

U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-193

License No: R-95

Report No: 50-193/98-202

Licensee: Rhode Island Atomic Energy Commission

Facility: Rhode Island Nuclear Science Center  
University of Rhode Island

Location: South Ferry Road  
Narragansett, Rhode Island

Dates: September 21-25, 1998

Inspector: Craig Bassett, Senior Non-Power Reactor Inspector

Approved by: Seymour H. Weiss, Director  
Non-Power Reactors and Decommissioning Project  
Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

9810150218 981013  
PDR ADOCK 05000193  
G PDR

## EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of various aspects of the licensee's programs concerning the conduct of operations and emergency preparedness as they relate to the licensee's 2 Megawatt (MW) Class 1 research reactor. The licensee's programs were directed toward the protection of public health and safety and were in compliance with NRC requirements. No safety concerns or violations of regulatory requirements were identified.

### Conduct of Operations

- Staffing, reporting, and record keeping met requirements specified in Technical Specifications (TS) 6.0.
- Review and oversight functions required by TS 6.4 were acceptably completed by the Nuclear and Radiation Safety Committee. No 10 CFR 50.59 changes had been implemented since the last NRC operations inspection.
- One Inspector Follow-up Item was identified involving the lack of documentation of required training. Medical examinations were being completed as required.
- Facility procedures and document reviews satisfied TS 6.0 requirements.
- The reactor fuel was being inspected annually as required by TS 4.9.
- The program for surveillance and LCO confirmations was being implemented in accordance with TS requirements.
- The program for the control of new experiments satisfied regulatory requirements and licensee commitments.

### Emergency Preparedness

- The Emergency Plan was found acceptable by the NRC in 1995 and no revisions have been made recently.
- The Implementing Procedures were being updated as required and were acceptable to carry out the provisions of the Emergency Plan.
- Emergency responders were knowledgeable of proper actions to take in case of an emergency but an Inspector Follow-up Item was identified for failure to maintain all the supplies and instruments in the storage cabinets as required.
- The licensee maintained current Letters of Agreement with offsite agencies for support in case of an emergency.

- Annual drills were held but the drill for 1997 was not documented. An Inspector Follow-up item was established to verify that future drills are documented and that the drills acceptably implement the required portions of the emergency plan.
- Documentation of emergency preparedness training was identified as an Inspector Follow-up Item.

## Report Details

### Summary of Plant Operations

Although the licensee's non-power reactor (NPR) was not operated during this inspection, a review of the applicable records indicated that the reactor continued to be operated at various power levels up to the maximum authorized level of 2 MW for physics experiments and to support research.

#### **1. Conduct of Operation:**

##### a. NPR Organization, Operations, and Maintenance Activities (Inspection Procedure [IP] 39745)

###### 1. Inspection Scope

To verify staffing, reporting, and record keeping requirements specified in Technical Specifications (TS) 6.0 were being met, the inspector reviewed:

- organization and staffing for the facility,
- administrative controls,
- the reactor console logs, and
- the annual reports.

###### 2. Observations and Findings

The licensee's current operational organization included a Director, an Assistant Director for Reactor Operations, Reactor Operators, and a Radiation Safety Officer. This organization was consistent with that specified in the TS. Other positions were listed on the organizational chart but the responsibilities for those positions were not specified by the TS. It was noted that the Director, the Assistant Director, and the Reactor Supervisor were all qualified Senior Reactor Operators.

The Assistant Director for Reactor Operations maintained and issued a six-month schedule for reactor operations, maintenance, and surveillance activities. This practice kept the staff aware of upcoming activities and helped ensure administrative control over operational aspects of the facility.

A review of the reactor console logs showed that they were being maintained as required and problems, if any, were being documented. The annual reports summarized the required information and were issued at the frequency specified in the TS.

Through a review of applicable records and interviews with licensee personnel, the inspector noted that the Facility Engineer, a position that had been filled by a Professional Engineer (PE), had retired about three years ago. Due to budget constraints, no replacement had been hired. Although this position is specified

in the organizational diagram in TS 6.0, it is not one required to be filled by the TS for facility operation. However, it was noted that the licensee is currently in the process of revising facility documents and upgrading facility equipment to increase their authorized power level for the reactor from two to five megawatts. This effort is being reviewed, and must be approved, by the NRC. Facility management must ensure that staffing is acceptable to support safe power upgrade activities.

### 3. Conclusions

Staffing, reporting, and record keeping met the requirements specified in TS 6.0.

#### b. NPR Review, Audit, and Design Change Functions (IP 40745)

##### 1. Inspection Scope

To verify that the licensee had established and conducted reviews and audits as required and to determine whether modifications to the facility were consistent with 10 CFR 50.59 and the TS, the inspector reviewed:

- Nuclear and Radiation Safety Committee meeting minutes,
- Nuclear and Radiation Safety Subcommittee meeting minutes,
- Audits and reviews, and
- Engineering changes under 10 CFR 50.59.

##### 2. Observations and Findings

Minutes of the Nuclear and Radiation Safety Committee (NRSC) showed that the committee met at the required frequency and that a quorum was present. The topics considered during the meetings were appropriate and as stipulated in TS 6.4. The Nuclear and Radiation Safety Subcommittee and/or persons from other institutions conducted audits and reviews as required and the NRSC reviewed the results. Problems noted during audits were discussed and recommendations for improvement were made. The licensee acceptably implemented the improvements.

The inspector noted that two former members of the NRSC had recently retired or left the committee. The resumes of the individuals who replaced those who left were reviewed. The individuals were well qualified to serve on the NRSC.

Through review of applicable records and interviews with licensee personnel, the inspector determined that no engineering changes had been initiated or completed since the last NRC operations inspection.

### 3. Conclusions

Review and oversight functions required by TS 6.4 were acceptably completed by the NRSC. No 10 CFR 50.59 changes had been carried out since the last NRC operations inspection.

#### c. NPR Operator Licenses, Requalification, and Medical Activities (IP 41745)

##### 1. Inspection Scope

To determine that operator requalification activities and training were conducted as required and that medical requirements were met, the inspector reviewed:

- active license status,
- logs and records of reactivity manipulations,
- written examinations,
- training records, and
- medical examination records.

##### 2. Observations and Findings

The licensee currently has three qualified senior reactor operators (SROs) and one reactor operator (RO). Two of the three SROs and the RO maintain active licenses while the third SRO's license is inactive. It was noted that, although no reactor operator licenses had expired, two people are due this fall to renew their licenses. The licensee was aware of this and was making preparations.

Training had reportedly been conducted in most of the areas outlined in the licensee's "Operator Requalification and Recertification Training Program Plan for the Rhode Island Nuclear Science Center." However, it was noted that no lectures had been given during the past year and a half and that certain training reviews and examinations had not been documented. Monthly and quarterly training was being documented. However, the Annual Operations Tests and the Annual Walk-through Examinations were not documented for 1997 or 1998. Through discussions and observations of records the inspector verified that operator knowledge was acceptable. The licensee was informed that the documentation of required requalification training would be noted by the NRC as an Inspector Follow-up Item (IFI) and would be verified during a future inspection (IFI 50-193/98-202-01).

Operators were receiving the required medical examinations at the frequency specified.

### 3. Conclusions

### 3. Conclusions

One Inspector Follow-up Item was identified involving the lack of documentation of required training. Medical examinations were being completed as required.

#### d. NPR Procedures (IP 42745)

##### 1. Inspection Scope

To determine whether facility procedures met TS requirements, the inspector reviewed:

- operating procedures,
- administrative procedures, and
- procedural reviews and updates.

##### 2. Observations and Findings

Operating procedures were acceptable for the facility and the current staffing level. Documents were being reviewed annually as required and updated as needed. It was noted that Appendix O, "Primary Flow Channel Calibration Check," to the operating procedures and Section 6, "Reactor and Control System Checkout Procedures," had been revised in 1997. No operations were conducted during this inspection but adherence to procedures was apparent from a review of logs and other records.

##### 3. Conclusions

Facility procedures and document reviews satisfied TS 6.0 requirements.

#### e. NPR Fuel Movement (IP 60745)

##### 1. Inspection Scope

To verify adherence to fuel handling and inspection TS 4.9 requirements, the inspector reviewed:

- fuel handling procedures,
- fuel inspection procedures, and
- applicable logs and records.

##### 2. Observations and Findings

The inspector determined that the reactor fuel had been inspected annually in accordance with fuel handling and inspection procedures. The procedures and radiological controls used were acceptable.

### 3. Conclusions

The licensee's reactor fuel was being inspected annually as required by TS 4.9.

#### f. NPR Surveillance (IP 61745)

##### 1. Inspection Scope

To determine that surveillances and Limiting Conditions for Operations verifications were being completed as required by TS 4.0, the inspector reviewed:

- selected surveillance procedures,
- selected surveillance data and records, and
- Limiting Conditions for Operations.

##### 2. Observations and Findings

The inspector noted that selected daily and other periodic checks, tests, verifications, and/or calibrations for TS-required surveillances and Limiting Conditions for Operations (LCO) were completed as required. The surveillances and LCO verifications reviewed were completed on schedule as required and in accordance with licensee procedures. All the recorded results were within the TS and procedural prescribed parameters. The records and logs reviewed were accurate, complete, and being maintained as required.

##### 3. Conclusions

The program for surveillance and LCO confirmations was being carried out in accordance with TS requirements.

#### g. NPR Experiments (IP 69745)

##### 1. Inspection Scope

To verify that experiments were being conducted within approved guidelines, the inspector reviewed:

- experiment review and approval by the NRSC,
- potential hazards identification, and
- control of irradiated items.

##### 2. Observations and Findings

The inspector reviewed an experiment designed to irradiate cell culture media and cells. It was noted that the licensee used form NSC-55 that required detailed dose rate calculations, identification of precautions, and a listing of



procedures to be used. The form was acceptably completed and submitted to the NRSC for approval in accordance with TS 6.4. The experiment was observed by the facility health physics technician and surveys were done following completion of the irradiation. The irradiated materials were released to a laboratory in accordance with procedures.

### 3. Conclusions

The license's program for the control of new experiments satisfied regulatory requirements and licensee commitments.

## 2. **Emergency Preparedness**

### a. Changes to the Emergency Plan (IP 82745)

#### 1. Inspection Scope

To determine compliance with the requirements of 10 CFR 50.54(q) and the licensee's Emergency Plan, the inspector reviewed:

- the Emergency Plan and Implementing Procedures,
- NRSC meeting minutes,
- recent revisions and updates, and
- applicable letters and documents concerning the Emergency Plan.

#### 2. Observations and Findings

The licensee submitted a revised Emergency Plan (E-Plan) to the NRC on July 5, 1994. The NRC reviewed the changes and found that they were acceptable to implement the requirements of 10 CFR Part 50, Appendix E. The licensee was notified of this by letter dated August 25, 1995. No changes have been made since then. The inspector did note that the E-Plan was last reviewed by the NRSC on December 4, 1996. Therefore, the plan is due to be reviewed this fall.

#### 3. Conclusions

The licensee's Emergency Plan was acceptable by the NRC in 1995 and no revisions have been made recently.

### b. Emergency Plan Implementing Procedures (IP 82745)

#### 1. Inspection Scope

To verify the adequacy of the licensee's Emergency Plan Implementing Procedures, the inspector reviewed:

- the Emergency Plan and Implementing Procedures,

- NRSC meeting minutes, and
- recent revisions and updates.

## 2. Observations and Findings

The licensee had reviewed and revised the Implementing Procedures as required. The procedures were last updated in July 1997 and were acceptable to implement the provisions stipulated in the E-Plan.

## 3. Conclusions

The Implementing Procedures were being updated as required and were acceptable to implement the provisions of the Emergency Plan.

### c. Emergency Preparedness Program Implementation (IP 82745)

#### 1. Inspection Scope

To determine the adequacy of the licensee's Emergency Preparedness Program, the inspector reviewed:

- facilities,
- equipment,
- instrumentation,
- supplies on hand, and
- emergency response personnel training.

#### 2. Observations and Findings

The facilities and equipment set aside for emergency response was generally being maintained as required. However, the inspector noted that not all the supplies listed in Appendix 3.1 to the Implementing Procedures were in the cabinets that had been set aside for storage of such gear. Specifically, five boxes of disposable gloves were not located in the storage cabinets, and a survey meter, a GM CDV-700 Survey Instrument with earphones, was not staged for use. The inspector verified that the licensee had access to other gloves and monitoring instrumentation that could be used in the event of an emergency to acceptably implement the plan requirements. The licensee was informed that the availability of required supplies and instrumentation would be noted by the NRC as an IFI and would be verified during a future inspection (IFI 50-193/98-202-02).

Through records review and interviews with licensee personnel, emergency responders were determined to be knowledgeable of the proper actions to take in case of an emergency.

### 3. Conclusions

Emergency responders were knowledgeable of proper actions to take in case of an emergency but an Inspector Follow-up Item was identified for failure to maintain all the supplies and instruments in the storage cabinets as required.

#### d. Offsite Support (IP 82745)

##### 1. Inspection Scope

To verify the adequacy of the offsite support that would be provided to the licensee in case of an emergency, the inspector reviewed:

- the Emergency Plan and Implementing Procedures,
- Letters of Agreement, and
- communications capabilities.

##### 2. Observations and Findings

Updated Letters of Agreement were on file indicating that various federal, state, and local agencies were available to respond in case of an emergency. An agreement also had been established with the Rhode Island Hospital in case a contaminated injured person required medical treatment. Communications with these agencies had been tested on a periodic basis.

##### 3. Conclusions

The licensee maintained current Letters of Agreement with offsite agencies for support in case of an emergency.

#### e. Emergency Preparedness Exercises and Drills (IP 82745)

##### 1. Inspection Scope

To determine that the licensee was conducting the exercises and drills as specified in the Emergency Plan, the inspector reviewed:

- the critiques of drill performance by emergency responders, and
- the documentation of recent drills.

##### 2. Observations and Findings

The inspector noted that drills had been conducted annually as required by the Emergency Plan. Critiques were generally held following the drills to discuss the positive and negative aspects of the exercise and to develop possible solutions to any problems identified. It was noted that the drill held in 1997 had not been documented in a memorandum to the staff but was shown on the calendars of

various staff members. The critique notes of the 1996 and 1998 drills indicated that the drills had been either too challenging (not realistic) or not challenging enough. The licensee acknowledged the importance of conducting appropriate drills and that drills usually highlight areas for improvement. The inspector verified through discussions that licensee personnel were acceptably prepared to implement the requirements of the Emergency Plan. The licensee was informed that the issues of conducting drills to test Emergency Plan requirements acceptably and of properly documenting each drill would be noted by the NRC as an IFI and would be verified during a future inspection (IFI 50-193/98-202-03).

### 3. Conclusions

Annual drills were held but the drill for 1997 was not documented. An Inspector Follow-up Item was established to verify that future drills are documented and to verify that the drills acceptably implement the required portions of the Emergency.

#### f. Emergency Preparedness Training (IP 82745)

##### 1. Inspection Scope

To verify the adequacy of the licensee's emergency training, the inspector reviewed:

- the Emergency Plan, and
- ⊗ training records.

##### 2. Observations and Findings

In the area of Emergency Preparedness and Response, training was reportedly being done but was not documented. Licensee personnel indicated that training was done as part of the reactor operator requalification program but no records of the completion of such could be found. The licensee was informed that the issue of documenting training pertaining to emergency preparedness would be noted by the NRC as an IFI and would be verified during a future inspection along with the verification of documentation of other operator training (IFI 50-193/98-202-01).

##### 3. Conclusions

Documentation of emergency preparedness training was identified as an Inspector Follow-up Item.

### 3. Follow-up on Previously Identified Inspector Follow-up Items

#### a. Inspection Scope

The inspector followed up on three Inspector Follow-up Items that had been noted during previous inspection and documented in Inspection Report No. 50-193/96-01, in Inspection Report No. 50-193/96-02, and in Inspection Report No. 50-193/97-01. The inspector reviewed the licensee's response, evaluation, and corrective actions, as applicable, to the problems or issues noted.

#### b. Observations and Findings

1. IFI 50-193/96-01-02 (Closed): Follow-up on QA Program to Ensure Completion of Changes Associated with Equipment Modifications.

The inspector verified that the licensee had established a Quality Assurance (QA) Program to govern actions taken when changes or modifications are made to the facility and to equipment. The QA Program is under the cognizance of the Reactor Supervisor.

2. IFI 50-193/96-02-02 (Closed): Replace Isolation Valve #1 in the ECCS System.

The inspector verified that the licensee had taken corrective actions. Isolation Valve #1, which originally had a pressure rating of approximately 100 pounds, had been replaced by a valve with a rating of 150 pounds.

3. IFI 50-193/97-01-01 (Closed): Ensure that the 10 CFR 50.59 Evaluation Form Includes a Block Indicating an NRSC Review Has Been Completed.

The inspector verified that the licensee's 50.59 Evaluation Form was revised to include a signature block that showed that the Nuclear and Radiation Safety Committee had reviewed and approved of the change being proposed.

#### c. Conclusions

Three Inspector Follow-up Items identified during previous NRC inspections were closed during this inspection.

### 4. Exit Interview

The inspection scope and results were summarized on September 25, 1998, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the findings 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

R. Clement, Radiation Protection Officer (RPO)  
W. Simoneau, Assistant Director for Reactor Operations  
V. Rose, Chairman, Rhode Island Atomic Energy Commission  
T. Tehan, Director  
C. Widdifield, Reactor Supervisor

## INSPECTION PROCEDURES USED

IP 39745: Class 1 Non-Power Reactors Organization, Operations, and Maintenance Activities  
IP 40745: Class 1 Non-Power Reactors Review and Audit and Design Change Functions  
IP 41745: Class 1 Non-Power Reactors Operator Licenses, Requalification, and Medical Activities  
IP 42745: Class 1 Non-Power Reactor Procedures  
IP 60745: Class 1 Non-Power Reactor Fuel Movement  
IP 61745: Class 1 Non-Power Reactor Surveillance  
IP 69745: Class 1 Non-Power Reactor Experiments  
IP 82745: Class 1 Non-Power Reactor Emergency Preparedness

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-193/98-202-01 IFI Follow-up on the timely documentation of required requalification and emergency preparedness training.  
50-193/98-202-02 IFI Follow-up on the availability of supplies and instruments that are required to be stored in the Emergency Storage Cabinets.  
50-193/98-202-03 IFI Follow-up on the issues of conducting appropriate emergency preparedness drills that are sufficiently challenging and of properly documenting each drill.

### Closed

50-193/96-01-02 IFI Follow-up on QA Program to Ensure Completion of Changes Associated with Equipment Modifications.  
50-193/96-02-02 IFI Replace Isolation Valve #1 in the ECCS System.  
50-193/97-01-01 IFI Ensure that the 10 CFR 50.59 Evaluation Form Includes a Block Indicating an NRSC Review Has Been Completed.

## LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
IFI	Inspector Follow-up Item
IP	inspection Procedure
LCO	Limiting Condition for Operations
MW	Megawatt
NPR	Non-Power Reactor
NRC	Nuclear Regulatory Commission
NRSC	Nuclear and Radiation Safety Committee
QA	Quality Assurance
RIAEC	Rhode Island Atomic Energy Commission
RINSC	Rhode Island Nuclear Science Center
RO	Reactor operator
RPO	Radiation Protection Officer
SRO	Senior reactor operator
TS	Technical Specifications
TRTR	Test, Research, and Training Reactor
URI	University of Rhode Island