



Rensselaer

DEPARTMENT OF MECHANICAL,
AEROSPACE, AND NUCLEAR ENGINEERING

RCF 14-01
March 14, 2014

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

Re: Operations Report for the Rensselaer Polytechnic Institute Reactor Critical Facility, NRC
License CX-22, Docket Number 50-225.

To Whom It May Concern:

This document constitutes the calendar year 2013 (CY2013) Operation Report of the Rensselaer Polytechnic Institute (RPI) Reactor Critical Facility (RCF) to the U.S. Nuclear Regulatory Commission (NRC) and the RPI management.

The RCF operated successfully during CY2013. The RCF was used for one laboratory course and supported an introductory course in the Nuclear Engineering curriculum. Also facility tours were provided to officer candidates from the West Point Military academy, operators in training at the Fitzgerald nuclear power plant and members of the local American Nuclear Society. The work during the year essentially supported the laboratory course and training of students.

Work proceeded on critical experiments with the 0.640" pitch lattice plates. Critical measurements were performed with the 326-pin configuration with Zr-4 reflectors installed on two of the unrodded external faces of the fuel array. Some subcritical experiments were also conducted with fewer pins. The SPERT (F1) fuel, used 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. These experiments have been designed to be similar to power reactor startup measurements.

The 2013 NRC annual inspection was rescheduled to January 2014 and has been reported in separate correspondence.

Training and proficiency requirements for all licensed operators have been reviewed and are current. Total staffing on December 31, 2013 is five licensed Senior Reactor Operators with one individual scheduled for a licensing examination in January 2014 concurrent with the NRC annual inspection.

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

1. Changes to the facility design: None.
2. Significant Maintenance, repairs, or other work performed on RCF systems:
New wiring for the reactor neutron detectors was installed and will be connected to the detectors as time permits. Two new linear picoammeters were procured and one has been installed. A new air compressor and filter pump were installed. One videographic recorder was replaced with a new unit.
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.
5. Changes, tests, or experiments requiring authorization from the USNRC under 10CFR50.59 (a) or (b): None.

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6. Staff Changes during CY 2013: The Operations Supervisor, Dr. Jason Thompson was replaced in February with Mr. Glenn Winters. Dr. Thompson remains on the RCF operations staff. The Facility Director, Dr. Sastry Sreepada was replaced with Dr. Peter Caracappa as of January 1, 2014. At that time, Ms. Annette Chism, Director of Environmental Health and Safety, took over supervision of Health Physics until a new Radiation Safety Officer, Mr. Anthony DeAngelo, was hired in February 2014.
7. Changes to Nuclear Safety Review Board during 2013: Dr Joseph Chow was appointed Administrative Dean of Engineering and replaced Dr. David V. Rosowsky on the NSRB.
7. Attachment 1 shows the current members of NSRB as of January 1, 2014.
8. Calculated Thermal Power:
Approximately 0.03 kwhr for all CY2013, far less than the 2 kwhr/yr limitation in the Technical Specifications. The April - June quarter recorded the highest usage at 0.024 kwhr.
9. Maintenance operations were carried out and logged with satisfactory results.
10. No discharges occurred in CY 2013
11. Environmental monitor dosimetry is performed at the exclusion area fence (EM1 through EM4), and at the site boundary fence (EM5 and EM6). The environmental monitoring results are reported without background subtraction, and the accumulated dose to an off-site control monitor is reported separately. The sum of the quarterly control readings from 2013 was 118 mrem. The sums of the gross readings and net dose results for 2013 are:

| | <u>Gross</u> | <u>Net</u> |
|------|--------------|------------|
| EM1: | 114 mrem | 0 mrem |
| EM2: | 114 mrem | 0 mrem |
| EM3: | 116 mrem | 0 mrem |
| EM4: | 103 mrem | 0 mrem |
| EM5: | 114 mrem | 0 mrem |
| EM6: | 115 mrem | 0 mrem |
12. No quarterly personnel monitoring badges reported an accumulated dose above the minimum detectable dose of 10 mrem per quarter during 2013.

Sincerely,



Dr. Peter Caracappa, Director
RPI Reactor Critical Facility

Cc:

Dr. Joseph Chow
Administrative Dean of
Engineering

Dr. Suvranu De, Head,
Mechanical, Aerospace, and
Nuclear Engineering
Department

Dr. Yaron Danon
Chairman, NSRB and Head,
Nuclear Engineering Program

Dr. Peter Caracappa
RCF Facility Director

Mr. Glenn Winters, RCF
Operations Supervisor

Ms. Annette Chism, Director
Environmental Health and
Safety

Mr. Anthony DeAngelo
Radiation Safety Officer

Attachment: 1

Members of NSRB as of January 1, 2014:

1. Dr. Yaron Danon, Head NSRB
2. Dr. Peter Caracappa , RCF Facility Director
3. Dr. Mark Embrechts
4. Dr. Tarek Abdoun (Associate Dean for Research)
5. Ms. Annette Chism, Director Environmental Health and Safety and Radiation Safety Officer
6. Sergeant. Marcie DelVechhio (Public Safety)
7. Dr. Wei Ji
8. Dr. Bimal Malaviya
9. Dr. George Xu
10. Dr. Mike Podowski
11. Mr. Glenn Winters, RCF Operations Supervisor
12. Ms. Leslie Norton (Public Safety)
13. Dr. Timothy Trumbull (RCF)