



Rensselaer

DEPARTMENT OF MECHANICAL,
AEROSPACE, AND NUCLEAR ENGINEERING

RCF 24-01
Feb 29, 2024

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

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 (CY) 2023 Operations Report of the Rensselaer Polytechnic Institute (RPI) Reactor Critical Facility (RCF) to the USNRC, and to Rensselaer management.

The RCF was operated successfully during CY2023. One trainee, Mr. Kyle Warns, took his Senior Reactor Operator licensing exam in May 2023 and was licensed later that summer. The RCF ended CY2023 with five Senior Reactor Operators.

A NRC inspection was performed in September 2023. During the inspection, no findings of significance were raised and RCF operations were found to be fully compliant with its license and technical specifications.

Training and proficiency requirements for all licensed and active operators have been reviewed and are current. Dr. Jason Thompson remains licensed, but has not been an active part of the operations staff (e.g. has not been the on-duty or on-call Senior Reactor Operator) since August 2022 and thus has not maintained proficiency requirements.

On November 15th, 2023 at approximately 8:30pm EST, a small moderator leak was found at the RCF (estimated leaked volume of 0.5 mL). The leak was found at a connection in the piping between the reactor tank and the sight glass used to view the water level from the control room. As per RCF procedures, the leak was isolated and a moderator sample was tested for possible contamination. Laboratory test results received on January 16th, 2024 confirmed that there was no contamination above acceptable effluent discharge levels present. The involved piping has been fully repaired and is confirmed to operate as intended.

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

1. Changes to facility design: No changes to the facility were made during CY2023.



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. The results were satisfactory. On September 6th, 2023, 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. Calculated integrated thermal power: Approximately 1.28×10^{-2} kw-hr for all of 2023.
7. There were no unplanned scrams in the report interval.
8. Maintenance operations were carried out and logged with satisfactory results.
9. There were no discharges of radioactive effluents.
10. Environmental monitor dosimetry is performed at the exclusion area fence (EM1 through EM4), and at the site boundary fence (EM5 and EM6). Results have been received for Quarters 1-3 at the time of this report. An update will be issued when Quarter 4 results are available. 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 2023 Q1-Q3 was 74 mrem.

The sums of the gross readings and net dose results for 2023 Q1-Q3 are:

	Gross [mrem]	Net [mrem]
EM1	69	0
EM2	72	0
EM3	61	0
EM4	62	0
EM5	42	0
EM6	73	0

Note that the gross reading for EM5 is lower than the other monitors because EM5 was missing from its monitoring location upon collection of the monitors during Q2. If EM5 from Q2 is conservatively assumed to have received the maximum dose of any other EM for that quarter, then the EM5 Q1-Q3 gross would be 65 mrem. This results in a net of 0 mrem.

11. Facility personnel exposures were all less than 10 mem (the minimum detectable exposure) during 2023, with the exception of Jason Thompson who received exactly 10 mrem. Since



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Dr. Thompson was not present during this time period, his measured dose should be considered a consequence of counting statistics rather than real exposure.

Sincerely,

A handwritten signature in black ink, appearing to read 'Wei Ji'.

Dr. Wei Ji, Facility Director
School of Engineering
Rensselaer Polytechnic Institute

cc:

Dr. Shekhar Garde, Dean, School of Engineering

Dr. Antoinette Maniatty, Head, Department of Mechanical, Aerospace, and Nuclear Engineering

Dr. Hyun Kang, NSRB Chair

Ms. Jen Kazmierczak, Director, Environmental Health & Safety and Risk Management

Ms. Ginger Carvalho, RPI Radiation Safety Officer

Dr. Peter Kowal, Reactor Critical Facility (RCF) Operations Supervisor