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March 28, 2000

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop O-5 C12  
Washington, DC 20555-0001

Re: Docket No. 50-134  
License R-61  
Annual Report for 1999

In accordance with the technical specifications for the WPI Nuclear Reactor Facility (License R-61), I am submitting the Annual Operating Report for 1999.

The WPI reactor is a non-power, university-based, teaching reactor. It continues to be used primarily in the academic mission of Worcester Polytechnic Institute, for the instruction of students, and in occasional scholarly research.

Please contact me if further information is required.

Sincerely,

Stephen J. LaFlamme,  
Director, Nuclear Reactor Facility

Cc: American Nuclear Insurers  
Town Center, Suite 300S  
29 South Main Street  
West Hartford, CT 06107-2430

## 1999 Annual Operating Report

Worcester Polytechnic Institute  
Nuclear Reactor Facility

License R-61  
Docket No. 50-134

### I. Operations Summary

#### *(a) changes in facility design*

There were no changes in facility design during 1999.

#### *(b) performance characteristics*

The operation of all reactor safety system components was normal during 1999. Performance of the fuel was also normal.

#### *(c) changes in operating procedures*

There were no changes made to operating procedures during 1999.

#### *(d) abnormal results of surveillance tests and inspections*

There were no unusual findings from the performance of surveillance tests and inspections.

#### *(e) personnel changes in reactor facility director, health physicist, or radiation, health, and safety committee members*

The Director of the Nuclear Engineering Program resigned his position effective in May of 1999. At that time, he also resigned his position as Radiological Safety Officer and Chairman of the Radiation Health and Safeguards Committee, effective in June of 1999. An existing member of the Committee was approved by the State of Massachusetts as the new Radiological Safety Officer, and another existing member of the Committee was elected as the new Chairman.

One member of the Radiation Health and Safeguards Committee, representing the Physics Department, retired from WPI effective in July of 1999.

The Assistant Radiological Safety Officer, who was a graduate student and was also a member of the Radiation Health and Safeguards Committee, resigned his position effective in August of 1999. A new Assistant Radiological Safety Officer, who is a

permanent WPI staff employee performing this added responsibility part of the time, and who also serves on the Committee, has replaced him.

The number of members on the Committee now stands at six, work is under way, however, to appoint a new member from another department on campus to fill one of the vacant seats.

## II. Power Generation (kilowatt-hours)

1999 Output:	308.7
Total LEU-Fuel :	1766.8
Total Reactor:	9180.8

## III. Unscheduled Shutdowns

There were seven unscheduled shutdowns during 1999. Of these, two were due to electrical transients during manual range switching of the linear power channels. Two were due to apparent electrical transients while operating the regulating blade control switch. The fifth unscheduled shutdown was caused by inadvertent disturbance of signal cables above the reactor during fuel movement. The sixth unscheduled shutdown was caused by the failure of a low voltage power supply in the NIM-BIN module supplying high voltage to the nuclear instrumentation channels, the module was replaced with a spare pending permanent replacement with a new bin power supply. And, the seventh unscheduled shutdown was caused by operator error in exceeding the overpower trip setpoint on one Nuclear Instrumentation Channel during startup. None of the scrams had any safety significance given the scope of the facility and all were related to activities involving its teaching and training mission.

## IV. Maintenance

The AC to DC power supply within the Building Evacuation Alarm Control Panel failed during the last quarter of 1999. While replacement options were investigated, it was necessary to temporarily backfeed DC power, supplied by a transformer and voltage regulating circuit board, in parallel with the normal DC battery backup power supply. The arrangement effectively kept the backup batteries charged while also supplying normal loads, and would have supplied the loads required for a building evacuation, if required. Replacement of the entire panel was scheduled for the first quarter of 2000.

## V. Changes, Tests, and Experiments Pursuant to 10CFR 50.59

There have been no changes to facility design, or new tests and experiments, requiring evaluations pursuant to 10CFR 50.59.

VI. Radioactive Effluents Release

There have been no measurable releases of radioactivity above background for liquid effluent releases. Gaseous Ar-41 has been released in trace amounts that are conservatively calculated to be well within 10CFR 20 release limits.

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