

Purdue University
School of Nuclear Engineering

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

March 29, 2009²⁰¹⁰

Docket No. 50-182

Enclosed please find a copy of the 2009 Annual Report for the Purdue University Reactor (PUR-1).

Sincerely,

A handwritten signature in black ink, appearing to read 'E. C. Merritt'.

E. C. Merritt
Reactor Supervisor

Copy sent to PM

A620
NRR

REPORT ON REACTOR OPERATIONS

**For the Period
January 1, 2009 to December 31, 2009**

**PURDUE UNIVERSITY REACTOR-1 (PUR-1)
Facility Docket No. 50-182
PURDUE UNIVERSITY
West Lafayette, Indiana 47907**

March 2010

**Prepared by
E. C. Merritt
Reactor Supervisor**

1. INTRODUCTION

This report is submitted to meet the requirements set forth in the technical specifications of the Purdue University Reactor (PUR-1) and 10 CFR 50.59 for the period January 1, 2009 to December 31, 2009.

During the reporting period a total of 936 people visited the reactor facility. Those people included 182 different groups, of which 54 groups were for the purpose of maintenance, fuel loading or surveillance testing, 24 groups were for class purposes, 99 groups were tours, and 5 groups participated in our reactor sharing program.

2. PLANT DESIGN AND OPERATIONAL CHANGES

2.1 Facility Design Changes

There were no design changes to the facility in 2009.

2.2 Performance Characteristics

The operation of the PUR-1 facility continued satisfactorily during the reporting period. During the visual inspection of the fuel no changes were identified. This inspection included any defects that might compromise the integrity of the cladding including any evidence of corrosion. Satisfactory performance of the fuel continued throughout the year.

2.3 Changes in Operating Procedures Concerning Safety of Facility Operations

There were no changes to the operating procedures of the facility during 2009.

2.4 Results of Surveillance Tests and Inspections

2.4.1 Reactivity Limits

The reactivity worths of the control rods were determined after the LEU was installed and were found to be as follows:

Shim-safety #1: 3.83%
Shim-safety #2: 2.20%
Regulating Rod: 0.275%

These values are consistent with previous reported values. The worth curves of the control rods were checked after the loading and the excess was determined to be 0.42%, and the shutdown margin was determined to be 1.78% based on these values.

The inspection of the control rods was completed on December 19, 2008 with no evidence of change or deterioration observed.

One new experiment was performed during July 29, 2009 which required a determination of the reactivity worth of the experiment per Technical Specification 4.1.c. the worth change was negligible.

2.4.2 Reactor Safety Systems

Each pre-startup check included a channel test for each safety system, provided the shutdown exceeded 8 hours or if the system was repaired or de-energized.

Each reactor safety system had a channel check performed at time intervals of 4 hours during operation.

On March 18, 2009, the electronic calibration of all safety channels was completed.

The required 2009 irradiation of gold foils for a power calibration was done on March 23, 2009. The calibration indicated that the actual power was below (i.e., conservative) the indicated power level (i.e. the actual power being 614 watts when the indicated power level was at 750 watts).

During the pre-startup, which precedes each run, the radiation area monitors and the continuous air monitor were checked for normal operation. During 2009, the calibration of the radiation area monitors was completed on January 16 and July 15 and the continuous air monitor was completed on January 12 and July 14.

The rod drop times were measured on December 22, 2008. The rod drop times fell between 609 and 678 milliseconds. These values are consistent with past measurements and are well within the specification limit of one second.

2.4.3 Primary Coolant System

The weekly measurements of the pH of the primary coolant consistently gave readings between 4.8 and 5.2 during 2009. These values are within the specification limits of 5.5 ± 1.0 . During the weekly checks and the pre-startup check, which precedes each run, the conductivity of the primary coolant was measured and the values never exceeded 1.21 micromhos-cm. This represents a resistivity of more than 826,000 ohm/cm, which exceeds the lower limit of 330,000 ohm/cm as given in the specifications.

The specification of 13 feet of water was always either met or exceeded, according to the pre-startup checklist that was completed prior to each reactor run.

Monthly samples of the primary coolant were collected and analyzed by personnel from Radiological and Environmental Management for gross alpha and beta activity. No activity was identified in the samples, which would indicate failure of the fuel plates.

2.4.4 Containment

Readings between 0.08 and 0.18 inches of water were recorded weekly for the negative pressure in the reactor room.

The semi-annual checks for the proper operation of the inlet and outlet dampers and the air conditioner were completed on June 9 and December 21, 2009. All worked satisfactorily.

The fuel was visually inspected on March 17, 2009. The surface condition of the fuel plates indicated no change from the last inspection, and the cladding of the other inspected plates identified no changes.

2.4.5 Experiments

The mass of the singly encapsulated samples and the flux of the reactor are such that the complete release of all gaseous, particulate, and volatile components of the samples would not result in doses in excess of 10% of the equivalent annual doses as stated in 10 CFR 20.

No samples of unknown composition were irradiated in 2009.

2.5 Changes, Tests and Experiments Requiring Commission Authorization

During 2009 no changes, or experiments, which required authorization from the Commission pursuant to 10 CFR 50.59 (a), were performed.

2.6 Changes in Facility Staff

There were no changes in the Facility Staff during the year. During 2009 there were three licensed operators, at the facility.

3. POWER GENERATION

Operation of the PUR-1 during 2009 consisted of 49 runs, which generated 161,627 watt-minutes of energy and covered an integrated running time of 145.8 hours.

4. UNSCHEDULED SHUTDOWNS

There were no unscheduled shutdowns during 2009.

5. MAINTENANCE

There were nine instances of non-routine maintenance during the reporting period. Seven had to do with standard parts (I.C., relay, tube, input assembly and resistor) replacement, or substitution. All problems of this type can be expected in our equipment. The HEPA filter for the room exhaust air was replaced October 28th. Room lights were replaced on December 4th, the HVAC room air-conditioner coil was cleaned July 21, and the heater steam-trap was replaced on December the 8th.

6. CHANGES, TESTS AND EXPERIMENTS

No changes, tests or experiments were carried out without prior Commission approval pursuant to the requirements of 10 CFR 50.59 (b).

7. RADIOACTIVE EFFLUENT RELEASES

No measurable amount of radioactive effluent was released to the environs beyond our effective control, as measured at or prior to the point of such release.

8. OCCUPATIONAL PERSONNEL RADIATION EXPOSURE

No radiation exposures greater than 25% of the appropriate limits of 10 CFR 20 were received during the reporting period.

March 29, 2010

Docket No. 50-228

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 2055-0001

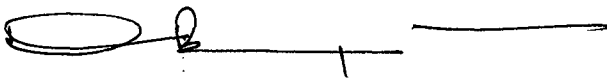
OATH AND AFFIRMATION

**Re: Aerotest Radiography and Research Reactor
License No. R-98
Request for Order for Indirect Transfer of License**

To Whom It May Concern:

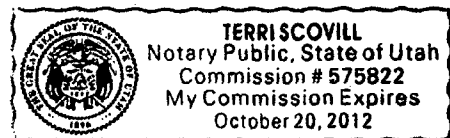
I, DARIO BRISIGHELLA, hereby certify that the contents of the license transfer request submitted by Aerotest Operations, Inc., X-Ray Industries, Inc., and Autoliv ASP, Inc., dated February 2, 2010, contains information that is true and correct to the best of my knowledge.

Respectfully submitted,



Dario Brisighella
President
Aerotest Operations, Inc.

cw



Terris Covill
3/29/2010

Autoliv ASP, Inc.
3350 Airport Road
Ogden, Utah 84405

Phone: (801) 625-4800
Fax: (801) 625-4911

