

November 6, 2014

Dr. Robert Dimeo, Director
NIST Center for Neutron Research
National Institute of Standards and Technology
U.S. Department of Commerce
100 Bureau Drive, Mail Stop 8561
Gaithersburg, MD 20899-8561

SUBJECT: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY – U.S. NUCLEAR
REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 50-
184/2014-203

Dear Dr. Dimeo:

On October 20 to 23, 2014, the U.S. Nuclear Regulatory Commission (NRC or the Commission) conducted an inspection at the National Institute of Standards and Technology Center for Neutron Research facility (Inspection Report No. 50-184/2014-203). The inspection included a review of activities authorized for your facility. The enclosed report documents the inspection results, which were discussed on October 23, 2014, with you, Sean O’Kelly, Chief, Reactor Operations and Engineering, Dan Hughes, Chief, Reactor Operations, and various other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission’s rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, “Public inspections, exemptions, and requests for withholding,” a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the NRC’s document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

R. Dimeo

- 2 -

Should you have any questions concerning this inspection, please contact Craig Bassett at (301) 466-4495 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA Plsaac for/

Kevin Hsueh, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

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

Enclosure:
NRC Inspection Report No. 50-184/2014-203

cc: See next page

National Institute of Standards and Technology

Docket No. 50-184

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Test, Research, and Training
Reactor Newsletter
University of Florida
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Gainesville, FL 32611

R. Dimeo

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DATE	11/05/2014	11/06/2014

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

Docket No: 50-184

License No: TR-5

Report No: 50-184/2014-203

Licensee: National Institute of Standards and Technology (NIST)

Facility: NIST Center for Neutron Research (NCNR)
NCNR National Bureau of Standards Reactor

Location: Gaithersburg, MD

Dates: October 20–23, 2014

Inspector: Craig Bassett

Accompanied by: Kevin Hsueh, Branch Chief, PROB
Eben Allen, NSPDP Rotational Assignee

Approved by: Kevin Hsueh, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

ENCLOSURE

EXECUTIVE SUMMARY

National Institute of Standards and Technology
Center for Neutron Research
National Bureau of Standards Reactor
NRC Inspection Report No. 50-184/2014-203

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the National Institute of Standards and Technology (the licensee's) Class I 20 megawatt test reactor facility safety program including: (1) organization and staffing, (2) review and audit and design change functions, (3) reactor operations, (4) operator requalification, (5) maintenance and surveillance, (6) fuel movement, (7) experiments, (8) procedures, and (9) emergency preparedness since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's safety program was acceptably directed toward the protection of public health and safety and was in compliance with NRC requirements. No violations or deviations were identified.

Organization and Staffing

- The organizational structure and supervisory qualifications were consistent with Technical Specification 6.1 requirements.
- Staffing levels at the facility 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

- Acceptable reactor operations were being conducted and the appropriate shift staffing was being maintained.
- Adequate shift turnover briefings were being conducted and each operating crew was appropriately cognizant of facility conditions.

Operator Requalification

- Operator requalification was being conducted and completed as required by the requalification program and the program was being maintained current.
- Physical examinations for the operators were being completed every 2 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 the facility's Technical Specifications.

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 procedure 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 various agencies as required.

REPORT DETAILS

Summary of Facility Status

The National Institute of Standards and Technology (NIST or the licensee) NIST Center for Neutron Research (NCNR) reactor, a 20 megawatt test reactor commonly known as the National Bureau of Standards Reactor (NBSR), continued to be operated in support of laboratory experiments and various types of research. During the inspection the reactor was not operated due to a routine maintenance shutdown that was in progress.

1. Organizational Functions and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69006)

To verify that the licensee was complying with the responsibilities, staffing, and training requirements specified in NBSR Technical Specification (TS) Section 6.1, "Organization," the inspector reviewed selected aspects of the following:

- Current NBSR organization and staffing
- NBSR Console Logbooks Nos. 148 through 151
- Qualifications of various management and supervisory personnel
- Execution of management and staff responsibilities outlined in the TS
- NBSR Administrative Rules (AR) 1.0, "Responsibilities of Operations Personnel," issued July 30, 2009
- NBSR AR 2.0, "Personnel Requirements," issued July 30, 2009
- NBSR Emergency Instruction (EI) 0.2, "Emergency Organization and Phone Numbers," issued July 25, 2104, listing emergency contact information for Reactor Operations personnel

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. 50-184/2013-202). Also, the organizational structure remained consistent with the requirements of TS Section 6.1 and Figure 6.1. In addition, the inspector 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.

In discussing staffing with management personnel, the inspector noted that there were 16 qualified senior reactor operators (SROs) at the facility who were either in management positions or assigned to various operating crews. It was also noted that there were three additional operator trainees who were assigned to one of the crews. Through interviews with operations personnel, the inspector determined that there were four operating crews at the facility who worked rotating shifts. Additionally, there was a fifth "day shift" crew that typically only worked during the weekdays, but also provided coverage on occasions when individuals from the other crews were unavailable. Each crew was typically

staffed with three or four individuals who were either trainees or licensed SROs as noted above.

Through a review of selected entries in the console logbooks for the period from January 2014 to the present and through interviews with operations personnel, the inspector verified that staffing during routine reactor operation was as required. It was also noted that a list of reactor facility personnel by name and telephone number was available to the reactor operators in the control room and was updated at least annually as required by TS Section 6.1.3. The list was last issued on July 23, 2014, and updated on October 14, 2014. Reactor operations staffing appeared to be adequate.

c. Conclusion

The organizational structure and supervisory qualifications were consistent with TS 6.1 requirements and the operations staffing level appeared to be adequate for the current level of operations.

2. Review and Audit and Design Change Functions

a. Inspection Scope (IP 69007)

The inspector reviewed the following to ensure that the requirements of TS Section 6.2, "Review and Audit," and Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, were being implemented effectively:

- Safety Evaluation Committee (SEC) meeting minutes for September 2013 through the present (Meeting Nos. 376 through 378)
- NBSR Procedure No. NBSR-0007-DOC-04, "Engineering Manual," Rev. 4 dated June 2009, which included procedures and instructions for completing changes at the facility
- 2013 reactor audit conducted in accordance with TS 6.2.4(1-4) by the NCNR Audit subcommittee of the SEC, dated September 31, 2013
- 2014 reactor audit conducted in accordance with TS 6.2.4(1-4) by the NCNR Audit Subcommittee of the SEC, conducted during September and October 2014, report not yet finalized
- "2013 Annual [Audit] Report of the Safety Assessment Committee," audit conducted during September 16-18, 2014, report not yet finalized
- NCNR Safety Evaluation Committee Charter, approval dated October 9, 2014
- NBSR Engineering Change Request/Engineering Change Notice (ECR/ECN) No. 835, "Prevent Contact in Emergency Power Breaker Logic," ECR Level II review, approval dated March 31, 2014, and ECN Level II review and approval dated April 16, 2014, (with the associated 50.59 Evaluation); implementation close out dated June 30, 2014
- NBSR ECR/ECN No. 849, "Cartridge Style Mechanical Seal for," ECR Level II review, approval dated June 5, 2014, and ECN Level II review

and approval dated July 8, 2014, (with the associated 50.59 Evaluation); implementation close out dated September 10, 2014

- Operations Report No. 65, "NBSR Annual Report," for the period from January 1, 2012, through December 31, 2012, issued March 28, 2013
- Operations Report No. 65, "NBSR Annual Report," for the period from January 1, 2013, through December 31, 2013, issued March 31, 2014

b. Observations and Findings

(1) Review and Audits Functions

The inspector reviewed the charter of the SEC required by the TS. It was noted that the charter delineated the committee's membership, organization, and responsibilities, as well as quorum and meeting requirements. The charter also authorized the formation of subcommittees to assist the SEC. Four subcommittees had been organized for that purpose including: 1) the Audit Subcommittee, 2) the Beam Experiment Subcommittee (BES), 3) the Irradiation Subcommittee, and 4) the Procedure Review Subcommittee. A charter had been developed for each subcommittee and the various charters had been reviewed and approved by the SEC.

Records of the meetings held by the SEC from September 2013 through the date of the inspection were reviewed. The meeting minutes showed that meetings were held at least semiannually as required by the SEC Charter and reviews of proposed changes and experiments were completed by the SEC or by 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.

A review of audit records indicated that the SEC Audit Subcommittee conducted an annual audit of the safety program at the facility in accordance with TS 6.2.4. The audits were reviewed by the full SEC and licensee management responded to the subcommittee's findings and recommendations and took corrective actions as needed.

Other records reviewed by the inspector showed that, as required by TS 6.2.5, an independent Safety Assessment Committee had conducted an annual audit. The 2013 audit was conducted by individuals who worked at other Research and Test Reactors in the United States including representatives from the University of Maryland, University of Missouri – Columbia, and Massachusetts Institute of Technology.

(2) Design Change Functions

The inspector reviewed selected requests for changes to the facility (i.e., changes to structures, systems, or components (SSCs)) that had been

proposed within the last 2 years. At NIST these change proposals were designated as Engineering Change Requests (ECRs). Each ECR 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. In order to track the change requests, they were numbered sequentially during the year. These were screened to determine whether or not a 10 CFR 50.59 review would be required. Based on the safety significance and the 10 CFR 50.59 screen results, the changes were classified as either Level I (Minor) or Level II (Major). All Level II ECRs required a 50.59 review which often resulted in the completion of a 50.59 evaluation.

Once an ECR was approved, indicating that the change project could move forward, an Engineering Change Notice (ECN) was developed which contained various sections. The sections detailed the design description, safety considerations and analysis, a safety evaluation, and the 10 CFR 50.59 screening criteria results.

A review of selected ECRs and ECNs demonstrated that changes were acceptably documented and reviewed in accordance with NRC requirements and the licensee's guidelines. It also indicated that the work and the required document revisions were being completed as necessary. 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), which would have required a license amendment from the NRC.

c. Conclusion

The SEC was meeting as required and reviewing the topics outlined in the TSs and an independent Safety Assessment Committee had conducted an annual audit as required. The licensee's design change program 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 Logbook Nos. 148 through 151
- Various NIST reactor control room log sheets
- Selected NIST reactor area inspection log sheets
- Shift supervisor's instructions and special log sheets
- NBSR Reactor Shift Supervisor Logbook Nos. 39 and 40

- Selected reactor operations shift turnover log notebook entries
- Associated reactor operations records from October 2013 to the present
- Gantt Chart for the 2014 October – November Shutdown
- NBSR AR 2.0, "Personnel Requirements," issued July 30, 2009
- NBSR AR 9.0, "Reactor Startup and Operation," issued July 30, 2009
- Selected NBSR Operating Instructions (OIs) (i.e., operating procedures)
- Facility "NBSR Annual Reports" for the past two years

b. Observations and Findings

The inspector was not able to observe reactor operations due to the maintenance shutdown that was in progress. However, a review of logs and related records indicated that, when the reactor was operated, operations were being conducted in accordance with facility procedures as required. The logs and records were clear and provided an indication of ongoing activities. The records demonstrated that shift staffing during reactor operation, as well as during maintenance periods, was being maintained as required by TS 6.1.3.

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 3.1 through 3.11 prior to startup. These verifications were being completed and recorded as required. The inspector noted that various other procedural requirements were also being met.

Through logbook review and through direct observation, the inspector also verified that shift turnover briefings were held prior to each shift change. In addition, it was noted that activities of the previous shift, and events or job evolutions scheduled for the upcoming shift, were discussed in detail. A status board was also maintained in the Control Room. The records kept and the briefings that were given ensured that the operators were aware of the current conditions in the facility and the status of any changes being made.

c. Conclusion

Acceptable shift staffing was being maintained. Adequate shift turnover was being conducted and each operating crew was cognizant of facility conditions.

4. Operator Requalification

a. Inspection Scope (IP 69003)

To verify compliance with the operator requalification program for the NBSR, which was last updated March 2009, the inspector reviewed:

- NBSR Console Logbooks Nos. 148 through 151
- Medical examination records from 2011 through 2014

- Current status of selected qualified operators' licenses
- NBSR requalification examinations (biennial) for 2012 and 2014
- NBSR 2014-2015 requalification program consisting of training provided in the areas of: reactor theory, radiation protection, emergency plan and actions, safety systems, physical security, reactor systems, and TS requirements
- Operator training records for the years 2012, 2013, and 2014 to date, documented on forms entitled, "Requalification Program Documentation Review and Reactivity Changes," no revision date
- Supervisor's annual operator evaluations documented on forms entitled, "Operator Evaluation," form revised November 2009

b. Observations and Findings

As mentioned previously, there were 16 qualified SROs employed at the facility, as well as three operator trainees. It was noted that one of the people in training would soon take the NRC operator qualification examination. Through a review of various requalification and training documents, the inspector verified that the SRO operators' licenses were current and records of the licensed operator's requalification status 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 verified that all operators had completed the requalification training and had taken the written biennial requalification examination. Additional training on various plant systems and industrial hygiene/safety was also provided. NBSR console logbooks and requalification records 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 confirmed that the operators had been given annual operating evaluations as required.

The inspector verified that the qualified operators were receiving a biennial physical examination as well.

c. Conclusion

Operator requalification was being conducted and completed as required by the licensee's requalification program. Physical examinations for the operators were being completed every 2 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 4, the inspector reviewed selected aspects of:

- NBSR Console Logbooks Nos. 148 through 151
- Reactor Technical Specification Log Book, Volume 2
- Selected TS surveillance schedules for each month for the period from January to October 2014, which indicated which surveillance activities were due for completion during that month
- Selected NIST reactor area inspection log sheets (completed every shift during routine operation) for the past 12 months
- Selected NIST reactor control room log sheets (data taken every hour during routine operation) for the past 12 months
- Selected NBSR Instrument Test Procedures and TS Procedures
- Facility "NBSR Annual Reports," for the past two years

b. Observations and Findings

(1) Maintenance Activities

During this inspection the reactor was in a maintenance shutdown and various activities were scheduled to be completed. However, due to scheduling conflicts, the inspector was only able to observe a limited number of maintenance activities including the trouble shooting of some of the electronics of the control panel in the Control Room. The inspector also reviewed various maintenance records, console logbooks, and data sheets which 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

The inspector also observed a limited number of surveillance activities which were being conducted including calibration of some monitors and attempts to calibrate a nuclear safety channel. In addition to the observations, the inspector reviewed various TS-required procedures used to conduct surveillances and calibrations. These procedures included checklists and tables for recording data which 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 the Chief of Reactor Operations, as well as by operations personnel. Tracking was done by means of the "TS Surveillance Schedule," which was updated as the tasks were completed and then revised, and a new surveillance schedule issued monthly. A review of the monthly surveillance schedules, console logbooks, and related data recorded on the appropriate forms indicated that the surveillances and calibrations were completed at the frequency specified in the TS and in

accordance with 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 TS or procedurally prescribed parameters.

c. Conclusion

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 TSs 3.9 and 5.3:

- NBSR Console Logbook Nos. 148 through 151
- NBSR Reactor Shift Supervisor Logbook Nos. 39 and 40
- Current core configuration, designated as Core No. 619
- Pool Log No. 3 and fuel transfer records from July 2013 to the present
- Core reload/refuel and core defuel/refuel verification and sign-off sheets for Core Nos. 614A and B through 619
- NBSR AR 6.0, "Refueling Operations," issued August 22, 2006
- NBSR Reference Procedure, Ref 62, "Reloading Fuel From Pool, with Known Shims and Known Core," last reviewed September 19, 2011

b. Observations and Findings

Licensee procedures and operator instructions provided approved methods to move and handle fuel consistent with the provisions of the TS and the licensee safety analysis. The inspector reviewed the core loading and fuel handling records for the most recent refueling cycles and found them to be complete and properly documented. Fuel movement, fuel loading/reloading, and fuel examination records 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. Conclusion

The licensee maintained and followed procedures which effectively implemented TS requirements for fuel handling.

7. Experiments

a. Inspection Scope (IP 69005)

To ensure that the requirements of TS 3.8, 4.8, and 6.5, and licensee's administrative procedures were being met governing the experimental program, the inspector reviewed selected aspects and/or portions of:

- Beam Experiment Subcommittee (BES) Report to the SEC dated September 19, 2014
- Experimental control procedures for various instruments located in the C 100 area and the guide hall
- Rabbit Request List maintained in the Control Room which contained the irradiation requests that have been authorized for the pneumatic system
- Experimental Proposal Approval Sheet, No. 495, "30m Small Angle Neutron Scattering (SANS) Instrument on NG-B_{upper}," approval dated May 20, 2014
- Experimental Proposal Approval Sheet, No. 498, "Determination of Evaporation/Condensation Coefficients for Evaporating Hydrogenated Cryogenic Propellants Using Neutron Imaging," approval dated September 10, 2014

b. Observations and Findings

Experiments at the NBSR included: 1) irradiation experiments and 2) beam experiments. Irradiation experiments were those conducted in a pneumatic tube or in any other NBSR irradiation facility inside the thermal shield. Beam experiments were ones which were conducted in or with experimental instruments outside the reactor thermal shield. Beam experiments were typically conducted in the C-100 area or the guide hall. For irradiation experiments, the reactivity worth and other criteria were delineated in the TS; no criteria were listed in the TS for beam experiments. Depending upon the type of experiment being proposed, either the Irradiation Subcommittee or the BES reviewed the experimental proposal as required and provided recommendations.

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 6.5 to include the beam port and guide hall experiments. The inspector interviewed the Chairman of the BES. He explained the procedure followed for experiment approval and discussed two recent experiments that were reviewed by his committee. The inspector reviewed the approval procedure and package for two beam experiments and noted that the BES and the facility's Hazards Review Committee had reviewed these experiments as well. The inspector verified that the beam experiment proposals were forwarded to the SEC for review and subsequently to the Director for approval. The inspector also noted that the approved beam experiment documentation required specific engineering and radiation protection controls that were required to be implemented to limit radiation exposure to personnel conducting the experiments.

c. Conclusion

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 6.4 were being met concerning written procedures:

- Procedure change, review, and approval process
- NBSR AR 5.0, "Procedures and Manuals," issued June 5, 2010
- NBSR-0005-CH-00, "Charter for the NCNR Safety Evaluation Committee Procedure Review Subcommittee," approval dated October 9, 2014
- SEC meeting minutes for September 2013 through the present (Meeting Nos. 376 through 378)
- Facility "NBSR Annual Reports," for the past two years

b. Observations and Findings

Written procedures for the activities listed in TS 6.4 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 reactor operations 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 of Reactor Operations, as specified in the TS.

The inspector noted that the licensee was continuing the process of reformatting all procedures so that they would all be in a standard format. Because this was a project that would take a great deal of time and effort to complete, the issue was identified in a previous report as an Inspector Follow-up Item (see Paragraph 10 below). During this inspection it was noted that an SEC subcommittee had been created to review the newly reformatted and revised procedures.

c. Conclusion

The procedure revision, control, and implementation program satisfied TS requirements.

9. Emergency Preparedness

a. Inspection Scope (IP 69011)

In order to verify compliance with the NBSR Emergency Plan (E-Plan) dated December 2008, the latest revision submitted May 17, 2012, the inspector reviewed selected aspects of:

- Emergency preparedness training records for 2013 and 2014
- Selected NIST reactor area inspection log sheets for the past 12 months
- Support provided by support groups (i.e., NIST Fire Department (FD), NIST Police Department (PD), and Montgomery County, Maryland)
- Records documenting annual evacuation drills and the latest biennial emergency exercise
- Documentation of inventories of emergency response supplies, equipment, and instrumentation
- Emergency Instruction (EI) Manual (containing the E-Plan implementing procedures)
- EI Procedure 0.2, "Emergency Organization Phone Numbers," latest revision/change dated July 25, 2014
- EI Procedure 0.3, "Emergency Classification and Criteria," latest revision/change dated December 10, 2012

b. Observations and Findings

The E-Plan in use at the reactor and support facilities was the same as the latest version submitted to the NRC. The E-Plan was being audited and reviewed biennially as required. It was noted that the emergency implementing procedures, contained in the Emergency Instruction Manual, were in the process of being updated and reformatted. The inspector verified that operators understood their duties in response to emergency conditions.

Records showed that radio communications with the NIST PD were checked weekly. Other communications capabilities were checked periodically and phone numbers for the various support organizations were verified annually, as stipulated in the TS. The inspector conducted an onsite tour of the licensee's Emergency Support Center and determined that communication equipment, radiological response supplies, and radiation detection equipment was functional.

The most recent biennial emergency exercise was conducted on December 11, 2012. A critique was held following the exercise to discuss the strengths and weaknesses identified and to develop possible solutions to any problems identified. The results of the exercise critiques were documented and filed. It was noted that, due to recent events at the facility, the next biennial emergency exercise was going to be composed of a series of Table Top exercises involving operations and health physics personnel. They were scheduled to be conducted in the next two months (November/December 2014 timeframe).

The most recent emergency drill was conducted on July 15, 2013. The inspector had the opportunity to observe that drill. It was challenging and provided good training for all the various NCNR responders and NIST support groups who were involved. A critique was held following the drill to discuss those things that were

done well and how to correct the problems identified. The inspector was able to participate in the current emergency evacuation drill which occurred on Tuesday during the inspection. Everyone evacuated the facility in a timely manner but some areas for improvement were noted such as ensuring that doors were closed as people left their areas.

Emergency preparedness and response training for NBSR personnel was being completed as required. This was accomplished through the initial training for incoming personnel and the refresher training provided for all NCNR employees. The licensee's health physics group conducted biennial emergency response training for the NIST FD and PD, as well. The inspector verified that the last training for these groups had been conducted during June and July 2014.

The inspector reviewed the results of selected emergency equipment inventories required by Section 8.5 of the E-Plan. It was noted that the emergency equipment in the lockers located in the A-wing front lobby/break area, in Basement Level 2, and in the C-200 area had been inventoried more frequently than required.

The inspector verified that the agreement with the Walter Reed National Military Medical Center for medical support in case of an emergency, originally signed December 22, 1983, remained in effect and was acceptable. It was noted that other hospitals in the vicinity of NIST were also equipped to handle emergencies involving a contaminated injured person if needed.

On Wednesday during the inspection, the inspector, the NCNR Chief, Reactor Operations, and a representative from the NIST Fire Department visited the Montgomery County Emergency Communications Center. It was noted that, if there were a large scale emergency at the reactor facility, or anywhere on the NIST campus, Montgomery County would probably become involved. The inspector noted that the Montgomery County Emergency Communications Center appeared to be more than capable of handling and coordinating support for any type of emergency that might occur at NIST/NCNR. Through observation of the Communications Center, it was apparent that the facility had the ability to direct extensive resources toward a problem. It was noted that there was a good working relationship between NIST and the County personnel.

c. Conclusion

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

10. Follow-up on Previously Identified Items

a. Inspection Scope (IP 92701)

The inspector reviewed the actions taken by the licensee to address a previously identified Inspector Follow-up Item (IFI) concerning facility procedures.

b. Observation and Findings

During the procedure review in December 2013, the inspector noted that the licensee was in the process of reformatting all procedures so that they would all be in a standard format. Once this was completed the licensee planned to conduct a review of each procedure and ensure that it was correct, reflected current practice, and was in accordance with the TS. This was identified by the NRC as an Inspector Follow-up Item (IFI).

During this inspection the inspector reviewed the progress made by the licensee regarding reformatting their procedures and incorporating the appropriate changes as needed. The inspector found that many of the Emergency Instructions had been revised but were in the process of being reviewed and approved. Several of the type of procedures referred to by the licensee as "Technical Specification Procedures" had also been revised. The inspector reviewed selected procedures and found that, in one instance, the revised procedure still contained an inappropriate reference. The licensee acknowledged this and indicated that the revision process was a "work in progress." It was agreed that more care would be given to conducting a proper review.

c. Conclusions

One IFI was reviewed. This issue remains open.

11. Exit Interview

The inspection scope and results were summarized on October 223, 2014, with members of licensee management. The inspector described the areas inspected and discussed the inspection findings. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

P. Brand	Chief, Reactor Engineering and Chair, Hazards Review Committee
F. Clark	Reactor Supervisor/Senior Reactor Operator
R. Dimeo	Director, NIST Center for Neutron Research
D. Hughes	Chief, Reactor Operations
R. Ibberson	Chair of the Beam Experiment Subcommittee
S. O'Kelly	Chief, Reactor Operations and Engineering
R. Strader	Quality Assurance Program Manager
R. Sprow	Reactor Supervisor/Senior Reactor Operator
D. Wilkison	Reactor Supervisor/Senior Reactor Operator

Other Personnel

W. Denell	Firefighter, Fire Protection Group, Emergency Services Division, Office of Facilities and Property Management, NIST
M. Strausbough	Computer Aided Dispatch (CAD) Manager, Montgomery County Emergency Communications Center, Montgomery County, Maryland

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
IP 92701	Follow-up on Open Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Discussed

50-184/2013-202-01	IFI	Follow-up on the licensee's actions to reformat existing procedures, review and revise the procedures, and develop written guidance on procedure writing and revision.
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Closed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Document Access Management System
AR	Administrative Rule
BES	Beam Experiment Subcommittee
ECN	Engineering Change Notice
ECR	Engineering Change Request
EI	Emergency Instruction
E-Plan	Emergency Plan
FD	Fire Department
IP	Inspection Procedure
IR	Inspection Report
NBSR	National Bureau of Standards Reactor
NCNR	NIST Center for Neutron Research
NIST	National Institute of Standards and Technology
NRC	U.S. Nuclear Regulatory Commission
OI	Operating Instruction
PD	Police Department
SEC	Safety Evaluation Committee
SRO	Senior Reactor Operator
SSC	Structures, Systems, and Components
TS	Technical Specification