



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 2, 2022

Dr. Cameron Goodwin, Director
Rhode Island Nuclear Science Center
16 Reactor Road
Narragansett, RI 02882-1165

SUBJECT: RHODE ISLAND ATOMIC ENERGY COMMISSION – U.S. NUCLEAR
REGULATORY COMMISSION ROUTINE INSPECTION REPORT
NO. 05000193/2022201

Dear Dr. Goodwin:

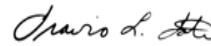
From March 14-17, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Rhode Island Nuclear Science Center research reactor facility. The enclosed report documents the inspection results which were discussed on March 17, 2022, with you and members of your staff, as well as Dr. Clinton Chichester, Chairman, Rhode Island Atomic Energy Commission.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed various activities, and interviewed various personnel. Based on the results of this inspection, no findings of significance 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 <https://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Craig Bassett at (240) 535-1842, or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,



Signed by Tate, Travis
on 06/02/22

Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-193
License No. R-95

Enclosure:
As stated

cc: See next page

Rhode Island Atomic Energy Commission

Docket No. 59-193

cc:

Governor
222 State House Room 115
Providence, RI 02903

Howard Chun, Commissioner
Cranston High School East
899 Park Avenue
Cranston, RI 02910

Dr. Clinton Chichester, Chairman
Rhode Island Atomic Energy Commission
College of Pharmacy
Pharmacy Building
7 Greenhouse Road
Kingston, RI 02881

Dr. John Breen, Chairman
Nuclear and Radiation Safety Committee
Providence College
Department of Chemistry and Biochemistry
1 Cunningham Square
Providence, RI 02918

Dr. Yana K. Reshetnyak, Commissioner
Department of Physics
University of Rhode Island
2 Lippitt Road, East Hall
Kingston, RI 02881

Dr. Nancy E. Breen, Commissioner
Marine and Natural Science Building 226
Roger Williams University
One Old Ferry Road
Bristol, RI 02809

Supervising Radiological Health Specialist
Office of Occupational and
Radiological Health
Rhode Island Department of Health
3 Capitol Hill, Room 206
Providence, RI 02908-5097

Test, Research and Training
Reactor Newsletter
Attention: Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

SUBJECT: RHODE ISLAND ATOMIC ENERGY COMMISSION – U.S. NUCLEAR
REGULATORY COMMISSION ROUTINE INSPECTION REPORT
NO. 05000193/2022201 DATED: JUNE2, 2022

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NAME	CBassett	NParker	TTate
DATE	3/31/2022	3/31/2022	6/2/2022

OFFICIAL RECORD COPY

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

Docket No.: 50-193

License No.: R-95

Report No.: 05000193/2022201

Licensee: Rhode Island Atomic Energy Commission

Facility: Rhode Island Nuclear Science Center

Location: Narragansett, Rhode Island

Dates: March 13-17, 2022

Inspector: Craig Bassett

Approved by: Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

Rhode Island Atomic Energy Commission
Rhode Island Nuclear Science Center Facility
Inspection Report No. 05000193/2022201

The primary focus of this announced, routine inspection was the onsite review of selected aspects of the Rhode Island Atomic Energy Commission's (the licensee's) Class I, 2-megawatt research reactor safety program including: (1) effluent and environmental monitoring; (2) organization and operations and maintenance activities; (3) review and audit and design change functions; (4) emergency preparedness; (5) radiation protection; and (6) transportation activities. The review covered from the date of the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas to the present. The NRC staff determined the licensee's program was acceptably directed toward the protection of public health and safety and in compliance with NRC requirements.

Effluent and Environmental Monitoring

- The environmental protection program satisfied NRC requirements.

Organization and Operations and Maintenance Activities

- Organizational structure and staffing, and operational activities were consistent with technical specification (TS) requirements.

Review and Audit and Design Change Functions

- The review and audit program was conducted and completed by the Nuclear and Radiation Safety Committee (NRSC), as stipulated in the facility's TS Section 6.2.
- Changes made at the facility were reviewed using guidance in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, tests and experiments."

Emergency Preparedness

- Emergency preparedness was effectively implemented through the emergency plan (E-Plan) and the associated implementing procedure.

Radiation Protection

- Implementation of the Radiation Protection and as low as reasonably achievable (ALARA) programs satisfied regulatory requirements.

Transportation Activities

- Shipments of radioactive material (RAM) made under the reactor license were in compliance with NRC and Department of Transportation (DOT) regulations.

REPORT DETAILS

Summary of Facility Status

The licensee's Rhode Island Nuclear Science Center (RINSC) Class I, 2-megawatt research reactor continued to be operated in support of experiments, research, education, training, and surveillance. During the inspection, the reactor was operated for research and experiments.

1. Effluent and Environmental Monitoring

a. Inspection Scope (IP 69004)

The inspector reviewed the following to verify that the requirements of 10 CFR Part 20, "Standards for Protection against Radiation," Appendix B and TS Sections 3.7.2 and 4.7.2 were met:

- stack continuous air monitor records
- records of liquid effluent releases to the sanitary sewer
- environmental dosimetry records for 2020 through the present
- Annual Radiation Safety Program Reviews for 2020 and 2021
- various Nuclear Science Center (NSC) forms including: NSC-03A, -03B, -52, and -78
- RINSC Annual Reports submitted to the NRC for the periods from July 1, 2019, through June 30, 2020, and July 1, 2020, through June 30, 2021

b. Observations and Findings

The inspector confirmed that environmental radiation monitoring consisted of using thermoluminescent dosimeters (TLDs) placed at monitoring sites outside the facility and the dosimetry results indicated dose rates less than the regulatory limit for the public.

The inspector verified that gaseous releases continued to be monitored, calculated, and documented, and that airborne concentrations of the gaseous releases were less than the concentrations stipulated in 10 CFR Part 20, Appendix B, Table 2. In addition, the inspector found that the dose rate to the public as a result of the gaseous releases was well below the dose constraint specified in 10 CFR 20.1101, "Radiation protection programs," paragraph (d) as demonstrated through COMPLY code calculations.

The inspector confirmed that liquid effluent releases were within the monthly average concentration limits established in 10 CFR Part 20, Appendix B, Table 3.

c. Conclusion

The inspector determined that effluent releases were within the specified regulatory and TS limits and the environmental protection program satisfied NRC requirements.

2. Organization and Operations and Maintenance Activities

a. Inspection Scope (IP 69006)

To verify that the licensee complied with the requirements for organization, staffing, and operations activities as specified in TS Sections 2.0, 3.0, and 6.0, and procedural requirements, the inspector reviewed selected aspects of the following:

- reactor logbooks Nos. 65 and 66
- RINSC organizational structure and staffing
- various notebooks, documents, and forms
- reactor operating data notebooks for 2020 and 2021

b. Observations and Findings

The inspector confirmed that the organizational structure at the facility was in compliance with the TSs. The inspector noted that the various logs and forms that were required to be filled out to document reactor operations were completed. The inspector verified that shift staffing requirements during reactor operations were met, as required by TS 6.1.2 and 6.1.3.

c. Conclusion

The inspector determined that the organizational structure and shift staffing, and operational activities were in compliance with TS and procedural requirements.

3. Review and Audit and Design Change Functions

a. Inspection Scope (Inspection Procedure (IP) 69007)

The inspector reviewed selected aspects of the following with respect to the review and audit program and design change activities to ensure compliance with TS Section 6.2 and 10 CFR 50.59:

- NRSC meeting minutes and associated records for 2020 through 2022
- RINSC Annual Reports for the past two reporting periods
- Annual Radiation Safety Program Reviews for 2020 and 2021
- RINSC Administrative Procedure, AP-03, "Facility Modifications"
- various NSC forms including NSC-24 and -51

b. Observations and Findings

(1) Review and Audit Functions

The inspector verified that NRSC meetings were held, and safety reviews and audits were conducted at the required frequency. The inspector confirmed that topics of those reviews and audits were consistent with TS requirements.

(2) Design Change Functions

The inspector reviewed the design change program used at the facility. The inspector noted that the licensee's design change procedure provided guidance using the 10 CFR 50.59 review and evaluation process. The inspector confirmed that the facility design change program was implemented in accordance with the regulations and the licensee procedure.

c. Conclusion

The inspector determined that the NRSC met at the required frequency and reviewed the topics outlined in the TS. The inspector also determined that changes to the facility, experiments, and procedures were evaluated using the criteria specified in 10 CFR 50.59.

4. Emergency Preparedness

a. Inspection Scope (IP 69011)

The inspector interviewed staff members and reviewed the following documents to verify compliance with regulatory requirements and the RINSC E-Plan, Revision 7:

- emergency preparedness notebook containing documentation of various activities including alarm tests; emergency drills; communication; and supply inventories
- RINSC Emergency Procedure, EP-01, "Emergency Plan Implementing Procedure"
- letters of agreement (LOA) between RINSC and the Narragansett Police Department (NPD), the Rhode Island Hospital, and the Narragansett Fire Department (NFD)

b. Observation and Findings

The inspector verified that the E-Plan was reviewed and updated biennially. The inspector noted that the associated implementing procedure was reviewed biennially and revised as needed.

The inspector confirmed that emergency and evacuation drills were conducted annually as required by the E-Plan. The inspector found that emergency training for licensee personnel was accomplished annually. The inspector verified that training for offsite support agencies (i.e., police and fire departments), which was not specifically required by the E-Plan, was provided when those organizations were available and/or whenever requested.

The inspector confirmed that the LOAs between the RINSC facility and the NPD and NFD remained in effect and stipulated that police and fire personnel would respond and provide support during an emergency at the facility. Likewise, the inspector verified that the LOA with the Rhode Island Hospital was current and ensured that the hospital would treat RINSC personnel in case of injury.

The inspector reviewed the communications capabilities with support groups and found that the various items of equipment were functional, available for use as needed, and were checked annually. The inspector confirmed that the emergency call list was

updated annually as required by the E-Plan and copies were posted in the control room and in other areas of the facility, as well as in the Emergency Support Center.

c. Conclusion

The inspector determined that the licensee maintained an effective emergency preparedness program through implementation of the E-Plan and the associated emergency procedure.

5. Radiation Protection

a. Inspection Scope (IP 69012)

The following documents were reviewed to determine compliance with 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," and 10 CFR Part 20 and with TS Sections 3.7.1 and 4.7.1 requirements regarding radiation protection:

- radiation safety training modules and records
- RINSC "Radiation Safety Office Radiation Safety Manual"
- RINSC Annual Reports for the past two reporting periods
- Annual Radiation Safety Program Reviews for 2020 and 2021
- copies of NRC Form 3, "Notice to Employees," posted at the facility
- quarterly dosimetry reports for facility personnel for 2020 and 2021
- selected survey program summary data and survey reports for 2021 to date
- selected calibration and maintenance records of portable survey instruments, area radiation monitors (ARMs), and stack monitors for the past 2 years

b. Observations and Findings

(1) Surveys

The inspector reviewed selected weekly, monthly, quarterly, and semi-annual radiation and contamination surveys. The inspector noted that surveys were completed by trained staff members at the frequency required by procedure. The inspector found that surveys results were documented, and the records maintained as stipulated by procedure. The inspector also accompanied the Reactor Health Physicist during a routine weekly survey of areas in the confinement building and noted that proper survey techniques were used.

(2) Postings and Notices

The inspector verified that caution signs and postings were posted as required in 10 CFR Part 20. The inspector noted that licensee personnel followed the directions of the postings and the precautions for access to the controlled areas in the facility. The inspector verified that copies of current notices to workers were posted in the facility and the copies of NRC Form 3 noted at the facility were the latest issue as required by 10 CFR 19.11, "Posting of notices to workers."

(3) Dosimetry Reports/Personnel Exposure

The inspector verified that the licensee used TLDs to monitor staff and designated users whole body radiation exposure and TLD finger rings for extremity monitoring. Through an examination of the TLD results for the past 2 years, the inspector confirmed that all the occupational doses for facility staff and designated user personnel were within 10 CFR Part 20 limits. The inspector confirmed that copies of each monitored individual's exposure information was maintained by the RINSC Radiation Safety Officer (RSO). The inspector also verified that the RSO maintained an NRC Form 5, "Occupational Dose Record for a Monitoring Period," equivalent, for those who received an annual occupational dose greater than 100 millirem, as required by 10 CFR Part 19.

(4) Maintenance and Calibration of Radiation Monitoring Equipment

The inspector examined selected radiation monitoring devices and noted that the instruments have up-to-date calibration stickers attached. The inspector verified that the licensee's survey instruments were calibrated annually as required by procedure. The inspector also confirmed that the ARMs used in the facility were calibrated annually as required by procedure. The inspector verified that calibration records were current and properly maintained. With regard to the stack monitors, the inspector verified that they were calibrated annually as required by the TS.

(5) Radiation Safety Training

The inspector noted that radiation safety training was given by the RSO to RINSC staff members, various others who were authorized to use the experimental facilities of the reactor (Authorized Users), and to students taking classes at the facility. The inspector confirmed that initial radiation worker training was provided for those new to the facility and staff refresher training was completed on an annual basis. The inspector confirmed that the subjects covered during training satisfied the requirements in 10 CFR 19.12.

(6) Radiation Protection Program

The inspector noted that the licensee's Radiation Protection and ALARA programs were established and described in the RINSC "Radiation Safety Office Radiation Safety Manual." The programs were also outlined in, and implemented through, the RINSC facility radiation safety procedures that were reviewed and approved by the NRSC. The inspector noted that the programs were reviewed annually as required by the regulations.

c. Conclusion

The inspector determined that the Radiation Protection and ALARA programs, as implemented by the licensee, satisfied regulatory requirements.

6. Transportation Activities

a. Inspection Scope (IP 86740)

The inspector reviewed the following documents to determine compliance with NRC and DOT regulations governing the transportation of RAM as specified in 10 CFR Part 20

and 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," and in 49 CFR Parts 171-178.

- training records for those designated as RAM "shippers"
- Annual Radiation Safety Program Reviews for 2020 and 2021
- RAM shipping papers and related records for 2021 through 2022
- licenses of those persons or entities receiving a RAM shipment from the licensee
- various forms including NSC-06 and -56

b. Observations and Findings

Through records review and discussions with the RSO, the inspector found that the licensee made various RAM shipments in 2021 and to date in 2022. The inspector verified that the shipments were completed in accordance with DOT and NRC regulations. The inspector also verified that the licensee maintained a copy on file of each recipient's license to possess RAM as required by the regulations.

The inspector verified that staff members who are currently designated as "shippers" received the appropriate training within the last 3 years covering the requirements of the DOT and the NRC.

c. Conclusion

The inspector determined that licensee shipments of RAM made under the facility's reactor license were completed in accordance with NRC and DOT requirements.

7. Exit Interview

The inspector presented the inspection results to licensee management and staff at the conclusion of the inspection on March 17, 2022. The inspector discussed the areas inspected and the inspection observations. The licensee acknowledged the results of the inspection and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Chichester	Chairman, Rhode Island Atomic Energy Commission
J. Davis	Assistant Director for Operations
C. Goodwin	Facility Director
M. Marrapese	Reactor Supervisor
J. McCullah	Reactor Health Physicist
S. Nam	Assistant Director for Radiation and Reactor Safety/Radiation Safety Officer
B. Sirr	Facility Engineer

Other Personnel

J. Conroy	Fire Captain, Narragansett Fire Department, Town of Narragansett
D. Sweet	Lieutenant, Narragansett Fire Department, Town of Narragansett

INSPECTION PROCEDURES USED

IP 69004	Class I Research and Test Reactor Effluent and Environmental Monitoring
IP 69006	Class I Research and Test Reactors Organization and Operations and Maintenance Activities
IP 69007	Class I Research and Test Reactor Review and Audit and Design Change Functions
IP 69011	Class I Research and Test Reactor Emergency Preparedness
IP 69012	Class I Research and Test Reactors Radiation Protection
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None