

May 24, 2017

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

10 CFR 50.4, Written Communications  
Operating License R-56, Docket 50-83

Subject: **CY2016 Annual Report for the UFTR**

Please find enclosed the UFTR annual report for calendar year 2016. This report is being submitted as required by our Technical Specifications, Section 6.7.1.

We recently submitted an annual report by letter dated February 28, 2017 (ML17059D637) covering the period from September 1, 2015 to August 31, 2016. The license renewal Technical Specifications approved March 31, 2017 changed the reporting period to include the previous calendar year with a new due date of June 30<sup>th</sup> of each year. Therefore, the reporting period in the attached annual report overlaps with the period reported on February 28, 2017.

I declare under penalty of perjury that the foregoing and attached are true and correct to my knowledge.

Executed on May 24, 2017.



Brian Shea  
Reactor Manager, University of Florida Training Reactor

cc: Duane Hardesty, Project Manager, NRC

University of Florida Training Reactor  
Annual Progress Report

January 1, 2016 – December 31, 2016

Submitted by  
Brian Shea  
Reactor Manager

University of Florida  
Gainesville, FL

May 2017

## **Introduction**

As stated in the UFTR Technical Specifications, Section 6.7.1:

*An annual report covering the previous calendar year shall be submitted to the NRC Document Control Desk by June 30 of each year consisting of:*

- 1. A narrative summary of reactor operating experience including the energy produced by the reactor or the hours the reactor was critical, or both;*
- 2. The UNSCHEDULED SHUTDOWNS including, where applicable, corrective action taken to preclude recurrence;*
- 3. Tabulation of major preventive and corrective maintenance operations having safety significance;*
- 4. A brief description, including a summary of the change evaluation, of changes, tests, and EXPERIMENTS implemented under 10 CFR 50.59;*
- 5. A summary of the nature and amount of radioactive effluents released or discharged to the environs beyond the effective control of the facility licensee as determined at, or before, the point of such release or discharge. The summary shall include to the extent practicable an estimate of individual radionuclides present in the effluent. If the estimated average release after dilution or diffusion is less than 25% of the concentration allowed, a statement to this effect is sufficient;*
- 6. A summarized result of environmental surveys performed outside the facility; and*
- 7. A summary of exposure received by facility personnel and visitors where such exposures are greater than 25% of that allowed in 10 CFR Part 20.*

## **1. Summary of Reactor Operation Experience**

Facility staff completed a restart plan in September 2015 after an extended maintenance outage starting in late 2008. The UFTR has continued the broad range of research and educational utilization performed in the past while continuing to refurbish and upgrade the overall facility and improving performance and reliability of reactor systems.

The energy generated and operation hours in 2016 are given as follows:

Energy generated: 7327.584 kW-hrs

Reactor runtime: 197.9 hrs.

## **2. Unscheduled Shutdowns**

On 8/19/16, the dump valve de-energized with the reactor operating at 100 kW steady state causing a full trip. There were no indications of why the dump valve lost power. The reactor key switch was inspected and sprayed with contact cleaner to remove any carbon buildup that may have been a contributing factor to the loss of power to the dump valve.

## **3. Safety Significant Major Maintenance Operations**

MLP 15-15 - 8/26/15 to 1/25/16, RMS Battery and Charger Replacements.

MLP 16-2 - 3/30/16 to 5/5/16, Repair of Linear Channel Grounds and Picoammeter Impedance.

MLP 16-3 - 4/12/16 to 4/18/16, Wide Range Drawer A7 Card (reactor period) Repair.

MLP 16-4 - 4/25/16 to 5/6/16, Safety Channel Two A1 Card Repair.

MLP 16-6 - 4/28/16 to 5/23/16, Auto Flux Controller Repairs to Reduce Hunting.

MLP 16-7 - 5/2/16 to 6/9/16, Source Alarm Repair.

MLP 16-11 - 7/12/16 to 7/13/16, Current Sensor Installation for Blade Drop Time Measurements

MLP 16-12A - 8/8/16 to 8/25/16, Picoammeter Ground Repairs.

MLP 16-14 - 9/27/16 to 9/29/16, Replacement of Failed Stack Monitor Detector.

MLP 16-15 - 11/15/16 to 11/15/16, Replacement of Broken Rupture Disc.

MLP 16-17 - 11/15/16 to 11/15/16, Repair of Control Blade 2 Bottom Limit Switch.

## **4. Summary of 10 CFR 50.59 Change Evaluations**

All proposed changes in equipment, tests, procedures, and experiments were screened against the requirements of 10 CFR 50.59. None required an evaluation under 10 CFR 50.59.

## 5. Radioactive Effluents

### Liquid Releases:

Wastewater is measured for radioactivity prior to release. The wastewater release data is shown in Table I.

**Table I**  
Wastewater Released

Date	Water Released (Gallons)	Gross Activity Released ( $\mu\text{Ci/ml}$ )
May 2, 2016	936.2	4.18E-10

### Argon-41 Releases:

The Argon-41 release concentration is measured semiannually during facility operation. Ar-41 was measured twice for this reporting period and the release values reported below reflect this. The Ar-41 release data is shown in Table II and below.

**Table II**  
Argon-41 Released

2016	Reactor Energy (kW-hrs)	Ar-41 Released ( $\mu\text{Ci}$ )
January	0.559	2.4773E+3
February	3.176	1.4074E+4
March	861.3	3.8164E+6
April	1694	8.7492E+6
May	513.8	2.6530E+6
June	508.8	2.6271E+6
July	252.6	1.3042E+6
August	2034	1.0504E+7
September	667.6	3.4472E+6
October	0.000	0
November	101.5	5.2419E+5
December	689.6	3.3811E+6

Release per kW-hr of operation (Jan-Mar): 4430.93  $\mu\text{Ci/ml}$   
Release per kW-hr of operation (Apr-Nov): 5163.60  $\mu\text{Ci/ml}$   
Release per kW-hr of operation (Dec): 4902.91  $\mu\text{Ci/ml}$

Total Ar-41 release for 2016: 37.02 Ci  
COMPLY Result for 2016 at Screening Level 4: 0.2 mrem/yr

## 6. Environmental Surveys

In addition to periodic radiation surveys using hand-held instruments, environmental monitoring is accomplished using radiation dosimetry badges. Areas monitored are located around the exterior of the reactor building and nearby buildings, including the Nuclear Sciences Building and the Journalism Building. This monitoring is performed by the Radiation Control Office of the Environmental Health and Safety Division at the University of Florida. The environmental dosimetry reports are tabulated and presented in Table III.

The environmental dosimetry badges closest to the reactor cell radioactive materials storage areas are at locations 1, 2, 5, and 7.

**Table III**  
Total Effective Dose Equivalent (TEDE) at Monitored Locations

Area No.	Quarterly TEDE (mrem)				Annual TEDE (mrem)
	Jan - Mar	Apr - Jun	Jul-Sep	Oct-Dec	
1	6	8	5	5	24
2	0	2	1	0	3
3	0	0	0	0	0
4	0	0	2	0	2
5	3	7	3	5	18
6	0	0	0	0	0
7	0	2	1	1	4
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
Reactor Cell	3	5	6	3	17

## 7. Radiation Exposures

Ten individuals were monitored for occupational radiation exposure during the reporting period. None received detectable exposures.