



A. JAMES CLARK
SCHOOL OF ENGINEERING

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Document Control Desk
U.S. Nuclear regulatory Commission
Washington D.C. 20555

ANNUAL REPORT

Enclosed is the Annual Report for the Maryland University Training Reactor (MUTR) in accordance with the requirements set forth in the facility Technical Specifications. This report covers the time period July 1, 2007 through June 30, 2008.

Sincerely,

A handwritten signature in cursive script, appearing to read "Vincent G. Adams".

Vincent G. Adams
Associate Director, Maryland University Training Reactor

Cc: Reactor Files

AD20
NRR

ANNUAL REPORT: July 1, 2007 – June 30, 2008

**FOR THE
MARYLAND UNIVERSITY TRAINING REACTOR**

License No. R-70

Docket No. 50-166



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TABLE OF CONTENTS

TABLE OF CONTENTS.....1

I. INTRODUCTION2

II. REACTOR USAGE.....3

III. SURVEILLANCE TESTS AND INSPECTIONS4

IV. CHANGES TO THE FACILITY6

V. ENVIRONMENTAL SURVEYS OF SURROUNDING AREAS7

VI. RADIOACTIVE RELEASE AND DISCHARGE TO THE ENVIRONMENT.....8

VII. ALARA REVIEW FOR FACILITY PERSONNEL AND VISITOR EXPOSURE9

VIII. UNSCHEDULED REACTOR SHUTDOWN/REPORTABLE OCCURENCES10

IX. SPECIAL EXPERIMENTS.....11

X. CHANGES IN FACILITY STAFF.....12

A. APPENDIX A. EPA COMPLIANCE13

I. INTRODUCTION

The University of Maryland Training Reactor (MUTR) is an open-pool type, TRIGA fueled reactor licensed for operation at 250 kW thermal power. The core is cooled by natural convection of the pool water with auxiliary cooling provided for protection of the filters and ion exchange equipment associated with reactor support piping.

The MUTR is used for academic instructions and operator training, performance of neutron and gamma irradiations, neutron activation analysis experiments, and tours and demonstrations for groups internal and external to the campus as well as for visiting nuclear power plant trainees.

REACTOR USEAGE

During the past year the MUTR operated for a total of 48 runs (Run Numbers 3867 - 3915), which are categorized below:

Operator Training/Requalification*	13 runs
Tours, Labs & Demonstrations	15 runs
Calibration, Maintenance, and Surveillance	15 runs
Irradiations and Activations	6 runs

*Note: Some runs involved training and surveillance and may be counted in both categories.

**Note: Some of the runs in the Classes category consisted of irradiations. They are not included in the Irradiations category.

To perform these runs the core produced 9.704 MWh (kWh meter change from 234687 kWh to 244380 kWh), with a corresponding burnup of 0.55 Grams of U-235.

III. SURVEILLANCE TESTS AND INSPECTIONS

All required surveillance tests and inspections were performed at the specified intervals. The required surveillance items for this reporting period include:

WATER SAMPLE TESTS

AIR SAMPLE TESTS

RADIATION SURVEYS

CONTROL ROD DROP TEST

RAM CALIBRATION

SNM INVENTORIES

ALARA REVIEW

In addition to the above surveillance items, the following maintenance operations were performed on the indicated dates:

9/10/07 Dri-rite baked.

12/03/07 Dri-rite replaced

3/04/08 Dri-rite baked.

6/15/08 Replaced air pump and Dri-rite.

Additional minor maintenance was performed such as light bulb replacement and fine-tuning of equipment was performed as necessary. Additional descriptions of some items from above can be found in Section IV.

IV. CHANGES TO FACILITY

There were no significant changes to the Facility during this reporting period.

V. ENVIRONMENTAL SURVEYS OF SURROUNDING AREAS

All continuous monitoring for this year was accomplished using fixed-mounted film badges throughout the interior of the reactor building itself. These badges recorded the following exposures:

<u>Monitor</u>	<u>Location</u>	<u>Dose (mrem)</u>
1	Control Room	63
2	Pool Surface	265
3	Hot Room	310
4	Prep Room	77
5	S. Wall Upper	0
6	S. Wall Lower	13
7	E. Wall Lower	49
8	Pump Room	227
9	N. Wall Lower	1350
10	W. Wall Lower	350

VI. RADIOACTIVE RELEASE AND DISCHARGE TO THE ENVIRONMENT

The Reactor Storage Sump was not discharged during this reporting period.

The only release from the MUTR consists of Ar-41. From Section 11 of the SER for the MUTR, a 9.7 MWh operation year would result in the generation of 38.6 mCi of Ar-41 for the entire year from the reactor pool tank. For this operation year, a combined 15.9 mCi of Ar-41 was released to the reactor building. This value was used in the EPA program COMPLY. The MUTR meets the EPA level 2 compliance for airborne release of radioactive materials. A copy of the output for the EPA computer program "COMPLY" is appended with this report.

VII. ALARA REVIEW FOR FACILITY PERSONNEL AND VISTOR EXPOSURE

A review of exposure records and all facility operations were performed by facility management as part of the annual ALARA audit. For this reporting period, all badged personnel and students received doses less than ten per-cent of their annual dose limit.

The Pocket Dosimeters recorded minimal exposure for all guests and service personnel. Calibrations of these self-reading dosimeters were performed on an annual basis by the University of Maryland's Radiation Safety Office.

VIII. UNSCHEDULED SHUTDOWNS/REPORTABLE OCCURRENCES

No unscheduled shutdowns occurred during this reporting period.

There were no reportable occurrences during this reporting period.

IX. SPECIAL EXPERIMENTS

There were no special experiments performed during this reporting period.

X. CHANGES IN FACILITY STAFF

There were no significant changes to staffing during this reporting period.

APPENDIX A: EPA COMPLIANCE

Below is the output from the EPA program COMPLY for the Ar-41 release from the MUTR:

COMPLY: V1.5d.

7/11/08 10:19

40 CFR Part 61
National Emission Standards
for Hazardous Air Pollutants

REPORT ON COMPLIANCE WITH
THE CLEAN AIR ACT LIMITS FOR RADIONUCLIDE EMISSIONS
FROM THE COMPLY CODE, VERSION 1.5d

Prepared by:

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Prepared for:

U.S. Environmental Protection Agency
Office of Radiation Programs
Washington, D.C. 20460

MARYLAND UNIVERSITY TRAINING REACTOR
2007-2008 ANNUAL OPERATING REPORT

COMPLY: V1.5d.

7/11/08 10:19

2007-2008 MUTR Annual Report Ar-41 Release

SCREENING LEVEL 1

DATA ENTERED:

Effluent concentration limits used.

DATA ENTERED FOR STACK 1:

Nuclide	CONCENTRATION (curies/cu m)
-----	-----
AR-41	3.84E-05

DATA ENTERED FOR STACK 2:

Nuclide	CONCENTRATION (curies/cu m)
-----	-----
AR-41	3.84E-05

NOTES:

Input parameters outside the "normal" range:

None.

RESULTS:

You are emitting 4750.0 times the allowable amount
given in the concentration table.

*** Failed at level 1.

MARYLAND UNIVERSITY TRAINING REACTOR
2007-2008 ANNUAL OPERATING REPORT

COMPLY: V1.5d.

7/11/08 10:19

2007-2008 MUTR Annual Report Ar-41 Release

SCREENING LEVEL 2

DATA ENTERED:

RELEASE RATES FOR STACK 1.

Nuclide	Release Rate (curies/YEAR)
AR-41	3.814E-02

RELEASE RATES FOR STACK 2.

Nuclide	Release Rate (curies/YEAR)
AR-41	3.814E-02

SITE DATA FOR STACK 1.

Release height 8 meters.

Building height 11 meters.

The source and receptor are not on the same building.

Distance from the source to the receptor is 8 meters.

Building width 15 meters.

SITE DATA FOR STACK 2.

Release height 8 meters.

Building height 11 meters.

The source and receptor are not on the same building.

Distance from the source to the receptor is 8 meters.

Building width 15 meters.

Default mean wind speed used (2.0 m/sec).

MARYLAND UNIVERSITY TRAINING REACTOR
2007-2008 ANNUAL OPERATING REPORT

COMPLY: V1.5d.

7/11/08 10:19

NOTES:

Input parameters outside the "normal" range:

None.

RESULTS:

Effective dose equivalent: 3.7E-02 mrem/yr.

*** Comply at level 2.

This facility is in COMPLIANCE.

It may or may not be EXEMPT from reporting to the EPA.

You may contact your regional EPA office for more information.

***** END OF COMPLIANCE REPORT *****

July 2008



To see a more concise version of your calendar, optimized for printing, click the printer icon to the left (Acrobat Reader req'd)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	1	2	3	4	5
			LINAC Off line			
6	7	8	9	10	11	12
LINAC Off line						
Shut down		Northrop New Source			Marina NEW SOURCE	
8 Eric OLD SOURCE		Vince Joel Williams Samp				
9 Vince source change to						
13	14	15	16	17	18	19
LINAC Off line						
Marina NEW SOURCE		Marina OLD SOURCE				
9 Training		Eric OLD SOURCE				
		9 Training		9 Requal 2p Tour		
20	21	22	23	24	25	26
LINAC Off line						
Marina OLD SOURCE		Northrop OLD SOURCE				
9 TOUR ENES 100		9 Training				
		9 Training		9 Requal 2p Tour		9 Air & Water
27	28	29	30	31	1	2
Northrop OLD SOURCE						
9 Training		9 Training		9 Requal 2p Tour		

MUTR, UMD gamma cell, UMD LINAC, Requal training, UMD gamma cell, UMD gamma cell, UMD Gamma Cell, UMD UMD, Aug 2008 (Eastern Time)

Gamma
Cell
U
M
D linac

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	1	2
Northrop OLD SOURCE						
	9am - Training @		9am - Training @	9am - Requal @ MUTR 2pm - Tour @ MUTR		
3	4	5	6	7	8	9
Eric OLD SOURCE						
	8am - NRC Training @ 9am - Training @	8am - NRC Training @ 9am - Training @	9am - Requal training 9am - Training @ 1pm - Tour @ RX 10	9am - Requal @ MUTR 9am - Requal training 1pm - PE group 2pm - Tour @ MUTR		
10	11	12	13	14	15	16
	9am - Training @	9am - Requal training	9am - Requal training 9am - Training @	Change to NEW 9am - Requal @ MUTR 9am - Requal training		
17	18	19	20	21	22	23
	9am - Training @	9am - Requal training	9am - Requal training 9am - Training @	9am - Requal @ MUTR 9am - Requal training		
24	25	26	27	28	29	30
NRC Inspection						
8am - U.S. NRC Inspection @ Reactor						
	9am - Training @	9am - Requal training	9am - Requal training 9am - Training @	9am - Requal @ MUTR 9am - Requal training		
31	1	2	3	4	5	6
	9am - Training @	9am - Requal training	9am - Requal training 9am - Training @	9am - Requal @ MUTR 9am - Requal training		