



# Rensselaer

DEPARTMENT OF MECHANICAL,  
AEROSPACE, AND NUCLEAR ENGINEERING

RCF 16-01  
April 29, 2016

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 2015 (CY2015) 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 CY2015. The RCF was used for one laboratory course, a senior design project and supported an introductory course in the Nuclear Engineering curriculum. Also facility tours were provided to officer candidates from the West Point Military Academy, undergraduate physics students from Vermont Technical College 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. A 327-pin configuration was used for some critical measurements. Subcritical experiments were conducted with fewer pins. The SPERT (F1) fuel used is 4.81 w/o enriched high density  $\text{UO}_2$  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 2015 NRC annual inspection was completed in September 2015 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, 2015 is four licensed Senior Reactor Operators with three additional individuals scheduled for a licensing examination in January 2016.

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

1. Changes to the facility design: The inner and outer perimeter fences were modified to accommodate construction work on the adjacent property. A safety analysis was performed in accordance with 10CFR50.59 to determine if changes require a license

AD 20  
NR

amendment. This analysis was reviewed by the Nuclear Safety Review Board at its meeting in November 2015 and concluded no license amendment was required.

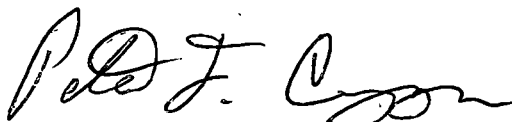
2. Significant Maintenance, repairs, or other work performed on RCF systems: None
3. Changes in operating procedures which relate to the safety of RCF operations: None.
4. Surveillance checks, tests, and calibrations were conducted and logged as required.
5. Changes, tests, or experiments requiring authorization from the USNRC under 10CFR50.59 (a) or (b): None.
6. Staff Changes during CY 2015: Dr. George Xu assumed supervision of Health Physics on a temporary basis. A search for a permanent Radiation Safety Officer is in progress.
7. Changes to Nuclear Safety Review Board during 2015: None. Attachment 1 shows the current members of NSRB as of January 1, 2016.
8. Calculated Thermal Power: Integrated power was approximately 0.074 kwhr for all CY2015, far less than the 2 kwhr/yr limitation in the Technical Specifications. The April - June quarter recorded the highest usage at 0.036 kwhr.
9. Maintenance operations were carried out and logged with satisfactory results.
10. No discharges occurred in CY 2015

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 2015 was 112 mrem. The sums of the gross readings and net dose results for 2015 are:

	Gross	Net
EM1	107 mrem	0 mrem
EM2	119 mrem	7 mrem
EM3	108 mrem	0 mrem
EM4	102 mrem	0 mrem
EM5	97 mrem	0 mrem
EM6	110 mrem	0 mrem

11. A total of 4 personnel monitoring badges recorded an accumulated dose greater than the minimum reportable dose of 10 mrem in at least one quarter of 2015, for a total collective dose of 54 mrem.

Sincerely,



Dr. Peter Caracappa, Director  
RPI Reactor Critical Facility



# Rensselaer

DEPARTMENT OF MECHANICAL,  
AEROSPACE, AND NUCLEAR ENGINEERING

Cc:

Dr. Shekhar Garde Dean of  
Engineering

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

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

Ms. Annette Chism, Director  
Environmental Health and  
Safety

Mr. Glenn Winters, RCF  
Operations Supervisor

**Attachment: 1**

**Members of NSRB as of January 1, 2016:**

1. Dr. Yaron Danon, Chairman 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
6. Sergeant Marcie DelVechhio (Public Safety)
7. Dr. Wei Ji
8. Dr. Bimal Malaviya
9. Dr. George Xu, Radiation Safety Officer
10. Dr. Mike Podowski
11. Mr. Glenn Winters, RCF Operations Supervisor
12. Ms. Leslie Norton (Public Safety)
13. Dr. Timothy Trumbull



# Rensselaer

DEPARTMENT OF MECHANICAL,  
AEROSPACE, AND NUCLEAR ENGINEERING

**Attachment #2 Updated list of RPI personnel and the mailing addresses.**

1. Peter F. Caracappa, Ph.D, CHP  
Facility Director  
NES Building, Room 1-19, Department of MANE  
Rensselaer Polytechnic Institute,  
110 8<sup>th</sup> street, Troy NY 12180-3590
2. Annette Chism, Director EH&S  
Rensselaer Polytechnic Institute,  
21 Union Street,  
Gurley Building, 2<sup>nd</sup> floor  
Troy, NY 12180
3. Glenn Winters  
RCF Operations Supervisor,  
2049 Jonsson Engineering Center  
Rensselaer Polytechnic Institute,  
110 8<sup>th</sup> street, Troy NY 12180
4. Dr. Yaron Danon  
Head NSRB  
NES Building, Room 1-9, Department of MANE  
Rensselaer Polytechnic Institute,  
110 8<sup>th</sup> street, Troy NY 12180