

April 6, 2016

Dr. Kelly Jordan  
Director of the University of Florida Training Reactor  
Nuclear and Radiological Engineering Department  
P.O. Box 11830  
University of Florida  
Gainesville, FL 32611

SUBJECT: UNIVERSITY OF FLORIDA – U.S. NUCLEAR REGULATORY COMMISSION  
INSPECTION REPORT NO. 50-083/2016-201

Dear Dr. Jordan:

From March 7-10, 2016, the U.S. Nuclear Regulatory Commission (NRC or the Commission) completed an inspection at your University of Florida Training Reactor facility. The enclosed report documents the inspection results, which were discussed with you; Mr. Brian Shea, Reactor Manager, and other members of your staff on March 10, 2016.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations*, Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

K. Jordan

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Should you have any questions concerning this inspection, please contact Mr. Ossy Font at (301) 415-2490 or by electronic mail at [Ossy.Font@nrc.gov](mailto:Ossy.Font@nrc.gov).

Sincerely,

**/RA/**

Anthony J. Mendiola, Chief  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-083  
License No. R-56

Enclosure:  
Inspection Report No. 50-083/2016-201

cc: See next page

University of Florida

Docket No. 50-083

Administrator  
Department of Environmental Regulation  
Power Plant of Siting Section  
State of Florida  
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Tallahassee, FL 32301

State Planning and Development Clearinghouse  
Office of Planning and Budgeting  
Executive Office of the Governor  
The Capitol Building  
Tallahassee, FL 32301

Chief, Bureau of Radiation Control  
Department of Health  
4052 Bald Cypress Way  
Tallahassee, FL 32399-1741

Test, Research and Training  
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Director of Nuclear Facilities  
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Brian Shea, Reactor Manager  
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Dean Cammy Abernathy  
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K. Jordan

- 2 -

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**OFFICIAL RECORD COPY**

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No: 50-083

Report No: 50-083/2016-201

Licensee: University of Florida

Facility: University of Florida Training Reactor

Location: Gainesville, Florida

Dates: March 7-10, 2016

Inspector: Ossy Font

Approved by: Anthony J. Mendiola, Chief  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

### University of Florida University of Florida Training Reactor Inspection Report No. 50-083/2016-201

The primary focus of this announced safety inspection was the onsite review of selected aspects of the University of Florida's (the licensee's) Class II training reactor (UFTR) safety program including: procedures, experiments, radiation protection program, design changes, committee audits and reviews, and transportation since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

#### Procedures

- The program for changing, controlling, and implementing facility procedures was acceptably maintained as required by the Technical Specifications (TS) and the applicable procedures.

#### Experiments

- The program for reviewing and conducting experiments generally satisfied procedural and TS requirements.

#### Radiation Protection Program

- The Radiation Protection Program being implemented by the licensee satisfied regulatory and TS requirements

#### Design Changes

- The review, evaluation, and documentation of changes to the facility generally satisfied NRC requirements.

#### Committee Audits and Reviews

- The review and audit program was generally being conducted acceptably by the Reactor Safety Review Subcommittee as stipulated in TS Section 6.2.5, "Review and Audit."

#### Transportation of Radioactive Materials

- No recent shipments, and transfers follow the transfer policy currently in place.

#### Follow-up

- Violation (VIO) 50-083/2015-202-01 was closed after verification of corrective action completion.

## **REPORT DETAILS**

### **Summary of Plant Status**

The University of Florida's (the licensee's) 100 kilowatt modified Argonaut training reactor is operating at low power, but was not operated during the inspection.

#### **1. Procedures**

##### **a. Inspection Scope (IP 69001)**

The inspector reviewed the following to ensure that the requirements of TS 6.3, "Procedures," were being met concerning written procedures:

- Records of changes and temporary changes to procedures
- Reactor Safety Review Subcommittee (RSRS) meeting minutes from October 2014 to February 2016
- UFTR Operating Procedure 0.1 and 0.1 A, 0.5 - 0.7
- UFTR Operating Procedure A.1, "Pre-Operational Checks," Rev. 19, approval dated October 24, 2014
- UFTR Operating Procedure A-7, "Verification of Emergency Plan training Requirements," Rev. 4, approval dated November 9, 2005

##### **b. Observations and Findings**

Procedures were available for the activities and items required by TS 6.3, "Procedures." Facility procedures were being revised as needed. The changes were controlled and approved the RSRS, as required.

During the previous inspection, the inspector identified a lack of participation from the fire department and the emergency management services (EMS) and the failure of the facility personnel to communicate the deficiency to the University Radiation Control Committee (RCC) or the Dean. This was a violation for failure to maintain the effectiveness of the E-Plan (VIO 50-083/2015-202-01). As a result, the licensee developed a procedure and an annual surveillance (SOP A-7) as one of the corrective actions (CA) to verify that all E-Plan training requirements were completed. The CA will be discussed further in a section below.

##### **c. Conclusion**

The program for changing, controlling, and implementing facility procedures was acceptably maintained as required by the TS and the applicable procedures.

## 2. Experiments

### a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to assure compliance with TS 3.5, "Limitations on Experiments," and 6.4, "Experiments Review and Approval:"

- UFTR Operating Procedure A.5, "Experiments," Rev. 5, approval dated October 13, 2006
- UFTR Form SOP-A.5A, "Request for UFTR Operation (Run Request Form)"
  - Request 15-01 and 16-01, "Beam Port Characterization via Foil Irradiation," Initial Run dated October 5, 2015
  - Request 15-02 and 16-02, "Neutron Imaging at the Thermal Column," Initial Run dated December 14, 2015
  - Request 16-03, "Reactor Operation for ENU4505L"
- "Policy for Transfer of Radioactive Materials Between the UFTR R-56 License and the University of Florida 356-1 State License," June 17, 2002
- UFTR Annual Report for period 2013-2014 and 2014-2015

### b. Observations and Findings

The inspector noted that three new experiments were reviewed and approved by the RSRS, as required by the TS. The experiments were screened using the Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, tests and experiments," process and presented to the RSRS during the 2015 meetings.

### c. Conclusion

The program for reviewing and conducting experiments generally satisfied procedural and TS requirements.

## 3. Radiation Protection Program

### a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," 10 CFR Part 20, "Standards for Protection Against Radiation," and TS Sections 3.4.1, "Area-Radiation Monitors," and 4.2.4 "Radiation Monitoring Systems and Radioactive Effluents Surveillance:"

- "Radiation Control Guide," dated February 1997
- "University of Florida Training Reactor Facility As Low As Reasonably Achievable (ALARA) Program"



- UFTR facility monthly personnel and environmental dosimetry records from 2014 to present
- Radiation and contamination survey records from 2014 to present
- Q-4 Surveillance, "Unrestricted Area Indoor/Outdoor Radiation Survey," from 2014 to present
- Q-5 Surveillance, "Restricted Area Radiation Survey," Rev. 3, dated February 2003, from 2014 to present
- Calibration and periodic check records from 2014 to present
- Radiation Safety Training Records from 2015 to present
- "Policy for Transfer of Radioactive Materials Between the UFTR R-56 License and the University of Florida 356-1 State License," June 17, 2002

The inspector also toured the facility and observed the various radiological signs and other postings as well.

b. Observations and Findings

The inspector reviewed the Radiation Control Guide, which requires that all personnel, who had unescorted access to radiation areas or to work with radioactive material, receive training in radiation protection, policies, procedures, requirements, and facilities. The training was being completed as required and had increased due to the reactor start-up after its extended maintenance outage.

The university's ALARA program provides guidance for keeping doses as low as reasonably achievable and is consistent with the guidance in 10 CFR Part 20, "Standards for Protection Against Radiation." The program also requires reviews of the radiation safety procedures, the occupational radiation exposure, and the radiation level surveys. These were being completed by the Radiation Safety Officer, as required.

The inspector reviewed the weekly area and storage contamination surveys completed in the restricted and unrestricted areas by the facility personnel. Additional surveys were completed as part of the restarting of the reactor after extended shutdown and to adjust shielding. The results were documented on the appropriate forms and were evaluated and reviewed as required. No readings or results were noted that exceeded set action levels.

The inspector reviewed the postings at the entrances to various controlled areas. The postings were acceptable and indicated the radiation and contamination hazards present. The inspector noted that the copies of NRC Form-3, "Notice to Employees," were posted at the facility, as required by 10 CFR Section 19.11, "Posting of notices to workers," and were the current version.

The licensee provided facility personnel with dosimetry from a National Voluntary Laboratory Accreditation Program-accredited vendor (Landauer). The monthly dosimetry records show doses were well below regulatory limits.

Pocket Ion Chambers were distributed to visitors for use during tours of the facility, but a review of the Pocket Dosimetry Accuracy Check record shows no use since 2012 due to the shutdown.

The inspector reviewed calibration records of selected portable survey meters, friskers, fixed radiation detectors, and air monitoring instruments in use at the facility. The records showed they were calibrated within the required frequency.

Two liquid releases were performed within the last 2 years. They were approved by the Facility Director or Reactor Supervisor and the Radiation Control Officer after analyses indicated that the releases met regulatory requirements for discharge into the sanitary sewer.

Argon-41 releases were also well below effluent concentration limits. As a note, the extended maintenance outage resulted in no releases for half of the reporting period.

The inspector also reviewed the environmental monitoring dosimetry results with the effective dose equivalent to the public well within the regulatory limits.

c. Conclusion

The Radiation Protection Program being implemented by the licensee satisfied regulatory and TS requirements.

**4. Design Change Functions**

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to assure that changes, tests, and experiments were being reviewed as required by 10 CFR 50.59:

- RSRS meeting minutes for 2014 to present
- UFTR Annual Report for period 2013-2014 and 2014-2015
- UFTR Operating Procedure 0.4, "10 CFR 50.59 Screening and Evaluation," Rev. 3, approval dated October 21, 2011
  - UFTR Form SOP-0.4A, "10 CFR 50.59 Applicability"
  - UFTR Form SOP-0.4B, "10 CFR 50.59 Screening"
  - UFTR Form SOP-0.4C, "10 CFR 50.59 Evaluation"
- 50.59 forms from August 5, 2015 to March 1, 2016

b. Observations and Findings

The inspector noted that several changes at the facility have been made, including the creation of surveillance to verify E-Plan training requirements previously mentioned, and incorporation of SOP edits.

The inspector reviewed the 10 CFR 50.59 evaluations and corresponding design change packages that were reviewed and approved by the RSRS and determined that they were focused on safety and met TS and UFTR procedure requirements.

c. Conclusion

The review, evaluation, and documentation of changes to the facility generally satisfied NRC requirements.

**5. Committees, Audits, and Reviews**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the audits and reviews stipulated in the requirements of TS Section 6.2.5, "Review and Audit," were being completed:

- Members and alternates of the UFTR Reactor Safety Review Subcommittee
- UFTR Reactor RSRS meeting minutes for the past 2 years
- Audits for the past 2 years
- SOP 0.5E, "Annual QA Audit Checklist," Rev. 3, dated February 2003
- UFTR Annual Report for period 2013-2014 and 2014-2015

b. Observations and Findings

The inspector reviewed the RSRS meeting minutes for the past 2 years. The inspector verified that the RSRS met at least quarterly, as required by Section 6.2.5 of the facility TS, though noted that they met more frequently due to the reactor restart and previous inspection violation.

Since the last inspection, all required audits of reactor facility activities and reviews of programs, procedures, equipment, and proposed tests or experiments had been completed and documented as required. The audits were completed by designated individuals and reviewed by the RSRS.

c. Conclusion

The review and audit program was generally being conducted acceptably by the RSRS, as stipulated in TS Section 6.2.5.

**6. Transportation**

a. Inspection Scope (IP 86740)

The inspector reviewed the following to verify compliance with TS Section 3.4.6, "Solid Radioactive Waste Disposal," and procedural requirements for transferring licensed material:

- "Policy for Transfer of Radioactive Materials Between the UFTR R-56 License and the University of Florida 356-1 State License," June 17, 2002

b. Observations and Findings

Through records review and discussions with licensee personnel, the inspector determined that no shipments of radioactive material had occurred since January 2012. Any activated samples or swipes, water and air samples are transferred from the reactor license to the state license following the requirements described in the transfer policy.

c. Conclusion

No recent shipments, and transfers follow the transfer policy currently in place.

**7. Follow-up**

a. Inspection Scope (IP 69001)

- Inspection Report No. 50-083/2015-201, dated July 17, 2015
- Reply to Notice of Violation (Ref. ADAMS Accession No. ML15194A260), dated August 14, 2015

b. Observations and Findings

The inspector issued a violation during the previous inspection for the licensee's failure to maintain the effectiveness of the E-Plan due to lack of participation from the fire department and EMS, and failure to inform the RCC and Dean of the deficiency (VIO 50-083/2015-202-01). The licensee submitted a response to the NOV (ADAMS Accession No. ML15232A475), which described the apparent causes and the corrective actions. During the current inspection, the inspector verified completion of the corrective actions, which included notification to staff, the RCC, and the Dean; a new surveillance and associated procedure,

previously discussed in this report; a review of the E-Plan to verify all requirements are being implemented; violation added to the emergency preparedness lecture of the requalification program; and completion of the missing orientation training and tour for the fire department and the EMS on August 21 and 28, 2015. The inspector has closed VIO 50-083/2015-202-01.

c. Conclusion

VIO 50-083/2015-202-01 was closed after verification of corrective action completion.

**8. Exit Meeting Summary**

The inspector reviewed the inspection results with members of licensee management at the conclusion of the inspection on March 10, 2016. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

### **PARTIAL LIST OF PERSONS CONTACTED**

|             |                          |
|-------------|--------------------------|
| D. Cronin   | Licensing Engineer       |
| K. Jordan   | Facility Director        |
| B. Shea     | Reactor Manager          |
| S. Stanford | Radiation Safety Officer |

### **INSPECTION PROCEDURE USED**

|          |                                     |
|----------|-------------------------------------|
| IP 69001 | Class II Research and Test Reactors |
|----------|-------------------------------------|

### **ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Open

#### Closed

|                    |     |  |
|--------------------|-----|--|
| 50-083/2015-202-01 | VIO | Failure to maintain the effectiveness of the E-Plan due to lack of participation from the fire department and EMS and failure to inform the University Radiation Control Committee and Dean of the deficiency. |
|--------------------|-----|--|

## **LIST OF ACRONYMS USED**

|        |   |
|--------|---|
| 10 CFR | Title 10 of the <i>Code of Federal Regulations</i>      |
| ADAMS  | NRC's Agencywide Documents Access and Management System |
| ALARA  | As Low As Reasonably Achievable                         |
| CA     | Corrective Action                                       |
| E-Plan | Emergency Plan  |
| EMS    | Emergency medical services                              |
| IP     | Inspection Procedure                                    |
| NRC    | U.S. Nuclear Regulatory Commission                      |
| Rev.   | Revision/Revised  |
| RCC    | Radiation Control Committee                             |
| RSRS   | Reactor Safety Review Subcommittee                      |
| SOP    | Standard Operating Procedure                            |
| TS     | Technical Specifications                                |
| UFTR   | University of Florida Training Reactor                  |
| VIO    | Violation   |