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U.S. Nuclear Regulatory Commission
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10 CFR 50.4, Written Communications
Operating License R-56, Docket 50-83

Subject: **CY2017 Annual Report for the UFTR**

Please find enclosed the UFTR annual report for calendar year 2017. This report is being submitted as required by our Technical Specifications, Section 6.7.1.

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

Executed on May 31, 2018.

A handwritten signature in black ink, appearing to read 'B. Shea', written over a horizontal line.

Brian Shea
Reactor Manager, University of Florida Training Reactor

cc: Duane Hardesty, Project Manager, NRC

University of Florida Training Reactor
Annual Report for Calendar Year 2017

The following annual report is submitted in accordance with Section 6.7.1 of the UFTR Technical Specifications.

Summary of Reactor Operations

Total Energy Output for CY2017: 1,650 kW-hrs

Cumulative Energy Output Since Conversion to LEU in 2006: 30,133 kW-hrs

Periodic routine reactor operations were conducted during the first three months of 2017 until the facility operating license was renewed on March 31st. The reactor remained shut down during April, May, June, and most of July while staff completed changes required for the license renewal.

Periodic routine reactor operations recommenced in early August until the end of the month when the Stack Radiation Monitor became inoperable.

Periodic routine reactor operations resumed in mid-October continuing until mid-November when operations were discontinued for maintenance on the Wide Range drawer.

Unscheduled Shutdowns

None.

Major Maintenance

A listing of all major maintenance is presented in Table I.

In Table I the first date for each entry is the date when the Maintenance Log Page (MLP) was opened; in quite a few cases, this date may be one or more days after the original problem was noted. The second date indicates the day the MLP was closed which can also be one or more days after work completion.

Table I
Major Maintenance Performed

MLP Number	Date Opened	Date Closed	Summary
17-1	1/20/17	2/8/17	Installation of a new core vent system radiation detector housing with installation of a second stack radiation detector. This corrected the core vent detector housing obsolescence issue and provides the capability for future stack radiation detection system upgrades.
17-2	2/17/17	3/14/17	Replacement / upgrading of the existing differential pressure (d/p) indicators and associated tubing for the core vent system absolute filter (magnehelic gage), roughing filter (inclined manometer), and flow (inclined manometer). This corrected the obsolescence issue, significantly improved meter readability, and provides future capabilities for remote monitoring and data recording / archiving.
17-3	4/3/17	4/3/17	Implementation of a modification to the evacuation alarm and reactor trip circuitry to eliminate auto-shutoff of the core vent and stack dilute fans upon actuation of evacuation siren while maintaining the automatic reactor trip function. This brings the system into alignment with the renewal licensing basis which assumes core vent and stack dilution remain operational in the event of a radiological accident.
17-4	4/4/17	*	Troubleshooting and repair of high plume exhaust fan controls circuitry to identify and repair/replace components damaged during an apparent lighting strike (*MLP 17-4 remained open through end of 2017).
17-5	7/7/17	7/7/17	Routine addition of makeup water to the PC Tank.
17-6	7/17/17	7/18/17	Adjustment of the High Power and High Temperature trip settings for alignment with the license renewal Technical Specifications.
17-7	8/30/17	10/13/17	Troubleshooting and repair of the core vent radiation detector system due to indication pegged low and "No Fail" light out. Resulted in replacement of the detector cable connector, the indicating module input board discriminator, and the detector.
17-8	10/15/17	10/15/17	Routine addition of makeup water to the PC Tank.
17-9	11/15/17	*	Performance of factory calibration, alignment, and repairs/replacements as needed on the Wide Range drawer (*MLP 17-9 remained open through the end of 2017).

Changes, Tests, and Experiments Implemented under 10 CFR 50.59

A listing of changes, tests, and experiments implemented under 10 CFR 50.59 is presented in Table II. All changes, tests, and experiments implemented during CY2017 screened-out from full evaluation.

Table II
Changes, Tests, And Experiments Implemented Under 10 CFR 50.59

Number	Date Approved	Summary
17-1	2/6/17	Modification of the core vent system radiation detector housing. This corrected the core vent detector housing obsolescence issue and allows for installation of a second detector providing capability for future Stack Radiation Monitor system upgrades (MLP 17-1).
17-2	2/28/17	Upgrade of existing differential pressure (d/p) indicators and associated tubing for the core vent system absolute filter (magnehelic gage), roughing filter (inclined manometer), and flow (inclined manometer). This corrected the obsolescence issue, significantly improved meter readability, and provides future capabilities for remote monitoring and data recording / archiving (MLP 17-2).
17-3	3/16/17	Experiment – Irradiation of Sb Doped BiI ₃ Crystals for materials research.
17-4	3/31/17	Implementation/insertion of the newly approved renewal Operating License, Technical Specifications, Emergency Plan, and FSAR into the Operating Documents Manual.
17-5	4/10/17	Modification to the evacuation alarm and reactor trip circuitry to eliminate auto-shutoff of the core vent and stack dilute fans upon actuation of evacuation siren while maintaining the automatic reactor trip function. This brings the system into alignment with the renewal licensing basis which assumes core vent and stack dilution remain operational in the event of a radiological accident (MLP 17-3).
17-7	7/3/17	Procedure Change to SOP-0.5, Quality Assurance Program, to incorporate editorial changes/updates for license renewal.
17-8	7/3/17	Procedure Change to Surveillance Q-1, Check of Scram Functions, to enhance the surveillance and incorporate renewal Technical Specification requirements.
17-9	7/3/17	Procedure Change – Creation of the new S-2 Surveillance, Calibration Check of Area Monitors, Stack Radiation Monitor, and Air Particulate Detector, to incorporate renewal Technical Specification and Emergency Plan requirements.
17-10	7/3/17	Procedure Change – S-1 Surveillance changed to A-9, Measurement of Control Blade Drop Times, to change the surveillance frequency and allowable drop times consistent with renewal Technical Specification requirements.
17-11	7/3/17	Procedure Change to Surveillance S-11, Replacement of Control Blade Clutch Current Lights, to update: for deletion of the S-5 Surveillance; required retests for bulb replacement, and commitment references.
17-12	7/3/17	Procedure Change – Deletion of the X-1 Surveillance, Inspection of the Control Blades and Drive Systems, consistent with renewal Technical Specification requirements.
17-13	7/3/17	Procedure Change to SOP-A.1, Pre-operational Checks, to enhance the procedure and incorporate new Technical Specification requirements associated with license renewal.
17-14	7/3/17	Procedure Change to SOP-A.2, Reactor Startup, to enhance the procedure and incorporate new Technical Specification requirements associated with license renewal.

17-15	7/3/17	Procedure Change to SOP-A.3, Operation at Power, to enhance the procedure and update consistent with the new Technical Specification requirements associated with license renewal.
17-16	7/3/17	Procedure Change to SOP-A.4, Normal Reactor Shutdown, to enhance the procedure and update consistent with the new Technical Specification requirements associated with license renewal.
17-17	7/3/17	Procedure Change to SOP-A.5, Experiments, to enhance the procedure and incorporate new Technical Specification requirements associated with license renewal.
17-18	7/3/17	Procedure Change to SOP-A.6, Operation of Secondary Cooling Water, to enhance the procedure and update consistent with the new Technical Specification requirements associated with license renewal.
17-19	7/3/17	Procedure Change to SOP-E.6, Argon-41 Concentration Measurement, to enhance the procedure and incorporate new Technical Specification requirements associated with license renewal.
17-20	9/7/17	Procedure Change to SOP-A.7, Determination of Control Blade Integral or Differential Reactivity Worth, to enhance the procedure and incorporate new Technical Specification requirements associated with license renewal.
17-21	10/12/17	Experiment – Neutron Imaging Using the Thermal Column for testing of the radiography camera setup and research.
17-22	10/12/17	Procedure Change to SOP-C.3, Fuel Inventory Procedure, to enhance the procedure and incorporate new SNM license requirements associated with license renewal.
17-23	11/14/17	Procedure Change to SOP-B.1, Radiological Emergency, to change the evacuation assembly location for personnel located in the lower floor of the reactor side of the Annex building.
17-24	11/14/17	Procedure Change to SOP-A.1, Pre-operational Checks, to correct the sequence of the “EXTERNAL” trip check and add a notation that Area Radiation Monitor checks can be performed in any order.

Radioactive Effluents

Liquid Waste

The UFTR made one wastewater release of 936.2 gallons to the sanitary sewer during CY2017. Total, dissolved, and suspended gross alpha and beta activity released was less than 25% of the concentration limit ($2E-9$ μ Ci/ml).

Gaseous Waste

The total activity of Argon-41 released during CY2017 was 8.08 curies. Using the calculation method described in the UFSAR, the maximum potential dose to a member of the public from UFTR Ar-41 emissions during CY2017 was $3.7E-2$ mrem/yr. This is significantly less than 25% of the ALARA constraint of 10 mrem/yr.

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 (RB) and nearby buildings, including the Nuclear Sciences Building (NSB), the Reed Lab (RL), and the Journalism Building (JB). The environmental dosimetry reports are tabulated and presented in Table III. Dose equivalents below the minimum measurable quantity are reported as “M”.

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

Area	Quarterly TEDE (mrem)				Annual TEDE (mrem)
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	
1. Reed Lab south wall (from annex roof)	7	10	11	10	38
2. SE corner of stack near release point	M	M	1	M	1
3. NSB Rm. 316 window - inside	M	M	M	M	M
4. NSB Rm. 316 window - outside	M	M	M	M	M
5. RB east wall under the light	1	6	7	8	22
6. Greenhouse SW corner - NSB roof	M	M	M	M	M
7. Ladder Post Leading to Annex Transformer Area	M	2	2	6	10
8. Stand on north side of NSB roof	M	M	M	M	M
9. Cooling tower east lighting arrestor	M	M	M	M	M
10. JB Third Floor Roof – Stand on west roof edge	M	M	M	M	M
11. JB Third Floor Roof – Stand on south roof edge	M	M	M	M	M
12. Control Badge - Building 683 west wall on electrical box	M	M	M	M	M
13. JB First Floor Roof – Stand in SW corner of roof	M	M	M	M	M

The dosimetry badges located in areas 1, 5, and 7 consistently registered a small dose with no correlation to reactor operations or radiation levels in the reactor cell. These doses are attributed to background radiation from the red brick and mortar used in construction of the Reactor Building and the Reed Lab in the 1950’s and 1960’s. None of the other badges are attached, or in tight proximity, to this red brick and mortar.

Radiation Exposures

There were no exposures received by facility personnel or visitors that were greater than 25% of that allowed in 10 CFR Part 20. Only two people received measurable occupational exposures (TEDE) at the UFTR during CY2017; 4 mrem TEDE each.