September 19, 2005

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. 50-184/2005-203

Dear Dr. Gallagher:

This letter refers to the inspection conducted on August 29 - September 1, 2005, 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/

Brian E. Thomas, 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. 50-184/2005-203
cc w/enclosure: Please see next page

National Institute of Standards
and Technology

Docket No. 50-184

cc w/encl:

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

Docket No.:	50-184
License No.:	TR-5
Report No.:	50-184/2005-203
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:	August 29 - September 1, 2005
Inspector:	Craig Bassett
Approved by:	Brian E. Thomas, 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.: 50-184/2005-203

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.) 115 through 118
- 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. 50-184/2004-203). 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 management and 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 2004 to the present and interviews with operations personnel, the inspector determined that there were four operating crews at the facility. Each typically was staffed with at least three individuals who were licensed senior reactor operators; currently three of the crews were staffed with four individuals. 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 21 qualified Senior Reactor Operators (SROs) at the facility. It was noted that two operators had left the facility since the last inspection but another person, who had been in training, had taken the licensing examination and had received an operating license. Also, two individuals had recently been hired and were currently in training. There appeared to be a satisfactory number of operators for the current level of operations at the facility.

It was also noted that the Chief, Reactor Operations and Engineering was set to retire in September 2005. However, the Chief, Reactor Engineering, who was hired last year and has many years of experience in the research reactor arena, has been designated to fill that position.

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 reviews and audits 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 November 2004 through the present (Meeting Nos. 357 and 358)
- Safety Audit Committee report for 2004 issued November 22, 2004
- NBSR Annual Report for the period from January 1, 2004 through December 31, 2004, issued March 17, 2005
- "Guidelines for Completing Engineering Change Notices," from the NBSR Engineering Manual, approved April 1, 2005
- "NBSR Reactor Engineering Document Control Plan," from the NBSR Engineering Manual, approved April 1, 2005
- "Quality Assurance Program for Modification to the NBSR Reactor," from the NBSR Engineering Manual, approved April 1, 2005
- NBSR (Major) Engineering Change Notice (ECN) No. 471, "Thermal Shield Pump Change," approved May 5, 2004
- NBSR Minor ECN No. 04-006, "Modification of Reactor Face at NG-0," approved September 3, 2004
- NBSR Minor ECN No. 05-002, "Modification of the Reactor Bioshield," approved February 22, 2005
- NBSR Minor ECN No. 05-003, "Modifications to Counting Room, C-003," approved April 7, 2005
- NBSR Minor ECN No. 05-004, "Modified Groove on Fuel Element Head," approved June 20, 2005
- NBSR Minor ECN No. 05-005, "Modification to Process Room Ventilation," approved July 28, 2005
- NBSR Minor ECN No. 05-006, "Replacement of Main Secondary Cooling Water Pumps and Suction and Discharge Valves in the Pump Room," approved July 25, 2005

b. Observations and Findings

(1) Review and Audit Functions

Records of the meetings held by the Safety Evaluation Committee (SEC) from November 2004 through the date of the inspection were reviewed. The meeting minutes showed that meetings were held at least semiannually as required by TS Section 7.2 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.

It was noted that, since the last operations inspection, a formal charter had been approved for the SEC. It delineated the committee's membership, organization, quorum and meeting requirements, and responsibilities. The charter also authorized the formation of subcommittees to assist the SEC. Two subcommittees, the Irradiation Subcommittee and the Beam Experiment Subcommittee, which had been in existence for several years, were formalized and charters had also been developed and approved for these subcommittees.

Other records reviewed by the inspector showed that an annual independent audit had been conducted by the Safety Audit Committee (SAC) as required by TS Section 7.3 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 comments and recommendations which were being considered by the licensee.

(2) Design Change Functions

The inspector reviewed selected changes to the facility and/or equipment that had been proposed within the last two years. The changes were designated as Major 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, a safety evaluation, and 10 CFR 50.59 screening criteria results. Minor ECNs were required to be reviewed and approved by the Chief, Reactor Operations and the Chief, Reactor Engineering. Major ECNs were to be reviewed by various groups including Reactor Operations, Electrical Engineering, Mechanical Engineering, Health Physics, and the SEC, and were approved by the Chief, Reactor Operations and Engineering and the Director, NCNR. The ECNs reviewed by the inspector had been properly prepared and reviewed, and the work approved as required.

Of the ECNs reviewed, the work had been completed but some of the packages were not closed out because the facility drawing changes and the formal procedure revisions had not been completed. Upon reviewing the ECNs that had been closed out, the inspector noted that the appropriate facility drawings and procedures had been revised and/or changed as required.

The ECNs reviewed demonstrated that changes were acceptably documented and reviewed in accordance with the TS and the licensee's guidelines and that the work and the required document revisions were being completed as stipulated. 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. 115 through 118
- NBSR Reactor Shift Supervisor Logbook No. 32
- Shift Supervisors Instructions and Special Log sheets
- NIST Reactor Area Inspection Log sheets, last revised July 2005
- NIST Reactor Control Room Log sheets, last revised November 2004
- associated reactor operations records from November 2004 to the present
- NBSR Annual Report for the period from January 1, 2004 through December 31, 2004, issued March 17, 2005
- 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 Checklist, "Primary Coolant System Checklist," issued January 25, 2001

- NBSR OI 2.2, “Operation of the D_2O 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
- NBSR OI 3.6, “Water Treatment System,” issued February 12, 1999
- NBSR OI 4.1, “Helium Sweep Gas System,” issued February 26, 1999
- NBSR OI 4.5, “Operation of Pneumatic Tube System,” issued March 18, 1998
- NBSR OI 5.6, “Beam Port Shutters, Boral Curtain, Neutron Guide Valves, and Cryostat Shutters,” issued December 23, 1996

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 TS and procedural 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 completed and recorded as required. The inspector noted that other procedural requirements were also being met.

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, if applicable, 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 last updated September 12, 1977, the inspector reviewed:

- current status of selected qualified operators’ licenses
- NBSR Console Logbooks Nos. 115 through 118
- operator training records for the years 2004-2005, documented on forms entitled, “Requalification Program Documentation Review and Reactivity Changes,” no revision date

- supervisor's annual operator evaluation documented on forms entitled, "Operator Evaluation," revised December 2004
- medical exam records from 2002-2005
- NBSR Requalification Examinations (biennial) for 2002 and 2004

b. Observations and Findings

As noted previously, there were currently 21 SROs employed at the facility. Through a review of various requalification and training documents, the inspector verified that, even though some of the SROs were in management positions, the licenses were current and 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. Operator physical examinations were being completed every two years as required.

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, 2004 through December 31, 2004, issued March 17, 2005
- Reactor Operations Reference Procedure, Reference Number (Ref. No.) 17, "Shim Arm Removal and Replacement," reviewed August 31, 2004
- Reactor Operations Reference Procedure, Ref. No. 30, "Filling Reactor Vessel," reviewed September 30, 2004
- NBSR Console Logbooks Nos. 115 through 118
- Reactor Technical Specification Log Book, Volume 2
- Technical Specification Surveillance Lists for 2005
- selected NIST Reactor Area Inspection Log forms, revised October 2002
- selected NIST Reactor Control Room Log forms, revised May 2002

- TS Procedure 5.1.1, “Channel Test of Confinement Closure,” issued July 24, 2004
- TS Procedure 5.2.2, “Testing of Primary System Relief Valve,” issued April 19, 1991
- TS Procedure 5.3.2, “Withdrawal and Insertion of Each Shim Arm and Regulating Rod,” issued September 20, 2004
- TS Procedure 5.3.4, “Operability Test of Reactor Safety System Channels,” issued July 4, 2004
- TS Procedure 5.4.2, “Starting Function of the Emergency Sump Pump,” issued April 2, 2001
- TS Procedure 5.5.1, “Operability Check and Calibration of –16 Monitors,” issued August 25, 1995
- TS Procedure 5.6.2, “Operability Test of Controls in the Emergency Control Station,” issued August 25, 1995
- 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_2O System Rupture,” issued March 18, 1998
- AP 0.5, “Primary Pump Failure,” issued July 21, 1995
- AP 0.6, “Stuck Rabbit and/or Pneumatic System Failure,” issued July 14, 1995
- AP 1.1-1.9, “AN 1-1 through 1-9: Beam Port Open,” issued July 21, 1995
- AP 1.70, “AN 1-70: Cold Source Trouble,” issued April 30, 1998
- AP 2.5, “AN 2-5: Sump Pit #4 Low Level,” issued July 28, 1995
- AP 2.9, “AN 2-9: Storage Pool Door,” issued September 26, 2003
- AP 3.4, “AN 3-4: Experimental D_2O Cooling Pressure Low,” issued July 22, 2004
- AP 4.24, “AN 4-24: Thermal Shield Flow Low,” issued October 22, 2002
- 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 reactor 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, the licensee had developed procedures, checklists, and tables for recording data and these were being 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 Surveillance 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. 115 through 118
- Core Loading Sheets Nos. 561 through 566
- 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 3.5, “Demineralized Water Experimental Cooling System,” issued September 19, 1995, with modifications dated February 27, 2002
- 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 January 14, 2005
- NBSR OI 6.3, “Operation of Spent Fuel Cutting Saw,” 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 and handle fuel, and cut spent fuel consistent with the provisions of the TS and the licensee safety analyses. Fuel movement and fuel examination records and Console Logbooks documented that fuel was moved and controlled as required. The records also showed that the fuel movements were verified by various individuals as required and that fuel elements were in the designated locations. Records further 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," last revised May 2005
- Experimental Proposal Approval Sheet, No. 432, "Neutron Radioactive Decay Experiment on NG-6," dated April 11, 2004 (the most recently approved beam experiment documented)
- NBSR Irradiation Request/Proposal, 2S434, dated August 2, 2005, dealing with the "Irradiation of 0.1%B Fertilizer"

b. Observations and Findings

Experiments at the NBSR, as defined by the TS, were those that were installed within the reactor (i.e., in the core). The reactivity worth and other criteria for these in-core irradiation experiments are delineated in TS Section 4.0. The Irradiation Subcommittee, a subcommittee of the SEC, 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 had been 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 review and approval by the Director, NCNR.

The inspector interviewed the Irradiation Subcommittee Chairman who stated that one new type of in-core experiment had been initiated, reviewed, and approved since the last inspection. The inspector reviewed the proposal and verified that it contained the required information, that the appropriate preliminary test had been conducted, and that the proposal had been reviewed and approved as required.

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 include the beam port and guide hall experiments. The licensee also developed a separate database of approved beam experiments, similar to the in-core irradiation experiments, which was being maintained and used by a separate subcommittee, the Beam Experiment Subcommittee.

The inspector interviewed the Interim Beam Experiment Subcommittee Chairman who indicated that the latest approved beam port experiment proposal was one that had

been prepared in 2004. The inspector reviewed that proposal and verified that it had been reviewed by the SEC and approved by the Director, NCNR 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. It was also noted that one new beam experiment proposal had been submitted in 2005 but it was still in the review and approval process.

c. Conclusions

The program for experiment review and approval satisfied TS 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 July 15, 2004
- NBSR Annual Report for the period from January 1, 2004 through December 31, 2004, issued March 17, 2005
- Safety Evaluation Committee meeting minutes for November 2004 through the present (Meeting Nos. 357 and 358)
- Safety Audit Committee report for 2004 issued November 22, 2004

b. Observations and Findings

Written procedures for the activities listed in TS Section 7.4 were available as required. Those 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 Chief, Reactor Operations as specified in the TS.

During the procedure review, the inspector noted that some of the procedures had not been re-issued in over 10 years. However, the inspector noted that many of the licensee's procedures, with the exception of the Operating Instructions, were reviewed annually by the operators during the requalification process. This annual review was not being documented in the procedures themselves nor on other paperwork that would indicate that a review had been completed and updates were made if needed. The inspector discussed the issue of annual or other periodic reviews of procedures and the

documentation thereof with licensee management. The licensee indicated that the procedure review process would be reviewed and changes made if necessary.

c. Conclusions

The procedures and procedure change process satisfied TS requirements.

9. Emergency Preparedness

a. Inspection Scope (IP 69011)

In order 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, and modified July 29, 2004
- NIST Reactor Area Inspection Log sheets, last revised July 2005
- EI Manual, Figure 6.3, "Emergency Organization Phone Numbers," dated November 28, 2004
- emergency response facilities, supplies, equipment, and instrumentation
- training records for 2004 - 2005
- 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 EI 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. It was noted that a table top exercise was scheduled for this fall (possibly October 2005). (A table top exercise, as opposed to a full scale exercise, was to be conducted because the County could not support a full scale exercise this year.)

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 by the Health Physics Group 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, in the Emergency Control Station, and in a cabinet near the Control Room, 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 licensee to review the agreement and to 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 if it were needed.

c. Conclusions

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

10. Exit Interview

The inspection scope and results were summarized on September 1, 2005, 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. Beasly, Reactor Supervisor/Senior Reactor Operator
D. Brown, Senior Health Physicist and Irradiation Subcommittee Chairman
H. Dilks, Reactor Supervisor/Senior Reactor Operator
E. Guarin, Senior Reactor Operator
J. Dura, Senior Scientist and Interim Beam Experiments Coordinator
P. Gallagher, Director, Center for Neutron Research
W. Mueller, Reactor Supervisor/Senior Reactor Operator
T. Myers, Chief, Reactor Operations
A. Toth, Reactor Supervisor/Senior Reactor Operator
W. Richards, Chief, Reactor Engineering
S. Weiss, Chief, Reactor Operations and Engineering
D. Wilkison, Reactor Supervisor/Senior Reactor Operator

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

None

LIST OF ACRONYMS USED

AP	Annunciator Procedure
AR	Administrative Rule
CFR	Code of Federal Regulations
ECN	Engineering Change Notice
EI	Emergency Instruction

E-Plan	Emergency Plan
FD	Fire Department
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
PD	Police Department
Rev.	Revision
SAC	Safety Audit Committee
SEC	Safety Evaluation Committee
SRO	Senior Reactor Operator
TS	Technical Specification