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March 5, 2010

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U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

**SUBJECT: Annual Report for University of Florida Training Reactor,
License R-56, Docket 50-83**

Please find enclosed the annual report for University of Florida Training Reactor, Docket No. 50-83. This report is being submitted as required by our Technical Specifications, Section 6.6.1. If you have questions on the content of this report, please contact Dr. Alireza Haghighat, Director of the University of Florida Training Reactor, at 352-392-1401 x306.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on March 5, 2010.

Sincerely,



Alireza Haghighat, PhD
FP&L Endowed Professor
Director of UFTR



Lisa L. Purvis
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March 5, 2010
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**UNIVERSITY OF FLORIDA
TRAINING REACTOR
ANNUAL PROGRESS REPORT**

SEPTEMBER 1, 2008 – AUGUST 31, 2009

**Submitted by
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Director of UFTR**

**Prepared by
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March 2010

Introduction

As stated in the University of Florida Training Reactor (UFTR) Technical Specifications, Section 6.6.1 Operating Report, routine annual reports covering the activities of the reactor facility during the previous calendar year shall be submitted to the Commission within nine (6) months following the end of each prescribed year. The prescribed year ends August 31 for the UFTR. This annual operating report includes 7 sections:

- (1) a narrative summary of reactor operating experience including the energy produced by the reactor and the hours the reactor was critical;
- (2) the unscheduled shutdowns including, where applicable, corrective actions taken to preclude recurrence;
- (3) tabulation of major preventive and corrective maintenance operations having safety significance;
- (4) tabulation of major changes in the reactor facility and procedures, and a tabulation of new tests or experiments, that are significantly different from those performed previously and are not described in the Safety Analysis Report, including conclusions that no unreviewed safety questions were involved;
- (5) A summary of the nature and amount of radioactive effluents released or discharged to the environs beyond the effective control of the facility operators 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;
- (7) A summary of exposure received by facility personnel and visitors where such exposures are greater than 25% of that allowed.

The following discussion on the above seven sections covers the period from September 1, 2008 to August 31, 2009, except as noted otherwise.

1. Summary of Operation Experience

In the past reporting year, UFTR has undergone major maintenance with modifications to the primary coolant piping to ensure continued operation in the future. The UFTR staff will have the reactor operational by early 2010 to ensure the UFTR continues to function as a reliable and productive facility with a broad range of research and educational utilizations by users within University of Florida as well as researchers and educators around the State of Florida.

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

Energy generated: 647.111 KWH

Reactor Run Time: 14.8 hrs

2. Unscheduled Shutdowns

From September 1, 2008 to August 31, 2009 there were 2 unplanned shutdowns, each one summarized in the table below.

Table I – Unplanned shutdowns in 2008-09

Reason	Corrective Action
10/14/08: Wide Range power indication on chart recorder (green pen) erratic and indicating low value compared to actual (<1 watt vs. 100 kW).	Performed unscheduled shutdown. Further investigation revealed loose connection to recorder. Connection tightened and performed successful pre-operational checks.
10/30/08: Linear (red pen) range signal not responding to increase in power at 0.4 watts.	Performed unscheduled shutdown. Further investigation revealed CIC insulation failure. Replacement CIC will be installed and tested as part of recovery in early 2010.

3. Safety Related Maintenance Operations

- 1) 10/08 – present: Primary coolant system piping replacement due to discovered leak in outlet piping. Reactor fuel removed and piping system redesigned to ensure full inspections of piping in the future and to accommodate new instrumentation.
- 2) 12/08 – present: S-2 control blade failed to drop during maintenance activity. Reactor scheduled to be defueled and opened to investigate primary piping issue. Investigation and repair of S-2 accomplished during the reactor outage.

4. Major Changes in Reactor Facility, Procedures and Experiments

Primary coolant piping modification and installation is ongoing during FY08-09. Modification of piping consists of rerouting outlet piping to ensure full integrity inspections in the future and the addition of instrumentation ports on the outlet headers.

5. Radioactive Effluents

Liquid release:

UFTR is equipped with a waste water holdup tank. The tank is released two or three times per year. The radioactivity in the released water is measured. Wastewater shall be sampled and monitored prior to tank discharge. No isotopic analysis is required if the estimated average release concentration is less than 25% of the concentration limit allowed in 10CFR20, Appendix B, Table 2. The current limit is $5.0E-9$ $\mu\text{Ci/mL}$ for releases to the sanitary sewer. Table II presents the amount and activity of the released waste water

Table II – Amount and activity of the released waste water

Time period (mm.dd.yyyy)	Water released (Gallon)	Activity released ($\mu\text{Ci/mL}$)
04.15.2008 – 11.13.2008	908.7	$1.59E-9$

Argon-41 Release:

The Argon-41 release concentration is measured about every six months. The annual Argon-41 release is estimated by the measurement and operation hours. Discharge concentrations of Ar-41 shall not exceed $1.0E-8$ $\mu\text{Ci/mL}$ per 10CFR20 Appendix B, Table 2 when averaged over 30 days.

Table III gives the measured instantaneous concentration of Ar-41, and the calculated Ar-41 release concentration per kW-hr.

Table IV presents the monthly average concentration of Ar-41 for the actual power generated, and the amount of release for 720 hrs of full-power operation.

Table III - UFTR Gaseous Release Data Table

Month(s)	Releases per Unit Energy Generation ($\mu\text{Ci}/\text{kW-hr}$)	Instantaneous Ar-41 Conc. at Full Power ($\mu\text{Ci}/\text{mL}$)
Sep. 2008	4756.73	9.77E-08
Oct. 2008 – Aug. 2009	4783.54	1.05E-07

Table IV - UFTR Gaseous Release Summary

Month	Release ($\mu\text{Ci}/\text{month}$)	Monthly Average Concentration ($\mu\text{Ci}/\text{mL}$)
September 2008	2.2647×10^5	6.4606×10^{-11}
October 2008	2.8677×10^6	8.7427×10^{-10}
November 2008	0	0
December 2008	0	0
January 2009	0	0
February 2009	0	0
March 2009	0	0
April 2009	0	0
May 2009	0	0
June 2009	0	0
July 2009	0	0
August 2009	0	0
Average for the Year		7.8240×10^{-11}

Based on the data given in Table IV, the total amount of Ar-41 release over the year is 3.09 Ci.

6. Environmental Surveys

The firm maintaining radiation records for the University of Florida keeps a year to date record, therefore it is easier to report radiation exposure by the nearest completed calendar year. The following film badge exposures are for the period January 1, 2008 to December 31, 2008. Thirteen areas (Numbered from 1 to 13) were monitored for the entire calendar year. A list of these numbered areas can be found in UFTR SOP. Reactor cell is separately monitored during the same time period. The area radiation exposures are tabulated below.

Table V – Total Effective Dose Equivalent (TEDE)
at different locations*

Area No.	TEDE (mrem)
1	22
2	39
3	< 1
4	< 1
5	8
6	2
7	11
8	< 1
9	< 1
10	< 1
11	< 1
12	< 1
13	< 1
Reactor Control	2

*These measurements are performed by the Radiation Control Office of the Environmental Health & Safety Division at the University of Florida

The area badges are meant to indicate exposures due to normal reactor operations. The elevated values can be attributed to normal operations and to the reactor being disassembled for maintenance early in 2008.

7. Radiation Exposures

Note that UFTR Technical Specifications requires only a summary of exposure received by facility personnel and visitors where such exposures are greater than 25% of that allowed. Since all personnel exposures during this period are below the limits, we provide an exposure summary for the UFTR staff.

The following table illustrates the radiation dosages of 5 workers for the period January 1, 2008 to December 31, 2008. All the dosages are in mrem.

Table VI – Total Effective Dose Equivalent (TEDE)
for the UFTR staff

Individual	TEDE (mrem)
Berglund, M.	135
Vernetson, W.	154
Yenatskyy, M.	6
Sly,	< 1
Shea, B.	4