

December 18, 2007

Dr. Eva J. Pell
Vice President for Research
Dean of the Graduate School
The Pennsylvania State University
304 Old Main
University Park, PA 16802-1504

SUBJECT: PENNSYLVANIA STATE UNIVERSITY - NRC NON-ROUTINE INSPECTION
REPORT NO. 50-5/2007-203

Dear Dr. Pell:

This letter refers to the inspection conducted on October 9-12, 16-19, and November 14-15, and 27, 2007, at the Pennsylvania State University Breazeale Research Reactor facility. The inspection included a review of activities authorized for your facility. The enclosed report presents the results of this inspection.

The inspection examined pool leakage identification and repair 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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Mr. Kevin M. Witt at 301-415-4075.

Sincerely,

/RA/

Johnny Eads, Branch Chief
Research and Test Reactors Branch B
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-5
License No. R-2

Enclosure: NRC Inspection Report No. 50-5/2007-203

cc w/encl. Please see next page

Pennsylvania State University

Docket No. 50-5

cc:

Mr. Eric J. Boeldt, Manager of
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Director, Bureau of Radiation Protection
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Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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ACCESSION NO.: ML073480163 TEMPLATE #: NRR-106

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DATE	12/17/07	12/17/07	12/17/07

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

Docket No: 50-5

License No: R-2

Report No: 50-5/2007-203

Licensee: Pennsylvania State University

Facility: Breazeale Research Reactor Facility

Location: State College, Pennsylvania

Dates: October 9-12, 16-19, and November 14-15, and 27, 2007

Inspectors: Kevin M. Witt
Johnny Eads

Approved by: Johnny Eads, Branch Chief
Research and Test Reactors Branch B
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Pennsylvania State University
Breazeale Research Reactor Facility
Inspection Report No. 50-5/2007-203

The primary focus of this non-routine, announced inspection was the on-site review of selected aspects and activities of the licensee's response to a minor leak of slightly radioactive water from the reactor pool including: observation of pool leakage identification and repair activities, operations logs and records, procedures, surveillance and limiting conditions for operations, health physics, committees, audits and reviews, maintenance logs and records, and fuel handling logs and records.

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

Observation of Pool Leakage Identification and Repair Activities

- During the course of the reactor pool water leakage incident, the inspector verified that the licensee was meeting all of the applicable requirements to ensure the public health and safety and the protection of the environment.

Operations Logs and Records

- Operational activities were consistent with applicable Technical Specification and procedural requirements.

Procedures

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

Surveillance and Limiting Conditions for Operations

- The licensee's program for completing surveillance inspections satisfied Technical Specification and licensee administrative controls.

Health Physics

- Surveys were being completed and documented as required
- Postings met regulatory requirements
- Radiation monitoring equipment was being maintained and calibrated as required
- The Radiation Protection Program satisfied regulatory requirements
- The radiation protection training program was being administered as required
- Environmental monitoring satisfied license and regulatory requirements.

Committees, Audits and Reviews

- Review and oversight functions required by the TSs were acceptably completed by the Reactor Safeguards Committee.

Maintenance Logs and Records

- Maintenance logs, records, and performance satisfied Technical Specification and procedure requirements.

Fuel Handling Logs and Records

- Fuel handling activities were completed and documented as required by Technical Specification and facility procedures.

REPORT DETAILS

Summary of Plant Status

The licensee's 1 Megawatt (MW) Training, Research, and Isotope Production, General Atomics (TRIGA) research reactor at the Pennsylvania State University (PSU) has been operated in support of experiments, reactor operator training, and periodic equipment surveillances. On October 9, 2007, the licensee called the NRC Operations Center to voluntarily report a minor leak of slightly radioactive water from the reactor pool. While the reactor was out of service, the licensee unsuccessfully tried several techniques to find the source of the leak and in the end recoated the entire surface of the pool. The licensee returned the reactor back to normal service on November 27, 2007.

1. Observation of Pool Leakage Identification and Repair Activities

a. Inspection Scope (Inspection Procedure [IP] 69001)

The inspector reviewed selected portions of the following to ensure that the licensee was following all appropriate requirements:

- Technical Specifications (TSs) for the Penn State Breazeale Reactor (PSBR), Amendment No. 37, dated October 14, 2004
- Reactor Safeguards Committee (RSC) meeting minutes
- Auxiliary Operating Procedure (AOP) -4, "Daily Smear Procedure," Revision (Rev.) 6, dated June 15, 2006
- Administrative Procedure (AP) -4, "Identification, Evaluation, and Documentation of Safety System Failures, Abnormal Events, and Operational Events," Rev. 3, dated May 18, 2004
- AP-6, "Penn State Reactor Safeguards Committee Charter and Operating Procedure," Rev. 4, dated April 20, 2006
- AP-10, "Tag-Out Procedure," Rev. 5, dated July 27, 2006
- AP-12, "Change," Rev. 4, dated October 14, 2005
- AP-13, "Maintenance/Repair," Rev. 4, dated September 6, 2004
- AP-17, "RWP Procedure," Rev. 3, dated March 7, 2005
- Emergency Procedure (EP) -4, "Loss of Pool Water," Rev. 2, dated December 13, 2004
- Master Procedure, "October 2007 Reactor Pool Drain to Repair Slow Leak," Rev. 0, dated October 15, 2007
- Master Procedure, "Reactor South Pool Fill and North Pool Drain," Rev. 0, dated November 13, 2007
- Standard Operating Procedure (SOP) -2, "Daily Checkout Procedure," Rev. 18, dated March 7, 2007
- SOP-3 "Core Loading and Fuel Handling," Rev. 3, dated April 18, 2005
- Special Procedure (SP) -2, "Reactor Pool – Pool Water Storage Tank Transfer," Rev. 3
- Completed AP-12 Form #2007-03 entitled, "Movement of Reactor Fuel and Fuel Racks to the South Pool," dated November 5, 2007
- Completed AP-12 Form #2007-04 entitled, "Demineralizer Modification," dated November 8, 2007

- Completed AP-13 Form entitled, "Clean console, check computers, etc., blue powder from spraying," dated November 14, 2007
- Completed AP-17 Form #07-01 entitled, "Drain South Side of Reactor Pool to the Primary Water Storage Tank in Accordance with Procedure SP-2," dated October 15, 2007
- Completed SOP-2, Page A-2 Forms, "PSBR Water Data," dated from October 1, 2007 to present
- PSBR Annual Operating Report for July 1, 2006 through June 30, 2007

b. Observations and Findings

Chronology of Events:

October 9, 2007

The licensee was completing the daily reactor checkout form when the operator noted that there was an unusual amount of water being lost from the reactor pool. The licensee normally expects a certain amount of water to be lost through evaporation, but the operator on duty noted that the water loss was significantly higher than normal. The licensee immediately notified the State of Pennsylvania Department of Environmental Protection. The licensee also decided to provide a courtesy notification to the NRC, although there are no requirements to do so. The NRC Operations Center received a call from the licensee and an event report was generated (NRC event number 43704):

"Pennsylvania State University Operations personnel noticed increased makeup at the Breazeale TRIGA reactor, an open pool reactor. At 1600, the leak rate was measured at approximately ten gallons per hour. The Pennsylvania Department of Environmental Health was notified of the probable leak to the environment (possibly to the ground around the containment pool). The licensee has not reached any required reporting criteria."

NRC Inspector Kevin Witt was dispatched to the reactor facility.

October 10, 2007

The inspector's initial observation of conditions at the facility indicated no immediate threat to public health and safety. The inspector verified the licensee's description of the situation was accurate. The inspector conducted a walk around of the reactor facility and did not observe any noticeable locations of water leakage. The licensee noted that the leak rate was approximately 10 gallons per hour (gph), including evaporation. PSU staff immediately conducted borescope observations of the pool drain lines and did not observe any unusual conditions. A borescope is an optical device consisting of a rigid or flexible tube with an eyepiece on one end, an objective lens on the other linked together by a relay optical system in between. PSU staff from the PSU Applied Research Laboratory also conducted a hydrophone test to determine if the leak location can be heard. The test results indicated that the leak was too small to hear. The inspector reviewed the latest radiation measurements of the pool water and determined that the water from the pool being released to the environment is less than the applicable limits in 10 CFR 20 Appendix B.

October 11, 2007

The licensee noted that the leak rate had increased to approximately 12 gph, including evaporation. The licensee discussed the need for environmental monitoring and decided to sample a nearby water well for overall area water quality. The inspector later verified that the results obtained indicated no abnormal radiation levels. The licensee utilized an underwater camera to search the pool surfaces for any indication of a leak. Several locations with cracks were identified; however the depth and severity of the wall cracks could not be determined without further evaluation. The licensee utilized a plastic bag to search for potential locations of leak paths. The licensee did not observe any noticeable fluctuations in the plastic bag and determined it was too difficult to distinguish random movements from any flow path that may result from a small leak.

October 12, 2007

The licensee noted that the current leak rate had increased to approximately 14 gph, including evaporation. The licensee decided that the next step to identify the leak was to drain half of the reactor pool and conduct visual examinations. The process to drain half of the pool takes approximately 3 days, and involves moving the reactor and all movable radioactive materials to the other half of the pool. After confirming the licensee had adequate procedures and an effective radiological protection program, NRC Inspector Kevin Witt left the reactor facility.

October 15, 2007

The licensee noted that the current leak rate had increased to approximately 17 gph, including evaporation. The licensee continued to move materials to prepare for the draining of the south half of the pool.

October 16, 2007

NRC Inspector Kevin Witt arrived on site to continue the inspection of pool leakage activities. The inspector reviewed the plans for the draining of the pool and all applicable procedures and checklists. The inspector noted that the procedures ensured the safety of the reactor and kept all radiation exposures as low as reasonably achievable (ALARA). The inspector reviewed the safety training for workers entering the drained half of the pool. The inspector verified that the training provided the staff with appropriate fall protection measures while using an aluminum ladder to ingress and egress out of the reactor pool.

October 17, 2007

NRC Branch Chief Johnny Eads arrived on site to assist with the inspection. The licensee initiated the pool drain and the inspectors verified that all procedures were followed and the process was completed in a safe manner. The inspectors observed that the licensee communicated to the staff the importance of following appropriate safety measures and all regulatory requirements. The inspectors conducted a walk around of all pool water handling systems and verified that all systems had operated properly. The licensee received a delivery of purified water from a local power station purified water system. The inspectors verified that the licensee measured the conductivity and pH of the delivered water to ensure that the water quality was in accordance with the TS requirements. The licensee health physics technician conducted a survey of the pool area in full anti-contamination gear and noted the general condition of the pool surface was relatively free of defects. The inspectors verified that the entry was made in a safe manner and was conducted in accordance with ALARA

principles. Based on the results of the survey, the licensee classified the bottom of the pool as a "High Radiation Area."

October 18, 2007

The licensee noted that the leak rate from the north side of the pool was approximately 8 gph, including evaporation. The inspectors reviewed the records and procedures for makeup water to the north side of the pool and confirmed that the licensee was following all of the requirements. NRC Inspector Kevin Witt left the reactor facility.

October 19, 2007

The licensee designed a radiation shielding device for the experimental facilities permanently attached to the floor of the south side of the pool. The inspector reviewed the design and placement of the shield and verified that the shield kept doses ALARA. NRC Branch Chief Johnny Eads left the reactor facility.

October 22, 2007

The licensee noted that the leak rate from the north side of the pool had increased to approximately 13 gph, including evaporation. The licensee halted further work on pool leakage detection and repair for an interim period so that the staff can provide attention to obtaining a contractor to recoat the entire pool surface.

October 24, 2007

The licensee noted that the leak rate from the north side of the pool had increased to approximately 17 gph, including evaporation.

November 1, 2007

The licensee noted that the leak rate had not changed from the previous value. The licensee investigated a detection technique utilizing micro-gravity measurements. The licensee did not receive any indications of possible leak locations with this tool. The licensee arranged for a contractor to inject a sealant into the pool wall, where there has always been noted leakage between the two halves of the pool.

November 5, 2007

The licensee noted that the leak rate from the north side of the pool had decreased to approximately 3 gph, including evaporation. The licensee stated that the leakage rate is very close to expected values due solely to evaporation. The licensee concluded that a major release pathway was through the pool divider wall and was sealed by the foam resin injected on November 1. The licensee arranged for another contractor to conduct work at the facility including hydro-lazing (high pressure water cleaning) which removes pool wall and floor surface material as well as deteriorated concrete and sealer, concrete remediation, and resealing (surface coating with an impermeable barrier). From the recoating operation, the hydro-lazing waste water was pumped out of the pool into 55 gallon drums. The debris was settled in the drums and subsequently piped to the evaporator waste tank. During the transfer of the waste water from the drums to the waste tank, the licensee noted that the material was not arriving at the expected destination. The licensee determined that the pipes were not connected correctly and the waste water had been released to the environment. The inspector verified that the licensee took radiation measurements of the waste water, which were below the applicable regulatory limits on effluents and determined that the licensee took the appropriate steps to correct the situation.

November 8, 2007

The licensee noted that the leak rate from the north side of the pool had increased to approximately 6 gph, including evaporation.

November 13, 2007

The licensee stated that the recoating of the south pool was finished. The licensee refilled the pool to normal levels and removed the gate separating the north and south pools. The licensee did not observe any indications of problems with the coating of the pool surfaces and verified that the pool water level was stable.

November 14, 2007

NRC Inspector Kevin Witt arrived on site to continue the inspection of pool leakage activities. The licensee initiated movement of all reactor equipment from the north side of the pool to the south side of the pool. The licensee also installed temporary fuel racks on the south side of the pool to accommodate the fuel that is normally stored in the north pool. The licensee subsequently moved all fuel from the north to the south pool. The inspector verified that the licensee did not move any fuel into or out of the reactor core. The inspector reviewed the fuel movement procedures and records and verified that all of the requirements were being followed.

November 16, 2007

The licensee completed movement of all materials and the reactor core from the north pool to the south pool. The licensee drained the north pool and started to prepare for remediation and repair efforts similar to what was performed in the south pool. NRC Inspector Kevin Witt left the reactor facility.

November 19, 2007

The licensee estimated that the pool leakage was reduced to levels close to the evaporation rate. The licensee stated that the recoating of the north pool was finished. The licensee refilled the north pool and verified that the short term pool water level was steady.

November 21, 2007

The licensee did not provide an estimate of the leakage rate due to the temperature variations from storing the water outside and bringing it inside, as well as replacing all of the materials that were removed from the pool. The licensee stated that all of the surveillance checks were completed as required and the reactor is almost ready for operation.

November 27, 2007

The licensee stated that all surveillance and test measurements were acceptable and as expected. The licensee noted that the most recent water level measurements indicate minimal water loss from the pool, as much as could be expected due to evaporation. The Director cleared the reactor for return to normal operations on November 24. The reactor was operated for experiments on November 24 and 25. On November 27, educational and research reactor operations as well as service work were resumed on an extended schedule.

c. Conclusions

During the course of the reactor pool water leakage incident, the inspector verified that the licensee was meeting all of the applicable requirements to ensure the public health and safety and the protection of the environment.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to ensure that the operations program was being implemented as required in TS Sections 3, 4, and 6:

- Reactor Logbooks and associated entries
- Operating forms and documentation
- RSC meeting minutes

b. Observations and Findings

The inspector verified that reactor operating characteristics related to the pool leakage incident, and other TS and procedure required entries, were recorded in the operations logbook. A review of the logs indicated that TS operational limits had not been exceeded. The information required for the daily checkout and the shutdown checklist were completed as appropriate. Operations records confirmed that shift staffing met the minimum requirements for duty personnel. The inspector determined that reactor recovery operations were carried out following written procedures and TS requirements. The inspector noted that the licensed operators on duty were knowledgeable and competent. Observation of operational activities with regard to the pool leakage incident also confirmed that operations were carried out in accordance with written procedures and TS requirements.

c. Conclusions

Operational activities were consistent with applicable TS and procedural requirements.

3. Procedures

a. Inspection Scope (IP 69001)

To verify that facility procedures were being reviewed, revised, and implemented as required by TS Section 6.3, the inspector reviewed selected aspects of:

- administrative controls
- procedural implementation
- selected administrative and operations procedures
- records of changes and temporary deviations to procedures

b. Observations and Findings

Procedures had been formulated for the safe operation of the reactor and associated equipment during the pool leakage incident. Records showed that procedures for potential malfunctions (e.g., radioactive releases and contaminations, and abnormal events) had also been developed and were used accordingly during this event. Training of personnel on procedures and changes was acceptable. Through observation of various activities at the facility, including surveillance activities and fuel movements, the inspector determined that licensee personnel conducted activities in accordance with applicable procedures.

c. Conclusions

The procedural review, revision, and implementation program satisfied TS requirements.

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the surveillance requirements and limiting conditions for operation (LCOs) specified in TS Section 4.0 were met:

- Surveillance forms and documentation
- RSC meeting minutes

b. Observations and Findings

The inspector noted that daily, monthly, semiannual, and annual channel checks, tests, and/or calibrations for TS-required surveillance were completed as required during the pool leakage incident. The LCO verifications were completed on schedule and in accordance with licensee procedures. All of the recorded results were within the TS and procedurally prescribed parameters. The records and logs were noted to be complete and were being maintained as required.

c. Conclusions

The licensee's program for completing surveillance inspections satisfied TS and licensee administrative controls.

5. Health Physics

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Parts 19 and 20, and the applicable TS requirements:

- radiological signs and posting in various areas of the facility
- facility and equipment during tours
- maintenance and calibration of radiation monitoring equipment
- organization and staffing

- radiological signs and posting
- facility monthly, annual, and other periodic contamination and area radiation surveys for the pool leakage incident from October 1, 2007 to present
- monthly pool water Tritium analyses from October 1, 2007 to present

b. Observations and Findings

(1) Surveys

The inspector reviewed radiation and contamination surveys of the reactor building during the pool leakage incident, which were conducted by radiation protection office (RPO) personnel. The results were documented on the appropriate forms, evaluated as required and corrective actions taken when readings or results exceeded set action levels. The number and location of survey points was adequate to characterize the radiological conditions. The licensee always investigates readings above background levels and ensures that the area is decontaminated. The inspector verified that the Radiation Safety Officer (RSO) reviews all of the survey records. Some elevated readings were discovered in places that are to be expected such as the booties from an entry to the bottom of the reactor pool. The licensee took prompt corrective action to reduce the levels of contamination in the discovered areas.

(2) Postings and Notices

The inspector reviewed the postings required by 10 CFR Part 19 at the entrances to various controlled areas including the Reactor Bay, and radioactive material storage areas. The postings were acceptable and indicated the radiation and contamination hazards present. The facility's radioactive material storage areas were found to be properly posted. No unmarked radioactive material was found in the facility.

(3) Radiation Monitoring Equipment

The inspector reviewed the use of the radiation monitoring equipment during the pool leakage incident and found that all of the equipment was being used properly. The calibration records of portable survey meters, friskers, fixed radiation detectors, and air monitoring equipment in use at the facility were reviewed and were completed as required.

(4) Radiation Protection Program

The licensee's Radiation Protection Program (RPP) was established through the procedures. The RPP provides guidance for keeping doses ALARA and is consistent with the guidance in 10 CFR Part 20. The inspector verified that the RPP was being implemented appropriately. The RPP requires that all visitors to the facility have proper training to ensure their safety around radioactive materials. The inspector reviewed the training records and verified that the program was effective in ensuring the wellbeing of visitors.

(5) Facility Tour

The inspector toured the reactor facility, the radiation detector calibration room and accompanying facilities. Control of radioactive material and control of access to

radiation and high radiation areas were observed to be acceptable. The postings and signs for these areas were appropriate. Licensee personnel followed the indicated precautions for access to controlled areas.

(6) Environmental Monitoring

The inspector reviewed the radiation measurements of the water being released into the ground and any other liquid waste that had been released during the course of the pool leakage incident. Records show that there was minimal radiation released to the environment during the pool leakage incident. Dose calculations show that exposures to the public were negligible and well below the regulatory limits. The licensee indicated that there were no solid or gaseous radioactive effluents from the facility during the incident.

c. Conclusions

The inspector determined that: (1) surveys were being completed and documented as required, (2) postings met regulatory requirements, (3) radiation monitoring equipment was being maintained and calibrated as required, (4) the RPP satisfied regulatory requirements, (5) the radiation protection training program was being administered as required, and (6) environmental monitoring satisfied license and regulatory requirements.

6. Committees, Audits and Reviews

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the requirements stipulated in TS Section 6.2 were being completed by the RSC:

- safety review records
- responses to the review and audit reports
- PSBR RSC Member List
- RSC meeting minutes

b. Observations and Findings

The RSC is defined in the TSs and the inspector verified that the committee was following all aspects of the requirements during the pool leakage incident. The RSC had discussions via email during the pool leakage incident and the RSC Chairman visited the facility on a regular basis. Review of the minutes indicated the RSC provided guidance, direction and oversight, and ensured safe use of the reactor facility during the pool leakage incident. The minutes provided an acceptable record of RSC review functions and of their safety oversight of reactor operations.

c. Conclusions

Review and oversight functions required by the TSs were acceptably completed by the RSC.

7. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To verify that the licensee was complying with the applicable regulations, the inspector reviewed selected aspects of:

- Maintenance forms and documentation
- RSC meeting minutes

b. Observations and Findings

The inspector reviewed the maintenance records related to the pool leakage incident maintenance activities. This maintenance was controlled and documented on facility maintenance forms. These documents indicated that all maintenance activities were controlled and documented in accordance with the requirements in 10 CFR 50.59.

All maintenance of reactor systems were reviewed by the associate director and/or the facility director. Implementation of changes to equipment, systems, tests, or experiments are generally done by the staff at the facility. After all maintenance items are completed, system operational checks are performed to ensure the affected systems function before returning them to service.

c. Conclusions

Maintenance logs, records, and performance satisfied TS and procedure requirements.

8. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

To verify that TS and procedural requirements were being met, the inspector reviewed selected aspects of:

- fuel examination records
- fuel handling equipment and instrumentation

b. Observations and Findings

The inspector determined that the licensee was maintaining the required records of the various fuel movements that had been completed during the pool leakage incident and verified that the movements were conducted and recorded in compliance with procedure. All fuel movements were noted in the Operating Logbook. Data recorded for fuel handling was clear and cross-referenced in the fuel movement records and the core map. The licensee is currently using core loading #52. Log entries clearly identified, as required by procedure, that a minimum of two persons were present when fuel was being moved. The inspector determined that the procedures and the controls specified for these operations were acceptable.

c. Conclusions

Fuel handling activities were completed and documented as required by TS and facility procedures.

9. Exit Interview

The inspector presented the inspection results to licensee management at the conclusion of the inspection on November 2, 2007. Subsequent conversations with the licensee continued until the licensee declared the reactor to be operational on November 27. The inspector described the areas inspected and discussed in detail the inspection observations. No dissenting comments were received from the licensee. 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.

KEY POINTS OF CONTACT

Licensee Personnel

E. Boeldt, Manager, Radiation Protection
M. Bryan, Research Engineer
L. Burton, Associate Dean of Engineering
M. Claver, Director, Environmental Health and Safety
C. Davison, Research and Education Specialist
B. Heidrich, Senior Research Assistant
M. Linzey, Associate Radiation Safety Officer
M. Morlang, Research Engineer
E. Pell, Vice President for Research and Dean of the Graduate School
A. Portanova, Reactor Operations Engineer
F. Sears, Director, Radiation Science & Engineering Center
M. Trump, Associate Director for Operations

Other Personnel

A. Barnard, Research Assistant, PSU Applied Research Laboratory
G. Meyer, Associate Research Engineer, PSU Applied Research Laboratory
L. Powers, PSU Public Relations Director

INSPECTION PROCEDURES USED

IP 69001 CLASS II NON-POWER REACTORS

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
AOP	Auxiliary Operating Procedure
AP	Administrative Procedure
CFR	Code of Federal Regulations
EP	Emergency Procedure
GPH	Gallons per Hour
IP	Inspection Procedure
LCO	Limiting Conditions for Operation

MW	Megawatt
NRC	Nuclear Regulatory Commission
PSBR	Pennsylvania State Breazeale Reactor
PSU	Pennsylvania State University
Rev.	Revision
RPO	Radiation Protection Office
RPP	Radiation Protection Program
RSC	Reactor Safeguards Committee
RSO	Radiation Safety Officer
SOP	Standard Operating Procedure
SP	Special Procedure
TS	Technical Specification
TRIGA	Training, Research, and Isotope Production, General Atomics