

January 6, 2012

Kelly A. Jordan, Ph.D.
Director, University of Florida Training Reactor
106 UFTR Building
University of Florida
Gainesville FL 32611-6400

SUBJECT: UNIVERSITY OF FLORIDA REQUEST FOR ADDITIONAL INFORMATION RE:
LICENSE RENEWAL FOR THE UNIVERSITY OF FLORIDA TRAINING
REACTOR (TAC NO. ME1586)

Dear Dr. Jordan:

The U.S. Nuclear Regulatory Commission (NRC) is continuing our review of your request for renewal of Amended Facility License No. R-56 for the University of Florida Training Reactor which you submitted on July 18, 2002, as supplemented. During our review of your renewal request, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information no later than February 6, 2012.

In accordance with Title 10 of the *Code of Federal Regulations* Part 50.30(b), your response must be executed in a signed original under oath or affirmation. Your response must be submitted in accordance with 10 CFR 50.4 "Written communications." Information included in your response that is considered security, sensitive, or proprietary that you seek to have withheld from the public must be marked in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding. Following receipt of the additional information, we will continue our evaluation of your license renewal request.

If you have any questions regarding this review, please contact me at (301) 415-3724 or by electronic mail at duane.hardesty@nrc.gov.

Sincerely,

/RA/

Duane A. Hardesty, Project Manager
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-83

Enclosure:
As stated

cc: See next page

University of Florida

Docket No. 50-83

cc:

Administrator
Department of Environmental Regulation
Power Plant of Siting Section
State of Florida
2600 Blair Stone Road
Tallahassee, FL 32301

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

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Test, Research and Training Reactor Newsletter
Nuclear & Radiological Engineering Department
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As stated

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NRR-088

Office	PRLB:PM	PRLB:LA	PRLB:BC	PRLB:PM
Name	DHardesty	GLappert	JQuichocho	DHardesty
Date	11/26/2011	1/5/2012	1/6/2012	1/6/2012

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OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR ADDITIONAL INFORMATION
REGARDING LICENSE RENEWAL FOR THE
UNIVERSITY OF FLORIDA TRAINING REACTOR
LICENSE NO. R-56; DOCKET NO. 50-83

The U.S. Nuclear Regulatory Commission (NRC) is continuing our review of your application for renewal of Facility Operating License No. R-56 for the University of Florida Training Reactor (UFTR) that you submitted on July 18, 2002, as supplemented by letters dated July 25, July 29, and July 31, 2002, February 25, 2003, August 8, 2006, February 2, 2007, April 7 and November 26, 2008, September 28 and October 20, 2009, February 26, March 11, March 26, May 3, and June 1, 2010. During our review of your renewal request, questions have arisen for which we require additional information and clarification. Please provide responses to the following request for additional information (RAI) no later than February 6, 2012.

1. The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 20.1301(a)(1) state that the total effective dose equivalent to individual members of the public likely to receive the highest dose from licensed operation may not exceed 0.1 rem (1 mSv) in a year. Section 11.1.1.1 of the 2002 UFTR Safety Analysis Report (SAR) provides estimates of the argon 41 (Ar-41) release rate based on two measurements of stack Ar-41 activity levels. In Appendix E of the UFTR responses to RAIs 11-1 and 11-2, dated November 6, 2008, another estimate is provided for the Ar-41 release that provides the basis for deriving a limit on maximum reactor operating hours of 235 hr/month. In responses to additional RAIs dated February 26, 2010, UFTR stated (see response to RAI #6) that "the information provided in the SAR should be substituted by more recent data." Please provide a reference to measurements or "more recent data," which provides the basis for the Ar-41 release rate of 9.228E-05 Ci/sec (or 1.24E-05 Ci/m³).
2. NUREG-1537, Part 1, Section 11.1.1.1, "Airborne Radiation Sources," requests discussion and calculations that show that facility design ensures doses to the facility staff and the public will not exceed 10 CFR Part 20 limits for effluents. The UFTR SAR, provides calculated results for the most exposed individual and highest air doses external to the facility from stack releases. However, Section 11.1.1, does not appear to discuss the collective doses for facility staff in the reactor cell and immediate vicinity or for members of the public in adjacent areas and rooms. Please provide discussion with calculations, during normal operations and in the event of the ventilation damper isolating the reactor cell, demonstrating that the resultant doses for the maximum concentration in the reactor room and released from the facility (i.e., by seepage) are within the limits of 10 CFR Part 20. Additionally, please provide a recent U.S. Environmental Protection Agency (EPA) COMPLY code calculation for radiation dose to a non-occupational maximally exposed individual from airborne radioactivity releases at UFTR, as referenced in UFTR SAR, Section 11.1.7.

ENCLOSURE

3. NUREG-1537, Part 1, Section 11.1.1.1, "Airborne Radiation Sources," requests discussion and calculations that show that facility design ensures doses to the facility staff and the public will not exceed 10 CFR Part 20 limits for effluents. The UFTR SAR (Section 11.2.2.1 and Table 11-4) utilizes a dilution factor of 200:1 in calculations for stack diluted emissions and maximum release concentrations for Argon-41. Please provide justification, including the source and derivation, for this dilution factor.
4. NUREG-1537, Chapter 13, "Accident Analyses" recommends maximum hypothetical accident (MHA) dose analysis to the public. The MHA presented in the 2002 UFTR SAR, as supplemented, does not appear to discuss the non-occupational dose to on-site occupants of the building such as students, faculty, visitors, etc. Please provide a dose assessment for the maximum exposed individual member of the public that shows compliance with 10 CFR 20.1301 for the unrestricted areas adjacent to the UFTR, such as the Nuclear Science Center, Reed lab, and other adjoining buildings for the MHA analyses. Please describe the assumptions used and any systems, plans, procedures or stay times for which credit is taken in the analysis such as: ventilation system status, leakage rate into the building, radiation exposure from the radioactive cloud shine, evacuation procedure and timing, etc.
5. The MHA presented in the 2002 UFTR SAR, as supplemented, states "*the current UFTR Environmental Impact Appraisal limits the UFTR to 235 full power hours per month.*" Additionally, the UFTR Emergency plan (EP), Revision 15, dated February 2007 contains assumptions and initial condition for reactor operation of 100 kW steady-state power for 4 hours per day for 30 days. The EP assumption is stated to be conservative based on the premise that the UFTR has a license limit of 23.5 MW-hours per month. Please provide justification for the limit on hours of operation including the source and derivation of this assumption for the stated limit and reference to the license condition or technical specification that provides this license limit.
6. The dose calculation results for the MHA in Section 13.4.3, Table 13-15 and fuel handling accident (FHA) in Section 13.3.3, Table 13-10 presented in the University of Florida fuel conversion SAR and the summary of occupational and public dose results for a FHA for the low-enriched uranium (LEU) fueled core in Table 1.1 of the UFTR Emergency plan, Revision 15, dated February 2007 are expressed as whole body and thyroid doses. Please provide updated occupational and public exposure results as a Total Effective Dose Equivalent (TEDE) in accordance with 10 CFR Part 20.
7. Table 11-3 of the UFTR SAR summarizes liquid waste of high and low energy emitting mixed nuclides released from the UFTR as a list of maximum activity in any release ($\mu\text{Ci/ml}$). Additionally, the UFTR "As Low As Reasonably Achievable" (ALARA) program included as Appendix 11-B of the UFTR SAR establishes Investigational levels for UFTR Facility liquid effluents. These investigational levels are stated as a percentage of the values in 10 CFR 20, Appendix B. Please explain the relationship between these release concentrations and investigational levels to the regulatory limits in 10 CFR Part 20, Appendix B for each radionuclide in the mixture applicable to the assessment and control of doses to the public and environment.