Rensselaer | DEPARTMENT OF MECHANICAL, AEROSPACE, AND NUCLEAR ENGINEERING

RCF 07-01
March 1, 2007

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

U.S. Department of Energy
NE-30
John Gutteridge
1000 Independence Avenue, SW
Washington, DC 20585

Re: Operations Report for the Rensselaer Polytechnic Institute (RPI) Reactor Critical Facility (RCF)
NRC License CX-22
Docket Number 50-225

To Whom It May Concern:

This document constitutes the calendar year 2006 Operations Report of the RPI RCF to the USNRC, USDOE, and to Rensselaer management.

The Reactor Critical Facility (RCF) operated successfully during calendar year 2006. The RCF was used for one laboratory course and two introductory courses in the Nuclear Engineering and Engineering Physics curricula. The facility staff trained three new Senior Reactor Operators who passed an NRC licensing exam in February 2006.

Work proceeded on critical experiments with the 0.640 pitch lattice plates. Critical measurements were performed with 332-pin and 333-pin configurations. Some subcritical measurements were conducted with fewer pins. The SPERT(F1) fuel is 4.81 w/o enriched high density UO_2 pellet fuel clad in stainless steel, so it is similar to power plant reactor fuel. The RCF is now the only facility in the U.S. carrying out reactor physics critical experiments in support of the power reactor function. These experiments are similar to power reactor startup measurements.

Rensselaer Polytechnic Institute
110 8th Street | Troy, NY 12180-3590 USA

A020

A NRC inspection was performed in February 2006. NRC findings have been reported in other correspondence.

Funds were provided under the USDOE URI and the USDOE INIE Programs to complete additional upgrades. The URI funds are expected to be used for miscellaneous support equipment. The INIE funds are planned to provide video equipment capability to show real-time reactor operations to classes over an Internet connection. This capability is primarily intended for use with RPI students.

Training and proficiency requirements for all licensed operators have been reviewed and are current.

The Technical Specifications, App. A to USNRC License CX-22 require reporting the following operational items:

1. Changes to facility design: None
2. Significant maintenance, repairs or other work performed on RCF systems:
    1. In March 2006 the solenoid on an air-operated valve failed. No safety functions were affected. This event was significant only because the reactor could not be operated until the solenoid was replaced.
    2. Electrical distribution switchboards and motor-starters for reactor equipment were replaced in November 2006 with new components with similar capability. The reactor tank fill pump was also replaced at the same time. All components were tested in December 2006 to verify correct operation.
3. Changes in operating procedures which relate to the safety of RCF operations: None
4. Surveillance checks, tests, and calibrations were conducted and logged as required. The results were satisfactory. In November 2006 an emergency preparedness drill was conducted at the RCF.
5. Changes, tests or experiments requiring authorization from the USNRC under 10CFR50.59 a or b: None
6. Glenn Winters has been Facility Director through this period. Jonathon Stevens was replaced by Dr. Timothy Trumbull as Operations Supervisor on February 1, 2006. Dr. Steiner resigned from the NSRB and has not been replaced.
7. Calculated integrated thermal power: Approximately 4.7×10^{-3} kwhr for all of 2006, far less than the Technical Specification 3.1.10 limit of 200 kwhr/yr.
8. There were no unplanned scrams in the report interval.
9. Maintenance operations were carried out and logged with satisfactory results.
10. The contents of the Storage Tank were discharged in November 2006 in accordance with operating procedures. Samples analyzed prior to discharge showed no detectable activity above background for Schenectady city water.
11. Environmental monitors (exclusion area and site boundary) recorded exposures less than 40 millirem per year above background with one exception. Environmental monitor #2 reported a neutron dose of 58 millirem during the 2nd quarter of the year. This was judged

10. The contents of the Storage Tank were discharged in November 2006 in accordance with operating procedures. Samples analyzed prior to discharge showed no detectable activity above background for Schenectady city water.

11. Environmental monitors (exclusion area and site boundary) recorded exposures less than 40 millirem per year above background with one exception. Environmental monitor #2 reported a neutron dose of 58 millirem during the 2nd quarter of the year. This was judged to be erroneous, since neutron doses external to the building are not credible. No such reading occurred in later quarters.

12. Facility personnel exposures were all less than 50 millirem for the report period.

Sincerely,

Glenn Winters, Director
RPI Reactor Critical Facility

cc:

Dr. Michael Podowski, Chairman
RPI NSRB

Dr. Tim Wei, Chair
MANE

Peter Collopy, Director
Environmental Health and Safety

Dr. Timothy Trumbull
RCF Operations Supervisor

Dr. Peter Caracappa
Radiation Safety Officer