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Reference: Annual Report: July 1, 2010 – June 30, 2011 for the Maryland
University Training Reactor ("MUTR") (TAC NO. ME1592), Docket No.
50-166, License No. R-70

The University of Maryland ("UMD") hereby submits a hard copy of the Annual
Report referenced above.

If there are questions about the information submitted, please write to me at the
address set forth above or email me at mohamad@umd.edu. Please copy Prof.
Robert Briber on any such correspondence (same address; rbriber@umd.edu).

I declare under penalty of perjury that the foregoing and attached information is true
and correct.

Sincerely,

Mohamad Al-Sheikhly
Professor and Director
Maryland University Training Reactor

cc: Robert Briber
Spyros Traiforos
Enclosure

AO20
NRK

ANNUAL REPORT: July 1, 2010 – June 30, 2011

FOR THE
MARYLAND UNIVERSITY TRAINING REACTOR

License No. R-70

Docket No. 50-166



Department of Materials and Nuclear Engineering
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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 44 runs (Run Numbers 4055 - 4098), which are categorized below:

Operator Training/Requalification*	11 runs
Tours, Labs & Demonstrations**	21 runs
Calibration, Maintenance, and Surveillance	5 runs
Irradiations and Activations	21 runs

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

**Note: Some of the runs in the Tours, Labs & Demonstrations category consisted of operator training. They are not included in the training category.

To perform these runs the core produced 6.887 MWh (kWh meter change from 285045 kWh to 291932 kWh), with a corresponding burnup of 0.39 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:

8/12/10 Dri-rite baked.
12/17/10 Dri-rite replaced.
3/14/11 Dri-rite baked.
6/11/11 Dri-rite replaced.

Additional minor maintenance was performed such as light bulb replacement and fine-tuning of equipment was performed as necessary.

IV. CHANGES TO FACILITY

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

There was one major system failure during this period. That failure occurred during operation number 4098 on February 17, 2011. The malfunction appeared in the Safety1, wide-range log power, and 1 cps interlock channels. The common item in these channels is the fission chamber. A complete report of the circumstances is attached as an appendix to this report.

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	151
2	Pool Surface	285
3	Hot Room	433
4	Prep Room	202
5	S. Wall Upper	33
6	S. Wall Lower	49
7	E. Wall Lower	172
8	Pump Room	303
9	N. Wall Lower	1597
10	W. Wall Lower	324

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 30.0 MWh operation year would result in the generation of 100 mCi of Ar-41 for the entire year from the reactor pool tank. For this operational year, a combined 22.96 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 five 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

There were no unscheduled shutdowns during this 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 significant changes to staffing during this reporting period. Three ROs received their licenses bringing the total to two Senior Operators and four Operators.

APPENDIX A: EPA COMPLIANCE

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

COMPLY: V1.5d.

09/28/11 10:02

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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College Park, Maryland

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Prepared for:

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

COMPLY: V1.5d.

09/28/11 10:02

FY 2011 MUTR Argon-41 Release

SCREENING LEVEL 1

DATA ENTERED:

Effluent concentration limits used.

DATA ENTERED FOR STACK 1:

Nuclide	CONCENTRATION (curies/cu m)
AR-41	1.48E-05

DATA ENTERED FOR STACK 2:

Nuclide	CONCENTRATION (curies/cu m)
AR-41	1.48E-05

NOTES:

Input parameters outside the "normal" range:

None.

RESULTS:

You are emitting 4350.0 times the allowable amount
given in the concentration table.

*** Failed at level 1.

COMPLY: V1.5d.

09/28/11 10:02

FY 2011 MUTR Argon-41 Release

SCREENING LEVEL 2

DATA ENTERED:

RELEASE RATES FOR STACK 1.

Nuclide	Release Rate (curies/YEAR)
AR-41	1.480E-05

RELEASE RATES FOR STACK 2.

Nuclide	Release Rate (curies/YEAR)
AR-41	1.480E-05

SITE DATA FOR STACK 1.

Release height 10 meters.

Building height 10 meters.

The source and receptor are on the same building.

Stack diameter 1.00 meters.

Distance from the source to the receptor is 1 meters.

Building width 15 meters.

Default volumetric flow rate from the stack used (0.3 cu m/sec).

SITE DATA FOR STACK 2.

Release height 10 meters.

Building height 10 meters.

The source and receptor are on the same building.

Stack diameter 1.00 meters.

Distance from the source to the receptor is 1 meters.

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Building width 15 meters.

COMPLY: V1.5d.

09/28/11 10:02

Default volumetric flow rate from the stack used (0.3 cu m/sec).

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

NOTES:

Input parameters outside the "normal" range:

Receptor is unusually CLOSE.

RESULTS:

Effective dose equivalent: 1.9E-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 *****

APPENDIX B: FISSION CHAMBER FAILURE AND RECOVERY