

The operating logs and records were clear and provided an indication of operational activities. The logs and records indicated that shift staffing was as required by TS. Logs and records also showed that operational conditions and parameters were consistent with license and TS requirements. Reactor start up procedure #O.I. 1.1 required verification of each of the limiting conditions for operation specified in TS sections 3.1 through 3.11 prior to start up. These verifications were recorded. Observation of operational activities confirmed that these conditions and requirements were satisfied.

c. Conclusions

The operations program satisfied Technical Specification requirements.

3. REVIEW AND AUDIT

a. Scope (IP 40745)

The inspector reviewed selected aspects of:

- safety review records
- audit records
- responses to safety reviews and audits
- review and audit personnel qualifications

b. Observations and Findings

Records showed that the Safety Evaluation Committee (SEC) met at the TS required frequency and provided guidance, direction, and oversight to ensure acceptable use of the reactor. SEC personnel qualifications satisfied TS requirements. The SEC Chairman noted that the TS specifies a quorum as 3 members but the current membership stands at 7.

The audit records showed that the annual independent audit by the Safety Audit Committee (SAC) had been completed in those areas outlined in the TS. The SAC found a dedication to safety and excellence in all areas reviewed.

c. Conclusions

The review and audit program satisfied Technical Specification requirements.

4. OPERATOR REQUALIFICATION

a. Scope (IP 69003)

The inspector reviewed selected aspects of:

- operator licenses
- operator training records
- operator physical examination records
- operator examination records
- operator active duty status

b. Observations and Findings

Operator licenses were current. The Deputy Chief Nuclear Engineer's assistant ensured that operator licenses were renewed prior to their expirations date. He also ensured that the requalification status of each operator was current with respect to the biennial requalification cycle. Records showed that training lectures and physical examinations of the operators were conducted as required. Records also showed that written and operating examinations of the operators were acceptably implemented. Reactivity manipulations required to maintain active duty status were recorded in the back pages of console log books as well as personnel files for easy verification.

c. Conclusions

Operator requalification was conducted as required by the Requalification Program.

5. SURVEILLANCE

a. Scope (IP 61745)

The inspector reviewed selected aspects of:

- surveillance and calibration procedures,
- surveillance and calibration checklists and records

b. Observations and Findings

The TS did not require procedures for the conduct of surveillances and calibrations. However, appropriate procedures, checklists, and data records were readily available and well kept. The surveillances and calibrations were completed on the schedule specified in the TS and in accordance with the procedures. All results were within the TS or the procedurally prescribed parameters.

c. Conclusions

The surveillance program satisfied Technical Specification requirements.

6. EXPERIMENTS

a. Scope (IP 69005)

The inspector reviewed selected aspects of:

- scope of experiments
- experiment review and approval
- 10 CFR 50.59 evaluation
- potential hazards identification
- reactivity assessment

b. Observations and Findings

Experiments at the NBS reactor, as defined by the TS, occur inside the thermal shield, i.e., in core. The reactivity worth and other criteria for these in core experiments were delineated in TS 4.0. The TS did not incorporate criteria for beam port experiments. However, licensee administrative procedures have extended the review and approval requirements in TS 7.2 to the beam port and guide hall experiments.

In 1970, an Irradiation Subcommittee was appointed by the SEC to review experiments and provide recommendations. This included pneumatic tube (rabbit) irradiations. A database of SEC approved protocols was created and has grown large. New proposals were compared by the subcommittee to this database. Experiments that fell outside the envelope of the database parameters require SEC approval. A subcommittee member stated that no new or unknown type of in-core experiments had been initiated, reviewed, or approved for several years.

Records indicated that new beam port and guide hall experiments had been proposed and were reviewed and approved by the SEC as specified by the licensee's administrative requirements. A separate database of approved beam experiments was maintained and used by a subcommittee similar to the in-core experiments. Engineering and radiation protection controls were implemented as required to limit exposure to radiation.

c. Conclusions

The experiment program satisfied Technical Specification and procedural requirements.

7. PROCEDURES

a. Scope (IP 42745)

The inspector reviewed selected aspects of:

- administrative controls
- changes process
- procedural implementation

b. Observations and Findings

Written procedures for the activities listed in TS 7.4 were available as required, including the radiation protection procedures. The procedures were reviewed by the SEC and approved by the Deputy Chief, Reactor Operations as specified in the TS. The only official copy of each procedure was kept in the control room.

The licensee stated that procedure changes can be initiated by any operator or result from an Engineering Change Notification. The process to permanently or temporarily change a procedure was described by the licensee as follows: draft procedures were developed by the Deputy Chief, Reactor Operations to assure consistency. Drafts were circulated to the operations staff for review and comment. Final versions were screened as per 10 CFR 50.59, and reviewed, approved, and issued as described in TS 7.4.

c. Conclusions

The procedures satisfied Technical Specification requirements.

8. SAFEGUARDS

a. Scope (IP 85012)

The inspector reviewed selected aspects of:

- storage and movement of fuel
- physical inventory
- SNM accountability records and reports

b. Observations and Findings

The only SNM holdings were the reactor fuel elements. Records provided the locations of each fuel element. The material control and accountability forms (DOE/NRC Forms 741, 742, and 742c) were prepared and transmitted as required.

c. Conclusions

Special Nuclear Materials were acceptably controlled and inventoried.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

N. Bickford, Senior Reactor Operator
P. Gallagher, Deputy Director, Center for Neutron Research
T. Myers, Senior Reactor Operator
H. Prask, Chairman, Safety Evaluation Committee
J. M. Rowe, Director, Center for Neutron Research
J. Torrence, Deputy Chief, Reactor Operations
S. Weiss, Chief, Reactor Operations and Engineering

NRC Foreign Assignee

N. Badinas, Philippine Nuclear Research Institute, Department of Science and Technology

INSPECTION PROCEDURES USED

IP 39745	CLASS I NON-POWER REACTORS ORGANIZATION AND OPERATIONS AND MAINTENANCE ACTIVITIES
IP 42745	CLASS I NON-POWER REACTOR PROCEDURES
IP 40745	CLASS I NON-POWER REACTOR REVIEW AND AUDIT AND DESIGN FUNCTIONS
IP 61745	CLASS I NON-POWER REACTOR SURVEILLANCE
IP 69003	CLASS I NON-POWER REACTOR OPERATOR LICENSES, REQUALIFICATION, AND MEDICAL ACTIVITIES
IP 69005	CLASS I NON-POWER REACTOR EXPERIMENTS
IP 85102	MATERIAL CONTROL AND ACCOUNTING - REACTORS

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
IFI	Inspector Follow up Item
IP	Inspection procedure
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
SAC	Safety Audit Committee
SEC	Safety Evaluation Committee
SNM	Special Nuclear Material
SHP	Supervisory Health Physicist
TS	Technical Specifications