

May 6, 2015

Dr. Sean McDeavitt, Director
Nuclear Science Center
Texas Engineering Experiment Station
1095 Nuclear Science Road
MS 3575
College Station, TX 77843

SUBJECT: TEXAS ENGINEERING EXPERIMENT STATION/TEXAS A&M UNIVERSITY
SYSTEM - REQUEST FOR ADDITIONAL INFORMATION REGARDING THE
RENEWAL OF FACILITY OPERATING LICENSE NO. R-83 FOR THE NUCLEAR
SCIENCE CENTER TRIGA REACTOR (TAC NO. ME1584)

Dear Dr. McDeavitt:

The U.S. Nuclear Regulatory Commission (NRC) is continuing its review of your application for the renewal of Facility Operating License No. R-83, dated February 27, 2003 (a redacted version of the application, including the safety analysis report, is available on the NRC's public Web site at www.nrc.gov under Agencywide Documents Access and Management System Accession No. ML102920025), as supplemented, for the Texas Engineering Experiment Station/Texas A&M University System, Nuclear Science Center, TRIGA reactor. During our review, questions have arisen for which additional information is needed. The enclosed request for additional information identifies the additional information needed to complete our review. We request that you provide responses to the enclosed RAI within 30 days from the date of this letter.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 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 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." Any information related to security should be submitted in accordance with 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements." Following receipt of the additional information, we will continue our evaluation of your renewal request.

S. McDeavitt

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If you have any questions, or need additional time to respond to this request, please contact me at (301) 415-0893 or by electronic mail at Geoffrey.Wertz@nrc.gov.

Sincerely,

/Alexander Adams for RA/

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

Docket No. 50-128

Enclosure:
Request for Additional Information

cc: See next page

S. McDeavitt

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ADAMS Accession No.: ML15125A280; *concurrence via email

NRR-106

OFFICE	DPR/PRLB/PM	DPR/LA	DPR/PRLB/BC	DPR/PRLB/PM
NAME	GWertz	Elee (w/comment)	AAdams	(AAdams for) GWertz
DATE	05/05/2015	05/06/2015	05/06/2015	05/06/2015

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Texas A&M University

Docket No. 50-128

cc:

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

The U.S. Nuclear Regulatory Commission (NRC) is continuing its review of your application for the renewal of Facility Operating License No. R-83, dated February 27, 2003 (a redacted version of the application, including the safety analysis report (SAR), is available on the NRC's public Web site at www.nrc.gov under Agencywide Documents Access and Management System (ADAMS) Accession No. ML102920025), as supplemented, for the Texas Engineering Experiment Station/Texas A&M University System (TEES/TAMUS), Nuclear Science Center (NSC), TRIGA reactor. During our review, the following questions have arisen for which additional information is needed. Provide responses to these questions within 30 days from the date of this letter.

1. The TEES/TAMUS updated SAR, dated June 9, 2011 (ADAMS Accession No. ML111950376), Section 7.2.3.4, "Servo Control System," provides general information about the servo control system, but does not describe specific details associated with the operation or reactivity control aspects of the servo system. NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content," Chapter 7.3, "Reactor Control System," provides guidance that the license should analyze the operation and performance of the system, including the bases for any technical specifications and surveillance requirements, and provide a description of the evaluation of any accident scenarios that may be created by a malfunction of the system (e.g., a malfunction of the servo bounded by another reactivity insertion event).
 - a. Provide details of the servo system operation including the normal reactivity control range, regulating rod position, interlocks, and any other significant design information, or justify why no additional information is necessary.
 - b. Explain if additional technical specifications are needed for the servo system, or justify why no changes are necessary.
2. The TEES/TAMUS proposed Technical Specification (TS) 5.5, "Radiation Monitoring System," Table 5, and TS 3.5.1, "Radiation Monitoring," Table 3 (ADAMS Accession No. ML15065A068), states, in part, information regarding the Facility Air Monitors (FAMs), Channels 1, 3, 4, and 5. However, the FAMs listed in Table 3 (channels 1, 3, and 4) do not match the FAM channels listed in Table 5 (channels 1, 3, 4, and 5). NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 3.7.1, "Monitoring Systems," provides guidance that the required radiation monitors should be listed in the TSs. Provide revised TSs addressing the

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inconsistencies in the list of FAMs in Tables 3 and 5, or justify why no changes are necessary.

3. The TEES/TAMUS proposed TS 5.5, "Radiation Monitoring System," Table 5, footnote (ADAMS Accession No. ML15065A068), states, in part, "fission product monitor", but does not appear to be one of the FAM channels listed in Table 5, or TS 3.5.1, Table 3. Furthermore, the TEES/TAMUS updated SAR, Section 7.7.2, "Facility Air Monitors," describes the fission product monitor as FAM Channel 2. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 3.7.1, "Monitoring Systems," provides guidance that the required radiation monitors should be listed in the TSs.
 - a. Provide a description of the fission production monitor, consistent with the SAR description of the FAM channels, and
 - b. Determine if the fission product monitor should be included in the TS 5.5, Table 5, and/or TS 3.5.1, Table 3. If so, provide revised TSs, or justify why no changes are necessary.
4. The TEES/TAMUS response to RAI No. 33.c, by letter dated March 2, 2015 (ADAMS Accession No. ML15065A068), provided information on the calculation of the setpoints for some of the FAM channels listed in proposed TS 5.5, Table 5. However, the calculation of the setpoint for FAM Channel No. 4 was not provided. Additionally, a description of how the setpoints ensure that personnel exposure and doses remain below the limits of 10 CFR Part 20 was not provided. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 3.7.1, "Monitoring Systems," provides guidance that the alarm and automatic setpoints should be specified to ensure that personnel exposures and potential doses remain below the limits of 10 CFR Part 20.
 - a. Provide the setpoint calculation for FAM Channel 4, similar to those provided for FAM Channels 1, 3, and 5. Include a setpoint calculation for the fission product monitor (FAM Channel 2), if added to the TSs based on the response to RAI 3 above, or justify why no additional information is necessary.
 - b. Provide a description of the FAM channel setpoints for channels 1, 3, 4, and 5, that indicates how the setpoints ensure that personnel exposures and doses remain below the limits of 10 CFR Part 20. Include the fission product monitor, if the response to RAI No. 3 above adds the fission product monitor to the TSs, or justify why no changes are necessary.
5. The TEES/TAMUS proposed TS 3.5.1, "Radiation Monitoring," Specification (ADAMS Accession No. ML15065A068), states, in part, "The above operations..." which appear to be described in the Applicability section of TS 3.5.1. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 1.2.2, "Format," provides guidance that the Specification information should be provided in the specified format. Provide a revised TS 3.5.1, Specification that describes the operations intended by TS 3.5.1, or justify why no change is necessary.

6. The TEES/TAMUS response to RAI No. 3, by letter dated November 14, 2012 (ADAMS Accession No. ML12321A321), provided the maximum exposure to an individual in an unrestricted area (at the fence line) that was based on the conservative assumption that the exposure was due to a total immersion in the plume generated from the immediate, ground level release of all fission products, from the reactor bay to the environment, that were produced by the Maximum Hypothetical Accident (MHA). Since the actual facility response to a significant radiological release would be to shutdown the exhaust system in order to limit the release of the MHA airborne radioactive material from the reactor bay, an additional calculation is needed to demonstrate the conservative assumptions provided by the plume model calculation. NUREG-1537, Part 1, Chapter 13, Section 13.1.1, "Maximum Hypothetical Accident," provides guidance that sensitivity analysis of the assumptions may be useful to determine more realistic results. Provide an estimate of the annual dose to a member of the public at the unrestricted area given that the MHA activity is confined in the reactor bay as a result of the isolation of the exhaust system (a simplified direct shine calculation assuming no leakage could be provided as a conservative estimate), or justify why no additional information is necessary.
7. The TEES/TAMUS proposed TS 1.3, "Definition," Pool Water Reference Operating Level (ADAMS Accession No. ML15065A068), states, in part, "the fission product air monitor." NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 1.3, "Definitions" provides guidance that the definitions applicable to a facility should be included verbatim. With regard to the response to RAI No. 3 above, determine if a revision of the definition of Pool Water Reference Operating Level is necessary, and provide a revision to the TS Definition of Pool Water Reference Operating Level, or justify why no change is necessary.
8. The TEES/TAMUS proposed TS 1.3, "Definition," Reactor Console Secured (ADAMS Accession No. ML15065A068), states, in part, that "whenever all scrammable rods..." However, the definition does not explain why it is limited to all scrammable rods and does not include all control rods. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 1.3, "Definitions" provides guidance that the definitions applicable to a facility should be included verbatim. Determine if a revision to the TS definition of Reactor Console Secured is needed to include all control rods, and provide a revised TS definition of Reactor Console Secured, or justify why no change is necessary.
9. The TEES/TAMUS proposed TS 1.3, "Definition," Reference Core Condition (ADAMS Accession No. ML15065A068), states, in part, "the reactivity worth of Xenon is negligible." However, negligible is not defined. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 1.3, "Definitions" provides guidance that the definitions applicable to a facility should be included verbatim. Provide a description of how TAMUS/TEES plans to implement the term "the reactivity worth of Xenon is negligible" in the definition of Reference Core Condition in operating procedures, or other guidance to the operators to ensure compliance with the TSs, or justify why no additional information is necessary.
10. The TEES/TAMUS proposed TS 3.2.2, "Reactor Systems and Interlocks," Specification (ADAMS Accession No. ML15065A068), states, in part, "any single safety channel or interlock may be inoperable with the reactor is operating..." may contain a typographic error. Consider if "with" should be changed to "when", or if another revision is needed, or justify why no change is necessary.

11. The TEES/TAMUS proposed TS 3.2.2, "Reactor Systems and Interlocks," Table 2b, Safety Channel, Pulse Stop Electro-Mechanical Interlock (ADAMS Accession No. ML15065A068), states the function is to prevent application of air to the Transient Rod unless the mechanical stop is installed. The corresponding Basis, Interlocks Required for Operation, item 5, states in part, that the interlock prevents application of air to the transient rod unless the cylinder is fully inserted. The TS 3.2.2, Pulse Stop Electro-Mechanical Interlock function and Basis description do not match. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 1.2.2, "Format," provides guidance that the Basis information should be provided in the specified format. Provide a revised TS 3.2.2 to correct the discrepancy between the Interlock function as described in Table 2b and the Basis item 5, or justify why no change is necessary.
12. The TEES/TAMUS proposed TS 3.3.2, "Equipment to Achieve Confinement," Specification 4 (ADAMS Accession No. ML15065A068), states, in part, "the fission product...facility air monitor." With regard to the response to RAI No. 3 above, determine if a revision of the TS 3.3.2, Specification 4 is necessary, and provide a revision to TS 3.3.2, Specification 4, or justify why no change is necessary.
13. The TEES/TAMUS proposed TS 5.7, "Reactor Building and Central Exhaust System," Specification 3 (ADAMS Accession No. ML15065A068), states, in part, "the system shall be designed to shutdown in the event of an alarm on the stack particulate monitor (FAM Ch. 1) radiation monitoring channel." The TEES/TAMUS updated SAR, Section 7.7.2, "Facility Air Monitors," indicates that FAM Channels 1, 2, and 5 automatically shutdown the facility air handling system. NUREG-1537, Part 1, Chapter 14, Appendix 14.1, Section 3.7.1, "Monitoring Systems," provides guidance that the required radiation monitors should be listed in the TSs. Provide a revised TS 5.7, Specification 3, which indicates which FAM channels automatically shutdown the facility air handling system, or justify why no change is necessary.
14. The TEES/TAMUS proposed TS 6.1.3, Specification 3.e. (ADAMS Accession No. ML15065A068), states, in part, "equal to or great..." which may contain a typographical error. Consider if "great" should be changed to "greater", if another revision is needed, or justify why no change is necessary.