REED COLLEGE Portland, Oregon 97202

REACTOR FACILITY

50-288

September 25, 2000

Document Control Desk
US Nuclear Regualtory Commission
Washington, DC 20555

Enclosed is Reed College Reactor's Annual Report for September 1, 1999 to August 31, 2000.

This has been another exciting year. Student participation in the program is at a record high with 24 licensed students and 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

REED REACTOR FACILITY ANNUAL REPORT

September 1, 1999 -- August 31, 2000

REED REACTOR FACILITY

ANNUAL REPORT

September 1, 1999 -- August 31, 2000

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

TABLE OF CONTENTS

OVERVIEW 3

PEOPLE 5

- Facility Staff 5
- Oversight Committees 6
- Radiation Safety Committee 6
- Reactor Operations Committee 6

FACILITIES 7

- Reactor Facility Floor Plan 7
- Rotating Specimen Rack Facility 7
- Pneumatic Transfer System 8
- In-Core Facilities 8
- In-Pool Facilities 8
- Beam Facilities 8

USERS 9

- Reactor Visitors 9
- Reactor Operations Seminar 9
- Nuclear Science Consortium 9
- High School Student Projects 11
- Pacific University Science and Technology Camp for Girls 11
- Pacific University Modern Physics Lab 11
- Concordia University 11
- Reed Classes 11
- Industrial and Commercial Applications 11

REACTOR OPERATIONS 13

- Operations 13
- Unplanned Reactor Shutdowns 13

REACTOR MAINTENANCE 15

- Significant Maintenance 15
- Safety Reviews 15

RADIATION PROTECTION 17

- Personnel Dosimetry 17
- Fixed Area Dosimetry 17
- Gaseous Releases 18
- Liquid Waste Releases 18
- Solid Waste Disposal 18
- Environmental Sampling 18

APPENDIX A - VISITORS 19

OVERVIEW

This report covers the period from September 1, 1999 to August 31, 2000, 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-FG03-96NE38158

The reactor 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 over 1911 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 17 colleges and universities in addition to 40 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.

The reactor was operated 267 times on 123 days. The thermal energy produced was 34.62 megawatt-hours.

The reactor staff consisted of a Director, an Associate Director, a contract Health Physicist, and approximately 24 Reed College undergraduate students licensed by the Nuclear Regulatory Commission as reactor operators or senior reactor operators.

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.

PEOPLE

Facility Staff

During the period September 1, 1999 to August 31, 2000, the facility staff consisted of:

Reactor Director:	Stephen Frantz (4/94 – Present)
Associate Director:	Ryan Gaffney (8/99 – 5/00)
Reactor Supervisor:	Amaria George (8/99 – 5/00)
Radiation Safety Officer:	Cindy Savage (4/93 – 5/00) Kathleen Fisher (8/00 – Present)
Contract Health Physicist:	Marshall Parrott (8/91 – Present)
Senior Reactor Operator (SRO):	Amaria George Emmi Olson Eric Weis Jay Bodzin Joshua Filner Kater Murch Ryan Gaffney Ryan Richter Stephen Frantz
Reactor Operator (RO):	Alexander Austin Ann Erickson Benjamin Tombaugh Chris Hoefler Cilicia Dorn-Lopez Dan Spoth David Jordan David Rosoff Jack Barnett Jesse Helm Jon Young Kristina Lestik Mat Brener Matt Shaw Michael Perry Nicki Ford Rachel Barnett Reid Burkland Rudy Gilmore Tim Cassidy

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. Gaffney, Mr. Filner, Ms. Savage, Ms. Fisher, and Dr. Parrott.

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(without vote):

Peter Steinberger *(Dean of the Faculty, Reed College)*
Stephen Frantz *(Director, Reed Reactor Facility)*
Ryan Gaffney *(Associate Director, Reed Reactor Facility)*
Marshall Parrott *(Contract Health Physicist)*
Amaria George *(Reactor Supervisor)*
Eric Weis *(Reactor Training Supervisor)*

Reactor Operations Committee

Voting Members:

Dan Gerrity (Chair) *(Chemistry Faculty, Reed College)*
Juliet Brosing *(Physics Faculty, Pacific University)*
Bob Reynolds *(Physics Faculty, Reed College)*
Johnny Powell *(Physics Faculty, Reed College)*
Josh Filner *(SRO and former Associate Director, Reed Reactor Facility)*

Ex Officio(without vote):

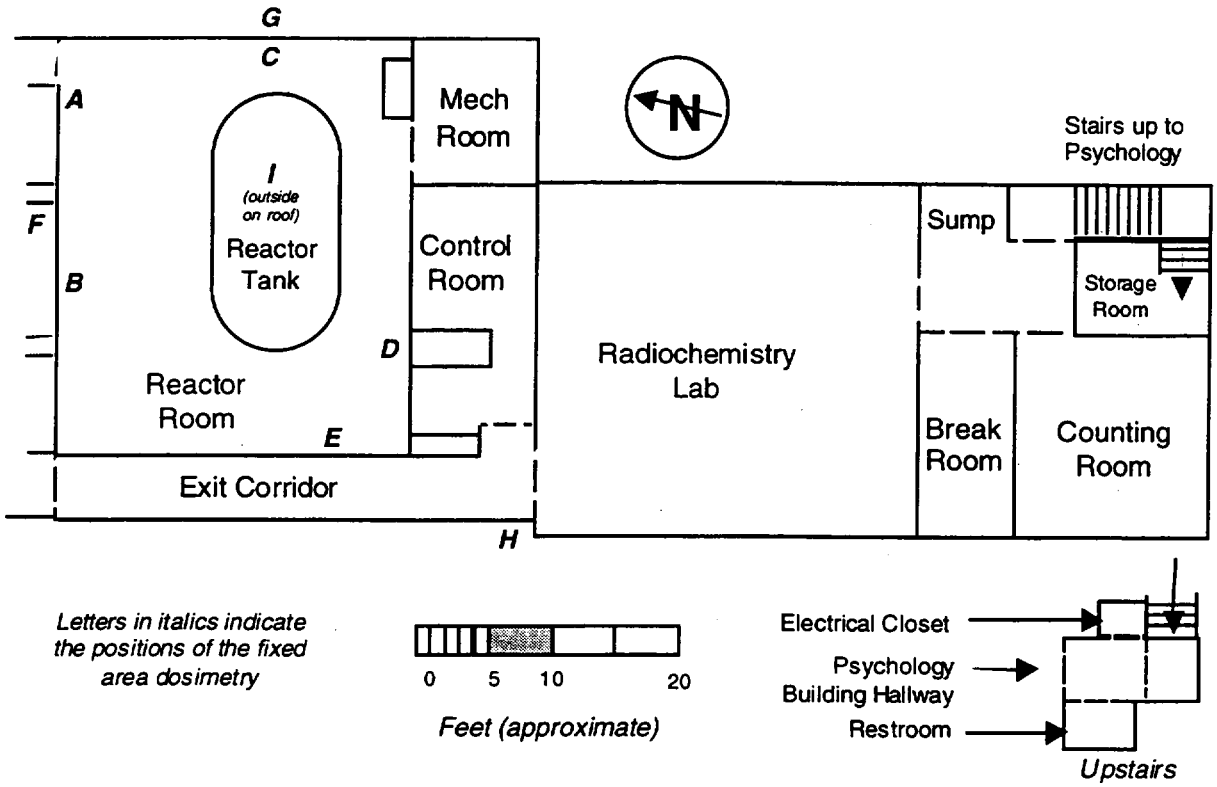
Peter Steinberger *(Dean of the Faculty, Reed College)*
Stephen Frantz *(Director, Reed Reactor Facility)*
Ryan Gaffney *(Associate Director, Reed Reactor Facility)*
Marshall Parrott *(Contract Health Physicist)*
Amaria George *(Reactor Supervisor)*
Eric Weis *(Reactor Training Supervisor)*

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 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-müller 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, 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 at full power is approximately 1.7×10^{12} n/cm^{2}s 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 5×10^{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 1×10^{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 1×10^{3} n/cm^{2}s when the reactor is at full power.

USERS

Reactor Visitors

A total of 1911 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 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, fifteen out of fifteen reactor operator candidates and both senior reactor operator candidates passed the NRC exams.

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

Bowie State University
Concordia University
Hampton University
Idaho State University
Linfield College
Mt. Hood CC
Oakwood College
Oberlin College
Occidental College
Oregon Health Science University
Oregon State University
Pacific University
Portland Community College
Portland State University
University of Oregon
University of California at Berkley
Whitworth College

HIGH SCHOOL & MIDDLE SCHOOL TOURS/USERS

Barlow High School
Beaumont Middle School
Benson High School
Canby High School
Century High School
Cleveland High School
Columbia River High School
Crossroads High School
David Douglas High School
Glencoe High School
Grant High School
Hood River Valley High School
Jesuit High School
Lake Ridge High School
Lincoln High School
Marshall High School
Newport High School
Oregon City High School
Oregon Episcopal School
Portland Jewish Academy
Rex Putnam High School
Ridgewood High School
Roosevelt High School
Sandy High School
Sellwood Middle School
Skyview High School
Southridge High School
St. Clair Middle School
Tubman Middle School
Wilson High School
Woodburn High School

SPECIAL GROUPS

Association Supporting Women in Engineering and Mathematics (ASWEM)
Bring Child to Work Day
Home School Program
Metro Learning Center
Middle School Symposium
Pacific University Summer Science Camp for Girls
Saturday Academy
Talented and Gifted Students
Upward Bound ETS
World Affairs Council, Kazakstan

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-müller 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. Students from Columbia River High School, Jesuit high School; Portland Jewish Academy, 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. The goal is to encourage the participants to continue in math and science.

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

Reed Classes

The Reed College Reactor Facility was used in two Reed College Classes.

- The Chemistry 101 class conducted a lab to determine the half-life of an isotope.
- 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 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 267 times on 123 days. The total energy produced was 34.62 megawatt-hours. Operating history by month appear in Table A:

Table A - Operating History

	Times Critical	Days Operated	MW-hrs	Visitors
Sep.	38	9	2.87	364
Oct.	24	11	3.79	91
Nov.	19	10	2.56	222
Dec.	13	7	1.26	71
Jan.	21	11	2.68	215
Feb.	19	13	2.26	122
Mar.	22	10	2.34	138
Apr.	37	12	3.77	228
May	33	14	2.97	112
Jun.	8	7	2.42	92
Jul.	17	9	4.19	77
Aug.	16	10	3.53	179
Total	267	123	34.62	1911

Unplanned Reactor Shutdowns

There were 14 inadvertent reactor shutdowns (scrams) as shown in Table B; none were unexplained. The number of unplanned reactor shutdowns is consistent with past experience.

Table B - Unplanned Reactor Shutdowns

Date	Scram Type	Cause Of Scram
9/15/99	Linear Power	Auto-range was disabled
9/15/99	Percent Power	Instrument noise
1/27/00	Period	Operator error, not watching meter
3/21/00	Linear Power	Flux controller transient when taking count rate channel to test
3/29/00	Linear Power	Operator error, not watching meter
5/1/00	Period	Operator error, not watching meter
5/19/00	Percent Power	Operator error, not watching meter
5/24/00	Linear Power	Operator error, did not range correctly
5/24/00	Period	Electrical transient
5/2600	Period	Adjusting height of log detector for power calibration
7/5/00	Period	Electrical transient
7/18/00	Period	Operator error, not watching meter
7/21/00	Mechanical	Operator bumped safety rod motor during maintenance
7/21/00	Linear Power	Operator error, did not range correctly

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
9/23/99	Linear Channel failed. Replaced isolation amplifier with identical unit from Sorrento Electronics
3/14/00	Safety Rod Motor sticking. Replaced with identical model in stock.
4/6/00	Air Particulate Monitor geiger-mueller tube broke. Replaced with one from stock.
5/18/00	Replaced Air Particulate Monitor with Eberline AMS-3.
5/22/00	Installed new Percent Power Module from Sorrento Electronics.
5/23/00	Installed new Log and Period electronics module from Sorrento Electronics and new detector donated from Hanford. Detector was defective, so reinstalled the original detector and electronics.
7/26/00	Replaced primary filter

Safety Reviews

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

1. Replace the NMC GA-2T Radiation Area Monitor (RAM) with a newer model, a Victoreen GammaGuard RAM. The new model is solid state and more reliable. It has a wider range, is more stable, is less temperature sensitive, and an improvement in almost every way. The Victoreen GammaGuard RAM will be used to fulfill Technical Specification requirements. The original NMC GA-2T RAM will face the reactor room and will be used as a backup.

2. Replace the support brackets for the four nuclear detectors to make adjusting their height easier. The detector tube is held to a support angle bracket by two u-bolts just below the surface of the water. The bracket is held to the reactor tank lip with two bolt-and-nut sets. The change replaces the two bolts on the tank with two threaded stocks that would stick up through the same mounting holes, but the support bracket would be held between two nuts at a higher elevation. There will be four nuts on each threaded stock.

3. Replace the logarithmic channel with a new Sorrento NLW-1000. The Sorrento NLW-1000 is an analog, wide range, logarithmic counting and logarithmic current module. A differentiator circuit provides period indication. It produces and displays its own high voltage and compensating voltage. It is designed to work with a new nuclear detector we obtained from Westinghouse-Hanford a few years ago. This change would remove the log-n detector and electronics (including period) and install the new ones. Note: This change is on hold since the detector from Westinghouse is faulty.

4. Replace the percent power channel with a new Sorrento NP-1000. The Sorrento NP-1000 is an analog logarithmic current module. It produces and displays its own high voltage.

5. Use a digital timer connected to the linear channel chart recorder to perform semi-annual control rod calibrations.

6. Change the frequency of radiation instrument calibration from every 6 months to every 12 months. This is in keeping with standards used in Oregon and across the United States.

7. Replace the installed Air Particulate Monitor (APM) with a newer model, an Eberline AMS-3 that is identical to the Continuous Air Monitor (CAM). The AMS-3 is solid state and more reliable. Since we will be removing the old APM enclosure, air leakage will be reduced.

8. Replace the control rod position indicators with new LCD displays. The new rod position indication system will display control rod positions on a scale ranging from 0.0 to 100.0 for all three control rods. The current display is given in millivolt units ranging from 100 to approximately 950. The external box will no longer be used.

9. Replace the Safety Rod Motor with an identical replacement in storage. The motor was sticking near the bottom of motion and needs to be physically assisted withdrawing.

RADIATION PROTECTION

Personnel Dosimetry

During the period July 1, 1999 to June 30, 2000 personnel dosimeters were issued to 38 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 period all except 5 whole body dosimeters were below detection limit, the largest recorded dose being 15 mrem. During the period all except 3 ring dosimeters were below detection limit, the largest recorded dose being 50 mrem.

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 C and E also measure neutron dose.

The radiation doses measured the period July 1, 1999 to June 30, 2000 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 Detected	Jul 1 - Sep 30	Oct 1 - Dec 31	Jan 1 - Mar 31	Apr 1 - Jun 30	Total
A	North Wall	1.6	β, γ	0	0	15	10	**25**
B	North Wall	2.3	β, γ	0	0	0	0	**0**
C	East Wall	1.5	β, γ	0	0	0	0	**0**
C	East Wall	1.5	neutron	0	0	0	0	**0**
D	South Wall	1.6	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	2.8	β, γ	0	0	0	0	**0**
G	East Outside	1.5	β, γ	0	0	0	0	**0**
H	South Outside	0.4	β, γ	0	0	0	0	**0**
I	Roof 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. For calendar year 1999, the average gaseous activity at the site boundary was 1.24×10^{-11} 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

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.

APPENDIX A - VISITORS

Date	Institution	Purpose	Number	URR Share
9/8/99	ABC Fire	Fire Protection Check	1	No
9/13/99	Reed	Chem 101 Lab	77	No
9/14/99	Reed	Training	4	No
9/14/99	Reed	Chem 101 Lab	48	No
9/15/99	Reed	Chem 101 Lab	47	No
9/16/99	Reed	Chem 101 Lab	54	No
9/17/99	Reed	Chem 101 Lab	34	No
9/21/99	World Affairs Council, Kazakstan	Tour	8	Yes
9/24/99	Reed	Alumni Tour	14	No
9/29/99	Hood River Valley HS	Tour	38	Yes
9/29/99	Kemper Insurance	Inspection	1	No
9/29/99	Reed	RSO Duties	1	No
9/29/99	Neighborhood Association	Tour	28	Yes
9/29/99	Reed	Training	9	No
10/7/99	Upward Bound ETS	Tour	14	Yes
10/7/99	Pacific University	Experiment	1	Yes
10/8/99	Columbia River HS	Experiment	1	Yes
10/12/99	NW Regional	Accreditation Inspection	1	No
10/15/99	Columbia River HS	Experiment	1	Yes
10/16/99	Columbia River	Experiment	1	Yes
10/19/99	Oregon Episcopal School	Experiment	2	Yes
10/22/99	ABC Fire	Fire Protection Check	1	No
10/26/99	Portland Fire Bureau	Emergency Training	4	No
10/26/99	Pacific University	Experiment	1	Yes
10/26/99	Reed	Training	3	No
10/26/99	Pacific University	Experiment	1	Yes
10/27/99	Portland Fire Bureau	Emergency Training	5	No
10/27/99	Reed	CSO Emergency Training	5	No
10/28/99	David Douglas HS	Tour	15	Yes
10/28/99	Portland Fire Bureau	Emergency Training	22	No
10/30/99	Reed	Tour	13	No
11/4/99	Oregon Health Science Univ.	Tour	6	Yes
11/5/99	Reed Families	Tour	26	No
11/5/99	Reed Families	Tour	42	No
11/9/99	Portland Fire Bureau	Emergency Training	9	No
11/10/99	Portland Jewish Academy	Tour	2	Yes
11/11/99	Portland HS Students	Tour	41	Yes
11/12/99	Oregon Episcopal School	Experiment	10	Yes
11/12/99	Reed	Tour	3	No
11/13/99	Linfield College	Experiment	1	Yes
11/15/99	Reed Reactor Seminar	Training	22	No
11/16/99	Oregon Episcopal School	Experiment	1	Yes
11/18/99	Reed	Chem 315 Lab	4	No
11/19/99	Reed	Chem 315 Lab	10	No
11/22/99	Talented & Gifted Students	Tour	21	Yes

Date	Institution	Purpose	Number	URR Share
11/22/99	Reed	Senior Symposium	23	No
11/22/99	ABC Fire	Fire Protection Check	1	No
12/8/99	Portland Police Bureau	Emergency Training	3	No
12/9/99	Portland Police Bureau	Emergency Training	4	No
12/10/99	Ridgewood HS	Tour	6	Yes
12/13/99	NRC	Inspection	1	No
12/13/99	NRC	Inspection	1	No
12/16/99	Reed	Tour/Labs	4	No
12/16/99	Rex Putnam HS	Tour	44	Yes
12/23/99	St. Clair Middle School	Tour	8	Yes
1/10/00	Reed	Training	23	No
1/11/00	Reed	Training	33	No
1/12/00	Reed	Training/Maintenance	15	No
1/13/00	Reed	Training	20	No
1/14/99	Reed	Training	14	No
1/17/00	Reed	Training	10	No
1/18/00	Reed	Training	20	No
1/19/00	Reed	Paidea Tour	14	No
1/20/00	Reed	Training	4	No
1/21/00	ABC Fire	Fire Protection Check	2	No
1/21/00	Reed	Training	7	No
1/24/00	Southridge High School	Lab/Tour	17	Yes
1/24/00	Reed	Training	12	No
1/26/00	Reed	Training	6	No
1/27/00	Reed	Training	8	No
1/28/00	Oregon Episcopal School	Experiment	2	Yes
1/28/00	Reed	Training	8	No
2/2/00	Woodburn HS	Tour	17	Yes
2/5/00	Reed	CSO Emergency Training	7	No
2/7/00	Reed	Training	8	No
2/8/00	Reed	Experiment	1	No
2/8/00	Saturday Academy	Tour	7	Yes
2/9/00	Reed	CSO Emergency Training	3	No
2/10/00	Reed	Training	3	No
2/10/00	Univ.of Oregon	Tour	10	Yes
2/16/00	Reed	Physics 332	1	No
2/21/00	Jesuit HS	Experiment	6	Yes
2/22/00	Portland Jewish Academy	Experiment	2	Yes
2/22/00	Reed	Training	3	No
2/24/00	Reed	Training	2	No
2/24/00	Canby High School	Tour	2	Yes
2/25/00	ABC Fire	Fire Protection Check	1	No
2/26/00	Middle School Symposium	Tour	35	Yes
2/29/00	Reed	Training	6	No
2/29/00	Lake Ridge High School	Tour	2	Yes
2/29/00	Crossroads High School	Tour	1	Yes
2/29/00	Wilson High School	Tour	1	Yes
2/29/00	Skyview High School	Tour	1	Yes

Date	Institution	Purpose	Number	URR Share
2/29/00	Columbia River High	Tour	1	Yes
2/29/00	Century High School	Tour	1	Yes
2/29/00	Oregon City High	Tour	1	Yes
3/1/00	Mt. Hood CC	Tour	3	Yes
3/1/00	David Douglas High	Tour	1	Yes
3/1/00	Marshall High School	Tour	1	Yes
3/1/00	Sandy High School	Tour	1	Yes
3/1/00	Barlow High School	Tour	1	Yes
3/2/00	Reed	Training	8	No
3/4/00	Reed	Tour	3	No
3/7/00	Reed	Training	3	No
3/7/00	Oregon City High School	Tour	1	Yes
3/7/00	Wilson High School	Tour	1	Yes
3/7/00	Century High School	Tour	1	Yes
3/7/00	Lake Ridge High School	Tour	1	Yes
3/8/00	Reed	Lab	5	No
3/9/00	Pacific University	Lab	25	Yes
3/9/00	Beaumont MS	Tour	2	Yes
3/9/00	Reed	Training	4	No
3/14/00	Reed	Physics J-Lab	5	No
3/15/00	Reed	RSO Duties	1	No
3/16/00	Talented & Gifted Students	Tour	14	Yes
3/17/00	ABC Fire	Fire Protection Check	1	No
3/21/00	Reed	Startup	1	No
3/21/00	Apprentice in Science / Eng	Tour	1	Yes
3/21/00	Reed	Training	3	No
3/21/00	Reed	Library Tour	4	No
3/21/00	Apprentice in Science / Eng	Tour	2	Yes
3/23/00	Apprentice in Science / Eng	Tour	2	Yes
3/23/00	Reed	Training	7	No
3/24/00	Home School Program	Tour	8	Yes
3/24/00	Reed	Training	2	No
3/27/00	Whitworth College	Tour	1	Yes
3/27/00	Hampton University	Tour	1	Yes
3/27/00	Bowie State	Tour	1	Yes
3/27/00	Occidental College	Tour	1	Yes
3/27/00	NSF	Tour	1	Yes
3/27/00	Oakwood College	Tour	1	Yes
3/27/00	Oberlin College	Tour	1	Yes
3/27/00	Apprentice in Science / Eng	Tour	1	Yes
3/28/00	Reed	Training	2	No
3/29/00	Glencoe High School	Tour	8	Yes
3/29/00	Portland Fire Bureau	Inspection	1	No
3/29/00	Apprentice in Science / Eng	Interview	1	Yes
3/30/00	Reed	Training	6	No
4/3/00	Apprentice in Science / Eng	Interview	1	Yes
4/5/00	Apprentice in Science / Eng	Interview	1	Yes
4/5/00	Reed	Training	6	No

Date	Institution	Purpose	Number	URR Share
4/6/00	Reed	Training	12	No
4/8/00	Tubman Middle School	Tour	24	Yes
4/10/00	Reed	Training	3	No
4/12/00	HS Counselor	Tour	3	No
4/12/00	Reed	Physics J-Lab	1	No
4/12/00	Reed	Training	5	No
4/12/00	Sellwood Middle School	Tour	2	Yes
4/12/00	Reed	Chem 223	5	No
4/12/00	Portland Community College	Tour	6	Yes
4/13/00	Reed	Training	2	No
4/13/00	Univ.of California - Berkley	Visit	1	Yes
4/13/00	Reed	Training	9	No
4/17/00	Reed Activity Days	Tour	16	No
4/18/00	Reed	Physics J-Lab	2	No
4/19/00	Reed Activity Days	Tour	7	No
4/19/00	Reed	Training	2	No
4/20/00	Reed Activity Days	Tour	22	No
4/20/00	ABC Fire	Fire Protection Check	1	No
4/21/00	Reed Activity Days	Tour	30	No
4/24/00	Pacific University	Tour	30	Yes
4/24/00	Reed	Training	2	No
4/25/00	Grant High School	Tour	1	Yes
4/26/00	Reed	Training	2	No
4/26/00	Newport High School	Tour	6	Yes
4/27/00	Pacific University		2	Yes
4/27/00	Bring Child to Work Day	Tour	24	No
5/1/00	NRC	License Exam	1	No
5/2/00	NRC	License Exam	2	No
5/3/00	NRC	License Exam	2	No
5/4/00	NRC	License Exam	2	No
5/5/00	NRC	License Exam	2	No
5/9/00	Reed	Tour	2	No
5/11/00	ABC Fire	Fire Protection Check	1	No
5/12/00	Reed	Tour	9	No
5/15/00	Linfield College	Tour	9	Yes
5/16/00	Oregon State University	Tour	3	Yes
5/16/00	Linfield College	Tour	39	Yes
5/17/00	Linfield College	Tour	12	Yes
5/17/00	Portland Community College	Tour	10	Yes
5/19/00	Linfield College	Tour	7	Yes
5/22/00	General Atomic	Maintenance	2	No
5/23/00	Oregon Electrical Group	Maintenance	1	No
5/23/00	General Atomic	Maintenance	3	No
5/24/00	General Atomic	Maintenance	1	No
5/25/00	General Atomic	Maintenance	1	No
5/26/00	General Atomic	Maintenance	1	No
5/31/00	Reed	Maintenance	2	No
6/1/00	Portland Community College	Tour	12	Yes

Date	Institution	Purpose	Number	URR Share
6/2/00	Metro Learning Center	Tour	12	Yes
6/10/00	Reed Alumni	Tour	22	No
6/13/00	Reed	Training	1	No
6/14/00	Reed	Weekly	2	No
6/16/00	Reed	Maintenance	1	No
6/19/00	RSO Class	Tour	6	No
6/20/00	RSO Class	Tour	10	No
6/21/00	RSO Class	Tour	10	No
6/21/00	ABC Fire	Fire Protection Check	2	No
6/22/00	RSO Class	Tour	11	No
6/23/00	Neighborhood	Tour	3	No
7/5/00	Summer Science Camp	Tour	26	Yes
7/10/00	Prospective Students	Tour	1	No
7/11/00	Reed	Tour	1	No
7/13/00	Reed	Tour	2	No
7/17/00	Saturday Academy	Class	11	Yes
7/18/00	Saturday Academy	Class	8	Yes
7/19/00	Saturday Academy	Class	8	Yes
7/19/00	Reed	Training	3	No
7/21/00	Saturday Academy	Tour	6	Yes
7/24/00	Electrician	Maintenance	6	No
7/24/00	ABC Fire	Fire Protection Check	2	No
7/27/00	Mt Hood Chemical	Maintenance	1	No
7/28/00	Prospective Students	Tour	2	No
8/1/00	Reed	Tour	2	No
8/2/00	Saturday Academy	Class	1	No
8/2/00	Diebold Security	Maintenance	1	No
8/2/00	Public	Tour	2	Yes
8/3/00	Idaho State University	Tour	1	Yes
8/3/00	Public	Tour	1	Yes
8/7/00	Public	Tour	2	Yes
8/8/00	Independent Counselors	Tour	33	No
8/10/00	ABC Fire	Fire Protection Check	1	No
8/21/00	Reed - New Students	Tour	48	No
8/22/00	Reed - New Students	Tour	23	No
8/23/00	Water Metrics	Maintenance	1	No
8/23/00	Reed - New Students	Tour	20	No
8/24/00	Reed - New Students	Tour	14	No
8/24/00	Rose City Astronomy Club	Tour	10	Yes
8/25/00	Reed - New Students	Tour	6	No
8/26/00	Reed - New Students	Tour	2	No
8/29/00	Reed - New Students	Tour	2	No
8/30/00	Portland Public School	Tour	1	No
8/30/00	Benson HS	Tour	3	No
8/30/00	Roosevelt HS	Tour	1	No
8/30/00	Grant HS	Tour	2	No
8/30/00	Cleveland HS	Tour	1	No
8/30/00	Lincoln HS	Tour	1	No