

January 4, 2001

Mr. S. J. LaFlamme, Director
Leslie C. Wilbur Nuclear Reactor Facility
100 Institute Road
Worcester Polytechnic Institute
Worcester, MA 01609

SUBJECT: NRC INSPECTION REPORT NO. 50-134/2000201

Dear Mr. LaFlamme:

On December 1, 2000, the NRC completed an inspection at the Worcester Polytechnic Institute Open Pool Training Reactor. The enclosed report represents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

No violations of regulatory requirements or significant safety issues were identified during this inspection. Accordingly, no response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this inspection, please contact Mr. Thomas Dragoun at 610-337-5373.

Sincerely,

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-134
License No. R-61

Enclosures: 1. NRC Inspection Report No. 50-134/2000201

cc w/encl:
Please see next page

Worcester Polytechnic Institute

Docket No. 50-134

cc:

Francis J. McGrath
City Manager
Worcester, MA 01608

Office of the Attorney General
Environmental Protection Division
19th Floor
One Ashburton Place
Boston, MA 02180

Department of Environmental
Quality Engineering
100 Cambridge Street
Boston, MA 02180

Prof. R. Sisson, Acting Chairman, Nuclear Engineering Program
100 Institute Road
Worcester Polytechnic Institute
Worcester, MA 01609

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

Dr. J. F. Carney, Provost/ VP Academic Affairs
100 Institute Road
Worcester Polytechnic Institute
Worcester, MA 01609

Commonwealth of Massachusetts (2)
Executive Office of Health and Human Services
Department of Public Health
Radiation Control Program
Attn: Robert M. Hallisey
174 Portland Street
Fifth Floor
Boston, MA 02114

January 4, 2001

Mr. S. J. LaFlamme, Director
Leslie C. Wilbur Nuclear Reactor Facility
100 Institute Road
Worcester Polytechnic Institute
Worcester, MA 01609

SUBJECT: NRC INSPECTION REPORT NO. 50-134/2000201

Dear Mr. LaFlamme:

On December 1, 2000, the NRC completed an inspection at the Worcester Polytechnic Institute Open Pool Training Reactor. The enclosed report represents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

No violations of regulatory requirements or significant safety issues were identified during this inspection. Accordingly, no response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this inspection, please contact Mr. Thomas Dragoun at 610-337-5373.

Sincerely,

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-134

License No. R-61

Enclosures: 1. NRC Inspection Report No. 50-134/2000201

cc w/encl:

Please see next page

DISTRIBUTION:

PUBLIC	REXB r/f	BDavis	TDragoun	DMatthews
LMarsh	JTappert	TMichaels	PDoyle	SNewberry
WEresian	PIsaac	EHylton	AAdams	SHolmes
CBassett	MMendonca	MSatorius (O16-E15)		

ACCESSION NO.: ML003779607

TEMPLATE #: NRR-056

OFFICE	REXB:LA	REXB:PM	REXB:RI	REXB:BC/DBC
NAME	EHylton:rdr	TMichaels	TDragoun	LMarsh/JTappert
DATE	12/27/2000	01/02/2001	01/02/2001	01/04/2001

C = COVER

E = COVER & ENCLOSURE
OFFICIAL RECORD COPY

N = NO COPY

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

Docket No: 50-134

License No: R-61

Report No: 2000201

Licensee: Worcester Polytechnic Institute

Facility: Open Pool Training Reactor

Location: Worcester, Massachusetts

Dates: November 28 - December 1, 2000

Inspector: Thomas F. Dragoun

Approved by: Ledyard B. Marsh, Chief
Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of selected aspects of the organization and staffing, operations logs and records, procedures, operator requalification program, surveillance and limiting conditions for operations, health physics program, design changes, committees and audits program, emergency preparedness program, fuel handling program, safeguards program, and security program since the last NRC inspection.

The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

ORGANIZATION AND STAFFING

The organization and staffing were consistent with Technical Specification requirements.

OPERATIONS LOGS AND RECORDS

The operations program satisfied Technical Specification requirements.

PROCEDURES

The procedural control and implementation program satisfied Technical Specification requirements.

OPERATOR REQUALIFICATION

Operator requalification was conducted as required by the Requalification Program.

SURVEILLANCE AND LIMITING CONDITIONS OR OPERATIONS

The surveillance program satisfied Technical Specification requirements.

HEALTH PHYSICS

The radiation protection program satisfied NRC requirements.

DESIGN CHANGES

The design change program satisfied NRC requirements.

COMMITTEES AND AUDITS

The review and audit program satisfied Technical Specification requirements.

EMERGENCY PREPAREDNESS

The emergency preparedness program was conducted in accordance with the Emergency Plan.

FUEL HANDLING

The fuel handling program satisfied licensee Technical Specification and procedural requirements.

SAFEGUARDS

Special Nuclear Materials were acceptably controlled and inventoried.

SECURITY

The NRC-approved security program was acceptably implemented.

Report Details

Summary of Plant Status

During the inspection the reactor was operated a few hours for a neutron activation laboratory exercise. Most of the staff was new.

1. ORGANIZATION AND STAFFING

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- organization and staffing
- qualifications

b. Observations and Findings

The organizational structure had not changed since the last inspection. However, personnel changes included the Provost, Director of the Nuclear Engineering Program, Director of the Nuclear Reactor Facilities, Radiological Safety Officer, Assistant Radiological Safety Officer, all licensed reactor operators, and some members of the Radiation, Health, and Safeguards Committee. Replacement personnel met Technical Specification requirements. The program director position was filled by an acting director since the faculty academic committee announced on October 31, 2000, that the nuclear engineering program would be dropped after the end of the current academic year. The reactor director stated that this would make it difficult to recruit student operators in the future. He is the only permanent operator and the TS requires two operators to move fuel.

Currently there are three licensed senior operators. Five students are scheduled to take the operator exam in February 2001.

c. Conclusions

The organization and staffing were consistent with Technical Specification requirements.

2. OPERATION LOGS AND RECORDS

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- operational logs and records
- staffing for operations
- selected operational, startup, and shutdown activities

b. Observations and Findings

The operating logs and records were generally clear and provided an indication of operational activities. The logs and records indicated that shift staffing, including on-call personnel, were as required by the TS. Logs and records also showed that operational conditions and parameters were consistent with license and TS requirements. Observation of operational activities further confirmed that these conditions and requirements were satisfied.

c. Conclusions

The operations program satisfied Technical Specification requirements.

3. PROCEDURES

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- administrative controls
- procedural implementation
- logs and records

b. Observations and Findings

There were no changes to procedures or policies. Personnel conducted activities in accordance with applicable procedures.

c. Conclusions

The procedural control and implementation program satisfied Technical Specification requirements.

4. OPERATOR REQUALIFICATION

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- the Requalification Program
- operator licenses
- operator physical examination records
- operator active duty status

b. Observations and Findings

The Requalification Program was maintained up to date. All three operator licenses were granted in 1999. The biennial physical examinations for the student operators were due. The Reactor Facility Director stated that these would be scheduled as soon as practical. This matter will be reviewed in a future inspection (Inspector Follow-up Item 50-134/2000201-01). Two student operators were properly requalified after failing to meet the minimum quarterly time required on console. Subsequent logs showed that operators maintained active duty status as required. Requalification status was reviewed during regular RHSC meetings.

c. Conclusions

Operator requalification was conducted as required by the Requalification Program.

5. SURVEILLANCE AND LIMITING CONDITIONS FOR OPERATIONS

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- surveillance and calibration procedures,
- surveillance, calibration and test data sheets and records

b. Observations and Findings

Surveillance and calibrations were completed on schedule and in accordance with licensee procedures. All the recorded results were within the TS and procedurally prescribed parameters. The records and logs reviewed were complete and were being maintained as required. Checks, tests, and calibrations were completed as required by TS.

c. Conclusions

The surveillance program satisfied Technical Specification requirements.

6. HEALTH PHYSICS

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- the Radiation Protection Program
- radiological signs and posting
- routine surveys and monitoring
- dosimetry records

- maintenance and calibration of radiation monitoring equipment
- control of effluent releases
- radiation worker training

b. Observations and Findings

The radiation protection program content had not changed since the last inspection. The RHSC reviewed the implementation of the radiation protection program quarterly, which exceeded the annual requirement in 10 CFR 20.1101(c).

Caution signs, postings and controls to radiation areas were as required in 10 CFR 20, Subpart J. Licensee personnel observed the indicated precautions for access to the radiation areas.

Use of dosimeters were in accordance with radiation protection requirements. The licensee used a National Voluntary Laboratory Accreditation Program (NVLAP)-accredited vendor to process dosimetry. Radiological exposure records showed that occupational doses and doses to the public were well below 10 CFR Part 20 limitations. In October 1999, the RHSC approved a radworker training program to be provided by the principal investigator under observation by the ARSO. Discussion with the ARSO indicated that the training content was acceptable.

Radiation monitoring and survey activities were as required. Equipment used for these activities were maintained, calibrated and used acceptably. The inspector noted that the radiation survey procedure (HP -10) requires gamma and neutron dose rate measurements in certain rooms above the reactor. One room on the third floor was not included on the survey report form. However, dosimeters on the second floor (closer to the reactor) indicated less than 1 millirem per calendar quarter. Correction of the survey report form will be reviewed in a future inspection (Inspector Follow-up Item 50-134/2000201-02)

The licensee did not require a respiratory protection program or planned special exposure program.

Liquid effluent releases to the sewer were properly monitored, controlled, and satisfied regulatory criteria. The annual report indicated that gaseous argon 41 emissions were below the NRC dose constraint.

c. Conclusions

The radiation protection program satisfied NRC requirements.

7. DESIGN CHANGES

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- facility design changes and records
- facility configuration

b. Observations and Findings

The Building Evacuation Alarm Panel was replaced due to unavailability of repair parts. This change was reviewed in accordance with 10 CFR 50.59 and approved by the RHSC. However, the review used the new format published in the Federal Register in October 1999. The licensee was not aware of the fact that implementation of the new format was postponed pending the issuance of guidance by the NRC. A review of the analysis indicated that the outcome would have been the same under the current format.

c. Conclusions

The design change program satisfied NRC requirements.

8. COMMITTEES AND AUDITS

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- RHSC membership
- RHSC minutes of meeting

b. Observations and Findings

The RHSC members lost during the staff turn-over have been replaced. A majority are faculty members as required by TS. Although the size of the RHSC was not specified by TS, the RSO stated that the size and mix of expertise on the committee was satisfactory.

Records showed that RHSC reviews were conducted at the TS required frequency. Topics of these reviews were also consistent with TS requirements to provide guidance, direction, and oversight, and to ensure acceptable use of the reactor.

c. Conclusions

The review and audit program satisfied Technical Specification requirements.

9. EMERGENCY PLANNING

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- the Emergency Plan
- offsite support
- emergency drills and exercises

b. Observations and Findings

The Emergency Plan (E-Plan) in use at the reactor was the same as the version most recently approved by the NRC. The E-Plan was audited and reviewed as required. Agreements with outside response organizations had been updated and maintained as necessary. Emergency drills had been conducted as required by the E-Plan. Critiques were held following the drills to discuss the strengths and weaknesses identified during the exercise and to develop possible solutions to any problems identified. The results of these critiques were documented and filed.

c. Conclusions

The emergency preparedness program was conducted in accordance with the Emergency Plan.

10. FUEL HANDLING

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- fuel handling procedures
- fuel handling records
- control blade examination records

b. Observations and Findings

Fuel handling procedures provided a prescribed method to move and handle fuel consistent with the provision of the TS. Fuel movement and control blade examination records were satisfactory. The reload of the core to a standard configuration took a few days due to spurious scrams from the nuclear instrumentation.

c. Conclusions

The fuel handling program satisfied licensee Technical Specification and procedural requirements.

11. SAFEGUARDS

a. Scope (85102)

The inspector reviewed selected aspects of:

- nuclear material inventory and locations
- accountability records

b. Observations and Findings

There were no receipts of SNM or shipments between April 1, 1998 and September 30, 2000. No U-235 burn up was reported due to the low kilowatt-hours of energy generated during this period.

Physical inventories were conducted annually as required by 10 CFR 70.51(d). The licensee's inventories were performed each July. On November 30, 2000, the inspector conducted a piece count of selected SNM at the facility. The following material was accounted for:

Plutonium Beryllium Sources

one in the reactor pool (sealed source serial no.M615)

Fuel Assemblies

twenty-one fixed plate fuel assemblies in the reactor core
one six plate fuel assembly in the reactor core

All Material Balance Reports (DOE/NRC Form-742) submitted by the licensee for the period April 1, 1998, through September 30, 2000, satisfied the requirements specified in 10 CFR 70.53.

c. Conclusions

Special Nuclear Materials were acceptably controlled and inventoried.

12. SECURITY

a. Inspection Scope (Inspection Procedure 81431)

The inspector reviewed:

- records, and reports
- key control
- detection aids
- physical barriers
- screening and access controls
- provisions for contingencies
- written procedures

b. Observations and Findings

The Physical Protection Plan was the same as the latest revision approved by the NRC. Reactor staff tested the security system semiannually and reported the results to the RHSC. All facility keys were accounted for after the substantial staff turnover.

The licensee's physical protection program was found to conform to NRC requirements and the licensee's implementing procedures.

c. Conclusions

The NRC-approved security program was acceptably implemented.

13. EXIT MEETING

The inspector presented the inspection results to licensee management at the conclusion of the inspection on December 1, 2000. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. LaFlamme, Nuclear Reactor Facility Director
D. Adams, Radiation Safety Officer
R. Steele, Assistant Radiation Safety Officer

INSPECTION PROCEDURES USED

IP 69001 CLASS II NON-POWER REACTORS
IP 81431 FIXED SITE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF
LOW STRATEGIC SIGNIFICANCE
IP 85102 MATERIAL CONTROL AND ACCOUNTING - REACTORS

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-134/2000201-01	IFI	Complete biennial physical exam of operators
50-134/2000201-02	IFI	Revise radiation survey report form

Closed

None

LIST OF ACRONYMS USED

ARSO	Assistant Radiation Safety Officer
CFR	Code of Federal Regulations
IFI	Inspector Follow-up Item
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
RHSC	Radiation, Health, and Safeguards Committee
RSO	Radiation Safety Officer
SNM	Special Nuclear Material
TS	Technical Specifications