

December 15, 2004

Dr. Patrick D. Gallagher, Director  
NIST Center for Neutron Research  
National Institute of Standards and Technology  
U. S. Department of Commerce  
Gaithersburg, MD 20899

SUBJECT: NRC ANNOUNCED INSPECTION REPORT NO. 50-184/2004-203

Dear Dr. Gallagher:

This letter refers to the inspection conducted on December 6-9, 2004, at your NIST Center for Neutron Research Test Reactor Facility, referred to as the National Bureau of Standards Reactor. The inspection included a review of activities authorized for your facility. 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 concerns or noncompliances to NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.390 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/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Craig Bassett at (404) 562-4712.

Sincerely,

**/RA/**

Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

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

Enclosure: NRC Inspection Report No. 50-184/2004-203  
cc w/enclosure: Please see next page

National Institute of Standards  
and Technology

Docket No. 50-184

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**U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION**

Docket No.: 50-184

License No.: TR-5

Report No.: 50-184/2004-203

Licensee: U. S. Department of Commerce

Facility: National Bureau of Standards Reactor

Location: National Institute of Standards and Technology (NIST)  
NIST Center for Neutron Research  
Gaithersburg, MD 20899

Dates: December 6-9, 2004

Inspector: Craig Bassett

Approved by: Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

NIST Center for Neutron Research  
National Bureau of Standards Reactor  
Report No.: 50-184/2004-203

The primary focus of this routine, announced inspection was the onsite review of selected aspects and activities at the NIST Center for Neutron Research Test Reactor, commonly known as the National Bureau of Standards Reactor (NBSR) facility related to operation of the 20 Megawatt (MW) Class 1 Test Reactor. It included a review of the licensee's safety programs including: organizational functions and staffing, review and audit and design change functions, reactor operations, operator requalification, maintenance and surveillance, fuel handling, experiments, procedural control, and emergency preparedness since the last NRC inspection of this facility. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

### Organizational Functions and Staffing

- The organizational structure and supervisory qualifications were consistent with Technical Specification Section 7.1 requirements and staffing levels were adequate for the current level of operations.

### Review and Audit and Design Change Functions

- The Safety Evaluation Committee was meeting as required and reviewing the topics outlined in the Technical Specifications. The Safety Audit Committee was conducting annual audits as required.
- The design change program being implemented at the facility satisfied NRC requirements.

### Reactor Operations

- NBSR reactor operations and operating parameters, shift turnovers, and operator cognizance of facility conditions were acceptable.

### Operator Requalification

- Operator requalification was being conducted and completed as required by the Requalification Program and the program was being maintained current. Operator physical examinations were being completed every two years as required.

### Maintenance and Surveillance

- The maintenance program was being conducted in accordance with applicable procedural requirements.
- The surveillance program was being completed in a timely manner and as specified in Technical Specification requirements.

### Fuel Handling

- Fuel movement was accomplished in accordance with Technical Specification and procedural requirements.

### Experiments

- The program for experiment review and approval satisfied Technical Specification and procedural requirements.

### Procedures

- The procedural revision, control, and implementation program satisfied Technical Specification requirements.

### Emergency Preparedness

- The Emergency Plan and Emergency Instruction Manual (or Implementing Procedures) were being audited and reviewed biennially as required.
- Drills and exercises were being held and follow-up critiques were conducted to identify corrective actions that could be taken as needed.
- Emergency preparedness training for staff and offsite personnel was being conducted as stipulated in the Emergency Plan.
- Adequate offsite emergency support was being provided by the appropriate agencies as required.

## REPORT DETAILS

### Summary of Plant Status

The licensee's NIST Center for Neutron Research (NCNR) Test Reactor, a 20 MW Test Reactor commonly known as the NBSR, continued to be operated in support of laboratory experiments, reactor operator training, and various types of research. During the inspection, the reactor was operated continuously on a 24-hour basis.

#### 1. Organizational Functions and Staffing

##### a. Inspection Scope (Inspection Procedure [IP] 69006)

To verify that the licensee was complying with the requirements specified in Section 7.1 of the NBSR Technical Specifications (TS), Revision (Rev.) 8, dated March 31, 1997, the inspector reviewed selected aspects of the following:

- NBSR organization and staffing
- NBSR Console Logbooks Numbers (Nos.) 112 through 115
- management and staff responsibilities outlined in the TS
- NBSR Administrative Rules (AR) 1.0, "Responsibilities of Operations Personnel," issued July 15, 2004
- NBSR AR 2.0, "Personnel Requirements," issued April 30, 1998

##### b. Observations and Findings

Through discussions with licensee personnel and review of pertinent documents, the inspector determined that the licensee's organizational structure had not changed since the last inspection in the area of reactor operations (refer to NRC Inspection Report No. 50-184/2003-203). As a result, the organizational structure remained consistent with the requirements of TS Section 7.1 and Figure 7.1. The inspector also found that the various supervisory personnel in the Reactor Operations Group exceeded the minimum qualifications specified in the TS with regard to education and experience.

Through a review of the Console Logbooks for the period from December 2003 to the present and interviews with operations personnel, the inspector determined that there were four operating crews at the facility. Each was staffed with at least three individuals who were licensed senior reactor operators (SROs). Staffing during reactor operation satisfied the requirements specified in TS Section 7.1.

In discussing staffing with management personnel, the inspector noted that there were 22 qualified Senior Reactor Operators (SROs) at the facility. It was noted that one SRO was anticipated to retire in January 2005 and another was expected to retire in the spring or summer of 2005. Also, one operator was leaving for personal reasons at the end of 2004. However, it was also noted that two people were in training in 2004. One recently qualified as an SRO and the other individual was expected to be qualified in early 2005. Thus, while three people were expected to leave, one had qualified and another would qualify shortly, leaving the facility, at that point, with 21 operators. That appeared to be a satisfactory number for the current level of operations at the facility.

c. Conclusions

The organizational structure and supervisory qualifications were consistent with TS Section 7.1 requirements and staffing levels were adequate for the current level of operations.

**2. Review and Audit and Design Change Functions**

a. Inspection Scope (IP 69007)

In order to ensure that the audits and reviews stipulated in the requirements of TS Sections 7.2 and 7.3 were being completed and to verify that any experiment or procedure changes or modifications to the facility were being reviewed as required by 10 CFR 50.59, the inspector reviewed the following:

- Safety Evaluation Committee meeting minutes for April 2003 through the present (Meeting Nos. 354, 355, 356, and 357)
- Safety Audit Committee report for the years 2003 and 2004
- NBSR Annual Report for the period from January 1, 2003 through December 31, 2003
- Guidelines for Completing Engineering Change Notices, issued November 24, 2000
- NBSR Engineering Change Notice (ECN) No. 469, "Fuel Storage Pool (HE-8) Heat Exchanger Upgrade," approved May 13, 2004
- NBSR ECN No. 470, "Removal of the 13% Scram," approved March 5, 2004
- NBSR ECN No. 471, "Thermal Shield Pump Change," approved May 5, 2004
- NBSR Minor ECN No. 04-004, "MACS Test Shield Hole Locations and Burns & Roe Drawing for B-128," approved August 10, 2004
- NBSR Minor ECN No. 04-005, "CT Fan Control Circuit Rearrangement," approved September 29, 2004
- NBSR Minor ECN No. 04-006, "Modification of the Reactor Face at NG-0," approved September 3, 2004

b. Observations and Findings

(1) Review and Audit Functions

Records of the meetings held by the Safety Evaluation Committee (SEC) from August 2003 through the date of the inspection were reviewed. The meeting minutes showed that meetings were held at least semiannually as required and reviews of proposed changes and experiments were conducted by the SEC or a designated subcommittee. The minutes also indicated that the SEC provided appropriate guidance and direction for reactor operations, and ensured suitable use and oversight of the reactor.

The records showed that an annual independent audit had been conducted by the Safety Audit Committee (SAC) during September 30 and October 1, 2004. Upon completion, the audit report was forwarded to the SEC. It provided a review of NBSR operations and the performance of the SEC were reviewed as outlined in the

TS. The SAC found that reactor operations were being conducted appropriately and that the SEC was doing a good job of reviewing operations and advising on the safety aspects of experiment proposals and engineering change notices. The SAC made various recommendations which were being considered by the licensee.

The inspector met with the Acting Chair of the SEC. He verified that there was adequate support for the committee, both from facility management and from committee members. It was noted that a charter was being developed for the committee to fully delineate the responsibilities and functions of the SEC.

## (2) Design Change Functions

The inspector reviewed selected changes to the facility and/or equipment that had been proposed within the last year. The changes were designated as ECNs or Minor ECNs and numbered sequentially during the year. Each ECN documented what was proposed to be changed, the facility drawings that would need to be changed, the procedures that would require revision, and any tests or measurements that would need to be completed following the change. Each ECN also contained sections detailing the design description, safety considerations and analysis, and a safety evaluation and conclusions. The ECNs reviewed had been properly prepared and reviewed, and the work approved as required.

Of the ECNs reviewed, all the work had been completed but the packages were not closed out because the facility drawing changes and the formal procedure revisions had not been completed. (Pen and ink changes were in place as needed but formally revised drawings and procedures had not been issued to date.) Nevertheless, the ECNs that were reviewed demonstrated that changes were acceptably documented and reviewed in accordance with the TS and the licensee's guidelines. It was noted that the changes were being tracked to completion by the licensee. None of the changes reviewed by the inspector met any of the criteria of 10 CFR 50.59(c)(2), or required a TS change or a license amendment.

### c. Conclusions

The Safety Evaluation Committee was meeting as required and reviewing the topics outlined in the TS and an annual audit was being conducted as required. The design change program implemented by the licensee satisfied NRC requirements.

## 3. Reactor Operations

### a. Inspection Scope (IP 69006)

To verify that the licensee was operating the reactor and conducting operations in accordance with TS Sections 2 and 3 and procedural requirements, the inspector reviewed selected portions of the following:

- NBSR Console Logbooks Nos. 112 through 115
- NBSR Reactor Shift Supervisor Logbook No. 31

- Shift Supervisors Instructions and Special Log
- associated reactor operations records from January 2004 to the present
- shift turnover sheets for July through November 2004
- NBSR Annual Report for the period from January 1, 2003 through December 31, 2003
- NBSR AR 2.0, "Personnel Requirements," issued April 30, 1998
- NBSR AR 9.0, "Reactor Startup and Operation," issued July 15, 2004
- NBSR Operating Instruction (OI) 1.1, "Reactor Startup", issued December 2, 2004
- NBSR OI 1.1, Checklist A, "Reactor Startup Checklist (Shutdown >24 Hours)", issued November 14, 2004
- NBSR OI 1.1, Checklist B, "Reactor Startup Checklist (Unplanned Shutdown <24 Hours)", issued November 16, 2004
- NBSR OI 1.2, "Reactor Normal Operation", issued February 9, 1996
- NBSR OI 1.3, "Reactor Shutdown", issued December 10, 1997
- NBSR OI 2.1, "Startup, Operation, and Shutdown of Primary Coolant System", issued July 22, 2004
- NBSR OI 2.1, "Primary Coolant System Checklist", issued January 25, 2001
- NBSR OI 2.2, "Operation of the D<sub>2</sub>O Auxiliary Systems", issued December 6, 2002, with Pen and Ink changes made November 23, 2004
- NBSR OI 2.3, "Operation of the Thermal Column System", issued September 26, 2003
- NBSR OI 3.1, "Operation of the Secondary Cooling System", issued December 5, 2002
- NBSR OI 3.1 Checklist, "Secondary Cooling System Valve Check List", issued August 20, 2002

b. Observations and Findings

The operating logs and records were clear and provided an indication of operational activities. The logs and records demonstrated that shift staffing was as required by TS. The records reviewed also showed that operational conditions and parameters were consistent with license and TS requirements and that these conditions and requirements were satisfied. Reactor startup procedure, NBSR OI 1.1, required verification of each of the limiting conditions for operation specified in TS sections 3.1 through 3.11 prior to startup. These verifications were being recorded as required.

Through record reviews and direct observations, the inspector also verified that shift turnover briefings were held during each shift change and that activities of the previous shift were discussed in detail. The records kept and the briefings that were given indicated that the operators were aware of the conditions existing in the facility and the status of equipment and experiments in progress.

c. Conclusions

Reactor operations and operating parameters, shift turnovers, and operator cognizance of facility conditions were acceptable.

#### **4. Operator Requalification**

##### **a. Inspection Scope (IP 69003)**

To verify compliance with the NBSR Requalification Program, which was dated September 12, 1977, the inspector reviewed:

- status of selected qualified operators' licenses
- NBSR Console Logbooks Nos. 112 through 115
- operator training records for the years 2004-2005, documented on forms entitled, "Requalification Program Documentation Review"
- supervisor's annual operator evaluation documented on forms entitled, "Operator Evaluation," revised December 2001
- medical exam records from 2000-2004
- NBSR Requalification Examinations (biennial) for 2002 and 2004

##### **b. Observations and Findings**

There are currently 22 SROs employed at the facility. Through a review of various requalification and training documents, the inspector verified that the SROs' licenses were current and that records of the requalification program were being maintained as required.

A review of program records also showed that operator training was consistent with the NBSR Requalification Program requirements. The inspector confirmed that the operators were being given annual operating evaluations and were acceptably completing biennial written examinations. NBSR Console Logbooks and related records also showed that operators maintained active duty status by participating in the reactivity manipulations and document reviews as outlined and required in the Requalification Program.

The inspector also verified that each qualified operator was receiving a biennial physical examination as required.

##### **c. Conclusions**

Operator requalification was being conducted and completed as required by the licensee's Requalification Program.

#### **5. Maintenance and Surveillance**

##### **a. Inspection Scope (IP 69006 and IP 69010)**

To ensure that maintenance activities were being completed and to determine that surveillance activities and calibrations were being completed as required by TS Section 5, the inspector reviewed selected aspects of:

- NBSR Annual Report for the period from January 1, 2003 through December 31, 2003
- Reactor Operations Reference Procedure, Reference Number (Ref. No.) 17, "Shim Arm Removal and Replacement," reviewed August 31, 2004
- Reactor Operations Reference Procedure, Ref. No. 20, "Reloading Plan After Installation of New Shims," reviewed October 8, 2004
- Reactor Operations Reference Procedure, Ref. No. 29, "Draining Primary Coolant," reviewed September 24, 2004
- Reactor Operations Reference Procedure, Ref. No. 30, "Filling Reactor Vessel," reviewed September 30, 2004
- NBSR Console Logbooks Nos. 112 through 115
- Reactor Technical Specification Log Book, Volume 2
- Technical Specification Surveillance Lists for 2004
- selected NIST Reactor Area Inspection Log forms, revised October 2002
- selected NIST Reactor Control Room Log forms, revised May 2002
- TS Procedure 5.1.2, "Operation of Reactor Building Leak Rate Test System," issued July 23, 1999
- TS Procedure 5.3.2, "Withdrawal and Insertion of Each Shim Arm and Regulating Rod," issued September 20, 2004
- TS Procedure 5.3.3, "Scram Time of Each Shim Arm's First 5E Drop," approved September 20, 2004
- NBSR OI 1.1, Checklist A, "Reactor Startup Checklist (Shutdown >24 Hours)", issued November 14, 2004
- NBSR OI 1.3, Checklist, "Unattended Facility Checklist", issued December 24, 2003
- Annunciator Procedure (AP) 0.1, "D<sub>2</sub>O System Rupture," issued March 18, 1998
- AP 0.6, "Stuck Rabbit and/or Pneumatic System Failure," issued July 14, 1995
- AP 1.70, "AN 1-70: Cold Source Trouble," issued April 30, 1998
- AP 2.9, "AN 2-9: Storage Pool Door," issued September 26, 2003
- AP SIMPLEX-FIRE, "Simplex Panel: Fire Alarm," issued July 12, 2004
- associated surveillance and calibration checklists and records

b. Observations and Findings

(1) Maintenance Activities

Because the reactor was in continuous operation during the inspection, the inspector could not observe maintenance activities in progress. However, a review of various maintenance records, Console Logbooks, and data sheets indicated that routine maintenance activities were conducted at the required frequency and in accordance with the applicable procedure or equipment manual. Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements.

(2) Surveillance Activities

Although the TS did not require procedures for the conduct of surveillances and calibrations, procedures, checklists, and tables for recording data had been developed by the licensee and were used to document completion of the required

surveillance activities. The frequency that these activities were to be performed was specified in the TS.

The completion and results of the surveillances and calibrations were tracked by operations personnel and by the Deputy Chief, Reactor Operations and Engineering. Tracking was done by means of the TS Surveillance List which was updated as the tasks were completed and then revised, and a new List issued, monthly. A review of the monthly Surveillance Lists, Console Logbooks, and related data recorded on the appropriate forms indicated that the surveillances and calibrations were completed in accordance with the schedule specified in the TS and as per procedure. If a surveillance activity could not be completed within the established time frame, the reason for the delay was typically documented in the logs or records. All results reviewed by the inspector were within the TS or the procedurally prescribed parameters.

c. Conclusions

The maintenance program was being conducted and documented as required by procedure. The surveillance program was being conducted as specified by TS requirements.

**6. Fuel Handling**

a. Inspection Scope (IP 69009)

The inspector reviewed selected aspects of the following to verify that fuel movement and handling was being conducted as required by TS Sections 3.7, 3.8, and 6.3:

- NBSR Console Logbooks Nos. 112 through 115
- Core Loading Sheets Nos. 559 through 561
- Core Loading, Offloading, and Reloading Verification and Sign-off sheets
- Pool log and fuel transfer records from January 2003 to the present
- NBSR AR 6.0, "Refueling Operations," issued July 15, 2004
- NBSR OI 6.1, "Fueling and Defueling Procedures," issued August 20, 1997, with modifications dated March 17, 1998, July 23, 1999, and November 16, 2004
- NBSR OI 6.2, "Operation of the Fuel Transfer System," issued October 8, 1998, with modifications dated February 25, 2002
- NBSR OI 6.3, "Operation of Spent Fuel Cutting Tool," issued April 23, 1999
- associated data sheets, checklists, and records

b. Observations and Findings

Operating Instructions 6.1 through 6.3 provided prescribed methods to move, handle, and cut spent fuel consistent with the provisions of the TS and the licensee safety analyses. Fuel movement and fuel examination records and observations showed that the fuel was moved and verified as required. Records also showed that fuel handling and monitoring equipment was operable. Personnel were knowledgeable of the procedural requirements that ensured criticality control and fuel integrity.

c. Conclusions

Fuel movement was conducted in accordance with TS and procedural requirements.

**7. Experiments**

a. Inspection Scope (IP 69005)

To ensure that the requirements of TS Sections 4.0 and 7.2 and licensee administrative procedures were being met governing the experimental program, the inspector reviewed selected aspects and/or portions of:

- experiment review and approval process
- "Guidelines for Preparation of Experimental Proposals," revised March 8, 1994 which required the inclusion of such subjects as: 1) scope of experiment, 2) 10 CFR 50.59 evaluation, and 3) potential hazards identification and reactivity assessment
- Experimental Proposal Approval Sheet, No. 432, "Neutron Radioactive Decay Experiment on NG-6," dated April 11, 2004
- NBSR Irradiation Request/Proposal, 2S433, dated June 15, 2004, dealing with the irradiation of (low alloy) steels

b. Observations and Findings

Experiments at the NBSR, as defined by the TS, are those that are installed within the reactor (i.e., in the core). The reactivity worth and other criteria for these in-core experiments are delineated in TS Section 4.0. A subcommittee of the SEC, the Irradiation Subcommittee had been established to review irradiation experiment proposals and provide recommendations. The predominant type of experiment in this category was pneumatic tube (rabbit) irradiations. A file of SEC approved irradiation requests/proposals was created and was being maintained. When new proposals were prepared they were compared to the records in this file by the subcommittee. Experiments that were determined to be outside the envelope of the existing file parameters required SEC approval.

The inspector interviewed the Irradiation Subcommittee Chairman who stated that one new type of in-core experiment had been initiated, reviewed, and approved during 2004. The inspector reviewed the proposal and verified that it contained the required information and had been reviewed and approved as required. The inspector also interviewed the Irradiations Coordinator who stated that the review process that had been established was adequate to ensure the safety of proposed experiments.

Since the TS did not include criteria for beam port experiments, the licensee developed administrative guidelines to extend the review and approval requirements in TS Section 7.2 to the beam port and guide hall experiments. The licensee also developed a separate database of approved beam experiments which was being maintained and used by the subcommittee similar to the in-core experiments. A review of these records indicated that one new beam port experiment had been proposed in 2004. The inspector reviewed the latest proposal and verified that it had been reviewed and

approved by the SEC as specified by the licensee's administrative requirements. The inspector also noted that engineering and radiation protection controls were required to be implemented to limit radiation exposure to personnel conducting the experiments.

c. Conclusions

The program for experiment review and approval satisfied Technical Specification and procedural requirements.

**8. Procedures**

a. Inspection Scope (IP 69008)

The inspector reviewed the following to ensure that the requirements of TS Section 7.4 were being met concerning written procedures:

- procedure change process
- procedural review and approval
- NBSR AR 5.0, "Procedures and Manuals," issued September 1, 1986

b. Observations and Findings

Written procedures for the activities listed in TS Section 7.4 were available as required. These activities included normal reactor operations, abnormal operations, emergency conditions involving the potential or actual release of radioactivity, radiation protection, site emergency actions, and fuel handling. The inspector verified that the official, approved copies of the Reactor Operations Group procedures were kept in the control room as stipulated by procedure. The inspector also verified that the procedures were reviewed by the SEC and approved by the Deputy Chief, Reactor Operations as specified in the TS.

The inspector noted that the licensee was in the process of reviewing operations procedures, revising them as necessary, and issuing them with a current date. This was a commendable step because some of the procedures had not been re-issued in over 10 years.

c. Conclusions

The procedures and procedure change process satisfied Technical Specification requirements.

**9. Emergency Preparedness**

a. Inspection Scope (IP 69011)

To verify compliance with the Emergency Plan, the inspector reviewed selected aspects of:

- NBSR Emergency Plan, dated September 30, 1982 with the latest revision dated April 28, 1997

- Emergency Instruction (EI) Manual (i.e., Emergency Plan Implementing Procedures), last revised December 20, 2000
- EI Manual, Figure 6.3, "Emergency Organization Phone Numbers," dated November 28, 2004
- emergency response facilities, supplies, equipment, and instrumentation
- training records for 2003 - 2004
- offsite support groups (i.e., NIST Fire Department and Police Department)
- records documenting annual emergency drills and biennial exercises

b. Observations and Findings

The Emergency Plan (E-Plan) in use at the reactor and support facilities was the same as the last version approved by the NRC. The E-Plan was being audited and reviewed biennially as required. Implementing procedures, contained in the Emergency Instruction Manual, were reviewed and revised as needed to effectively implement the E-Plan. The inspector verified that operators understood their duties in response to emergency conditions.

Records showed that radio communications with the NIST Police Department (PD) were checked weekly. Other communications capabilities were checked annually, as stipulated in the E-Plan. The last emergency exercise was conducted on December 23, 2003, and the last evacuation drill was held on October 27, 2004. Critiques were held following the exercise and drill to discuss the strengths and weaknesses identified and to develop possible solutions to any problems identified. The results of the critiques were documented and filed.

Emergency preparedness and response training for NBSR personnel was being completed as required. Emergency response training for NIST Fire Department (FD) and PD personnel was being conducted as well.

The results of the annual inventories required by E-Plan Section 8.5 were reviewed by the inspector. It was noted that the emergency equipment in the locker located in the Front Lobby and in the Emergency Control Station had been inventoried even more frequently than required.

According to the licensee, the agreement with the Bethesda Naval Medical Hospital for medical support in case of an emergency, originally signed December 22, 1983, was current and acceptable. The Radiation Safety Office at the hospital had been contacted by the NRC Project Manager to review the agreement and verify that the proper support would be available in case of an emergency. Personnel at the hospital agreed that the agreement was still in effect. It was noted that other hospitals in the vicinity of NIST are now also equipped to handle emergencies involving a contaminated injured person.

The inspector visited the NIST FD and interviewed the FD Chief. The Chief explained the capabilities of the FD, gave the inspector a tour of the facility, and demonstrated the equipment on hand. The inspector noted that there were adequate supplies and equipment available at this support site in case of an emergency. In addition, there appeared to be a good working relationship between the licensee and this support organization.

c. Conclusions

The emergency preparedness program was being conducted in accordance with the Emergency Plan.

**10. Follow-up on Previous Open Items**

a. Inspection Scope

The inspector reviewed the licensee's actions taken in response to previously identified Inspector Follow-up Items (IFI).

b. Observation and Findings

- (3) (Closed) IFI 50-184/2003-203-01 - Follow-up on changes to the Emergency Plan to reflect the correct point of contact in the NRC following an emergency and the actual items of emergency equipment at the facility.

During a review of the E-Plan in 2003, the inspector noted that the licensee's initial point of contact in the NRC following an event was listed as Region I in Section 7.1.a.1. The inspector indicated that the primary point of contact should be the NRC Operations Center not the region. It was also noted that the E-Plan listed self-contained breathing apparatus (SCBAs) as part of the emergency equipment that should be inventoried annually by the licensee. The licensee no longer had SCBAs on hand for use nor did the facility have a program for training personnel on their use or maintenance. The inspector informed the licensee that these two items should be changed so that the E-Plan reflected the correct point of contact in the NRC and the actual items of emergency equipment at the facility.

During this inspection, the inspector reviewed the status of these issues. It was determined that the licensee had kept the Regional number on the Emergency Contact List form but that information was listed as a tertiary contact behind the NRC Operations Center and the Research Reactor group in Headquarters. It was also noted that the licensee had issued a statement to accompany the E-Plan that indicated that SCBAs were potential emergency equipment but not primary or required emergency equipment. The use of SCBAs was re-evaluated and the licensee found that other means of respiratory protection were more suitable. Therefore, the SCBAs were removed from the emergency equipment inventory. This issue is considered closed.

- (4) (Closed) IFI 50-184/2003-203-02 - Follow-up to ensure that annual inventories required by Section 8.5 of the E-Plan, involving the emergency equipment in the locker located in the Emergency Control Station, are completed and documented.

While reviewing the results of the annual inventories required by E-Plan Section 8.5 during the inspection in 2003, the inspector noted that the emergency equipment in the locker located in the Emergency Control Station did not appear to have been inventoried as required and the licensee was informed. Upon further investigation, the licensee found that Health Physics (HP) personnel were verifying that the equipment in the locker was present, but the documentation was not readily

available. However, it was determined that the HP verifications had been completed at least annually. Because no adequate documentation of the annual inventory was available, the licensee indicated that the inventory would be conducted and the results documented.

During the inspection, the inspector reviewed the status of this issue. It was determined that the licensee had been able to locate the documentation of the past emergency equipment inspections. Nevertheless, the licensee developed a new form to show that this was being completed. The inspector reviewed the new form and noted that it was being completed monthly. This issue is considered closed.

c. Conclusions

Two previously identified IFIs were reviewed and closed.

**11. Exit Interview**

The inspection scope and results were summarized on December 9, 2004, with members of licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee Personnel

R. Beasley, Reactor Supervisor/Senior Reactor Operator  
N. Bickford, Irradiation Coordinator  
D. Brown, Senior Health Physicist and Irradiation Subcommittee Chairman  
F. Clark, Reactor Supervisor/Senior Reactor Operator  
H. Dilks, Reactor Supervisor/Senior Reactor Operator  
R. Dimeo, Beam Experiments Coordinator  
P. Gallagher, Director, Center for Neutron Research  
R. Lindstrom, Acting Chairman, Safety Evaluation Committee  
W. Mueller, Reactor Supervisor/Senior Reactor Operator  
T. Myers, Deputy Chief, Reactor Operations and Engineering  
W. Richards, Senior Nuclear Engineer  
S. Weiss, Chief, Reactor Operations and Engineering  
D. Wilkison, Reactor Supervisor/Senior Reactor Operator

### Other Personnel

T. Rhodes, Chief, NIST Fire Department

## INSPECTION PROCEDURES USED

IP 69003: Class 1 Research and Test Reactor Operator Licenses, Requalification, and Medical Activities  
IP 69005: Class 1 Research and Test Reactors Experiments  
IP 69006: Class 1 Research and Test Reactors Organization, Operations, and Maintenance Activities  
IP 69007: Class 1 Research and Test Reactors Review and Audit and Design Change Functions  
IP 69008: Class 1 Research and Test Reactor Procedures  
IP 69009: Class 1 Research and Test Reactors Fuel Movement  
IP 69010: Class 1 Research and Test Reactors Surveillance  
IP 69011: Class 1 Research and Test Reactors Emergency Preparedness

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

None

### Closed

50-184/2003-203-01	IFI	Follow-up on changes to the Emergency Plan to reflect the correct point of contact in the NRC following an emergency and the actual items of emergency equipment at the facility.
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50-184/2003-203-02      IFI      Follow-up to ensure that annual inventories required by Section 8.5 of the E-Plan, involving the emergency equipment in the locker located in the Emergency Control Station, are completed and documented.

**LIST OF ACRONYMS USED**

CFR	Code of Federal Regulations
ECN	Engineering Change Notice
EI	Emergency Instruction
E-Plan	Emergency Plan
IFI	Inspector Follow-up Item
IP	Inspection Procedure
IR	Inspection Report
MW	Megawatt
NBSR	National Bureau of Standards Reactor
NCNR	NIST Center for Neutron Research
NIST	National Institute of Standards and Technology
Nos.	Numbers
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
SAC	Safety Audit Committee
SCBA	Self-contained breathing apparatus
SEC	Safety Evaluation Committee
SRO	Senior Reactor Operator
TS	Technical Specification