

September 29, 2011

Dr. Warren D. Reece, Director  
Nuclear Science Center  
Texas Engineering Experiment Station  
1095 Nuclear Science Road  
MS 3575  
College Station, Texas 77843

SUBJECT: TEXAS A&M SYSTEM, TEXAS ENGINEERING EXPERIMENT STATION –  
REQUEST FOR ADDITIONAL INFORMATION REGARDING THE NUCLEAR  
SCIENCE CENTER REACTOR LICENSE RENEWAL (TAC NO. ME1584)

Dear Dr. Reece:

The U.S. Nuclear Regulatory Commission (NRC) staff is continuing the review of your application for renewal of Facility Operating License No. R-83, dated February 27, 2003, as supplemented on March 30, 2005, July 22, 2009, August 30, 2010, May 27, and June 9, 2011. During our review, several questions have arisen for which we need additional information and clarification.

The enclosed request for additional information identifies the additional information needed to complete our review. Please provide responses to the enclosed request for additional information within 30 days of the date of this letter.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.30(b), you must execute your response in a signed original document 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."

If you have any question, please contact me at (301) 415-4103 or by electronic mail at [Linh.Tran@nrc.gov](mailto:Linh.Tran@nrc.gov).

Sincerely,

*/RA/*

Linh N. Tran, Senior Project Manager  
Research and Test Reactors Licensing Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-128  
Enclosure: As Stated

September 29, 2011

Dr. Warren D. Reece, Director  
Nuclear Science Center  
Texas Engineering Experiment Station  
1095 Nuclear Science Road  
MS 3575  
College Station, Texas 77843

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REQUEST FOR ADDITIONAL INFORMATION REGARDING THE NUCLEAR  
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Linh N. Tran, Senior Project Manager  
Research and Test Reactors Licensing Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-128  
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TEMPLATE # NRR-088

OFFICE	PRLB :PM	PRLB: PM	PRPB: LA	PRLB: ABC	PRLB: PM
NAME	FDiMeglio	LTran	GLappert	PSilva	LTran
DATE	9/27/2011	9/27/2011	9/27/2011	9/29/2011	9/29/2011

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Texas A&M University

Docket No. 50-128

cc:

Mayor, City of College Station  
P.O. Box Drawer 9960  
College Station, TX 77840-3575

Governor's Budget and  
Planning Office  
P.O. Box 13561  
Austin, TX 78711

Texas A&M University System  
ATTN: Jim Remlinger, Associate Director  
Nuclear Science Center  
Texas Engineering Experiment Station  
1095 Nuclear Science Road  
MS 3575  
College Station, Texas 77843

Radiation Program Officer  
Bureau of Radiation Control  
Dept. Of State Health Services  
Division for Regulatory Services  
1100 West 49<sup>th</sup> Street, MC 2828  
Austin, TX 78756-3189

Susan M. Jablonski  
Technical Advisor  
Office of Permitting, Remediation & Registration  
Texas Commission on Environmental Quality  
P.O. Box 13087, MS 122  
Austin, TX 78711-3087

Test, Research and Training  
Reactor Newsletter  
202 Nuclear Sciences Center  
University of Florida  
Gainesville, FL 32611

OFFICE OF NUCLEAR REACTOR REGULATION  
REQUEST FOR ADDITIONAL INFORMATION  
TEXAS A&M UNIVERSITY TEXAS ENGINEERING EXPERIMENT STATION  
NUCLEAR SCIENCE CENTER REACTOR  
FACILITY OPERATING LICENSE NO. R-83  
DOCKET NO. 50-128

The U.S. Nuclear Regulatory Commission (NRC) staff is continuing the review of your application for renewal of Facility Operating License No. R-83, dated February 27, 2003, as supplemented on March 30, 2005, July 22, 2009, August 30, 2010, May 27, and June 9, 2011. During our review, several questions have arisen for which we need additional information and clarification. Please address and provide the requested information to the following:

1. NUREG 1537, Part 1, Section 4.3, Reactor Tank and Pool, states that the applicant should present all information about the pool necessary to ensure its integrity and should assess the possibility of uncontrolled leakage of contaminated primary coolant and should discuss preventive and protective features. Chapter 4 of your safety analysis report (SAR) does not provide this information. The following information is needed to complete our review:
  - a. Please provide a discussion of the reactor pool water level monitoring system, alarm levels and required responses from the reactor operator and/or university personnel for remote alarm signal. Please provide the minimum detectable leakage as well as an estimate of the amount of time necessary to detect the leakage.
  - b. Please provide a discussion of the potential drainage pathways of reactor pool water leakage, operator response, and radioactivity monitoring. If water enters the uncontrolled environment, please discuss the radiological impact.
2. NUREG 1537, Part 1, Section 10.1, Experimental Facilities and Utilization, states that the applicant should provide sufficient information to demonstrate that no proposed operations involving experimental irradiations will expose reactor operations personnel, experimenters, or the general public to unanticipated radiological consequences. The proposed TS 3.6.2.1.d states that:

Cumulative exposures for explosive materials in quantities greater than 25 milligrams (TNT-equivalent) shall not exceed  $10^{12}$  n/cm<sup>2</sup> for neutron or 25 Roentgen for gamma exposures.

Please provide a basis/justification for this limitation.

In addition, the proposed TS 3.6.2.2 states that:

Each fueled experiment shall be controlled such that the total inventory of iodine isotopes 131 through 135 in the experiment is no greater than 10 Ci.

Please provide an analysis to demonstrate that a failure in a fueled experiment will not lead to consequences beyond those of the maximum hypothetical accident (MHA).

3. NUREG-1537 Chapter 13, Accident Analysis, recommends MHA doses analysis to the public. The MHA analysis presented in the TAMU TRIGA SAR, as supplemented, is incomplete in that; (1) while providing considerable information, it does not provide a clear presentation of the analyzed scenario, and (2) it does not discuss the dose to on site, non-occupational individuals in the Laboratory Building such as students, faculty, visitors, etc.
  - a. Please provide a dose assessment for the maximum exposed individual member of the public in the Laboratory Building. Please describe the assumptions used and any systems, plans, procedures, or stay times for which credit is taken in the analysis.
  - b. If evacuation of these areas is necessary following an MHA, please show that this contingency is discussed in the emergency plan.
  - c. Please discuss the assumptions used in the dose assessment for the members of the public such as ground release rate, exposure pathways (inhalation, immersion), exposure time for members of public, and dose conversion factors.
4. NUREG 1537, Chapter 11, Radiation Protection Program and Waste Management, states that the applicant should describe airborne radioactive sources. The description should show that the facility design ensures that doses to the staff and the public will not exceed 10 CFR Part 20 limits and that its ALARA [As Low As Reasonably Achievable] requirements for effluents are satisfied. Chapter 11 of your SAR, as supplemented, while providing considerable information, is incomplete in that it does not provide a bounding calculation for Argon-41 doses to the staff and to members of the public.

The following information is needed to complete the review:

- a. Please provide a bounding calculation of Argon-41 doses to staff members (occupational dose) and members of the public (Laboratory Building, fence, nearest residence). Please discuss the assumptions used in the dose models such as, wind directions, air stability model, exposure pathways (inhalation, immersion, or sky shine), and the use of appropriate dose conversion factors.
- b. In the bounding calculation above, please consider all modes of operation (e.g., against and away from thermal column).