REED COLLEGE *Portland, Oregon 97202*

REACTOR FACILITY

September 25, 2002

Document Control Desk
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-288

Enclosed is Reed College Reactor's Annual Report for September 1, 2001 to August 31, 2002.

This has been another exciting year. We continue to make progress on many of our long term projects. Details are shown in the report.

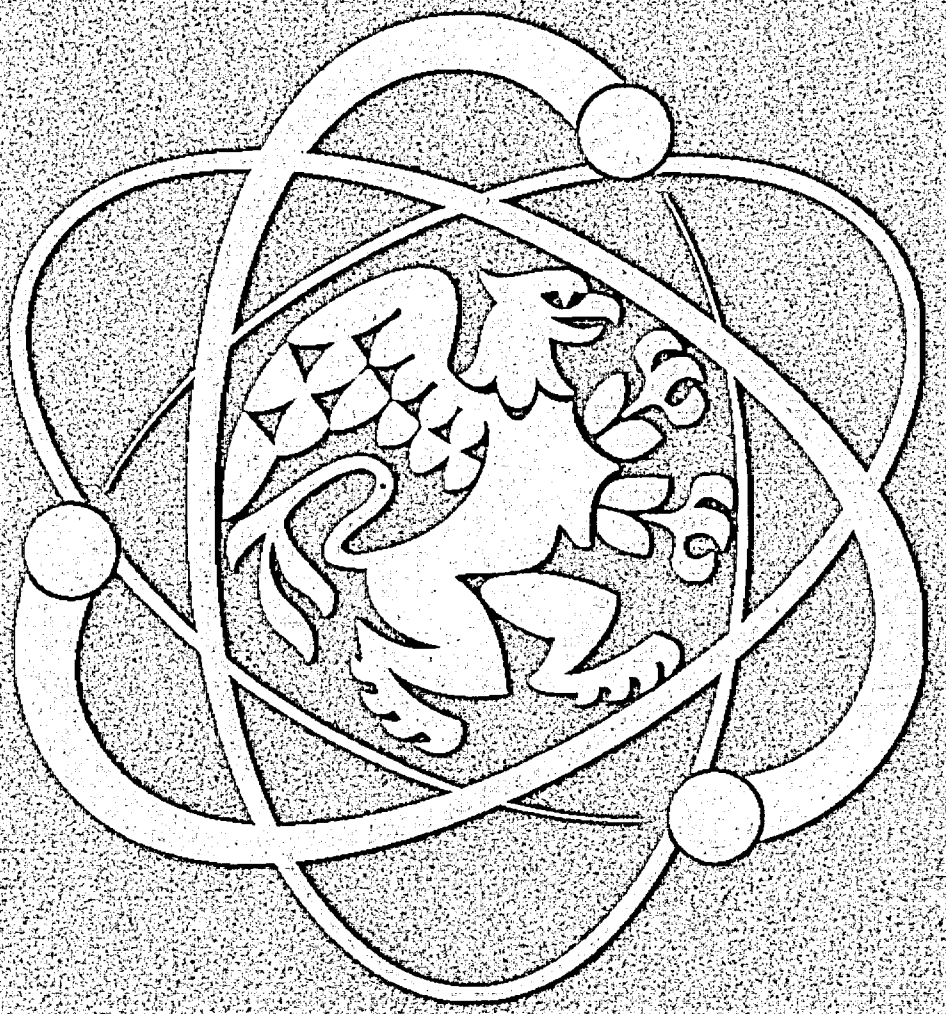
Please feel free to contact me for additional information.

Regards,

Stephen G. Frantz
Director, Reed College Reactor

A020

ANNUAL REPORT



September 1, 2001 – August 31, 2002

REED REACTOR FACILITY

ANNUAL REPORT

September 1, 2001 -- August 31, 2002

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Stephen G. Frantz
Director, Reed Reactor Facility
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TABLE OF CONTENTS

OVERVIEW

This report covers the period from September 1, 2001 to August 31, 2002, and is intended to fulfill the reporting requirements of the U.S. Nuclear Regulatory Commission, the U.S. Department of Energy, and the Oregon Department of Energy including:

- U. S. Nuclear Regulatory Commission, License No. R-112 (Docket 50-228)
- Oregon Office of Energy Rule No. 345-030-010
- U. S. Department of Energy Grant No. DE-FG07-01ID14076
- U. S. Department of Energy Grant No. DE-FG07-01ID14153

We also wish to thank other funding sources and grants including Portland General Electric, Precision Cast Parts Corporation, and Pacific Northwest National Laboratory.

The reactor is a Triga Mark I reactor with zirconium hydride / uranium hydride fuel elements in a circular grid array at the bottom of a 25-foot-deep tank of water and is surrounded by a graphite reflector. The fuel is enriched to 19.9% in uranium-235.

The Reed College Reactor Facility has been a resource for research and educational projects in the Portland area since its establishment in 1968. The main uses of the Reed Reactor Facility are instruction and research, especially trace-element analysis. In addition to providing student research opportunities, the reactor staff works to educate the surrounding community on the principles of nuclear energy and radiation safety.

There were 1690 individual visits to the Reactor Facility during the year. Most were students in classes at Reed College or area universities, colleges, and high schools. Including tours and research conducted at the facility, the Reed Reactor Facility contributed to the educational programs of 9 colleges and universities in addition to 25 pre-college groups. The reactor was operated 286 times on 139 days. The thermal energy produced was 34.9 megawatt-hours.

The reactor staff consists of a Director, an Associate Director, a contract Health Physicist, Reed College undergraduate students, and some non-students who licensed by the Nuclear Regulatory Commission as reactor operators or senior reactor operators. The number of licenses varies from year to year. As this report is being written the licensed operators comprise 13 undergraduate women, 9 undergraduate men, and 4 men who are not students (including staff).

During the reporting period, 9 reactor operator candidates passed their NRC exams and 5 senior reactor operator candidates passed their NRC exams. During the past ten years 79 people have taken the NRC reactor operator exam and 77 received licenses. During the same period 40 people have taken the senior reactor operation exam and 39 have received senior reactor operation licenses.

There were no radiation exposures to individuals in excess of 1% of the limit during the year. There were no releases of liquid radioactive material from the facility and airborne releases were well within regulatory limits. There was one shipment of radioactive waste to the US Ecology site in Richland, Washington.

The facility experienced a small transient fuel leak this year. The leak disappeared before we were able to identify the source. Normal operations were resumed.

As to be expected, the facility was affected by the tragic events of September 11, 2001 and the security concerns that followed. There were significant security reviews of the facility, both internal and external. Our physical security barriers and procedures were modified.

The Nuclear Regulatory Commission conducted their annual inspection during the week of October 15, 2001. There were no violations, concerns, or follow up items. Additionally, the NRC visited the facility in January of 2002 specifically to review our security condition.

PEOPLE

Facility Staff

During the period September 1, 2001 to August 31, 2002, the facility staff consisted of:

Reactor Director:	Stephen Frantz (4/94 – Present)	
Associate Director:	Eric Weis (6/01 – Present)	
Reactor Supervisor:	Rachel Barnett (5/01 – 9/01) Reid Burkland (9/01 – 5/02) Megan Othus (5/02 – Present)	
Training Supervisor:	Rachel Barnett (5/01 – Present)	
Radiation Safety Officer:	Stephen Frantz (8/00 – Present)	
Contract Health Physicist:	Marshall Parrott (8/91 – Present)	
Senior Reactor Operators (SRO):	Rachel Barnett	Stephen Frantz
	Jay Bodzin	Ryan Gaffney
	Mat Brener	Rudy Gilmore
	Reid Burkland	Chris Hoefler
	Tim Cassidy	Kater Murch
	Lily Cool	Megan Othus
	Cilicia Dorn-Lopez	David Rosoff
	Ann Erickson	David Rubin
	Joshua Filner	Eric Weis
	Nicki Ford	
Reactor Operators (RO):	Katie Bray	Joaquin Ramsey
	Nick Chaimov	Peter Rovegno
	Erin Freed	Seth Samuel
	Steve Katz	Dan Spoth
	Ariah Kidder	Nancy VanProoyen
	Judy Kim	Gabriel Ycas
	Eric Lawrence	Jon Young
	Kristina Lestik	Joy Wattawa
	Andrea Neuhoff	

The list of operators includes everyone who held a license during the reporting period. ROs who upgrade their licenses to SRO during the reporting period are listed under SRO. All staff members were Reed College undergraduates except Mr. Frantz, Mr. Filner, Mr. Gaffney, Ms. Fisher, and Dr. Parrott.

The number of licenses and the gender ratio varies from year to year. As this report is being written there are 13 undergraduate women with reactor licenses, 9 undergraduate men with licenses, and 4 men who are not students (including staff) who have licenses.

Oversight Committees

The Reed Reactor Facility has two oversight committees: the Radiation Safety Committee and the Reactor Operations Committee. When they meet together they comprise the Reactor Review Committee. The Radiation Safety Committee is concerned with emergency preparedness, health physics, radiation safety, physical security, environmental impact, and the interface between the Reed Reactor Facility and the Reed College and the surrounding community. The Reactor Operations Committee deals with the day-to-day operations of the reactor, reactor maintenance, reactor safety, operator training, and requalification. The membership of the committees during the reporting period is shown below:

Radiation Safety Committee

Voting Members:

John Frewing (Chair) *(Oregon Independent College Foundation)*
Wayne Lei *(Environmental Director, Portland General Electric)*
Jack Mahoney *(Neighborhood Resident)*
Tom Meek *(Radiation Protection Manager, Trojan Nuclear Power Plant)*
Steve Reese *(Reactor Director, Oregon State University)*
Kathleen Fisher *(Reed Environmental and Safety Director)*

Ex Officio(without vote):

Ellen Stauder *(Dean of the Faculty, Reed College)*
Stephen Frantz *(Director, Reed Reactor Facility)*
Eric Weis *(Associate Director, Reed Reactor Facility)*
Marshall Parrott *(Contract Health Physicist)*
Reid Burkland *(Reactor Supervisor)*
Rachel Barnett *(Reactor Training Supervisor)*

Reactor Operations Committee

Voting Members:

Robert Reynolds (Chair) *(Physics Faculty, Reed College)*
Daniel Gerrity *(Chemistry Faculty, Reed College)*
Juliet Brosing *(Physics Faculty, Pacific University)*
Jan Mieszkowski *(German Faculty, Reed College)*
Raymond Mayer *(Mathematics Faculty, Reed College)*
Josh Filner *(Medical Student, Oregon Health Science University)*

Ex Officio(without vote):

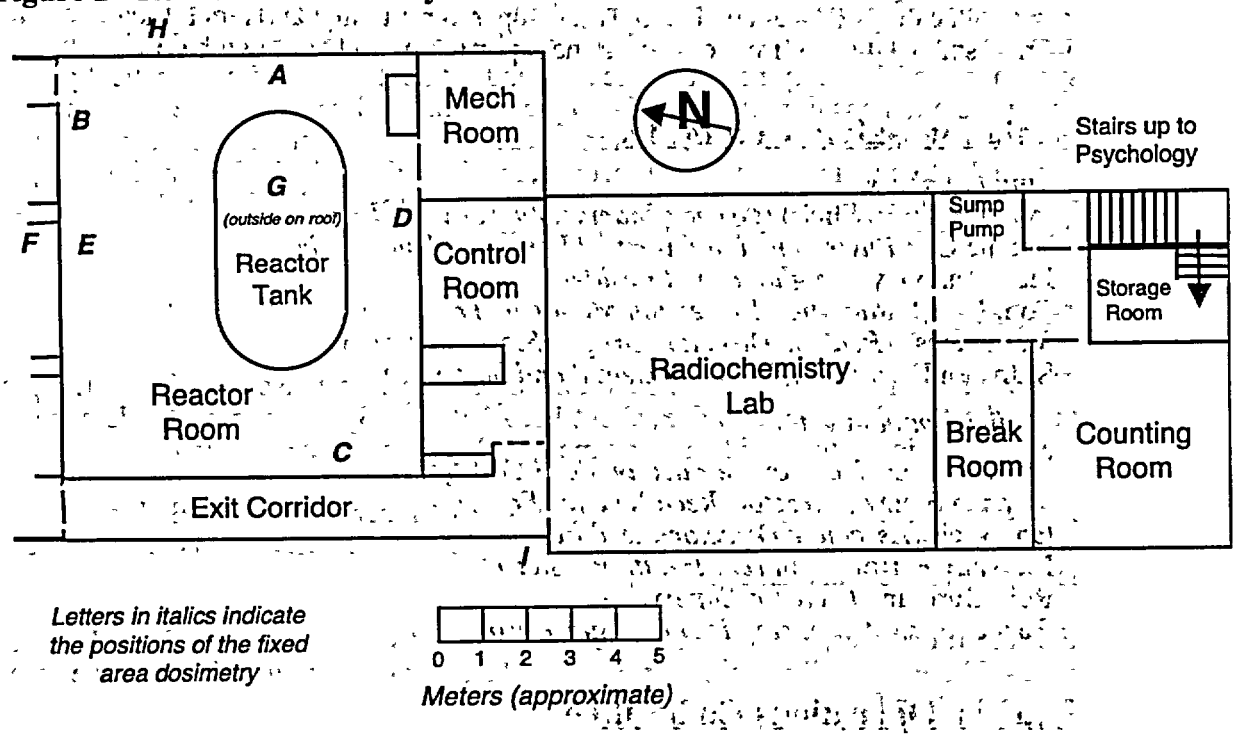
Ellen Stauder *(Dean of the Faculty, Reed College)*
Stephen Frantz *(Director, Reed Reactor Facility)*
Eric Weis *(Associate Director, Reed Reactor Facility)*
Reid Burkland *(Reactor Supervisor)*
Rachel Barnett *(Reactor Training Supervisor)*

FACILITIES

Reactor Facility Floor Plan

In addition to the reactor, the Reed Reactor Facility has space for a radiochemistry lab. A floor plan appears as Figure 1.

Figure 1 - Reed Reactor Facility Floor Plan



The equipment available at the reactor facility includes high purity germanium gamma spectrometers, X-ray florescence detector, surface barrier detectors, alpha spectrometers, silicon lithium X-ray detectors, a whole body counter, gas flow proportional counters, ion chambers, beta counters, Geiger Muller tubes, neutron detectors, alpha detectors, and thermoluminescent dosimeter readers. The instruments are used for experiments and training in nuclear science and radiation detection. Two hand and shoe monitors are in the reactor bay. A liquid scintillation detector serves the campus radioisotope committee. The reactor facility has several systems for performing irradiations, described below.

Rotating Specimen Rack Facility

The rotating specimen rack ("lazy susan") is located in a well on top of the graphite reflector surrounding core. The rack consists of a circular array of 40 tubular receptacles; each of which can accommodate two irradiation tubes. Vials holding up to 17 ml (four drams) are used in this system. Samples are loaded in the specimen rack prior to the start-up of the reactor. The rack automatically rotates during irradiation to ensure each sample receives the same neutron flux. Typically, researchers use the rotating rack when longer irradiation times (generally greater than five minutes) are required. The average thermal neutron flux in the rotating rack position at full power is approximately 1.7 $x10^{12}$ n/cm^2s

with a cadmium ratio of 6. The specimen rack can be used for gamma irradiations (approximately 8 rad/min) when the reactor is shutdown.

Pneumatic Transfer System

The pneumatic transfer system ("rabbit") consists of an irradiation chamber in the outer E-ring of the core with its associated pump and piping. This allows samples to be transferred in and out of the reactor core very rapidly, while the reactor is at power.

Routine use of the pneumatic transfer system involves placing samples into vials, which in turn are placed in special capsules known as "rabbits." The capsule is loaded into the system in the laboratory next to the reactor and is then transferred pneumatically into the core-irradiation position. At the end of a predetermined time the sample is transferred back to the receiving terminal, where it is removed for measurement. The transfer time from the core to the terminal is about seven seconds, making this method of irradiating samples particularly useful for experiments involving radioisotopes with short half-lives. The flux in the core terminal is approximately $5x10^{12}$ n/cm^{2}s when the reactor is at full power.

In-Core Facilities

The central thimble is a water-filled irradiation chamber about 3 cm in diameter. It provides the highest available neutron flux, about $1x10^{13}$ n/cm^{2}s. Special sample holders are used in the central thimble to provide maximum flexibility in experiment design.

A source holder assembly can also be used. The chamber fits into a fuel-element position within the core itself. It holds only one specially positioned irradiation container 7.5 cm in length and 2.5 cm in diameter.

Foil-insertion holes, 0.8 cm in diameter, are drilled at various positions through the grid plates. These holes allow inserting special holders containing flux wires into the core, to obtain neutron flux maps of the core.

In-Pool Facilities

Near core, in-pool irradiation facilities can be arranged for larger samples. Neutron fluxes will be lower than in the lazy susan and will depend on the sample location.

Beam Facilities

The central thimble can be evacuated with gas, producing a vertical neutron beam. This beam can be used to generate directional neutron flux, or for limited irradiations above the tank. Neutron radiography is also possible. The flux above the beam exit is approximately $1x10^3$ n/cm^{2}s when the reactor is at full power.

USERS

Reactor Visitors

A total of 1,690 individuals visited the Reed Reactor Facility during the year, as derived from the visitor log - Entry List B. Individuals who visited more than once are counted for each visit. Visitors include all individuals who are not listed as facility staff. The visitors included 1570 individuals for training or tours, of whom 563 were in programs funded in part by the U.S. DOE Reactor Sharing program. A large percentage of these were students in classes at area colleges and schools as discussed below. A monthly breakdown of the number of visitors is shown on Table A; a list is included as Appendix A.

Reactor Operations Seminar

The Reed Reactor Facility conducts an annual seminar series for students from Reed and other area educational institutions. This non-credit course serves as an introduction to nuclear reactor theory, health physics, and reactor operation. Some of the students continue with in-depth reactor operator training and subsequently apply for a reactor operator license. If successful, the individual may be hired to operate the reactor. In addition, existing reactor operators may take the NRC senior reactor operator exam to upgrade their licenses.

During the reporting period, 9 out of 10 reactor operator candidates passed their NRC exams and 5 out of 5 senior reactor operator candidates passed their NRC exams.

Historically most students who fail the NRC exam only fail one section and they are allowed to retake that section later. During the past ten years only two students who have taken the exam have ultimately failed to get an NRC license. During the past ten years 79 people have taken the NRC reactor operator exam and 77 received licenses. During the same period 40 people have taken the senior reactor operation exam and 39 have received SRO licenses.

Nuclear Science Consortium

In order to better use the resources of the Reed Reactor Facility, several area colleges and universities established the Nuclear Science Consortium of the Willamette Valley in 1970. Funding for the Consortium has been derived from Reactor Use Sharing Grants of the U.S. Department of Energy. This made the facility available without charge to classroom groups and unfunded research projects for consortium members.

The following institutions have participated in facility tours, experiments, and research projects in the reporting period.

COLLEGE TOURS/USERS

- Concordia University
- Linfield College
- Linfield School of Nursing
- Oregon State University
- Pacific University
- Portland Community College
- Portland State University
- University of Texas

- Warner Pacific College

HIGH SCHOOL & MIDDLE SCHOOL TOURS/USERS

- Cleveland High School
- Creswell High School
- David Douglas High School
- Forest Hills Lutheran
- Gold Beach High School
- Heritage School
- Hillsboro High School
- Hood River Valley High School
- Jesuit High School
- JFK High School
- Lincoln High School
- Oregon Episcopal School
- Rex Putnam High School
- Roosevelt High School
- Sunset High School
- The Sharon Academy
- Tubman Middle School
- Valley Catholic High School

SPECIAL GROUPS

- Apprenticeships in Science and Engineering
- Boy Scouts
- Bring Child to Work Day
- NW Pottery Research
- Pacific Northwest National Labs
- Reed College Women's Committee
- Saturday Academy
- Science Camp
- Seniors Groups (SMILE)

Many reactor tours include hands-on use of facility equipment to conduct experiments in radiation science, health physics, and nuclear physics. A typical lab involves determining the background of a Geiger Muller scalar system and then determining the half-life of radioactive material. College classes are generally more closely tailored to the individual interests and needs of the Consortium faculty member involved. Experiments include more direct use of the reactor itself by the students, more detailed analysis of materials, and emphasize the incorporation of other classroom activities as much as possible.

Several special programs for gifted children used the reactor. These are designed to enrich their educational program and prepare them for college. Some of the groups who use the reactor target minority and disadvantaged youth who are historically under-represented in science professions.

High School Student Projects

The Reed Reactor Facility continued to be used in independent science projects initiated by students from several Oregon high schools.

Pacific University Modern Physics Lab

Each year the Modern Physics Lab at Pacific University spends lab sessions at the reactor. The students do several labs including basic health physics, sub-critical multiplication, and neutron activation analysis.

Concordia University

The reactor provides training and experiments involving radiation, radioactive material, environmental sampling, and trace element analysis for the Environmental Remediation & Hazardous Material Management Program (ERHMM) at Concordia University

Scaler Kits

Through the generosity of Portland General Electric, the reactor lends out suitcases containing a geiger counter, a scaler, and some small exempt sources to local high schools for their use in their program.

Reed Classes

- Chemistry 271 students conducted a lab using neutron activation analysis to determine chemical composition of an unknown.
- A senior successfully performed computer assisted neutron tomography using the central thimble for his thesis project. This was a spectacular success in imaging materials using neutrons.
- A senior used the reactor to check the elemental composition of a compound to check a synthesis process as part of her thesis project.

Industrial and Commercial Applications

The Reed Reactor Facility is available for industrial or commercial concerns when it does not conflict with our educational goals. As in past, the primary operations involved neutron activation analysis of materials or environmental samples.

The facility also provides radiation protection training to interested parties and schools in the area.

REACTOR OPERATIONS

Operations

During the year the reactor was taken critical 286 times on 139 days. The total energy produced was 34.98 megawatt-hours. Operating history by month appear in Table A:

Table A - Operating History

	Times Critical	Days Operated	MW-hrs	Visitors
Sep.	10	9	4.847	113
Oct.	31	14	7.382	120
Nov.	27	13	2.193	233
Dec.	8	6	2.481	39
Jan.	21	13	3.480	252
Feb.	27	11	1.557	101
Mar.	24	12	1.803	127
Apr.	54	23	2.051	305
May	33	16	2.927	157
Jun.	10	6	2.379	106
Jul.	31	10	2.990	56
Aug.	10	6	0.886	81
Total	286	139	34.976	1690

Unplanned Reactor Shutdowns

There were 5 inadvertent reactor shutdowns (scrams) as shown in Table B; none were unexplained. The number of unplanned reactor shutdowns is about half of our past experience.

Table B - Unplanned Reactor Shutdowns

Date	Scram Type	Cause Of Scram
10/25/01	Linear Power	Inadvertent switch to manual ranging on linear channel
10/30/01	Period	Electrical transient from switching into automatic
11/14/01	Linear Power	Inadvertent switch to manual ranging on linear channel
2/9/02	Percent and Linear Power	Electrical transient
3/9/02	Linear Power	Auto-ranging left in manual

Security

There were significant security reviews of the facility, both internal and external. Our physical security barriers and procedures were modified and improved.

Fuel Leak

The Reed Reactor Facility exhibited characteristics of a fuel leak at 1135 on Monday 9/24/01. It was immediately following a short run of 20 minutes at 240 kW. The pool temperature was 29°C, which is a little higher than the normal 15-25°C. The limit is 48.9°C. There was a very small release–too small to even classify. We found fission products (Cs-138 and Rb-88) in the stack Air Particulate Monitor (APM) filter. The highest APM reading was approximately 1800 (alarm set point is 10,000). The highest reactor room Continuous Air Monitor (CAM) reading was approximately 20,000 (alarm set point is 10,000). The highest Gaseous Stack Monitor (GSM) reading was approximately 600 (alarm set point is 500). The peak radiation levels outside the reactor facility were 0.026 millirem per hour above background (less than 1% of the federal limit for the public). The ventilation system was in isolation from the time of the fuel leak until the next morning. No one entered the reactor room from the time of the fuel leak until the next morning.

On Tuesday, 9/25/01, the radiation levels in the reactor room returned to normal. There were no fission products on the air filters or on surface wipes. This was the expected result because the longest-lived gaseous fission product has a 2.8-hour half-life. The plan was to see if the leak occurred again. If it were to leak again, we could start trying to determine which one was leaking.

On Wednesday, 9/26/01, with the permission of the Reactor Review Committee, we operated the reactor at 240 kW (full power) for 3.5 hours and with the pool temperature at 28°C. We found fission products (Cs-138 and Rb-88) in the stack APM filter. The highest APM reading was approximately 1700. The highest CAM reading was approximately 26,000. The highest GSM reading was approximately 600. The peak radiation levels outside the reactor facility were 0.025 millirem per hour above background. It appeared that we could produce the leak at power.

The Reactor Review Committee met 1800 Thursday, 9/27/01. They approved following SOP-91 Method A, which involves swapping out several fuel elements, operating the reactor to look for the leak, and then swapping out some more.

Between 09/28/01 and 10/9/01 we operated the reactor in various configurations, but were unable to determine which elements was leaking. Finally on Tuesday, 10/9/01, we operated the reactor in its original configuration for over four hours with pool temperature at 40°C without a leak. Either the leak stopped or the source was tramp uranium.

With the permission of the Reactor Review Committee normal operations were resumed.

Important footnote: While moving the fuel elements and graphite elements on 09/28/01 we dropped one of the graphite elements. There was no release of radioactivity. On Monday, 10/01/01, we extensively tested the fuel tool and were unable to repeat the event. We also retrieved the dropped graphite element. The lower pin on the graphite element appears bent, so it has been labeled and removed from the pool. The dose rate on contact with the graphite element was 5 millirem per hour.

REACTOR MAINTENANCE

Significant Maintenance

Routine equipment checks are conducted by reactor staff members on a daily, weekly, bimonthly, semiannual (January and July) and annual (January) basis as required by facility procedures. Reed College maintenance personnel assist with routine preventative maintenance to auxiliary equipment. Significant maintenance operations which were not part of a regular schedule are listed in Table D.

Table D - Significant Maintenance Operations

Date	Maintenance
9/20/01	New security system wiring and sensors installed
9/21/01	Installed emergency shutdown button for primary and secondary pumps
11/15/01	New log channel installed
1/7/02	Paging system repaired
1/10/02	Replaced potentiometer for safety rod position indication
4/28/02	Changed primary water system filter
5/21/02	Replaced secondary inlet pressure gage
5/24/02	Installed eye-wash fountain installed in mechanical room
6/11/02	Replaced elbow in air supply loop
6/12/02	Replaced air pump for CAM
6/14/02	Replaced high/low water alarm float

Safety Reviews

There were no changes under the provisions of 10CFR50.59 review performed during the reporting period. All changed were under 10CFR50.59 reviews completed in the previous reporting periods.

RADIATION PROTECTION

Personnel Dosimetry

During the period July 1, 2001 to June 30, 2002 personnel dosimeters were issued to 41 Reed students and staff and 1 contractor. Since dosimeters are changed on a calendar quarter schedule, this period is the closest to the reporting period. Individuals were issued beta-gamma sensitive ring badges and whole-body badges. The Director and Associate Director were issued beta-gamma-neutron sensitive dosimetry.

During the year the largest reading on a whole body dosimeter was 12 mrem deep dose equivalent. The largest reading on a ring dosimeter was 50 mrem shallow dose equivalent. No one exceeded a quarter of a percent of his or her federal limits.

Fixed Area Dosimetry

Radiation levels are continually monitored to provide an indication of the average radiation levels in the reactor bay and dose outside the facility. The locations of these dosimeters are shown on Figure 1. All dosimeters monitor beta and gamma radiation. Locations A and C also measure neutron dose.

The deep dose equivalent radiation measured by fixed dosimeters during the period July 1, 2001 to June 30, 2002 are shown in Table E. Since dosimeters are changed on a calendar quarter schedule, this period is the closest to the reporting period. There are radioactive material sample storage locations along the north wall: a radioactive source storage safe and a lead enclosed sample box where samples are placed immediately upon removal from the reactor. The neutron howitzer is stored on the east wall.

Table E - Area Radiation Dosimeters
(doses are in mRem per calendar quarter)

Location		Height (m)	Radiation Detected	Jul 1 - Sep 30	Oct 1 - Dec 31	Jan 1 - Mar 31	Apr 1 - Jun 30	Total
A	East Wall	1.5	β, γ, n	125	58	125	214	**522**
B	North Wall	1.6	β, γ	22	16	13	18	**69**
C	West Wall	1.0	β, γ n	3	6	5	8	**22**
D	South Wall	1.6	β, γ	7	2	7	6	**22**
E	North Wall	2.3	β, γ	30	34	21	24	**109**
F	North Outside	2.8	β, γ	14	3	7	7	**31**
G	Roof Outside	0.4	β, γ	2	3	0	5	**10**
H	East Outside	1.5	β, γ	0	0	0	0	**0**
I	South Outside	0.4	β, γ	0	0	0	0	**0**

Gaseous Releases

The only routine release of gaseous radioactivity is from Ar-41 (1.83 hour half-life) and N-16 (7.13 second half-life). These come from activation of pool water and air dissolved in the pool water and in the irradiation facilities. For calendar year 2001, the average gaseous activity at the site boundary was 1.18×10^{-10} μCi/ml, which would deliver a dose to a member of the public of approximately 0.06 mrem per year, well below regulatory guidelines and constraints.

Liquid Waste Releases

No liquid radioactive waste was released from the Reed Reactor Facility during this report period.

Solid Waste Disposal

A shipment of four barrels of low-level solid radioactive waste was made from the Reed Reactor Facility to the US Ecology site in Richland, Washington during this report period. The volume was 30 cubic feet containing 37 millicuries.

Environmental Sampling

Soil samples taken from the area surrounding the facility showed no activity above background. Water samples taken from the facility's secondary cooling system showed no activity above background.

APPENDIX A - VISITORS

Date	Institution	Purpose	Number	U-Share
9/1/01	Reed	Tour	2	No
9/5/01	Oregon Electric Group	Maintenance	4	No
9/5/01	Reed	Tour	1	No
9/6/01	Oregon Electric Group	Maintenance	2	No
9/6/01	Packard	Tour	2	No
9/7/01	Oregon Electric Group	Maintenance	2	No
9/10/01	Oregon Electric Group	Maintenance	2	No
9/10/01	Reed	Training	56	No
9/22/01	Reed	Tour	1	No
9/22/01	USN	Tour	1	No
9/24/01	Hood River Valley HS	Tour	18	Yes
9/26/01	Reed	Training	6	No
9/27/01	Oregon Electric Group	Maintenance	1	No
9/27/01	Reed	Training	14	No
9/28/01	Reed	Training	1	No
10/1/01	Reed Physical Plant	Maintenance	1	No
10/1/01	Reed	Training	1	No
10/3/01	Reed	Training	6	No
10/4/01	Reed	Training	8	No
10/6/01	Reed	Training	2	No
10/9/01	Reed	Training	1	No
10/10/01	Reed	Training	4	No
10/11/01	Reed	Training	13	No
10/12/01	Reed Physical Plant	Maintenance	1	No
10/12/01	Reed	Thesis Experiment	1	No
10/15/01	Reed	Tour	1	No
10/16/01	NRC	Inspection	1	No
10/17/01	NRC	Inspection	1	No
10/17/01	Reed	Training	8	No
10/18/01	NRC	Inspection	1	No
10/19/01	Oregon Electric Group	Maintenance	1	No
10/23/01	Portland Fire Bureau	Inspection	8	No
10/23/01	Portland Tribune	Tour	1	No
10/23/01	Reed	Training	2	No
10/24/01	Portland Fire Bureau	Inspection	8	No
10/24/01	Reed	Training	3	No
10/25/01	Portland Fire Bureau	Inspection	4	No
10/25/01	Reed	Training	4	No
10/25/01	Oregon Episcopal School	Tour	1	Yes
10/27/01	Reed	Training	6	No
10/27/01	Oregon Episcopal School	Tour	2	Yes
10/28/01	Reed	Training	1	No
10/29/01	Reed	Training	1	No
10/30/01	Pacific University	Tour	20	Yes
10/30/01	Reed	Thesis Experiment	2	No
10/31/01	Reed	Training	6	No

Date	Institution	Purpose	Number	U-Share
11/2/01	Oregon Electric Group	Maintenance	1	No
11/3/01	Oregon Episcopal School	Tour	6	Yes
11/3/01	Reed	Training	4	No
11/6/01	Reed	Training	1	No
11/8/01	Reed	Tour/Class	12	No
11/8/01	Reed	Thesis Experiment	1	No
11/9/01	KOIN-TV	News Story	2	No
11/9/01	Reed	Tour	81	No
11/10/01	Reed	Tour	2	No
11/13/01	General Atomic	Maintenance	1	No
11/13/01	Pacific University	Training	12	Yes
11/14/01	Reed	Training	1	No
11/15/01	General Atomic	Maintenance	1	No
11/15/01	Reed	Training	4	No
11/17/01	Tubman	Tour	12	Yes
11/17/01	Reed	Tour/Class	14	No
11/17/01	Reed	Training	3	No
11/19/01	Reed	Thesis Experiment	1	No
11/19/01	Reed	Tour	2	No
11/23/01	Reed	Tour	8	No
11/23/01	Reed	Training	1	No
11/26/01	Reed	Thesis Experiment	2	No
11/26/01	Reed	Tour	1	No
11/27/01	Reed	Training	1	No
11/28/01	Reed	Training	7	No
11/29/01	Sunset High School	Tour	27	Yes
11/29/01	Reed	Training	8	No
11/29/01	Reed	Training	1	No
11/30/01	Gold Beach High School	Tour	1	Yes
11/30/01	Reed	Training	3	No
11/30/01	Boy Scout Troop #252	Tour	12	Yes
12/3/01	Oregon Episcopal School	Tour	1	Yes
12/3/01	Reed	Training	1	No
12/4/01	Reed	Tour	1	No
12/5/01	Reed	Training	2	No
12/5/01	Oregon Electric Group	Maintenance	2	No
12/6/01	Oregon Electric Group	Maintenance	4	No
12/6/01	Reed	Training	1	No
12/7/01	Oregon Electric Group	Maintenance	3	No
12/7/01	Reed	Training	1	No
12/10/01	Reed	Training	1	No
12/10/01	Pacific University	Tour	1	Yes
12/12/01	United Fire	Maintenance	2	No
12/14/01	Oregon Episcopal School	Tour	2	Yes
12/15/01	Reed	Tour	1	No
12/18/01	Reed	Tour	2	No
12/19/01	Reed	Tour/Class	13	No
12/19/01	Hillsboro High School	Tour	1	Yes

Date	Institution	Purpose	Number	U-Share
1/5/01	Oregon Episcopal School	Tour	3	Yes
1/8/01	Reed	Training	10	No
1/9/01	Reed	Training	15	No
1/10/01	Reed	Training	14	No
1/11/01	Reed	Training	11	No
1/14/01	Reed	Training	1	No
1/16/01	Reed	Training	9	No
1/17/01	Reed	Training	5	No
1/19/01	Reed	Training	4	No
1/19/01	Reed	Tour	1	No
1/21/01	Reed	Training	1	No
1/21/01	Reed	Tour	1	No
1/22/01	Oregon Electric Group	Maintenance	1	No
1/23/01	Oregon Episcopal School	Tour	12	Yes
1/24/01	Oregon Episcopal School	Tour	1	Yes
1/25/01	Warner Pacific College	Tour	2	Yes
1/25/01	Reed	Weekly/Shutdown	1	No
1/26/01	Oregon State University	Tour	1	No
1/26/01	Reed	Training	2	No
1/26/01	Oregon Episcopal School	Tour	1	Yes
1/26/01	PCC Engineering Club	Tour	6	Yes
1/27/01	Reed	Training	3	No
1/27/01	Concordia University	Tour	7	Yes
1/28/01	Warner Pacific College	Tour	1	Yes
1/30/01	Reed	Maintenance	1	No
1/30/01	Reed	Training	1	No
1/31/01	Reed	Training	1	No
2/2/01	Reed	Training	1	No
2/3/01	Reed	Training	2	No
1/7/02	Reed	Training	12	No
1/8/02	Reed	Training	15	No
1/8/02	United Fire	Maintenance	2	No
1/8/02	NRC	Inspection	1	No
1/9/02	Reed	Training	14	No
1/10/02	Reed	Training	14	No
1/12/02	Reed	Tour	3	No
1/12/02	Reed	Training	5	No
1/14/02	Reed	Training	16	No
1/15/02	Reed	Training	13	No
1/16/02	Reed	Tour	4	No
1/16/02	Reed	Training	10	No
1/17/02	Reed	Training	2	No
1/18/02	Reed	Training	3	No
1/18/02	ROC	Auditor	1	No
1/21/02	NW Pottery Research	Experiment	2	No
1/22/02	Reed	Training	1	No
1/23/02	Reed	Training	1	No
1/24/02	Reed	Training	4	No

Date	Institution	Purpose	Number	U-Share
1/25/02	Oregon Electric Group	Maintenance	1	No
1/25/02	US Bank	Tour	1	No
1/28/02	Reed	Tour	1	No
1/30/02	Reed	Training	5	No
1/31/02	Reed	Training	2	No
2/1/02	Rex Putnam High	Tour	16	Yes
2/1/02	Reed	Tour	1	No
2/1/02	Reed	Training	1	No
2/6/02	Reed	Training	1	No
2/6/02	Reed	Training	1	No
2/6/02	PNNL	Tour	1	No
2/7/02	Reed	Thesis Experiment	2	No
2/7/02	Reed	Training	3	No
2/7/02	Reed	Maintenance	1	No
2/9/02	Reed	Training	3	No
2/9/02	Reed	Tour	5	No
2/11/02	Reed	Training	1	No
2/12/02	Reed	Training	2	No
2/12/02	Reed	Maintenance	1	No
2/13/02	Reed	Training	4	No
2/14/02	Reed	Training	3	No
2/15/02	Reed	Training	2	No
2/16/02	Reed	Training	1	No
2/18/02	Boy Scouts	Tour	17	Yes
2/19/02	Saturday Academy	Tour	13	Yes
2/20/02	Reed	Training	1	No
2/21/02	Reed	Tour	2	No
2/21/02	The Sharon Academy	Tour	1	Yes
2/21/02	Reed	Training	4	No
2/21/02	Reed	Tour	1	No
2/23/02	Reed	Training	1	No
2/23/02	Reed	Tour	1	No
2/26/02	Reed	Maintenance	1	No
2/26/02	United Fire	Maintenance	1	No
2/27/02	Reed	Training	1	No
2/28/02	IBEW	Maintenance	1	No
2/28/02	Reed	Training	3	No
2/28/02	Reed	Tour	2	No
2/28/02	Museum of Jurassic Tech.	Tour	2	No
3/6/02	SMILE	Tour	1	Yes
3/6/02	Reed	Training	1	No
3/7/02	Reed	Training	2	No
3/7/02	Macalister College	Tour	1	No
3/8/02	Reed	Tour	1	No
3/11/02	Reed	Training	1	No
3/12/02	Saturday Academy	Tour	9	Yes
3/13/02	Reed	Training	1	No
3/14/02	Portland Police	Training	2	No

Date	Institution	Purpose	Number	U-Share
3/15/02	Reed	Training	1	No
3/15/02	Roosevelt High School	Tour	18	Yes
3/18/02	Hunter Mech. Engineering	Maintenance	4	No
3/18/02	Reed	Training	1	No
3/19/02	Reed	Training	4	No
3/20/02	Lincoln High School	Tour	23	Yes
3/20/02	Reed	Training	2	No
3/21/02	Reed	Training	2	No
3/21/02	Lincoln High School	Tour	25	Yes
3/21/02	Reed	Training	2	No
3/22/02	Reed	Training	1	No
3/25/02	Saturday Academy	Tour	1	Yes
3/26/02	Reed	Startup	5	No
3/27/02	Saturday Academy	Tour	3	Yes
3/27/02	Reed	Training	3	No
3/28/02	Reed	Training	4	No
3/28/02	Reed	Thesis Experiment	1	No
3/28/02	Reed	Maintenance	1	No
3/28/002	Reed	Tour	2	No
3/29/02	Reed	Thesis Experiment	4	No
3/29/02	Reed	Maintenance	1	No
4/1/02	Jesuit High School	Tour	6	Yes
4/1/02	Reed	Tour	3	No
4/1/02	Reed	Training	1	No
4/1/02	Reed	Thesis Experiment	1	No
4/1/02	Cleveland High School	Tour	1	Yes
4/2/02	Reed	Tour	3	No
4/2/02	Reed	Thesis Experiment	1	No
4/3/02	Reed	Training	3	No
4/4/02	Reed	Training	3	No
4/6/02	Reed	Training	1	No
4/8/02	SSI	Tour	18	No
4/8/02	College Counselor Tour	Tour	4	No
4/9/02	Concordia University	Tour	14	Yes
4/9/02	Reed	Training	1	No
4/11/02	Reed	Training	10	No
4/11/02	Reed College Women's Committee	Tour	27	No
4/11/02	Reed	Thesis Experiment	1	No
4/12/02	Reed	Thesis Experiment	1	No
4/15/02	Reed	Thesis Experiment	1	No
4/15/02	Reed	Training	1	No
4/15/02	Reed	Tour	7	No
4/16/02	Reed	Thesis Experiment	1	No
4/16/02	Reed	Training	1	No
4/16/02	Reed	Tour	9	No
4/17/02	Reed	Thesis Experiment	1	No
4/17/02	Reed	Tour	6	No

Date	Institution	Purpose	Number	U-Share
4/17/02	Reed	Training	1	No
4/18/02	Reed	Training	3	No
4/18/02	Reed	Tour	14	No
4/18/02	Reed	Thesis Experiment	1	No
4/19/02	Reed	Training	2	No
4/19/02	Reed	Tour	10	No
4/19/02	Reed	Thesis Experiment	1	No
4/19/02	Reed	Env. Health Services	2	No
4/19/02	MRP	Maintenance	2	No
4/20/02	Reed	Thesis Experiment	1	No
4/21/02	Reed	Training	2	No
4/22/02	DDHS	Tour	43	No
4/23/02	Reed	Training	1	No
4/24/02	Reed	Training	7	No
4/24/02	Warner Pacific College	Tour	7	Yes
4/24/02	Reed	Tour	1	No
4/25/02	Reed Child to work day	Tour	31	No
4/25/02	Reed	Tour	5	No
4/26/02	Reed	Tour	2	No
4/28/02	Reed	Training	7	No
4/29/02	United Fire	Maintenance	2	No
4/29/02	Pacific University	Tour	26	Yes
4/29/02	Reed	Training	1	No
4/30/02	NRC/trainees	NRC Exam	5	No
4/30/02	Reed	Training	2	No
5/1/02	NRC/trainees	NRC Exam	6	No
5/1/02	Reed	Training	1	No
5/1/02	Reed	Tour	2	No
5/2/02	NRC/trainees	NRC Exam	5	No
5/2/02	University of Texas	Tour	2	No
5/2/02	Reed	Tour	1	No
5/2/02	Reed	Training	2	No
5/3/02	Reed	Tour	2	No
5/6/02	Linfield School of Nursing	Tour	17	Yes
5/7/02	Reed	Training	1	No
5/7/02	Creswell High School	Tour	10	Yes
5/8/02	Linfield College	Tour	19	Yes
5/8/02	MRP	Maintenance	2	No
5/8/02	Reed	Tour	1	No
5/10/02	Reed	Tour	1	No
5/10/02	Linfield College	Tour	10	Yes
5/10/02	Reed	shutdown	1	No
5/12/02	Reed	Tour	7	No
5/13/02	Reed	Tour	4	No
5/14/02	JFK High School	Tour	12	Yes
5/14/02	Reed	Tour	4	No
5/16/02	Reed	Maintenance	2	No
5/18/02	Reed	Training	1	No

Date	Institution	Purpose	Number	U-Share
5/21/02	Portland Community College	Tour	6	Yes
5/22/02	Portland Community College	Tour	3	Yes
5/23/02	Portland Community College	Tour	14	Yes
5/24/02	MRP	Maintenance	1	No
5/28/02	United Fire	Maintenance	1	No
5/29/02	Reed	EHS	1	No
5/30/02	Reed	Thesis Experiment	1	No
5/30/02	Portland Community College	Training	13	Yes
5/31/02	Good Sam. Hosp	Training	2	No
5/31/02	Reed	Training	2	No
6/2/02	Reed	Training	2	No
6/2/02	Reed	Training	19	No
6/4/02	Reed	Training	6	No
6/6/02	Reed	Training	10	No
6/9/02	Reed Reunions	Tour	31	No
6/10/02	Reed Library	Tour	3	No
6/13/02	Reed	Thesis Experiment	1	No
6/17/02	Reed	Training	2	No
6/17/02	Oregon Electric Group	Maintenance	1	No
6/18/02	Reed	Training	2	No
6/19/02	Reed Reactor Intern	Training	1	No
6/20/02	Reed Reactor Intern	Training	1	No
6/21/02	Reed Reactor Intern	Training	1	No
6/21/02	United Fire	Maintenance	1	No
6/24/02	Saturday Academy	Tour	3	Yes
6/24/02	PSU	Tour	1	No
6/25/02	Reed	Thesis Experiment	1	No
6/26/02	Reed Reactor Intern	Training	1	No
6/26/02	Science Camp	Tour	12	Yes
6/26/02	Reed	Tour	1	No
6/27/02	Reed	Training	1	No
6/27/02	Reed	Tour	4	No
6/27/02	Reed	EHS	1	No
7/3/02	Reed	Tour	2	No
7/9/02	Reed	Tour	7	No
7/10/02	Reed	Tour	2	No
7/11/02	Heritage School	Tour	7	Yes
7/15/02	Saturday Academy	Tour	15	Yes
7/17/02	Reed	Tour	3	No
7/17/02	PF&R	Tour	1	No
7/18/02	Saturday Academy	Tour	10	Yes
7/18/02	UVA	Tour	2	No
7/18/02	Reed	Tour	1	No
7/19/02	Reed	Tour	1	No
7/22/02	Reed	Maintenance	2	No
7/29/02	FM Global	Maintenance	1	No
7/30/02	Reed	Tour	1	No
7/30/02	United Fire	Maintenance	1	No

Date	Institution	Purpose	Number	U-Share
8/5/02	Reed	Tour	1	No
8/6/02	Reed	Tour	1	No
8/8/02	Heritage	Tour	1	Yes
8/8/02	Agape	Tour	1	Yes
8/8/02	Forest Hills Lutheran	Tour	3	Yes
8/8/02	Valley Catholic High School	Tour	5	Yes
8/13/02	Reed	Tour	1	No
8/15/02	Mt. Hood College	Tour	1	No
8/15/02	ASE	Tour	1	No
8/16/02	Oregon OSHA	OSHA	1	No
8/16/02	Reed	EHS	2	No
8/16/02	Reed	Maintenance	2	No
8/19/02	Reed	Tour	1	No
8/22/02	Reed	Tour	7	No
8/26/02	Reed	Tour	26	No
8/27/02	Reed	Tour	19	No
8/28/02	Reed	Startup	1	No
8/28/02	Reed	Tour	5	No
8/28/02	Reed	Tour	1	No
8/28/02	United Fire	Maintenance	1	No