REED COLLEGE *Portland, Oregon 97202*

REACTOR FACILITY

October 26, 1999

To: Nuclear Regulatory Commission
Document Control Desk
Washington DC 20555

Marvin Mendonca, Senior Project Manager, NRC

From: Stephen Frantz, Reed Reactor Facility, Docket 50-288

Re: Annual Report for Reed Reactor Facility

Enclosed is Reed College Reactor's Annual Report for September 1, 1998 to August 31, 1999.

The Annual Report fulfills many of the federal reporting requirements for our reactor. Please do not hesitate to contact me for additional information.

Sincerely,

Stephen G. Frantz
Director, Reed Reactor Facility

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3203 SE Woodstock Blvd., Portland, OR 97202-8199 Tel: (503) 777-7222 Fax: (503) 777-7274 email: sgf@reed.edu

REED REACTOR FACILITY

ANNUAL REPORT

September 1, 1998 -- August 31, 1999

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3203 Southeast Woodstock Blvd.
Portland, Oregon 97202-8199
503-777-7222
fax: 503-777-7274
reactor@reed.edu

Stephen G. Frantz
Director, Reed Reactor Facility
Program Director, Nuclear Science
Consortium of the Willamette Valley

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EXECUTIVE SUMMARY

This report covers the period from September 1, 1998 to August 31, 1999. This report is intended to fulfill several purposes including the reporting requirements of the U.S. Nuclear Regulatory Commission, the U.S. Department of Energy, and the Oregon Department of Energy.

There were over 1400 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 twelve colleges and universities in addition to nineteen pre-college groups. Most of the reactor use by non-Reed personnel was conducted under the auspices of the Nuclear Science Consortium of the Willamette Valley, supported by a grant from the U.S. Department of Energy through the Reactor Sharing Program.

During the year, the reactor was operated 212 times. The total energy production was approximately 25 MW-hours.

The reactor staff consists of a Director, an Associate Director, a contract Health Physicist, and approximately twenty Reed College undergraduate students licensed by the Nuclear Regulatory Commission as reactor operators.

There were no radiation exposures to individuals recorded during the year. There were no releases of liquid radioactive material from the facility and airborne releases were well within regulatory limits.

INTRODUCTION

The Reed College Reactor Facility has been a resource for research and educational projects in the Portland area since its establishment in 1968. Cooperative programs between Reed and several public and private high schools, colleges, and universities in northwestern Oregon were established in 1970. These programs, fostered by the reactor staff, are an important part of the educational picture of the region. Partial funding from the U.S. Department of Energy's Reactor Use Sharing Program through the Nuclear Science Consortium of the Willamette Valley enables use of the reactor by educational institutions other than Reed.

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

The Reed Reactor operates at various steady power levels. The reactor is brought up to a desired power level (up to the license ceiling of 250 kW-thermal) and is kept at that power until the experiment or irradiation is completed. This power level is usually maintained for periods ranging from a few minutes to several hours. Repeated operation over several days are possible for long-term irradiations.

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.

PERSONNEL

Facility Staff

During the period from September 1, 1998 to August 31, 1999, the facility staff consisted of the following:

Reactor Director:	Stephen Frantz (4/94 – Present)
Associate Director:	Chris Melhus (8/97 – 7/99)
Reactor Supervisor:	Silas Cook (9/98 – 5/99) Chris Melhus (5/99 – 7/99)
Radiation Safety Officer:	Cindy Savage (4/93 – Present)
Contract Health Physicist:	Marshall Parrott (8/91 – Present)
Senior Reactor Operators:	Tobias Boes Silas Cook Joshua Filner Stephen Frantz Ryan Gaffney Amaria George Chris Melhus Emmi Olson Ryan Richter Greta Vanderbeek Zoe VanHoover Eric Weis
Reactor Operators:	Alexander Austin Jeanette Blaine Jay Bodzin Jesse Brown David Jordan Chris Meacham Kater Murch Lien Ngo Michael Perry Patrick Reuther Matt Shaw Ben Tombaugh

The list of operators includes everyone who held a license at some time during the reporting period. Reactor Operators who upgraded their licenses to Senior Reactor Operator during the reporting period are listed under Senior Reactor Operator. All staff members were Reed College undergraduates during the report period with the following exceptions. Mr. Frantz and Mr. Melhus are the Director and Associate Director, respectively. Mr. Filner is a former Associate Director. Ms. Savage is the Reed Campus Safety Officer. Dr. Parrott works on contract to Reed College as Reactor Health Physicist.

Oversight Committees

The Reed Reactor Facility has two oversight committees: the Radiation Safety Committee and the Reactor Operations 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:

Curt Keedy (Chair) *(Chair of Chemistry Department, Lewis and Clark College)*
John Frewing *(Oregon Independent College Foundation)*
Wayne Lei *(Environmental Director, Portland General Electric)*
Jack Mahoney *(Neighborhood Resident)*
Tom Meek *(Radiation Protection Manager, Trojan Nuclear Power Plant)*
Cindy Savage *(Radiation Safety Officer, Reed College)*

Ex Officio:

Peter Steinberger *(Dean of the Faculty, Reed College)*
Stephen Frantz *(Director, Reed Reactor Facility)*
Chris Melhus *(Associate Director, Reed Reactor Facility)*
Marshall Parrott *(Contract Health Physicist)*
Silas Cook *(Reactor Supervisor)*
Zoe VanHoover *(Reactor Training Supervisor)*

Reactor Operations Committee

Voting Members:

Dan Gerrity (Chair) *(Chemistry Faculty, Reed College)*
Juliet Brosing *(Physics Faculty, Pacific University)*
John Essick *(Physics Faculty, Reed College)*
Johnny Powell *(Physics Faculty, Reed College)*
Josh Filner *(SRO and former Associate Director, Reed Reactor Facility)*
Michael Pollock *(Health & Safety Coordinator, AGRA Earth & Environmental, Inc.)*

Ex Officio:

Peter Steinberger *(Dean of the Faculty, Reed College)*
Stephen Frantz *(Director, Reed Reactor Facility)*
Chris Melhus *(Associate Director, Reed Reactor Facility)*
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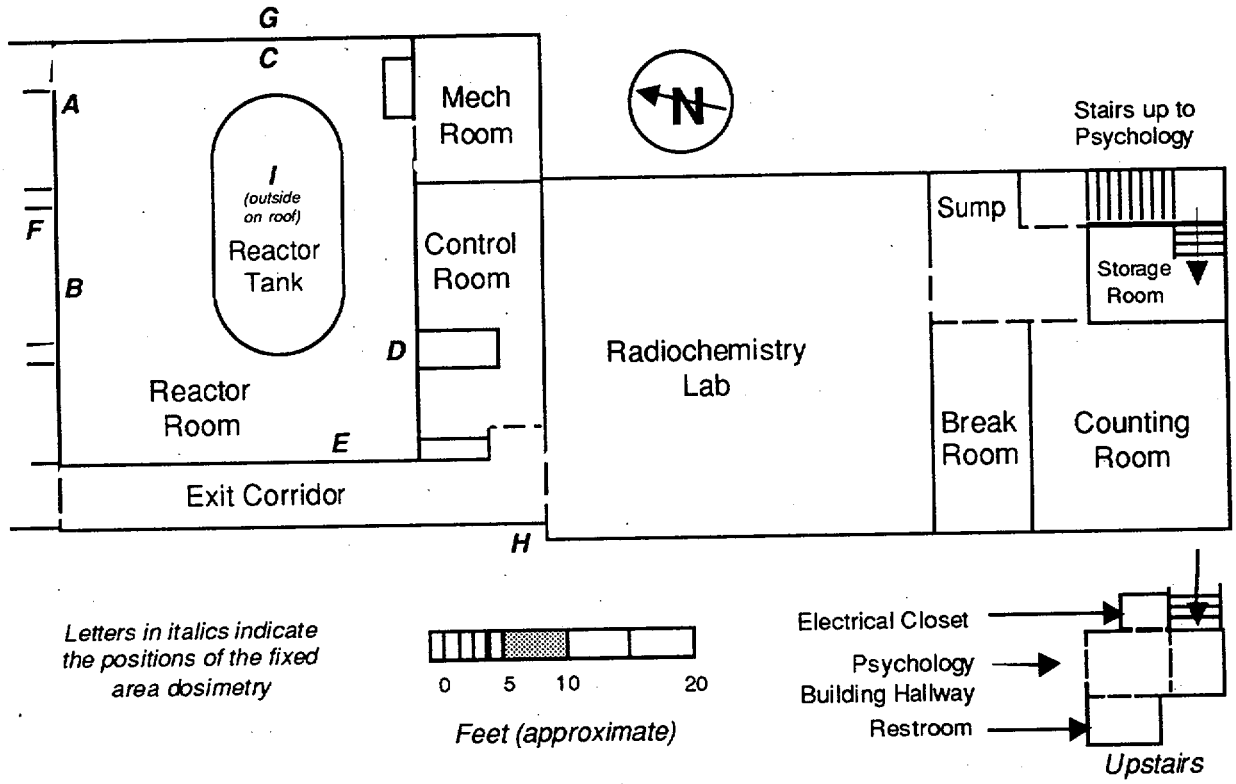
Silas Cook *(Reactor Supervisor)*
Zoe VanHoover *(Reactor Training Supervisor)*

FACILITIES

Reactor Facility Floor Plan

In addition to the reactor, the Reed Reactor Facility has associated 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 four gamma spectrometers (with high purity germanium), 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-müller tubes, neutron detectors, alpha detectors, and thermoluminescent dosimeter readers. The instruments are used for experiments and training in basic nuclear science and radiation detection. Hand and shoe monitors are used in the reactor bay. A liquid scintillation detector is available in the chemistry department and 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 which surrounds the core. The rack consists of a circular array of 40 tubular receptacles. Each receptacle can accommodate two TRIGA-type irradiation tubes, so that up to 80 separate samples may be irradiated at any one time. Vials holding up to 17 ml (four

drams) are routinely used in this system. Depending upon its geometry, a sample up to about 40 ml could be irradiated by joining two vials. 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, the rotating rack is used by researchers when longer irradiation times (generally greater than five minutes) are required. The average thermal neutron flux in the rotating rack position is approximately 1.7 $x10^{12}$ n/cm^2s with a cadmium ratio of 6.0 at full power. The specimen rack can also be used for gamma irradiations when the reactor is shutdown. The shutdown dose rate in the specimen rack is approximately 8 R/min.

Pneumatic Transfer System

The pneumatic transfer system ("rabbit") consists of an irradiation chamber in the outer 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^2s when the reactor is at full power.

In-Core Facilities

The central thimble, which is a water-filled irradiation chamber about 3 cm in diameter, provides the highest available neutron flux, about $1x10^{13}$ n/cm^2s. Special sample holders can be designed for 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. However, it holds only one specially positioned irradiation container, containing a cavity 7.5 cm in length and 2.5 cm in diameter. Use of the chamber as an irradiation facility necessitates special arrangements.

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^2s when the reactor is at full power.

REACTOR USERS

Reactor Visitors

A total of 1420 individuals visited the Reed Reactor Facility during the year, as derived from the visitors 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. A large percentage of these were students in classes at area universities, colleges, and high schools as discussed below. A monthly breakdown of the number of visitors is shown on Table 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, four out of eight reactor operator candidates and all four senior reactor operator candidates passed the NRC exams.

Nuclear Science Consortium

In order to better use the resources of the Reed Reactor Facility, Dr. Scott and representatives of 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

Clark College
Concordia University
George Fox University
Lewis and Clark College MAT students
Marylhurst University
Oregon Health Science University
Oregon State University
Pacific University
Portland Community College
Portland State University
University of Oregon Nuclear Choices Seminar
Warner Pacific University

HIGH SCHOOL & MIDDLE SCHOOL TOURS

David Douglas High School
Forest Grove High School
Gold Beach High School
Hood River High School
Lincoln High School
Linfield School of Nursing
Oregon Episcopal School
Pacific University Summer Science Camp for Girls
Rex Putnam High School
Saint Mary's Academy
St. Francis Academy
Sunset High School
Westview High School

SPECIAL GROUPS

American Chemical Society
Association Supporting Women in Engineering and Mathematics (ASWEM)
High School Counselors Portland
Pacific Northwest National Laboratories
Saturday Academy
Sellwood Research

Many of the reactor tours include actual hands-on use of facility equipment to conduct experiments in basic radiation science, health physics, and nuclear physics. The most popular experiments for middle school students are a demonstration of the inverse square law and the absorption of radiation by different types of material. For high school classes, a typical lab experience would involve determining the background of a geiger-müller scalar system and then determining the half-life of a 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. Students from Elmira High School, Gold Beach High School, Jesuit high School; Lincoln High School, and Oregon Episcopal School performed special science research projects at the reactor this year.

Pacific University Science and Technology Camp for Girls

The Pacific University Science and Technology Camp for Girls holds a summer camp for 7th and 8th grade girls funded by Intel. The goal is to encourage the participants to continue in math and science.

Portland State University

Each year the reactor provides irradiation services for the Geology Department at Portland State University. This is usually accompanied by a tour for the students.

Pacific University Modern Physics Lab

Each year the Modern Physics Lab at Pacific University spends two lab sessions (4-5 hours each) at the reactor. The students do several labs including basic health physics, sub-critical multiplication, and neutron activation analysis.

Concordia University

Two or three times each year the Environmental Remediation & Hazardous Material Management Program (ERHMM) at Concordia University visits the facility. The reactor provides training and experiments involving radiation, radioactive material, environmental sampling, and trace element analysis.

Reed Classes, Theses, and Faculty Research

The Reed College Reactor Facility was used in two Reed College Classes and one senior thesis.

- The Chemistry 110 class conducted a lab using neutron activation analysis to analyze for potassium in a compound synthesized earlier in the course.
- Chemistry 315 students conducted a lab using neutron activation analysis to evaluate the presence of impurities in aluminum foil.

Industrial and Commercial Applications

The Reed Reactor Facility is available for use by industrial or commercial concerns when it does not conflict with our educational goals. As in past years, the primary operations involve neutron activation analysis of materials or environmental samples. Arrangements may be made either on a time lease basis or the industry may contract for sample analysis.

This year work included attempts to find trace elements in soil samples and renting analytical equipment. 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 212 times on 109 days. The total energy production was 24.911 MW-hr. Operations by month appear in Table A:

Table A - Operations History

	Times Critical	Days Operated	MW-hrs	Visitors
Sep.	17	9	0.945	160
Oct.	15	9	3.456	141
Nov.	28	14	4.498	271
Dec.	14	7	0.387	23
Jan.	18	11	2.570	123
Feb.	14	11	3.233	116
Mar.	20	10	2.004	80
Apr.	35	15	3.777	201
May	18	8	1.013	92
Jun.	16	7	1.187	95
Jul.	10	6	1.564	104
Aug.	7	2	0.277	14
Total	**212**	**109**	**24.911**	**1420**

Unplanned Reactor Shutdowns

There were twenty unplanned reactor shutdowns (scrams) during the period, as shown in Table B. All were classified as inadvertent; none were unexplained. The number of unplanned reactor shutdowns is higher than normal. As usual, most reactor scrams are associated with improper operation of the Linear Power range switch. The increase in Percent Power scrams is due to calibration difference between it and the Linear Channel which is normally used to control power.

Table B - Unplanned Reactor Shutdowns

Date	Scram Type	Cause Of Scram
9/25/98	Percent Power	Percent Power channel reached scram set point when linear was still below 96%. Operator was watching the Linear Channel.
11/4/98	Linear Power	Doing Sub-critical Multiplication lab demonstration and reactor went critical. Power crept up to the scram setpoint.
11/5/98	Linear Power	Operator ranging error.
11/6/98	Period	Operator inattention.
11/6/98	Linear Power	Operator ranging error.
11/10/98	Linear Power	Trainee ranging error.
11/13/98	Linear Power	Trainee ranging error.
11/19/98	Linear Power	Trainee ranging error.
12/8/98	Period	Operator inattention.
12/30/98	Period	Operator inattention
1/14/99	Linear Power	Trainee ranging error.
1/29/99	Percent Power	Percent Power channel reached scram set point when linear was still below 96%. Operator was watching the Linear Channel.
2/12/99	Percent Power	Percent Power channel reached scram set point when linear was still below 96%. Operator was watching the Linear Channel.
2/23/99	Linear Power	Operator ranging error.
3/4/99	Percent Power	Percent Power channel reached scram set point when linear was still below 96%. Operator was watching the Linear Channel.
4/9/99	Linear Power	Trainee ranging error.
4/9/99	Linear Power	Trainee ranging error.
5/14/99	Percent Power	Percent Power channel reached scram set point when linear was still below 96%. Operator was watching the Linear Channel.
5/6/99	Linear Power	Trainee ranging error.
6/4/99	Percent Power	Percent Power channel reached scram set point when linear was still below 96%. Operator was watching the Linear Channel.

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
10/29/98	Chart Recorders replaced
11/24/98	Changed Primary filter
3/10/99	Moved skimmer on primary water system
4/15/99	Jumpered the slave bypass closed relay
4/20/99	Moved RAM
7/29/99	New Linear Channel Installed

Safety Reviews

There were seven changes performed during the reporting period under the provisions of 10CFR50.59:

SOP Changes - August 1998

During the summer of 1998 the SOPs were reviewed and revised. Every SOP was changed; some changes were major and some were wording or format.

Replace Main Chart and Radiation Monitor Recorders

Replaced the main chart recorder, a Honeywell Electrik 19, with a new Honeywell DPR-100 C. At the same time replaced the three separate chart recorders for the radiation monitors (APM, GSM, and CAM) with another DPR-100 C. The DPR-100 is chart recorder with up to 3 pens and a 12 digit alphanumeric LED display. It can print times, events, and values directly on the chart. It comes with a mathematics package that allows it to calculate and display (or print) values derived from the input parameters.

Revise Security Plan

This change revised the Security Plan

Additional Skimmer

This change moved the skimmer to the southwest corner of the pool which is currently a "dead spot" in the tank surface flow. The existing skimmer can't remove items from that corner.

Shim Rod Slave Relay Jumper

This change jumpered the Slave Relay on the Shim Rod.

Move RAM to southwest corner of the reactor pool

The RAM and its support bracket was moved from the northwest corner of the reactor pool to the southwest corner so that it can be read from the control room window without the need of binoculars or a telescope.

Replace Linear Power Channel Electronics

Replaced the existing linear power channel with a new Sorrento NMP-1000. The Sorrento NMP-1000 is an analog, wide range, linear current module. It produces and displays its own high voltage and compensating voltage. It indicates the range with lights and displays the power on a vertical meter. The linear channel detector itself was not changed.

RADIATION PROTECTION

Personnel Dosimetry

During the period from July 1, 1998 to June 30, 1999, personnel dosimeters were issued to 30 Reed students and staff and 1 contractor working at the reactor. Since dosimeters are changed on a calendar quarter schedule, this period is the closest to the reporting period. During the year 103 whole body dosimeters were issued of which 103 were below detection limit. During the year 103 ring dosimeters were issued of which 103 were below detection limit. Individuals were issued beta-gamma sensitive ring badges and whole-body badges. The Director and Associate Director were issued beta-gamma-neutron sensitive dosimetry.

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. For calendar year 1998, the average gaseous activity at the site boundary was 3.47×10^{-12} uCi/ml which would deliver a dose to a member of the public at the site boundary of approximately 0.02 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

No solid radioactive waste was shipped from the Reed Reactor Facility during this report period.

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.

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 are thermoluminescent dosimeters (TLDs) designed to monitor beta and gamma radiation. In addition, locations C and E TLDs measure neutron dose.

The radiation doses measured during the period beginning July 1, 1998 and ending June 30, 1999 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.

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

	Location	Height (m)	Radiation Type	7/1 - 9/30	10/1 - 12/31	1/1 - 3/31	4/1 - 6/30	Total
A	North wall	1.5	β , γ	10	10	15	15	**50**
B	North wall	2.5	β , γ	0	0	0	0	**0**
C	East wall	1.7	β , γ	0	0	0	0	**0**
C	East wall	1.7	neutron	0	0	0	0	**0**
D	South wall	1.7	β , γ	0	0	0	0	**0**
E	West wall	1.0	β , γ	0	0	0	0	**0**
E	West wall	1.0	neutron	0	0	0	0	**0**
F	North outside	3.0	β , γ	0	0	0	0	**0**
G	East outside	1.5	β , γ	0	0	0	0	**0**
H	South outside	0.2	β , γ	0	0	0	0	**0**
I	Roof outside	0.0	β , γ	0	0	0	0	**0**

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
9/5/98	Visitor	2	Tour
9/11/98	Oregon Episcopal School	33	Tour
9/14/98	Physical Plant	1	Maintenance
9/15/98	Physical Plant	2	Maintenance
9/15/98	Visitor	1	Tour
9/16/98	Visitor	2	Tour
9/18/98	Chemistry & Admissions Faculty	7	Tour
9/22/98	Pacific University	1	Tour
9/22/98	Reed Students	47	Training
9/23/98	Physical Plant	1	Maintenance
9/23/98	Reed Students	2	Training
9/25/98	Hood River Valley High School	21	Tour
9/25/98	Visitor	2	Tour
9/25/98	Reed Students	4	Tour
9/27/98	Visitor	2	Tour
9/28/98	Reed Students	1	Training
9/29/98	PEO	11	Tour
9/30/98	Reed Students	18	Training
9/31/98	Reed Students	2	Training
10/1/98	Reed Students	7	Training
10/7/98	Faculty	17	Tour
10/7/98	Reed Students	1	Training
10/8/98	Reed Students	6	Training
10/9/98	Pacific Northwest National Laboratories	2	Tour
10/10/98	Reed Students	9	Training
10/11/98	Visitor	2	Tour
10/12/98	Reed Students	2	Training
10/14/98	Visitor	1	Tour
10/16/98	Reed Students	1	Training
10/20/98	Reed Students	3	Training
10/20/98	Saturday Academy	16	Tour
10/22/98	Portland Fire Bureau	3	Tour
10/22/98	Reed Students	4	Training
10/23/98	Portland Fire Bureau	12	Tour
10/28/98	Linfield School of Nursing	32	Tour
10/28/98	Reed Students	4	Training

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
10/30/98	Reed Students	8	Training
10/30/98	Linfield School of Nursing	11	Tour
11/2/98	Linfield School of Nursing	17	Tour
11/2/98	Reed Students	3	Training
11/3/98	Visitor	1	Tour
11/4/98	Reed Students	3	Training
11/5/98	Portland Police	3	Tour
11/5/98	Reed Students	3	Training
11/5/98	David Douglas High School	26	Tour
11/6/98	Reed Parents	27	Tour
11/6/98	Reed Students	6	Tour
11/6/98	Reed Students	2	Training
11/6/98	Visitor	11	Tour
11/10/98	Chemistry 110 Students	19	Tour
11/10/98	Saturday Academy	7	Tour
11/11/98	Chemistry 110 Students	20	Tour
11/11/98	Reed Students	4	Training
11/12/98	Reed Students	4	Training
11/12/98	Chemistry 110 Students	22	Tour
11/13/98	Reed Students	4	Training
11/13/98	Chemistry 110 Students	19	Tour
11/14/98	Visitor	2	Tour
11/16/98	Reed Students	2	Training
11/16/98	Chemistry 110 Students	22	Tour
11/18/98	Sunset High School	23	Tour
11/18/98	Reed Students	3	Training
11/19/98	Chemistry 315 Students	5	Tour
11/19/98	Reed Students	3	Training
11/20/98	Chemistry 315 Students	5	Tour
11/20/98	Prospective student	1	Tour
11/24/98	Reed Students	3	Changing primary Filter
11/25/98	Reactor Assistant Director	1	No-TLD
12/2/98	Reed Students	7	Training
12/3/98	Chemistry 315 Students	5	Tour
12/8/98	Reed Students	1	Training
12/8/98	Reed Community safety	8	Tour

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
12/10/98	Associated Press	1	Tour
12/16/98	Reed Students	1	Weekly
1/13/99	Reed Students	25	Training
1/14/99	Reed Students	26	Training
1/14/99	Physical Plant	1	Maintenance
1/15/99	Physical Plant	1	Maintenance
1/15/99	Reed Students	10	Training
1/18/99	Reed Students	13	Training
1/19/99	Reed Students	11	Training
1/20/99	Physical Plant	2	Maintenance
1/20/99	Reed Students	5	Training
1/21/99	Oregon Episcopal School	1	Experiments
1/21/99	Reed Students	12	Training
1/22/99	Reed Students	3	Training
1/23/99	Reed Students	1	Training
1/25/99	Gold Beach High School	2	Experiments
1/26/99	Nuclear Regulatory Commission	1	Inspection
1/26/99	Reed Students	3	Training
1/27/99	Reed Students	1	Training
1/27/99	Physical Plant	1	Maintenance
1/29/99	Reed Students	2	Training
1/29/99	Portland State University	2	Experiments
2/1/99	Reed Students	1	Training
2/1/99	Warner Pacific University	12	Tour
2/2/99	Reed Students	2	Training
2/3/99	High School Counselors Portland	13	Tour
2/3/99	Reed Students	1	Training
2/5/99	Reed Students	2	Training
2/7/99	Reed Students	2	Training
2/9/99	Reed Students	6	Training
2/9/99	ABC Fire Safety	2	Testing fire safety equipment
2/12/99	Reed Students	2	Training
2/16/99	George Fox United	11	Tour
2/16/99	Reed Students	1	Training
2/18/99	Reed Students	2	Training
2/18/99	Rex Putnam High School	26	Tour

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
2/19/99	Reed Students	1	Training
2/19/99	Visitor	2	Tour
2/21/99	Visitor	2	Tour
2/22/99	Reed Students	1	Training
2/23/99	Oregon Episcopal School	13	Tour
2/23/99	Reed Students	8	Training
2/24/99	Reed Students	3	Training
2/24/99	Oregon State University	1	Tour
2/25/99	Reed Students	1	Training
2/26/99	Reed Students	1	Training
3/2/99	Ass. Supporting Women in Engineering & Math	13	Tour
3/2/99	Reed Students	1	Training
3/3/99	Reed Students	1	Training
3/4/99	Reed Students	2	Training
3/4/99	Pacific University	8	Tour
3/5/99	Reed Students	1	Training
3/9/99	Reed Students	1	Training
3/9/99	Visitor	1	Tour
3/10/99	Reed Students	2	Training
3/11/99	Reed Students	1	Training
3/12/99	Reed Students	4	Training
3/12/99	Physical Plant	2	Maintenance
3/12/99	Prospective student	1	Tour
3/13/99	Reed Students	2	Training
3/14/99	Reed Students	1	Training
3/18/99	Reed Students	1	Training
3/19/99	Reed Students	2	Training
3/22/99	Reed Students	2	Training
3/22/99	Apprenticeship in Science and Engineering	1	Tour
3/22/99	Reed safety officer classes	3	Class
3/23/99	Reed safety officer classes	3	Class
3/23/99	Apprenticeship in Science and Engineering	2	Tour
3/24/99	Reed safety officer classes	5	Class
3/24/99	Physical Plant	1	Maintenance

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
3/24/99	Reed Students	1	Training
3/24/99	ABC Fire Safety	2	Testing fire safety equipment
3/25/99	Physical Plant	2	Maintenance
3/25/99	Apprenticeship in Science and Engineering	1	Tour
3/26/99	Reed Students	4	Training
3/29/99	Reed Students	1	Training
3/29/99	Visitor	1	Tour
3/29/99	Apprenticeship in Science and Engineering	1	Tour
3/30/99	Reed Safety Committee	1	Audit
3/30/99	Physical Plant	1	Maintenance
3/30/99	Apprenticeship in Science and Engineering	1	Tour
3/30/99	Reed Students	2	Training
3/31/99	Physical Plant	1	Maintenance
4/2/99	Apprenticeship in Science and Engineering	2	Interview
4/6/99	Reed Students	7	Training
4/8/99	Physical Plant	2	Cleaning
4/8/99	Saint Francis Academy	9	Tour
4/9/99	Reed Students	1	Training
4/10/99	Concordia College	4	Tour
4/13/99	Reed Students	1	Training
4/13/99	Reed Visitor	1	Tour
4/14/99	Reed Students	2	Training
4/14/99	Physical Plant	1	Maintenance
4/14/99	Lincoln High School	22	Tour
4/15/99	Reed Students	4	Training
4/15/99	Visitor	14	Tour
4/15/99	Ass. Supporting Women in Engineering & Math	12	Tour
4/16/99	Lincoln High School	28	Tour
4/16/99	Physical Plant	1	Maintenance
4/19/99	Physical Plant	1	Maintenance
4/19/99	Visitor	9	Tour
4/20/99	Physical Plant	2	Maintenance

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
4/20/99	RAD	2	Tour
4/21/99	Reed Students	1	Training
4/21/99	RAD	5	Tour
4/22/99	Visitor	16	Tour
4/23/99	Reed Safety Committee	1	Inspection
4/23/99	Visitor	13	Tour
4/26/99	Reed Students	2	Training
4/26/99	Pacific University	16	Tour
4/28/99	ABC Fire Safety	2	Testing fire safety equipment
4/28/99	Reed Students	3	Training
4/29/99	Saint Mary's Academy	12	Tour
4/29/99	Reed Students	1	Training
4/30/99	Visitor	2	Tour
4/30/99	Physical Plant	2	Maintenance
5/3/99	Reed Students	4	Training
5/3/99	Nuclear Regulatory Commission	1	NRC Exam
5/4/99	Nuclear Regulatory Commission	2	NRC Exam
5/4/99	Reed Students	3	NRC Exam
5/5/99	Reed Students	4	NRC Exam
5/5/99	Nuclear Regulatory Commission	2	NRC Exam
5/6/99	Nuclear Regulatory Commission	1	NRC Exam
5/6/99	Reed Students	1	NRC Exam
5/7/99	Reed Students	1	weekly
5/11/99	Visitor	2	Tour
5/13/99	Visitor	4	Tour
5/14/99	Oregon Health Science University	2	Project
5/15/99	Visitor	4	Tour
5/15/99	ABC Fire Safety	2	Testing fire safety equipment
5/19/99	Portland Community College	15	Tour
5/20/99	Reed Students	2	Training
5/20/99	University of Oregon Nuclear Choices Seminar	10	Tour
5/24/99	Portland Community College	17	Tour
5/26/99	Reed Students	2	Chemistry Project

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
5/26/99	Forest Grove High School	13	Tour
6/1/99	West View High School	18	Tour
6/1/99	Marylhurst University	8	Tour
6/1/99	Sellwood Research	2	Tour
6/1/99	Portland Community College	7	Tour
6/4/99	Saint Francis Academy	15	Tour
6/4/99	Portland Community College	10	Tour
6/14/99	Physical Plant	1	Maintenance
6/15/99	Physical Plant	2	Maintenance
6/20/99	American Chemical Society	3	Tour
6/21/99	ABC Fire Safety	1	Testing fire safety equipment
6/22/99	Physical Plant	1	Maintenance
6/22/99	Apprenticeship in Science and Engineering	1	Project
6/24/99	Apprenticeship in Science and Engineering	1	Project
6/28/99	Apprenticeship in Science and Engineering	1	Project
6/28/99	Reed Development Office	10	Tour
6/28/99	Physical Plant	1	Maintenance
7/9/99	Physical Plant	1	Maintenance
7/9/99	Interstate Roofing	2	Maintenance
7/12/99	Saturday Academy	5	Tour
7/13/99	Reed Students	1	Training
7/13/99	Pacific University Summer Science Camp for Girls	24	Tour
7/13/99	Saturday Academy	8	Tour
7/14/99	Saturday Academy	8	Tour
7/14/99	Prospective student	1	Tour
7/14/99	Prospective student's parents	2	Tour
7/15/99	Interstate Roofing	1	Maintenance
7/15/99	Reed Students	3	Training
7/15/99	Lewis and Clark College MAT students	23	Tour
7/15/99	Reed Visitor	2	Tour
7/16/99	Reed Students	1	weekly
7/18/99	Reed Students	1	Training

Appendix A
Reed Reactor Visitors 1998-1999

Date	Institution	Number	Comments
7/20/99	Reed Students	1	Training
7/21/99	Physical Plant	3	Maintenance
7/21/99	Clark College	13	Tour
7/21/99	Reed Students	2	Training
7/22/99	Reed Students	1	Training
7/22/99	Evan House Painting	1	Maintenance
7/22/99	Physical Plant	1	Maintenance
7/23/99	Physical Plant	1	Maintenance
7/23/99	Evan House Painting	1	Maintenance
7/23/99	Reed Students	1	Training
7/26/99	General Atomic	1	Maintenance
7/27/99	General Atomic	1	Maintenance
7/28/99	ABC Fire Safety	2	Testing fire safety equipment
7/29/99	General Atomic	1	Maintenance
8/4/99	Water Metrics	1	Maintenance
8/4/99	Physical Plant	1	Maintenance
8/12/99	Physical Plant	2	Maintenance
8/12/99	Boeing Corporation	4	Tour
8/17/99	ABC Fire Safety	1	Testing fire safety equipment
8/18/99	Student's Family	5	Tour
8/26/99	Watermetrics	1	Maintenance