

March 27, 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. 50-184/2001-201

Dear Dr. Rowe:

This refers to the inspection conducted on February 26 - March 1, 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/**

Ledyard B. Marsh, Chief  
Events Assessment, Generic Communications  
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. 50-184/2001-201

cc w/enclosure: Please see next page

National Institute of Standards  
and Technology

Docket No. 50-184

cc:

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Department of Natural Resources  
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U.S. Department of Commerce  
Gaithersburg, MD 20899

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U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-184

License No: TR-5

Report No: 50-184/2001-201

Licensee: U. S. Department of Commerce

Facility: National Bureau of Standards Reactor

Location: National Institute of Standards and Technology  
Gaithersburg, Maryland 20899

Dates: February 26 - March 1, 2001

Inspector: Thomas F. Dragoun

Approved by: Ledyard B. Marsh, Chief  
Events Assessment, Generic Communications 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 radiation protection program, environmental protection program, safeguards program, and security program since the last NRC inspection of this program.

The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

### RADIATION PROTECTION

The radiation protection program satisfied NRC requirements

### ENVIRONMENTAL PROTECTION

The environmental monitoring program satisfied Technical Specification requirements.

### SAFEGUARDS

Special Nuclear Materials were acceptably controlled and inventoried.

### SECURITY

The security plan and its implementation satisfied the governing requirements in 10 CFR 73.

## Report Details

### Summary of Plant Status

During the inspection, the reactor was operated continuously at full power. Construction of a replacement cooling tower was underway.

#### 1. RADIATION PROTECTION

##### a. Scope (IP 83743)

The inspector reviewed selected aspects of:

- organization and staffing
- worker training
- the Radiation Protection Program
- radiological signs and posting
- routine surveys and monitoring
- dosimetry records
- protective clothing program

##### b. Observations and Findings

All positions in the reactor health physics management chain will be vacated this year due to retirements. The Occupational Health and Safety Division Chief has already been replaced. The supervising reactor HP (SHP) stated that his position will be filled. No negative impact on the program was expected due to the number of highly qualified staff.

The content of the computer-based training program for researchers satisfied requirements in 10 CFR 19.12. The inspector also reviewed the exam bank questions and answers and provided comments.

The DOT recently informed NIST that, as a federal agency transporting RAM and SNM using federal employees and federal vehicles to conduct federal business, NIST was exempt from DOT regulations. The SHP stated, as an internal policy, NIST will continue to comply with DOT regulations except for 49 CFR 177.842(b). A NIST request for an exemption from this particular rule lead to the DOT response. He also stated that compliance with applicable NRC transportation regulations will continue as before.

Some records of in-plant monitoring listed in Health Physics Instruction #3-1 could not be located during the inspection. The SHP stated that some records check may be added to the responsibilities of the HP designated to conduct the quarterly facility audit. This matter will be reviewed in a future inspection (Inspector Follow up Item 50-184/2001-201-01). The SHP also indicated an intention to review the core program Health Physics Instructions (HPI) and the reactor specific Health Physics Procedures (HPP) prior to his retirement.

Caution signs, postings and controls to radiation areas were as required in 10 CFR 20, Subpart J. Licensee personnel observed the indicated precautions for access to the radiation areas.

Exit frisking was by sensitive, automated equipment. Some of this equipment was being replaced by newer, more sensitive models. This constitutes a program strength.

Records showed that occupational doses were within 10 CFR Part 20 limitations.

Protective clothing was laundered on the site in accordance with HPI 3-8. The clothing was adequately surveyed prior to re-issuance.

c. Conclusions

The radiation protection program satisfied NRC requirements.

2. ENVIRONMENTAL PROTECTION

a. Scope (IP 69004)

The inspector reviewed selected aspects of:

- soil and vegetation sample preparation
- a special fence line monitoring report
- gaseous release records

b. Observations and Findings

Environmental soil and vegetation samples were collected and prepared for analysis using generally accepted technique. The data indicated that there were no significant changes. The results were acceptably documented in the Annual Report.

A draft report, "NBS-NIST Fence line Environmental Monitoring Program 1964-1999", indicated doses have been indistinguishable from background in all quadrants around the reactor since 1976.

Releases of argon 41 and tritium gases to the environment were acceptably monitored and recorded.

c. Conclusions

The environmental monitoring program satisfied Technical Specification requirements.



3. SAFEGUARDS

a. Scope (IP 85012)

The inspector reviewed selected aspects of:

- SNM shipping and receiving
- storage and movement
- physical inventory
- accountability records and reports

b. Observations and Findings

The licensee acquires new fuel as needed to minimize the amount stored on the site. The material control and accountability program tracked the identity, locations and quantity of fuel. SNM inventories were conducted at least annually as required by 10 CFR 70.51(d). The possession and use of SNM were limited to the locations and purposes authorized under the license. 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.

4. SECURITY FOR SNM OF MODERATE STRATEGIC SIGNIFICANCE

a. Scope (IP 81421)

The inspector reviewed selected aspects of:

- records and reports
- physical barriers
- access controls
- key control
- intruder detection aids
- written security procedures
- implementation of the Physical Protection Plan

b. Observations and Findings

Physical protection systems, equipment and instrumentation exceeded the requirements of the Physical Protection Plan. A new computerized alarm panel was installed at the dispatch location. Access control was as required. Implementing procedures were consistent with the Physical Protection Plan. Annual audits of Plan implementation were completed. No deficiencies were reported.

The licensee indicated that a change was under consideration to shift control of the security force to a centralized off-site location. The inspector stated that, in accordance with 10 CFR 50.54(p), the licensee could make no change which would decrease the effectiveness of the Plan, prepared pursuant to 10 CFR 73, without prior NRC approval. In particular, the review of proposed changes should include the performance considerations provided in 10 CFR 73 Appendix C.

c. Conclusions

The security plan and its implementation satisfied the governing requirements in 10 CFR 73.

5. EXIT INTERVIEW

The inspectors presented the inspection results to members of the licensee management on March 1, 2001. The licensee acknowledged the findings presented.

## **PARTIAL LIST OF PERSONS CONTACTED**

### **Licensee**

D. Brown, Nuclear Engineer  
T. Myers, Senior Reactor Operator  
J. M. Rowe, Director, Center for Neutron Research  
C. Shupe, Captain, NIST Police  
L. Slaback, Supervisory Health Physicist  
S. Weiss, Chief, Reactor Operations and Engineering

## **INSPECTION PROCEDURES USED**

IP 69004	CLASS I NON-POWER REACTOR EFFLUENT AND ENVIRONMENTAL MONITORING
IP 81421	FIXED SITE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF MODERATE STRATEGIC SIGNIFICANCE
IP 83743	CLASS I NON-POWER REACTORS RADIATION PROTECTION
IP 85102	MATERIAL CONTROL AND ACCOUNTING - REACTORS

## **ITEMS OPENED, CLOSED, AND DISCUSSED**

### **Opened**

50-184/2001-201-01 IFI Audit records of routine radiation surveys

### **Closed**

None

## **LIST OF ACRONYMS USED**

CFR	Code of Federal Regulations
DOT	Department of Transportation
HPI	Health Physics Instruction
HP	Health Physicist
HPP	Health Physics Procedure
IFI	Inspector Follow up Item
IP	Inspection procedure
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
RAM	radioactive material
SHP	Supervising Health Physicist
SNM	Special Nuclear Material
TS	Technical Specifications