

January 5, 2017

Dr. Peter Caracappa, Director  
Reactor Critical Facility  
NES Building 1-10  
Rensselaer Polytechnic Institute  
110 8<sup>th</sup> Street  
Troy, NY 12180-3590

SUBJECT: RENSSELAER POLYTECHNIC INSTITUTE – U.S. NUCLEAR REGULATORY  
COMMISSION OPERATIONS INSPECTION REPORT NO. 50-225/2016-201

Dear Dr. Caracappa:

From October 17-20, 2016, the U.S. Nuclear Regulatory Commission (NRC, or the Commission) conducted a routine announced inspection at the Rensselaer Polytechnic Institute. The inspection included a review of activities authorized for your facility. The enclosed report documents the inspection results, which were discussed on October 20, 2016, with you and members of your staff.

The inspection examined activities conducted under your license as they relate to public health and safety to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. Based on the results of this inspection, no findings of non-compliance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations*, Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (Agencywide Documents Access and 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).

P. Caracappa

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Should you have any questions concerning this inspection, please contact Mr. Ossy Font at (301) 415-2490 or electronic mail at [Ossy.Font@nrc.gov](mailto:Ossy.Font@nrc.gov).

Sincerely,

**/RA/**

Anthony J. Mendiola, Chief  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-225  
License No. CX-22

Enclosure:  
As stated

cc: See next page

Rensselaer Polytechnic Institute

Docket No. 50-225

cc:

Mayor of the City of Schenectady  
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P. Caracappa

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SUBJECT: RENSSELAER POLYTECHNIC INSTITUTE – U.S. NUCLEAR REGULATORY  
COMMISSION OPERATIONS INSPECTION REPORT NO. 50-225/2016-201  
DATED January 5, 2017

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**NRC-002**

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

Docket No: 50-225

License No: CX-22

Report No: 50-225/2016-201

Licensee: Rensselaer Polytechnic Institute

Facility: Reactor Critical Facility

Location: Schenectady, NY

Dates: October 17-20, 2016

Inspector: Ossy Font  
Xiaosong Yin (Trainee)

Approved by: Anthony Mendiola, Chief  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

Rensselaer Polytechnic Institute  
Reactor Critical Facility  
NRC Inspection Report No. 50-225/2016-201

The primary focus of this announced operations inspection was the onsite review of selected aspects of the Rensselaer Polytechnic Institute's 100 Watt Class II research reactor safety program including: (1) organization and staffing, (2) operations logs and records, (3) operator requalification, (4) surveillance and limiting conditions for operations (LCO), 5) emergency preparedness, (6) maintenance logs and records, and (7) fuel handling logs and records since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety and generally in compliance with the NRC requirements.

### Organization and Staffing

- Organizational structure and staffing were consistent with Technical Specification (TS) requirements.

### Operations Logs and Records

- Operational activities were consistent with applicable TS and procedural requirements.

### Operator Requalification

- Operator requalification was conducted as required by the Requalification Program and Title 10 of the *Code of Federal Regulations* Part 55, Operators' Licenses."

### Surveillance and LCO

- LCO and surveillances required by TS were being properly implemented.

### Emergency Preparedness

- The emergency preparedness program was generally conducted in accordance with NRC requirements.

### Maintenance Logs and Records

- Maintenance activities were conducted consistent with TS requirements.

### Fuel Handling Logs and Records

- Fuel handling activities were conducted in accordance with TS and facility procedures.

## REPORT DETAILS

### Summary of Facility Status

The Rensselaer Polytechnic Institute's (RPI's or the licensee's) 100 watt critical facility continued to be operated in support of academic instruction, operator training, surveillance, and research. The reactor was not operated for the performance based portion of the inspection due to an unexpected power grid maintenance.

### 1. Organization and Staffing

#### a. Inspection Scope (Inspection Procedure (IP) 69001)

The inspectors reviewed selected aspects of the following to verify compliance with Technical Specification (TS) Section 6.1, "Organization":

- Organizational structure and management responsibilities
- RPI Nuclear Safety Review Board (NSRB) meeting minutes for the past two years
- Operations Report for the RPI Reactor Critical Facility (RCF) for the past two years
- RCF logbook entries for the past two years

#### b. Observations and Findings

Through review of records and logs, and through discussions with licensee personnel, the inspectors determined that the organizational structure and staff responsibilities observed at the RPI RCF met the requirements stated in Section 6.1 of the TS.

#### c. Conclusion

The organizational structure and staffing were consistent with TS requirements.

### 2. Operations Logs and Records

#### a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with TS Section 3, "Limiting Conditions for Operation," TS Section 4, "Surveillance Requirements," and TS Section 6, "Administrative Controls":

- RCF Operating Procedures, Version 3.0, dated July 2013
- RCF logbook entries for past two years
- Completed pre-start checklists for the past two years
- Completed reactor secured checklists for the past two years

Enclosure

b. Observations and Findings

On the evening of October 19, 2016, the inspectors were scheduled to observe a reactor startup and verify compliance with the appropriate written procedures and TS. However, due to an unexpected power grid maintenance in the area, the power was out for an extended period of time and the scheduled startup was not observed.

A review of the licensee's logs and records indicated that the TS operational limits had not been exceeded. The operations were well documented and all operations were conducted according to the RCF procedures

c. Conclusion

Operational activities were consistent with applicable TS and procedural requirements.

**3. Operator Requalification**

a. Inspection Scope (IP 69001-02.04)

The inspectors reviewed selected aspects of the following to verify compliance with the U.S. Nuclear Regulatory Commission (NRC)-approved requalification program and other regulatory requirements:

- RPI RCF Requalification Program, Version 1.0, dated September, 2008
- Individual licensed operator files
- RCF logbook entries for the past two years

b. Observations and Findings

The inspectors verified that all operator licenses were current and that operators were enrolled in the licensee's NRC-approved requalification and training program and had completed the minimum required hours of reactor operation per quarter. The inspectors noted that operators were receiving the required biennial medical examinations.

The licensee's requalification program included requirements for an annual operating test and a biennial written examination. The inspectors verified that both examinations were administered at the specified frequency and that the level of difficulty was comparable to that of NRC-administered examinations.

The inspectors confirmed that the requalification program was being administered in a manner that sufficiently maintains the qualifications and proficiency of all licensed operators.



During the review of the requalification plan, the inspectors noted that the tracking methods for operators' duty hours and requalification sign-offs had changed since the last plan update. The inspectors discussed the discrepancy with the licensee and opened inspector follow-up item (IFI) 50-225/2016-201-01 to follow-up on the requalification plan update.

c. Conclusion

Operator requalification was conducted as required by the Requalification Program and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55, Operators' Licenses."

**4. Surveillance and Limiting Conditions for Operation**

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with TS Section 3, "Limiting Conditions for Operation," and TS Section 4, "Surveillance Requirements":

- RCF Surveillance Procedures, Version 4.0, dated September 2014
- RCF surveillance schedule for the past two years
- RCF logbook entries for the past two years

b. Observations and Findings

Daily, weekly, monthly, and other periodic checks, tests, and verifications for TS required limiting conditions for operation were being completed as required. The inspectors performed a random sampling of the required surveillances and verified that they were completed on schedule and all of the recorded results were within the TS and procedurally prescribed parameters. The records and logs were noted to be complete and were being maintained as required.

c. Conclusion

Limiting conditions for operation and surveillances required by TS were being properly implemented.

**5. Emergency Preparedness**

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with the licensee's emergency plan and other regulatory requirements:

- RCF Emergency Plan, Version 3.0, dated August 2004
- RCF Emergency Procedures, dated May 2006

- RCF Emergency Plan and Procedures Reviews for past two years

b. Observations and Findings

The licensee's emergency plan has clearly defined emergency procedures. The emergency response drills based on different scenarios were conducted once every year for 2014, 2015, and 2016. All the required emergency equipment checks were conducted according to the emergency procedures.

The inspectors noted that the emergency plan has not been updated since 2004. Since then there has been on-going constructions around the facility that has altered the facility's layout and emergency exclusion areas. Additionally, the plan is missing the notice of unusual event classification level. The inspectors discussed the discrepancies with the licensee and opened IFI 50-225/2016-201-02 to follow-up on the licensee's update to the emergency plan.

c. Conclusion

RCF emergency plan and procedures need to be updated to reflect the impact of the new constructions around the RCF facility.

**6. Maintenance Logs and Records**

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with TS requirements:

- RCF logbook entries for the past two years
- Operations Report for RPI RCF for the past two years
- RCF Maintenance Procedure

b. Observations and Findings

The inspectors reviewed selected portions of reactor logbooks regarding scheduled and unscheduled maintenance activities since the last inspection. This review indicated that equipment malfunctions were logged. Maintenance activities that have an effect on reactor safety were carried out and reported as required. After maintenance items were completed, system operational checks were performed to ensure the affected systems were operable before returning them to service.

c. Conclusion

Maintenance activities were conducted consistent with TS requirements.

## **7. Fuel Handling Logs and Records**

### **a. Inspection Scope (IP 69001)**

The inspectors reviewed selected aspects of the following to verify compliance with TS Section 3, "Limiting Conditions for Operation," TS Section 4, "Surveillance Requirements":

- RCF logbook entries for the past two years
- RCF Operating Procedures, Section K, "Fuel Handling," Version 3.0, dated July 2013

### **b. Observations and Findings**

The licensee primarily conducted fuel movements for fuel inspections and experiments. During the inspection period however, a complete reactor core fuel removal was conducted on July 2016 and all fuels were reinserted into the core on August 3, 2016. The fuel removal and installation were well documented and conducted according to the RCF fuel handling procedures. The inspector found that the procedures used for the safe handling of fuel elements were adequate.

### **c. Conclusion**

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

## **8. Exit Interview**

The inspectors reviewed the inspection results with members of licensee management and NSRB members at the conclusion of the inspection on October 20, 2016. The licensee acknowledged the items presented.

### **PARTIAL LIST OF PERSONS CONTACTED**

#### **Licensee**

P. Caracappa	RCF Director
G. Winters	RCF Operations Supervisor

### **INSPECTION PROCEDURES USED**

IP 69001	Class II Non-Power Reactors
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### **ITEMS OPENED, CLOSED, AND DISCUSSED**

#### **Opened**

50-225/2016-201-01 IFI	Follow-up on the license's update to the requalification plan.
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50-225/2016-201-02 IFI	Follow-up on the license's update to the emergency plan.
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#### **Closed**

None

### **LIST OF ACRONYMS USED**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
IFI	Inspector Follow-Up Item
IP	Inspection Procedure
NSRB	Nuclear Safety Review Board
NRC	U.S. Nuclear Regulatory Commission
RCF	Reactor Critical Facility
RPI	Rensselaer Polytechnic Institute
TS	Technical Specification