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Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

UFTR Emergency Plan
Revision 14 – Addendum 2

University of Florida Training Reactor (UFTR)
Facility License R-56, Docket No. 50-83

By letter dated June 19, 2006, the Revision 14 package to the approved UFTR Emergency Plan was submitted for review. As noted in the submittal letter, the changes are considered relatively minor in nature; they are all associated with the conversion from using high enriched uranium (HEU) to low enriched uranium (LEU) fuel in the UFTR. That submittal consists of a set of updates and revisions to the title page, page v, pages 1-1, 1-6, 1-12, 1-13, 1-14, 5-1 and 6-1.

Subsequently, an addendum was submitted by letter dated June 29, 2006 consisting of one additional change to page 10-4 in the approved UFTR Emergency Plan.

Enclosed is a second addendum to the June 19, 2006 submittal consisting of changes to the previously submitted pages 1-12 and 1-13. Typographical and processing errors occurred in the second full paragraph on page 1-12 summarizing the Fuel Handling Accident (FHA) and with the correlating values presented in Table 1.1 on page 1-13. Unfortunately, the numbers in Table 1.1 and the paragraph on page 1-12 were inadvertently taken from the Maximum Hypothetical Accident (MHA) versus the FHA as intended. Therefore, for Addendum 2, the paragraph on page 1-12 and the table on page 1-13 are changed to describe correctly the results of the calculations for the Fuel Handling Accident as discussed with the Project Manager.

As indicated previously, this change has already been reviewed by UFTR management and by the Reactor Safety Review Subcommittee as part of the Tech Spec changes and does not decrease the effectiveness of the UFTR Emergency Plan. The error in the earlier submittal was a transcription error. In general, this change and the earlier submittal changes update the Plan to reflect the conversion from HEU to LEU fuel and make the Plan better suited to assure a proper response to emergencies at the University of Florida Training Reactor.

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If there are any questions, please let us know. Thank you for your consideration.

Sincerely,

William G. Vernetson
Director of Nuclear Facilities

WGV/dms
Enclosures

cc: A. Adams, Sr. Project Manager, NRC
Reactor Safety Review Subcommittee (letter only)

Sworn and subscribed this 21 day of July 2006

Notary Public

Diana L. Dampier
Commission # DD4
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this event was considered extremely unlikely; again, it was used only as the maximum hypothetical accident, not a credible accident.

Therefore, in agreement with the Battelle study, it was concluded that the most credible accident was the loss of cladding on one fuel plate due to a fuel handling accident. The cladding loss accident lacks a detailed causal explanation, but intuition suggests that the outer plates of a fuel element are the most likely to suffer mechanical damage. The Battelle postulated cladding loss is equivalent to two sides of a single fuel plate. In the LEU core, for the Fuel Handling Accident (FHA), the reactor is assumed to operate at 100 kW steady state power for 4 hours per day for 30 days. Then the fuel element with highest power was selected for evaluation with the accident applied to the highest power fuel bundle with a 3 day delay since at least 3 days are required to pass after the last reactor operation at power before not only fuel handling but also before moving the last two layers of protective concrete blocks to access the fuel to limit possible potential consequences of fuel handling accidents and to preclude damaging a fuel bundle with a dropped shield block before 3 days have elapsed. For the FHA, the assumption continues that the cladding would be stripped from the selected LEU fuel bundle for the fuel handling accident.

As indicated in Table 1.1, the radiological exposure from the FHA calculated for a member of the public at closest approach would be much less than 1.0 mRem whole body dose from the noble gases and less than 6 mRem to the thyroid from the iodine gases. Correspondingly, occupational radiological exposure would be much less than 1.0 mRem whole body dose and less than 3 mRem to the thyroid. For these accidents, radiation doses to the public in unrestricted areas as well as workers would be far below the limits stipulated in 10 CFR 20.

Even so, the assumptions used in these calculations are believed to be very conservative for three reasons:

(1) First, it is highly unlikely that dropping a fuel element would be severe enough to cause fuel damage equivalent to stripping the cladding from an entire fuel plate.

(2) Second, fuel transfer operations cannot begin immediately after shutdown. The shielding blocks first must be removed from the structure to reveal the fuel elements in the core. In addition, the UFTR does not shut down and immediately begin to manipulate fuel. Typically, the UFTR will shut down from power operations for more than 7 days prior to commencing fuel-handling operations. In all cases, the reactor would be shutdown from power operations at least 3 days to allow substantial decay of fission product inventory. In addition, the last two layers of shield blocks over the core area will not be removed for at least 3 days after the last operation at power.

(3) The UFTR would not usually operate 4 hours/day for a 30-day period. The reactor has a license limit of 23.5 MW-hours per month but the UFTR averaged less than 25.0 MW-hours per year for a typical ten-year period (9/81–8/91).

Table 1.1

Summary of Occupational and Public Dose Results for the Fuel Handling Accident (FHA) for the LEU Fueled Core

Occupational Radiological Exposure Rate from LEU Core				
	Thyroid Dose Rate		Whole Body Dose	
Distance	Rate (rem/hr)	5-Minute Exposure (rem)	Rate (rem/hr)	5-Minute Exposure (rem)
Inside Reactor Building	0.0285	0.0024	5.63×10^{-5}	4.69×10^{-6}

Limit: Thyroid = 30 rem, Whole Body = 5 rem

Radiological Exposure for the Public from LEU Core							
Distance (m)	Time of Exposure (hr)	Thyroid Dose (rem)			Whole Body Dose (rem)		
		Leak Rate (% Vol/hr)			Leak Rate (% Vol/hr)		
		10%	20%	100%	10%	20%	100%
16.5	2	0.00134	0.00243	0.00639	1.0×10^{-6}	1.8×10^{-6}	4.9×10^{-6}
190.0	24	0.000180	0.000222	0.000251	1.6×10^{-7}	1.8×10^{-7}	1.9×10^{-7}

Limit: Thyroid = 3 rem, Whole Body = 0.5 rem