June 20, 2008

Mr. Jere Jenkins, Director
Purdue University Radiation Laboratory
School of Nuclear Engineering
400 Central Drive
West Lafayette, IN 47904-2017

SUBJECT: NRC INSPECTION REPORT NO. 50-182/2008-201

Dear Mr. Jenkins:

This letter refers to the inspection conducted on June 2 through 5, 2008, at your Purdue University Reactor (PUR-1). 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 concern or noncompliance of Nuclear Regulatory Commission (NRC) requirements was 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 Agencywide Document Access 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).

Should you have any questions concerning this inspection, please contact Marcus Voth at 301-415-1210.

Sincerely,

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

Docket No. 50-182
License No. R-87

Enclosure: As stated

cc w/ enclosure:
See next page

cc:

Mayor
City of West Lafayette
609 W. Navajo
West Lafayette, IN 47906

John H. Ruyack, Manager
Epidemiology Res Center/Indoor & Radiological Health
Indiana Department of Health
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Howard W. Cundiff, P.E., Director
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Indiana State Department of Health
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Mr. Ed Merritt
Reactor Supervisor
Department of Nuclear Engineering
Purdue University
West Lafayette, IN 47907

Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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

Docket No:	50-182
License No:	R-87
Report No:	50-182/2008-201
Licensee:	Purdue University
Facility:	Purdue University Reactor (PUR-1)
Location:	West Lafayette, IN
Dates:	June 2 through 5, 2008
Inspectors:	Marcus H. Voth, Lead Gregory M. Schoenebeck
Approved by:	Johnny H. Eads, Branch Chief Research and Test Reactors Branch B Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Purdue University
Purdue University Reactor (PUR-1)
NRC Inspection Report No. 50-182/2008-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the licensee's Class II research reactor facility safety programs including organization and staffing; operations logs and records; procedures; requalification training; surveillance and limiting conditions for operation; experiments; health physics; effluent and environmental monitoring; design changes; committees, audits and reviews; emergency planning; maintenance logs and records; fuel handling logs and records; transportation; and follow-up on previously identified items since the last NRC inspection of these areas. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Organization and Staffing

- The licensee's organization and staffing was in compliance with the requirements specified in the Technical Specifications.

Operations Logs and Records

- Within the scope of this review, the licensee's operations record keeping program conformed to Technical Specification requirements.

Procedures

- The inspectors found that appropriate procedures were in effect, new procedures were being prepared as needed, and dated procedures were being updated as necessary.

Requalification Training

- Current operator requalification was conducted as required by the Requalification Program. Two outstanding legacy issues were closed.

Surveillance and Limiting Conditions for Operation

- Surveillance was observed to be performed in accordance with requirements as stated in the Technical Specifications.

Experiments

- No new experiments were requested but procedures existed to review them pursuant to Technical Specification requirements should one be requested.

Health Physics

- The inspectors verified that the licensee's health physics program was effective in minimizing radiation doses to individuals through training, notices to workers, radiation monitoring and surveys, and calibrated equipment.

Effluent and Environmental Monitoring

- Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory limits.

Design Changes

- No new changes, tests, or experiments subject to 10 CFR Part 50.59 reporting were performed.

Committees, Audits and Reviews

- The Committee on Reactor Operations provided the oversight required by the Technical Specifications.

Emergency Planning

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

Maintenance Logs and Records

- The licensee maintained records documenting principal maintenance activities.

Fuel Handling Logs and Records

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

Transportation

- The activities involving the shipment of highly enriched uranium fuel observed by the inspectors were found to be in compliance with regulatory requirements.

REPORT DETAILS

Summary of Facility Status

The Purdue University Reactor, PUR-1, continued to be operated in support of graduate and undergraduate education and laboratory instruction. Since the previous inspection the reactor was refueled with a newly licensed low enriched uranium (LEU) fuel type which replaced the original highly enriched reactor (HEU) fuel. The HEU fuel was shipped from the site. The inspection placed special emphasis on these activities because of their uniqueness relative to normal operations of a research reactor.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69001 and IP 92701)

The inspectors reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Section 6.1 of the licensee's Technical Specifications (TS), Amendment No. 12 to License No. R-87, dated August 9, 2007, were being met:

- organizational structure
- staffing requirements
- "Report on Reactor Operations for the Period January 1, 2007, to December 31, 2007," E. Merritt, March 2008
- Reactor Logbook No. 45, July 20, 2007 to September 25, 2007
- Reactor Logbook No. 46, September 25, 2007 to November 28, 2007
- Reactor Logbook No. 47, November 28, 2007 to present
- File of completed Pre-start Checklists including those for 2007 and 2008
- Committee on Reactor Operations (CORO) Meeting Minutes, January 22, 2007

b. Observations and Findings

Through discussions with licensee representatives, the inspectors determined that the management structure at the facility had not changed since the previous NRC inspection. The reactor staff consisted of three individuals, all of whom maintained NRC Senior Reactor Operator (SRO) licenses. Staffing of the reactor shifts, including designated on-call individuals, met TS requirements as documented in the reactor logbook and pre-start checklists.

A previously identified issue was investigated and closed. Inspector Follow-up Item (IFI) 50-182/2006-201-01 called for follow-up with the licensee to ensure that a clear organizational framework is developed. At issue was the fact that the TS identified a position of Reactor Supervisor (RS) while the organizational structure designated a Laboratory Director (LD) in addition to the RS. The reactor organization was addressed in a license renewal application being prepared for submittal to the NRC at the end of the month. The IFI was therefore closed. (IFI 50-182/2006-201-01 was closed.)

c. Conclusions

The licensee's organization and staffing was in compliance with the requirements specified in the Technical Specifications.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed selected parts of the following reactor operations records to verify that the requirements of TS Section 6.5, Operating Records, were being met:

- Purdue University Reactor (PUR or PUR-1) Procedures Manual
- "Report on Reactor Operations for the Period January 1, 2007, to December 31, 2007," E. Merritt, March 2008
- Reactor Logbook No. 45, July 20, 2007 to September 25, 2007
- Reactor Logbook No. 46, September 25, 2007 to November 28, 2007
- Reactor Logbook No. 47, November 28, 2007 to present
- File of completed Pre-start Checklists including those for 2007 and 2008
- File of completed Shutdown Checklists including those for 2007 and 2008
- Safety Analysis Report for the Conversion of the Purdue University Research Reactor from HEU to LEU Fuel, July 2006
- Safety Analysis Report for the Purdue University PUR-1 Reactor, June 1986

b. Observations and Findings

During the last half of 2007 the reactor was shut down to allow for decay of fission products in the HEU fuel originally provided with the reactor, the reactor was defueled, used fuel was shipped offsite, new LEU fuel was received, the license was amended to allow the use of the new fuel type, the LEU core was assembled, and startup testing and benchmarking were completed. Numerous new procedures were prepared to support these activities.

The PUR procedures specified a records system that was commensurate with TS requirements. Procedures called for most operational data to be recorded in the reactor logbooks, startup checklists, and shutdown checklists. Data recorded indicated that the reactor was operated within the envelope of safety parameters established in the reactor license and TS.

The inspectors observed a technician taking a reactor water sample in accordance with TS requirements, noting that proper procedures were followed and logbook entries were made. The inspectors also observed records of the new LEU fuel plate receipt inspection, noting that plates with visible marks, despite meeting the quality assurance acceptance criteria, were not used and set aside as spares.

c. Conclusions

Within the scope of this review, the licensee's operations record keeping program conformed to Technical Specification requirements.

3. Procedures

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to ensure that the requirements of TS Section 6.3, Operating Procedures, were being met concerning written procedures:

- PUR Procedures Manual
- PUR-I Standard Operating Procedure (SOP) 07-01, SOP for Partial or Complete Disassembly and Reassembly of the PUR-1 Core, Rev. 13, September 8, 2007
- PUR-I Standard Operating Procedure 07-02, Inspection and Disassembly of Control Rods, Rev. 2, July 16, 2006
- PUR-I Standard Operating Procedure 07-03, Fresh LEU Fuel Receipt and Inspection, Rev. 10, June 4, 2008
- PUR-I Standard Operating Procedure 07-05, SOP for Core Loading, Rev. 4, August 28, 2007
- PUR-I Standard Operating Procedure 07-12, Initial Fuel Assembly Loading Procedure, Rev. 12, August 28, 2007

b. Observations and Findings

The inspectors reviewed the licensee's written procedures and revisions to procedures. Significant work had been done during the past year developing, reviewing and approving procedures for the conversion to the LEU core. Procedures appeared thorough and of the appropriate level of detail. The Procedures Manual included lists of "Approved Procedures" and "Maintenance Procedures", both of which were reviewed and approved by the CORO.

The inspectors noted that the Procedures Manual contained a Table of Contents which listed procedures by name and number. However, the Table of Contents did not include the current revision number of procedures or an effective date for the Table of Contents. Also, some of the approved procedures in the manual were not listed in the Table of Contents. The licensee said that the Table of Contents was not intended for that purpose but agreed that it could be a source of confusion or error. The licensee stated that a clarification such as that discussed would be made.

c. Conclusions

The inspectors found that appropriate procedures were in effect, new procedures were being prepared as needed, and dated procedures were being updated as necessary.

4. Requalification Training

a. Inspection Scope (IP 69001and IP 92701)

The inspectors reviewed the following to verify that the requirements of 10 CFR Part 55 were being met:

- Operator Requalification Program for the PUR-1 Reactor Facility, 1988
- J. Jenkins, PUR-1 Operator Proficiency Examination Form, March 28, 2008

- J. Jenkins, PUR-1 Operator Requalification Program Performance Evaluation Form March 31, 2006
- B. Revis, PUR-1 Operator Proficiency Examination Form, March 26, 2008
- 10 CFR Part 55.53, Operators' Licenses, Conditions of Licenses
- PUR-1 Instructor Lecture/Experiment Schedule, September 20, 2006 through December 8, 2006, and February 19, 2007 through December 8, 2007

b. Observations and Findings

The inspectors reviewed the records for licensed operators and noted that they were maintained as required by the Requalification Program.

The inspectors reviewed whether the PUR-1 facility had completed the actions required for any disqualified individual not meeting the requirements of 10 CFR 55.53(e) of the requalification program.

The inspectors determined that the licensee conducted its requalification program consistent with the Office of Nuclear Reactor Regulations (NRR) approved Requalification Program. It was determined that PUR-1 staff did this through:

- Discussing and reviewing changes in the facility, procedures, and license.
- Reviewing and simulating abnormal and emergency procedures.
- The assurance that operators maintained an active duty status in accordance with 10 CFR 55.53(e).
- The conduct of formal training, e.g., lectures and seminars

In addition to reviewing the aforementioned inspection topics, the inspectors followed up on the status of two outstanding IFIs. First was IFI 50-182/2005-201-01, follow-up to verify that the licensee's future audits of the qualifications and training of the licensed operators ensure that all conditions of the operator's licenses are being met. In 2005 the inspectors noted that in the previous year there was only one licensed reactor operator on the PUR-1 staff assigned to support facility operations, leaving unclear the designated activities for the trainer and trainee addressed by 10 CFR 55.53 (e). This issue has been made moot at the current time by the fact that there are three SROs on the reactor staff.

The second outstanding IFI reviewed was 50-182/2001-201-02, follow-up on the licensee's actions to document the On-The-Job-Training discussed in Section C of the Requalification Program. The requalification program at the PUR-1 facility was designed to comply with the intent of 10 CFR Part 55, Appendix A, concerning the continued training and requalification of operators for the PUR-1 reactor. However, documentation by the licensee did not indicate that each SRO was involved in the training of each topical area required by the requalification program.

The licensee stated that an updated Operator Requalification Program was being prepared as part of the facility relicensing application later in the month. Considering that there will be a systematic review of the revised Operator Requalification Program by the NRC licensing staff followed by a review of the effective implementation of the revised program by the site inspector, both of these IFIs were considered closed. (IFIs 50-182/2001-201-02 and 50-182/2005-201-01 were closed.)

c. Conclusions

Current operator requalification was conducted as required by the Requalification Program. Two outstanding legacy issues were closed.

5. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001 and IP 92701)

The inspectors reviewed the following to determine if the periodic surveillance tests on safety systems were performed as stipulated in TS Section 4.0, Surveillance Requirements:

- Surveillance Manual
- CORO Audit Report, January 18, 2008
- File of completed Pre-start Checklists including those for 2007 and 2008

b. Observations and Findings

Surveillance requirements were primarily done as part of the pre-start checkout; surveillance such as control rod drop time tests and water chemistry tests were documented with individual procedures or in the Surveillance Manual. The protocols and techniques randomly selected for inspection were considered to be effective in verifying acceptable performance of the safety equipment. Checks and calibrations were completed as required by TS.

TS 6.2.6.a required that the CORO perform an annual audit of facility operation the TS and applicable license conditions. A thorough audit report indicated completion of the audit requirement for the year 2007. The audit proved effective in that it identified a weekly reactor water sample that was missed the week of December 24, 2007.

The inspectors investigated an Unresolved Item (URI) from a previous inspection, URI 50-182/2005-201-03, Failure to conduct damper checks of the ventilation system in accordance with TS requirements. The licensee reported the completion of this surveillance on the required semi-annual intervals since that time. They also had indication that the surveillance in question was performed at the time in question but concluded that they failed to log the fact that it was done, providing a basis to close that issue. (URI 50-182/2005-201-03 was closed).

c. Conclusions

Surveillance was observed to be performed in accordance with requirements as stated in the Technical Specifications.

6. Experiments

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with TS Section 3.5, Limitations on Experiments:

- Requested Irradiations Forms

b. Observations and Findings

The inspectors reviewed the irradiations requests and through discussion with staff members determined that no new types of experiments were reviewed or approved during the past two years. Procedures were observed to be in effect to require an evaluation of new experiments for conformance to TS requirements at such time as an experiment of a new type is requested.

c. Conclusions

No new experiments were requested but procedures existed to review them pursuant to Technical Specification requirements should one be requested.

7. Health Physics

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with 10 CFR Part 20 requirements:

- SOP Section 52, “Radiological Safety Program”
- Radiation Safety Manual (RSM)
- Personnel dosimetry records
- Radiation Monitor Calibration Logbook, September 6, 2007 to March 19, 2008
- Nuclear Reactor Facility (NRF) Radiation Surveys, July 2, 2006 to May 16, 2008

The inspectors toured the facility to interview and observe licensee personnel and practices regarding the use of dosimetry and radiation monitoring equipment, placement of radiological signs and postings, use of protective clothing, and practices for handling and storing radioactive material or contaminated equipment.

The inspectors observed general health physics practiced by Radiological and Environmental Management (REM) personnel during a reactor pool water sample analysis and Radiological Air Monitor (RAM) filter paper retrieval.

b. Observations and Findings

The inspectors reviewed records of radiation surveys performed by a REM Health Physics Specialist, and found activity levels to be generally consistent with background radiation. Facility postings and observed instrument indication by the inspectors supported the survey records. No unmarked radioactive material was found in the facility. A copy of the current NRC Form 3 notice to radiation workers required by 10 CFR Part 19 was posted at the entrance to the Control Room and Reactor Bay.

Dosimetry results were reviewed by the inspectors; PUR-1 facilities’ associated exposures were in conformance with 10 CFR Part 20 and administrative limits.

The calibration records of selected devices were reviewed. Calibration tags on devices found throughout the facility were verified to be current and in accordance with the calibration records that were reviewed. REM calibrated the PUR-1 facility and their portable radiological monitoring equipment onsite.

REM was also responsible for the campus-wide Radiation Protection Program. The program contained an As Low As Reasonably Achievable (ALARA) policy and commitment. University requirements required that individuals using sources of ionizing radiation have training conducted by REM, regarding radiation safety and emergency procedures prior to the initiation of any work. Continuing education is provided at specific intervals (e.g., use of x-ray equipment, sealed source, etc.) Information on pre-natal radiation exposure was provided in the Radiation Safety Manual (RSM) and referenced NRC Regulatory Guide 8.13 which outlines health risk estimates associated with radiation exposure and means to reduce risks. Regulatory Guide 8.13 was distributed to all workers during the initial training sessions. All personnel with the potential for receiving significant exposure from high-energy beta or gamma emitters were required to wear appropriate dosimetry as outlined in Section 8.4 of the RSM. As a means for keeping personnel radiation exposures as low as possible, REM sends a Form F-1 to any individual receiving greater than 100 millirem to the whole body or extremities during any wear period. To monitor and identify significant uptake of radioiodine, Purdue University maintained a bioassay program.

The licensee did not take credit for minimizing the intake of radioactive material through the use of respiratory equipment and therefore did not have a respiratory protection program.

c. Conclusions

The inspectors verified that the licensee's health physics program was effective in minimizing radiation doses to individuals through training, notices to workers, radiation monitoring and surveys, and calibrated equipment.

8. Effluent and Environmental Monitoring

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with the requirements of 10 CFR Part 20:

- 2007 Reactor Air and Water Annual Report

b. Observation and Findings

Due to the minimal power generation and air introduction into the system there had been no appreciable evidence of Ar-41 production and no liquid effluent release to necessitate environmental monitoring.

During the month of October 2007, the PUR-1 reactor facility removed the original highly enriched uranium core and replaced it with a new core consisting of low enriched uranium fuel. Upon completion of the fuel change-out, REM staff determined that all water and air analysis remained consistent with previous analyses and indicated that

there was no discernable breach of fuel or spread of radioactivity to the environment. Licensee air samples showed that all samples were below minimum detectable activity; they were normally counted approximately two weeks after collection to allow for radon daughter decay.

The licensee also reported the results of several thermoluminescent dosimeters (TLDs) placed around the PUR-1 facility as environmental radiation monitors, including the Electrical Engineering classroom above it. In all cases, the TLDs indicated no significant difference from background radiation levels.

c. Conclusions

Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory limits.

9. Design Changes

a. Inspection Scope (IP 69001)

The inspectors reviewed the following materials to verify compliance with regulatory requirements:

- "Report on Reactor Operations for the Period January 1, 2007, to December 31, 2007," E. Merritt, March 2008

b. Observations and Findings

The licensee reported that since the previous inspection there were no changes made which constituted a change reportable under 10 CFR 50.59.

c. Conclusions

No new changes, tests, or experiments subject to 10 CFR Part 50.59 reporting were performed.

10. Committees, Audits, and Reviews

a. Inspection Scope (IP 69001 and IP 92701)

The inspectors reviewed the following to verify compliance with the requirements of TS Section 6.2, Review and Audit:

- CORO Meeting Minutes, January 22, 2007
- CORO Meeting Minutes, March 29, 2007
- CORO Meeting Minutes, July 16, 2007
- CORO Meeting Minutes, October 5, 2007
- CORO Meeting Minutes, January 18, 2008
- CORO Meeting Minutes, May 12, 2008
- CORO Audit Report, January 18, 2008

- Letters from V. Bralts, head of the School of Nuclear Engineering, to T. Jevremovic, R. Taltyarkhan, and D. Koltic, March 22, 2007

b. Observations and Findings

The composition of the Committee on Reactor Operations (CORO) was verified to be in accordance with TS Section 6.2.2. A quorum as defined in TS Section 6.2.4 was present at each of the six meetings reviewed. Meetings were held at the required frequency as specified in TS Section 6.2.3.

Through reviewing CORO minutes of meetings from the recent past the inspectors verified that the committee was performing the review responsibilities defined in TS Section 6.2.5.

The inspectors reviewed two similar issues remaining open from previous inspections; IFI 50-182/2001-201-01, follow-up on completion of an audit of the performance training and qualifications of the licensed facility staff by the CORO or other designated individual and URI 50-182/2006-201-02, failure to conduct the required emergency and security plan audits as specified by TS 6.2.6. The inspectors reviewed the report of the audit performed pursuant to TS 6.2.6 for 2007, documented in a January 18, 2008, memo, and verified that the issues in question were addressed and the respective IFI and URI were closed. (IFI 50-182/2001-201-01 and URI 50-182/2006-201-02 were closed.)

c. Conclusions

The Committee on Reactor Operations provided the oversight required by the Technical Specifications.

11. Emergency Planning

a. Inspection Scope (IP 69001)

The inspectors reviewed the implementation of selected portions of the emergency preparedness program including:

- Emergency Plan for the Purdue University Reactor, March 20, 2000
- Radiation Emergency Procedures, approved March 25, 2003
- University of Purdue Campus Fire Station Training Records
- Emergency Response Team Radiation Scenario Exercise After Action Report

b. Observations and Findings

The inspectors visited the campus police and fire department facilities to ascertain emergency preparedness. Both facilities provided a description of response activities and capabilities. Regarding the fire response personnel, the on-duty staff provided an adequate demonstration of radiological equipment use proficiency. Through the review of training records at the fire station and further discussion regarding emergency response actions, the inspectors found that there is sufficient interaction with REM to coordinate efforts in an event involving the release of radiological material.

The current PUR-1 facility emergency plan and implementing procedures were current and readily available, although the facility stated that it will be modified to account for the low enriched uranium core. Facility staff indicated that the new version would be submitted with the relicense application.

The inspectors determined that the licensee conducts training for emergency response personnel as required. Exercises and drills required by the emergency plan were conducted to reinforce training and were deemed adequate. Lessons learned appear to be adequately addressed in the after action report and corrected by the respective party having a deficiency.

c. Conclusions

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

12. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed the following selected maintenance logs and records to verify compliance with the requirements of TS Section 6.5.1.a:

- Maintenance Logbook
- Reactor Logbook No. 45, July 20, 2007 to September 25, 2007
- Reactor Logbook No. 46, September 25, 2007 to November 28, 2007
- Reactor Logbook No. 47, November 28, 2007 to present

b. Observations and Findings

The inspectors reviewed selected portions of the reactor logbooks governing the interval of time since the previous inspection. Major maintenance activities were found documented with detail commensurate with the safety significance of the activity.

c. Conclusions

The licensee maintained records documenting principal maintenance activities.

13. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with requirements of TS Section 6.5.2.d:

- Safety Analysis Report for the Conversion of the Purdue University Research Reactor from HEU to LEU Fuel, July 2006
- Reactor Logbook No. 45, July 20, 2007 to September 25, 2007
- Reactor Logbook No. 46, September 25, 2007 to November 28, 2007

- Reactor Logbook No. 47, November 28, 2007 to present
- "Report on Reactor Operations for the Period January 1, 2007, to December 31, 2007," E. Merritt, March 2008
- Purdue University Reactor Procedures Manual
- PUR-1 Standard Operating Procedure 07-04, Loading of New Fuel Assemblies, reviewed by CORO July 16, 2007 (typical of 4 new fuel procedures reviewed)

b. Observations and Findings

Because of the core conversion from HEU to LEU fuel in the previous year, the inspectors concentrated their activities on those activities. Procedures for refueling, fuel movement, and TS required fuel inspections and surveillances were reviewed and approved as required and were available to control operations. New procedures were prepared as needed. Fuel movement, log keeping, and data recording were being done as directed by procedures. Log entries clearly identified that a licensed reactor operator was present for all fuel transfers.

c. Conclusions

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

14. Transportation

a. Inspection Scope (IP 86740)

The inspectors interviewed personnel and reviewed the following to verify compliance with regulatory and procedural requirements for transferring licensed material:

- PUR-1, Quality Procedure, Quality Assurance Organization, Draft , August 27, 2007, Reviewed by CORO October 5, 2007 (typical of 13 quality assurance procedures)
- Records of HEU Fuel Shipment in October 2007

b. Observations and Findings

Because of the return shipment of the irradiated HEU fuel in the previous year, the inspectors concentrated their activities on those activities. Numerous activities new to the facility operation were required for compliance with 10 CFR Part 73, Physical Protection of Plants and Materials. A quality assurance program for the shipment of the fuel was prepared, addressing those criteria for activities in which the licensee was engaging.

c. Conclusions

The activities involving the shipment of HEU fuel observed by the inspectors were found to be in compliance with regulatory requirements.

15. Exit Interview

The inspection scope and results were summarized on June 5, 2008, with members of licensee management. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

V. Bralts, Interim Head of Nuclear Engineering
M. Handy, Health Physicist
J. Jenkins, Laboratory Director
E. Merritt, Reactor Supervisor
M. Pflug, Health Physicist
K Ply, Fire Chief
B. Revis, Electronics Technician
M. Rosenbarger, Detective Sergeant
J. Schweitzer, Radiation Safety Officer and Director, Radiological and Environmental Management

Other Personnel

None

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors
IP 86740	Transportation
IP 92701	Follow-up

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-182/2001-201-01	IFI	Follow-up on completion of an audit of the performance training and qualifications of the licensed facility staff by the CORO or other designated individual.
50-182/2001-201-02	IFI	Follow-up on the licensee's actions to document the On-The-Job-Training discussed in Section C of the Requalification Program.
50-182/2005-201-01	IFI	Follow-up to verify that the licensee's future audits of the qualifications and training of the licensed operators ensure that all conditions of the operator's licenses are being met.
50-182/2005-201-03	URI	Failure to conduct damper checks of the ventilation system in accordance with TS requirements.

50-182/2006-201-01	IFI	Follow-up with the licensee to ensure that a clear organizational framework is developed.
50-182/2006-201-02	URI	Failure to conduct the required emergency and security plan audits as specified by TS 6.2.6.

Discussed

None

PARTIAL LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ADAMS	Agencywide Document Access Management System
CFR	Code of Federal Regulations
CORO	Committee on Reactor Operations
HEU	Highly enriched Uranium
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LEU	Low Enriched Uranium
LD	Laboratory Director
No.	Number
NRC	Nuclear Regulatory Commission
NRF	Nuclear Reactor Facility
NRR	(Office of) Nuclear Reactor Regulation
PARS	Publicly Available Records
PUR	Purdue University Reactor
PUR-1	Purdue University Reactor 1
RAM	Radiation Area Monitor
REM	Radiological and Environmental Management
Rev.	Revision
RO	Reactor Operator
RS	Reactor Supervisor
RSM	Radiation Safety Manual
SOP	Standard Operating Procedure
SRO	Senior Reactor Operator
TLD	Thermoluminescent Dosimeter
TS	Technical Specifications
URI	Unresolved Item