

September 28, 2010

Dr. T. Tehan, Director
Rhode Island Nuclear Science Center
Rhode Island Atomic Energy Commission
16 Reactor Road
Narragansett, RI 02882-1165

SUBJECT: RHODE ISLAND ATOMIC ENERGY COMMISSION - NRC ROUTINE
INSPECTION REPORT NO. 50-193/2010-203

The U.S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection on September 7-9, 2010, at the Rhode Island Nuclear Science Center Reactor facility (Inspection Report No. 50-193/2010-203). The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. Based on the results of this inspection, no safety concern or noncompliance of requirements was identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulation, Section 2.390* "Inspections, exemptions, requests for withholding", a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or the NRC's document system (Agencywide Document Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Jack Donohue at 860-495-5332 or electronic mail at Jack.Donohue@nrc.gov.

Sincerely,

/RA/

Johnny H. Eads, Jr. Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

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

Enclosure:
As stated
cc w/ encl: See next page

Rhode Island Atomic Energy Commission

Docket No.: 50-193

cc:

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Test, Research, and Training Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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DATE	9/15/10	9/28/10	9/28/10

OFFICIAL RECORD COPY

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

Docket No: 50-193

License No: R-95

Report No: 50-193/2010-203

Licensee: Rhode Island Atomic Energy Commission

Facility: Rhode Island Nuclear Science Center Research Reactor

Location: Narragansett, Rhode Island

Dates: September 7-9, 2010

Inspector: Jack Donohue

Approved by: Johnny H. Eads, Jr., Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Rhode Island Atomic Energy Commission
Rhode Island Nuclear Science Center Reactor Facility
NRC Inspection Report No. 50-193/2010-203

The primary focus of this routine, announced operations inspection was the onsite review of selected aspects of the Rhode Island Atomic Energy Commission (the licensee's) two megawatt Class I research reactor safety programs including organization and staffing, operations and maintenance; surveillance; fuel movement; reactor operator licenses, requalification and medical examinations; and emergency preparedness. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with U. S. Nuclear Regulatory Commission (NRC) requirements.

Organization and Operations and Maintenance Activities

Organization, operations, and maintenance were observed to be in accordance with Technical Specification (TS) requirements. The licensee continued improvements in the areas of staffing, communications and maintaining a safety conscious work environment.

Surveillance

Operations were found to be in compliance with the limiting conditions for operation and surveillance requirements as stated in the TS.

Fuel Movement

The licensee made very infrequent reactor fuel movements but when required, followed written procedures that met TS requirements.

Reactor Operator Licenses, Requalification and Medical Examinations

The licensee was conducting a reactor operator re-qualification program in compliance with NRC regulations and the licensee's written program.

Emergency Preparedness

The licensee maintained an effective emergency preparedness program through implementation of the written emergency plan.

REPORT DETAILS

Summary of Facility Status

The Rhode Island Atomic Energy Commission's (RIAEC, the licensee) Rhode Island Nuclear Science Center (RINSC) two megawatt Class I research reactor continued to be operated in support of research, service, education, training, and surveillance. During the inspection, the inspector observed the reactor in operation to irradiate samples as part of its research and service mission.

1. Organization and Operations and Maintenance Activities

a. Inspection Scope (Inspection Procedure (IP) 69006)

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Section 6.0, Administrative Controls, of the RINSC Technical Specifications (TS), Amendment No. 29 to License No. R-95 was being met:

- Reactor Logbook No. 57, dated June 17, 2009 to August 8, 2010 and Logbook No. 58, dated August 16, 2010 to present
- Annual Report for July 1, 2009 through June 30, 2010, dated July 30, 2010
- Standard Operating Procedures
- RINSC organizational structure and staffing
- Policy Statement, Safety Conscious Work Environment, Issued by the RIAEC meeting minutes, dated May 14, 2010

b. Observations and Findings

The inspector observed a reactor checkout, startup, approach to critical and escalation to full power. The inspector reviewed portions of the reactor logbook, verifying compliance with the staffing requirements of TS Sections 6.1.2 and 6.1.3 and that the NRC-licensed Senior Reactor Operator (SRO) on duty were designated by name in the reactor logbook. This individual executed duties in accordance with TS Sections 6.3.2, Senior Reactor Operators 6.5, Operating Procedures; and 6.9, Plant Operating Records.

The inspector noted no changes occurred in key licensee personnel; however a newly qualified SRO and Reactor Operator (RO) have been redesignated in the staff. The Reactor Supervisor position continues to be vacant following the promotion of the previous Supervisor to Assistant Director. The inspector discussed with licensee management and reaffirmed the importance of timely replacement of key staff members.

The inspector additionally noted that RINSC procedures have continued going through a systematic revision and update process. A new numbering system has been developed and approved by the Nuclear and Radiation Safety Committee

(NRSC). Under this system, procedures are grouped according to whether they are operating procedures, test procedures, calibration procedures, etc. As the procedures are updated, they are being put into a uniform standard format that was also approved by the NRSC. All new procedures and procedure revisions are submitted to the NRSC for review and approval quarterly. Once approved, the staff is informed about the changes, and the procedures are incorporated into the Procedure History Record, the shared hard drive file for current procedures, and the control room procedure notebook. The Procedure Index is also updated to indicate the current list of procedures, as well as the latest revision in use.

The inspector discussed with licensee management the status of aspects of a safety conscious work environment. The licensee staff personnel indicated communication among RINSC staff members has improved, a result, in part, of weekly staff meetings called by the Director. A weekly email from the Director to RINSC following the weekly staff meeting updates the RIAEC to the status of the RINSC safety conscious work environment.

c. Conclusion

Organization, operations, and maintenance were observed to be in accordance with TS requirements.

2. Surveillance

a. Inspection Scope (IP 69010)

The inspector reviewed the following to verify compliance with TS Section 3.0, Limiting Conditions for Operation, and to determine if the periodic surveillance tests on safety systems were performed as stipulated in TS Section 4.0, Surveillance Requirements:

- RINSC Reactor Operating Data Notebook, 2009 and 2010
- Periodic Maintenance Notebook containing the documentation of maintenance items
- Reactor Parameter Testing Procedure (TP) TP-03, Control Rod Reactivity Worth, dated December 4, 2009
- Reactor Parameter Testing Procedure (TP) TP-04, Control Rod Reactivity Insertion Rates, dated December 4, 2009
- Reactor Operations Request NSC-49, Pre-Start Check Sheet NCS-1, Shift Record Data Sheet NSC-11, and RINSC Reactor Operations Data NSC-18 for 2009 and 2010

b. Observations and Findings

The inspector witnessed a reactor startup, approach to critical and ascension to power. Surveillances and compliance with TS limits was accomplished through adherence to written procedures which had been reviewed by the NRSC in accordance with TS Section 6.3, Operating Procedures. Additional records for

the surveillances cited above were also reviewed including: weekly primary and secondary water analysis (September 9, 2010), core element inspection (August 11, 2010), shim safety rod inspection (August 11, 2010), shim safety rod drop times (August 12, 2010), cold clean blade reactivity (August 24, 2010), control blade reactivity worth's (August 30, 2010).

c. Conclusion

Operations were found to be in compliance with the Limited Condition for Operation (LCO) and surveillance requirements as stated in the TS.

3. Fuel Movement

a. Inspection Scope (IP 69009)

The inspector reviewed the following to verify compliance with TS Sections 4.9.b and 6.9.1.g which require visual inspection of fuel elements every five years and the surveillance at least a fifth of the fuel elements each year maintaining operating records of the fuel inventory, respectively:

- Reactor Logbook No. 57, dated June 17, 2009 to August 8, 2010 and Logbook No. 58, dated August 16, 2010 to present
- Annual Report for July 1, 2009 through June 30, 2009, dated July 30, 2010.
- Standard Operating Procedures
- RINSC Operating Procedure Appendix Z, [Special Nuclear Material] SNM Accounting, Rev. 5, for inventory taken October 22, 2007
- RINSC Operating Procedure Appendix Z, SNM Accounting, Rev. 6, for inventory taken April 14, 2008
-

b. Observations and Findings

During a previous fuel inspection on May 5, 2009, the RINSC staff discovered that the core positions of two fuel elements had been transposed. This item was reported in IR 50-193/2009-201. Following the investigation the staff determined that this transposition had occurred when the two fuel elements were removed from the core and placed into a storage rack to perform a gamma irradiation experiment. Following the experiment the elements were placed back into the core in the reversed locations. The elements were reinstalled in the pool maintaining As Low As Reasonably Achievable (ALARA) considered prior to validation. The corrective action has been implemented with both increases in verification personnel and lighting. The inspector in discussion with the licensee indicated that the newly increased lighting facilitated the recent fuel inspections.

The inspector reviewed the fuel inspection of required annual surveillance of two elements performed on June 25, 2010 at the request of Argonne National

Laboratory to aid in computer modeling and the remaining fuel elements on August 23, 2010.

c. Conclusion

The licensee has made infrequent reactor fuel movements and has made additional changes to ensure fuel once removed returns to previous or required locations. The licensee followed written procedures that met TS requirements.

4. Reactor Operator Licenses, Requalification and Medical Examinations

a. Inspection Scope (IP 69003)

The inspector reviewed the following to verify compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55, Operators' Licenses, and the licensee's reactor operator requalification program:

- RINSC Operating Procedures Appendix U, Reactor Operator Re-Qualification, Revision (Rev.) 2, dated June 29, 2005
- Individual RO and SRO Requalification files containing:
- NRC Form 396, Certification of Medical Examination by Facility Licensee
- Operator Re-qualification Program Checklist
- Medical Certification and Monitoring of Certified Personnel, American National Standards Institute/American Nuclear Society (ANSI/ANS) 15.4, Selection and Training of Personnel for Research Reactors, to use as the basis for determining adequate physical fitness to serve as an SRO or RO.

b. Observations and Findings

The inspector reviewed the licensee's operator requalification program to verify that it met the requirements of 10 CFR Part 55 and reviewed selected licensed RO and SRO files, verifying that the program was being conducted in accordance with the written procedure. The annual operating examination and the biennial written examination were of equivalent difficulty to NRC-administered examinations as required. Records were available documenting the fact that during the requalification cycle the individual operators performed the required number of licensed activities and reviewed changes to the facility, regulations, and procedures in addition to passing the examinations. Medical examinations for selected licensed personal were also reviewed satisfactorily.

c. Conclusion

The licensee was conducting a reactor operator re-qualification program in compliance with NRC regulations and the licensee's written program.

5. Emergency Preparedness

a. Inspection Scope (IP 69011)

The inspector reviewed the following documents and visited the facilities discussed below to verify compliance with regulatory requirements and the licensee's emergency plan commitments:

- Emergency Plan, Rev. 2, dated January 2007
- RINSC Nuclear and Radiation Safety Committee Charter, Rev O
- RINSC Operating Procedure Appendix X, Emergency Plan Implementing Procedures, Rev. 0, dated June 19, 2007, containing:
 - Attachment B, Form NSC-31, Emergency Communications Network
 - Attachment E, Emergency Classification Matrix
- [Emergency] Communication Tests file
- Emergency Equipment Inventory file
- Emergency Drill file containing:
 - Letter from Mr. H. Bicehouse to NRSC, Radiological Emergency Response Plan, dated October 31, 2007
 - Letter of Agreement between Narragansett Police Department and RINSC, signed by Mr. M. J. Davis and by Chief J. Little on March 17, 2010
 - Letter of Agreement for Medical Services, from John B. Murphy MD, Vice President of Medical Affairs Rhode Island Hospital, to Mr. T. Tehan, RIAEC, dated February 2, 2010
 - Letter of Agreement between Narragansett Fire Department and RINSC, signed by Mr. M. J. Davis and Chief J. Cotter dated December 30, 2009

b. Observation and Findings

The inspector reviewed the emergency plan, including an attachment submitted with the transmittal letter. The inspector concurred with the licensee's conclusions regarding each of the changes reviewed. The licensee maintained a file of recent agreement letters with off-site emergency agencies identified in the plan and reissues the agreement biennially.

The inspector reviewed previous annual emergency drills for 2009 and follow-up action items from the critiques. The critiques were conducted to review emergency preparedness in general and to identify any weakness or lessons learned from the drills that warranted follow-up actions.

On September 7, 2010 the annual drill was performed by the licensee. The reactor building was evacuated and all staff personnel reported to Coastal Institute to await further instructions. The licensee reviewed the RINSC

Operating Procedure, performed personnel accountability and all instructions. The inspector observed that licensee personnel fully understood evacuation procedures and instructions.

The Narragansett Fire Department personnel arrived the following day as scheduled to tour the facility. The licensee provided an extensive tour and discussion with the licensee on potential access areas for several types of potential fires in radiological areas as well as locations for fire fighting equipment.

The inspector visited the Emergency Support Center (ECS), observing the inventory of emergency supplies, instruments, and information committed to be stored there by the plan. The licensee maintained records indicating that the emergency supplies were periodically inventoried as part of the surveillance program invoked by the emergency plan

c. Conclusion

The licensee maintained an effective emergency preparedness program through implementation of the written emergency plan and emergency implementing procedures.

6. Exit Interview

The inspector presented the inspection results to licensee management at the conclusion of the inspection on September 9, 2010. The inspector described the areas inspected and discussed in detail the inspection observations. No dissenting comments were received from the licensee. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection and that the results of the inspection are subject to management review

PARTIAL LIST OF PERSONS CONTACTED

Licensee

H. Bicehouse	Radiation Safety Officer and Assistant Director for Radiation and Reactor Safety
M. Damato	Health Physics Technician and Senior Reactor Operator
M.J. Davis	Assistant Director, Rhode Island Nuclear Science Center
S. Guarino	Health Physicist
B. MacGregor	Facility Engineer/Senior Reactor Operator
B. Nassersharif	Rhode Island Atomic Energy Commission
Z. Richards	Reactor Operator
T. Tehan	Director, Rhode Island Nuclear Science Center

INSPECTION PROCEDURES USED

IP 69003	Class 1 Research and Test Reactor Operator Licenses, Requalification, and Medical Examinations
IP 69006	Class 1 Research and Test Reactors Organization and Operations and Maintenance Activities
IP 69009	Class 1 Research and Test Reactors Fuel Movement
IP 69010	Class 1 Research and Test Reactors Surveillance
IP 69011	Class 1 Research and Test Reactors Emergency Preparedness

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Document Access Management System
ALARA	As Low As Reasonably Achievable
ANSI/ANS	National Standards Institute/American Nuclear Society
ESC	Emergency Support Center
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LCO	Limiting Conditions for Operation
NRC	U. S. Nuclear Regulatory Commission
NRSC	Nuclear and Radiation Safety Committee
NSC	Nuclear Science Center
Rev	Revision
RIAEC	Rhode Island Atomic Energy Commission
RINSC	Rhode Island Nuclear Science Center
RO	Reactor Operator
RSO	Radiation Safety Officer
SNM	Special Nuclear Material
SOP	Standard Operating Procedure
SRO	Senior Reactor Operator
TP	Testing Procedure
TS	Technical Specification