

U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-193

License No: R-95

Report No: 50-193/98201

Licensee: Rhode Island Atomic Energy Commission

Facility: Rhode Island Nuclear Science Center

Location: South Ferry Road
Narragansett, Rhode Island

Dates: January 13-15, 1998

Inspectors: Thomas F. Dragoun, Project Scientist

Approved by: Seymour H. Weiss, Director
Non-Power Reactors and Decommissioning Project Directorate

EXECUTIVE SUMMARY

The licensee's programs were directed toward the protection of public health and safety and were found to be in compliance with NRC requirements. No safety concerns or violations of regulatory requirements were identified.

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Report Details

Summary of Plant Status

The reactor was operated periodically at full power for physics experiments.

R1 Radiological Protection

a. Inspection Scope (Inspection Procedure 83743)

The inspector reviewed:

- Radiation protection organization
- Radiation protection policies and procedures,
- Radiological controls,
- Personnel dosimetry and exposure records,
- Management oversight and audits,
- Control of solid waste, and
- Training of personnel

b. Observations and Findings

The RSO and Health Physicist were responsible for both the RIAEC reactor license and University of Rhode Island byproduct license radiation safety programs. A memorandum of understanding between RIAEC and URI dated July 1, 1997, updated the funding and portion of professional and clerical effort for each program. A slight decrease in reactor HP effort was noted. In addition, an HP Technician was assigned full-time to the reactor. The RSO stated that staffing was adequate for the workload and could be adjusted if proposed experiments increase the HP workload in the future.

The RINSC Radiation Safety Guide was not revised since April 1995 and the HP implementing procedures were unchanged. The inspector noted that, although occurrences of loose surface contamination in the facility were rare, there were no how-to-frisk instructions for tools or personnel in the Safety Guide or HP procedures. In addition, the HP procedures had inconsistent format and levels of detail varied. The RSO stated that these matters would be reviewed.

Since the last inspection, the licensee indicated that they have improved radiological signs, postings, and controls. Wide, high visibility tape replaced rope in denoting radiation area boundaries. Local maps posted at each controlled area list the radiation levels for low and high reactor power at various locations within the area. Reactor operators and experimenters indicated this information has been useful to them in their work. The area radiation monitoring system (5 channels) was replaced with a new Ludlum system in December 1997. The detector at the thermal column was changed from a gamma to a neutron detector after historical survey data showed that neutron radiation was predominant at this location. The neutron beam

at port R1 was enclosed in a tube to prevent inadvertent personnel access to the high radiation area of the beam.

Dosimetry records indicated that personnel exposures were well below regulatory requirements, TLDs were processed quarterly, and extremity monitoring was used as required.

TS 6.4.2(h) requires the Nuclear and Radiation Safety Committee to annually review the radiation safety aspects of the facility. Minutes of meeting indicated that the committee routinely reviews radiation safety during quarterly meetings and provides appropriate guidance to the staff. In addition, 10 CFR 20.1101(c) requires an annual review of the content and implementation of the HP program. This was done in December 1996 and January 1998 by an RSO from another research reactor. No major weaknesses were reported.

Solid radioactive waste was packed in 55 gallon drums. The drums were properly marked in a locked and posted storage area, and showed no signs of degradation. Isotopic content was determined by gamma scan. Drums were placed on a turnstile and dose rates measured at ten predetermined locations. This data was used by the HP to estimate the curie content using generally accepted calculations. The RSO verifies the waste classification and form as specified in 10 CFR 61.55 and 61.56. Over four years, 8 drums of dewatered resin and 4 drums of laboratory waste were generated and placed in storage. The facility director stated that there was no present plan to ship waste for disposal due to the uncertainties at the disposal sites and adequate on-site reserve storage capacity.

Personnel training required by 10 CFR 19.12 was provided by the RSO. Forms signed by the individual verified that specific regulatory and HP program information was provided in the training.

c. Conclusions

The radiation protection program met regulatory requirements.

R2 Effluent and Environmental Monitoring

a. Inspection Scope (Inspection Procedure 80745)

The inspector reviewed:

- Airborne effluent release data,
- Compliance with air emission constraint rule effective January 9, 1997, and
- Control of liquid releases.

b. Observations and Findings

Stack releases of argon 41 are continuously monitored by an in-line isokinetic sampling system. Grab samples of stack gas were analyzed in the laboratory to annually calibrate the stack monitor as required by TS 4.7. This was an acceptable technique.

As of February 1997, the license began reporting the argon 41 concentration in the stack rather than a percentage of the limit for effluent concentration. This approach conforms with requirements in TS 3.7.2. Data indicated that public exposure to airborne radioactive material was below the constraint value (10 millirem per year).

The HP technician analyzed liquid waste by gamma scanning, gross beta measurement of residues after evaporation, and liquid scintillation. Analytical results are entered into a computer spreadsheet for comparison to discharge limits. Data was transferred to form NSC9A which was reviewed and signed by the RSO to authorize the discharge. Adequate control of discharges was demonstrated.

c. Conclusions

Effluent releases and doses to the public were properly controlled and monitored.

R3 Experiments

a. Inspection Scope (Inspection Procedure 69745)

The inspector reviewed:

- Experiment review and approval,
- Potential hazards identification, and
- Control of irradiated items.

b. Observations and Findings

The inspector reviewed an experiment designed to produce Sm153. For each new experiment, the licensee used form NSC-55 that required detailed dose rate calculations, precautions and procedures. These were acceptably completed and submitted to the Nuclear and Radiation Safety Committee for approval in accordance with TS 6.4. A contractor arranged for shipment off-site of the material.

c. Conclusions

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

X1 Exit Interview (Inspection Procedure 30703)

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on January 15, 1998. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Cunningham, HP technician
N. Jacobs, Radiation Protection Officer
D. Johnson, Health Physicist
V. Rose, Chairman, RIAEC
T. Tehan, Director

INSPECTION PROCEDURES USED

IP 30703: ENTRANCE AND EXIT INTERVIEWS
IP 80745: CLASS I NON-POWER REACTORS EFFLUENT AND ENVIRONMENTAL
MONITORING
IP 83743: CLASS I NON-POWER REACTORS RADIATION PROTECTION
IP 69745: CLASS I NON-POWER REACTOR EXPERIMENTS

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
HP	Health Physics
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
RIAEC	Rhode Island Atomic Energy Commission
RINSC	Rhode Island Nuclear Science Center
RSO	Radiation Safety Officer
TLD	Thermoluminescent dosimeter
TS	Technical Specifications
URI	University of Rhode Island