

U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

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

Report No: 50-193/96-01

Licensee: Rhode Island Atomic Energy Commission

Facility: Rhode Island Nuclear Science Center

Location: South Ferry Road  
Narragansett, Rhode Island

Dates: March 11-15, 1996

Inspector: Thomas F. Dragoun, Project Scientist

Approved by: John R. White, Chief, Radiation Protection Branch  
Division of Reactor Safety

## EXECUTIVE SUMMARY

Proposed retirement incentives for state employees, which could result in immediate loss of two senior operators and impact reactor operations, will probably not be enacted. Several safety systems changes were well engineered, thoroughly reviewed, and formally approved. However, some improvement in documentation related to these changes will be made by the staff as discussed in Sections 2.0. Compliance with limiting condition of operations and control of experiments was good. Surveillance procedures will be revised to add detail as discussed in Section 3.0. Staff resolution of widespread, low-level floor contamination inside reactor confinement and efforts to pinpoint a leak of reactor pool water was good. Implementation of the revised emergency plan was adequate.

## Report Details

### Summary of Plant Status

The reactor has been shut down since November 1995 for installation of a second primary water heat exchanger, two primary water pumps, connections to the new cooling tower, waste water filters, new waste water holdup tanks to replace the 15,000 gallon buried tank, and partial installation of an emergency core cooling system. Restart was delayed by a decision to replace the new primary pumps, which contain cast iron casings and aluminum impellers, with stainless steel pumps. Extending the outage allowed replacement of the confinement isolation valve air-supply compressor and piping, increased attention to housekeeping in containment, and initiation of a project to locate the source of a pool water leak.

### **1.0 ORGANIZATION, LOGS, AND RECORDS (Inspection Procedure 39745)**

The inspector reviewed the organization with respect to requirements in Technical Specifications (TS) 6.0. The assistant director for operations and the reactor supervisor stated that proposed retirement incentives for state employees, if passed, would result in their prompt retirement. This would leave only one senior and one junior reactor operator, and could impact reactor operations relative to the ability to comply with staffing requirements during fuel movement. The chairman of the RIAEC and chairman of the Reactor and Radiation Safety Committee were aware of this situation, but indicated that passage of the legislation was unlikely. The facility director stated that licensing students and researchers may be considered as a means to augment the reactor operations staff.

The inspector noted that the RIAEC chairman retired and was replaced.

Operator Logs were reviewed. Entries were clear and descriptive.

### **2.0 REVIEW, AUDIT, AND DESIGN CHANGE FUNCTIONS (Inspection Procedures 40745)**

The inspector reviewed the RRSC functions and membership to verify compliance with recently approved TS Amendment #21. RRSC meeting minutes and its predecessor, the Reactor Utilization Committee, indicated that the committees met with the required quorum and with the required frequency. The minutes indicated that procedures and facility changes were reviewed as required.

The inspector reviewed design change documents related to the modifications discussed above and evaluations required by the TS and 10 CFR 50.59 for the following:

- replacement of the through tube flange covers with PVC material;
- replacement of the primary temperature monitoring system;
- relocation of the beryllium reflectors in the core;
- installation of 1/2-inch orifices in the beam tube drain lines; and
- installation of a magnahelic gauge to monitor containment pressure.

The inspector noted that the committee minutes did not clearly indicate acceptance of safety evaluations, as specified in TS 6.4.2(c) and (d). The assistant director stated that the minutes would be reformatted to clearly record concurrence. (Inspector Followup Item 50-193/96-01-01)

The inspector also noted that records specified by TS 6.9 were not readily available. The assistant director stated that a checklist will be developed and incorporated into the quality assurance program that will record completion of acceptance tests, procedure changes, committee approvals, and as-built drawings. (Inspector Followup Item 50-193/96-01-02)

### **3.0 SURVEILLANCE AND LIMITING CONDITIONS FOR OPERATIONS (Inspection Procedure 61745)**

The inspector reviewed the licensee program for control and conduct of surveillance activities and compliance with limiting conditions for operations. Procedures, data, and records were readily available, well maintained, and demonstrated compliance with TS requirements.

The inspector noted that the pre-startup check sheet (OP Section 6) was revised to place steps in the correct order, approved by the RRSC, and issued on May 16, 1995. (Inspection Followup Item 50-193/95-01-01 is closed.)

The inspector also noted that the checklist for the surveillance on the confinement and emergency exhaust system needs to be expanded to demonstrate compliance with specific equipment responses provided in TS 4.4, 4.5, and 4.6. The assistant director stated that the checklist would be expanded. (Inspector Followup Item 50-193/96-01-03)

The licensee stated that two TS requirements are under evaluation for change. TS 4.6.1(f) limits the amount of dilution air fed to the cleanup system. The licensee is considering that elimination of this limit may enhance system effectiveness. Additionally, operating history indicates that maintenance of the pool water level in TS Table 3.1 and the SAR often result in pool overflow from thermal expansion each reactor startup. A minor change to this setting would significantly reduce liquid discharges from the facility.

### **4.0 EXPERIMENTS (Inspection Procedure 69745)**

The inspector examined the control program for experiments. The review, approval, recordkeeping, and conduct of experiments acceptably met the requirements in TS 4.8 and 3.1. The experimenter's checklist provided useful reminders of radiation protection precautions.

### **5.0 EMERGENCY PREPAREDNESS (Inspection Procedure 82745)**

A revised emergency plan was approved by the NRC on April 5, 1994, and amended by the licensee to incorporate NRC comments in May 1994. The first drill under the new plan was effective for a small staff. Followup on suggested improvements was good.

## 6.0 RADIOLOGICAL CONTROLS (Inspection Procedure 83743)

The inspector confirmed, through discussions with the RPO and senior health physicist, that analysis and precautions taken prior to abandoning the 15,000 gallon underground waste water holdup tank would ensure no unmonitored releases to the environment.

The RP staff described actions taken after low-level contamination was concentrated in vacuum cleaner bags used during a major cleanup in the reactor confinement building, even though routine surveys of the building did not indicate any activity greater than the lower limited detectability. Although the situation was not radiologically significant, the staff response demonstrated good attention to detail.

The staff also described a program underway to determine the source of pool water leakage, which is not currently significant but could worsen. Lessons learned at other facilities served as the basis for a plan that included cutting grooves in the floor to collect leakage and using the Sodium 24 produced during routine operations as a decay-corrected tracer. This is a good initiative.

## 7.0 EXIT INTERVIEW (Inspection Procedure 30703)

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on March 15, 1996. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

N. Jacobs, Radiation Protection Officer  
H. Knickle, Chairman, Reactor and Radiation Safety Committee  
V. Rose, Chairman, RIAEC  
W. Simoneau, Assistant Director for Reactor Operations  
T. Tehan, Director

INSPECTION PROCEDURES USED

IP 39745: CLASS I NON-POWER REACTORS ORGANIZATION AND OPERATIONS AND  
MAINTENANCE ACTIVITIES  
IP 40745: CLASS I NON-POWER REACTOR REVIEW AND AUDIT AND DESIGN CHANGE  
FUNCTIONS  
IP 61745: CLASS I NON-POWER REACTOR SURVEILLANCE  
IP 69745: CLASS I NON-POWER REACTOR EXPERIMENTS  
IP 82745: CLASS I NON-POWER REACTOR EMERGENCY PREPAREDNESS  
IP 83743: CLASS I NON-POWER REACTORS RADIATION PROTECTION

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-193/96-01-01 IFI indicates RRSC concurrence with 50.59 evaluations  
50-193/96-01-02 IFI QA program to ensure completion of changes associated  
with equipment modifications  
50-193/96-01-03 IFI expand confinement and emergency exhaust surveillance  
to include equipment responses

Closed

50-193/95-01-01 IFI to rearrange startup procedure steps

## LIST OF ACRONYMS USED

NRC Nuclear Regulatory Commission  
PVC Polyvinyl chloride  
RP Radiation protection  
RIAEC Rhode Island Atomic Energy Commission  
RPO Radiation Protection Officer  
RRSC Radiation and Reactor Safety Committee  
SAR Safety Analysis Report  
TS Technical Specifications