

# PURDUE

UNIVERSITY

SCHOOL OF NUCLEAR ENGINEERING

29 June 2012

Document Control Desk  
US Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

Attn: Ms. Cindy Montgomery, Research & Test Reactors (NRR/DPR/PRLB), Mailstop O12 D20


SUBJECT: PURDUE UNIVERSITY - REQUEST FOR ADDITIONAL INFORMATION  
REGARDING THE PURDUE UNIVERSITY REACTOR LICENSE RENEWAL (TAC NO. ME  
1594), RESPONSES TO RAIs (ML103400115 and ML103400250)

Dear Ms. Montgomery:

Enclosed please find the responses to the Request for Additional Information regarding the Purdue University Reactor License Renewal dated 6 July 2011. Included with this submission are responses to questions 48, 58, 96, 97 and 98. Should you have any questions or require further information, please don't hesitate to call me at 765.496.3573, or e-mail at jere@purdue.edu.

I hereby certify under penalty of perjury with my signature below that the information contained in this submission is true and correct to the best of my knowledge.

Very respectfully



Jere H. Jenkins  
Director of Radiation Laboratories

Attachments: As described.

Cc: Duane Hardesty, USNRC Project Manager for PUR-1  
Leah Jamieson, Purdue University College of Engineering  
Jim Schweitzer, Purdue University REM  
Ahmed Hassanein, Purdue NE

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**REQUESTED ADDITIONAL INFORMATION IN RESPONSE TO RAIs**

**REGARDING THE PURDUE UNIVERSITY REACTOR LICENSE RENEWAL (TAC NO. ME 1594)**

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- 48. NUREG-1537, Part 1, Section 1.7, states the applicant should briefly describe how they meet the requirements of the Nuclear Waste Policy Act of 1982, Section 302(b)(1)(B). Please provide details for the Purdue University Research Reactor (PUR-1) contract for disposition of fuel. Include the contract number and with whom the contract exists.**

Response:

Purdue meets the requirements of the Nuclear Waste Policy Act of 1982, Sec. 302(b)(1)(B). PUR-1 has fuel owned by the U.S. Department of Energy (DOE), and it is supported by a Standard Fuels Support Contract. The Prime Contractor for DOE is Battelle Energy Alliance, with a contract number of DE-AC07-05ID14517. The specific sub-contract for Purdue University is sub-contract number 78286.

- 58. NUREG-1537 states in part that important process variables reflecting the physical condition of the reactor should be monitored. Section 7 of the SAR describes the PUR-1 instrumentation, but does not discuss any potential impact of the proposed power uprate on safe operation of the system. Please discuss if any of the nuclear instrumentation used to monitor the power level of the reactor have to be recalibrated or replaced if the requested power uprate is granted. Also discuss any potential impacts of the power uprate on any nuclear or process parameters important to safe and effective operation of the PUR-1 reactor and facility.**

Response:

The power uprate to 12 kW would require adjustment of the LogN (ch 2) and CSA 1 to the new power levels at 100%. The I&C system was designed for a reactor of higher power (typical Lockheed MTR reactors of this type were built for operation from 100-250 kW), and would be capable of the new operation parameters. Normal calibration procedures would be adhered to ensure the safety, operability and accuracy of the instrumentation.

- 96. SAR, Section 13.2.1 discusses calculation of the reactor building. Please explain if the area evacuated within the stated time constitutes the operations or site boundary. Additionally, please provide documentation substantiating the "past experience" for the evacuation time.**

Response:

The area to be evacuated is the reactor room.

The average person's walking speed is 3 miles per hour, which is 4.4 feet per second. The farthest distance that would have to be walked in the reactor room during an evacuation is approximately fifty (50) feet. Based on the average person's walking speed, it should take approximately 12 seconds to reach an exit.

- 97. SAR, Section 7.5.4 designates the hallway immediately outside the reactor room as B76A. This room appears to be an interior room within the Nuclear Engineering laboratories. Please update the SAR for consistency of designated areas.**

Response:

Section 7.5.4 of the SAR as submitted discusses the instrumentation and control system of PUR-1, not any of the information contained within this question.

- 98. SAR, Section 13.2.1, page 13-9 states "This radiation exposure approaches the limits established in the Technical specifications, Sec 3.5.f for a singly encapsulated experiment." The proposed PUR-1 TSs do not contain a TS 3.5.f. Please propose a TS to establish limits for a singly encapsulated experiments, reference the applicable TS, or justify why a TS is not required.**

Response:

3.5(f) was omitted inadvertently from the relicensing submission inadvertently. It has been reinserted. Please see the response to question 8, submitted 15 November 2011.