

July 15, 2010

Dr. Tatjana Jevremovic
Director, Utah Nuclear Engineering Program
Joseph Merrill Engineering Building
50 Central Campus Drive, Room 2298
University of Utah
Salt Lake City, UT 84112

SUBJECT: UNIVERSITY OF UTAH - REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE LICENSE RENEWAL (TAC NO. ME1599)

Dear Dr. Jevremovic:

The U.S. Nuclear Regulatory Commission (NRC) is continuing the review of your application for renewal of Facility Operating License No. R-126, for the University of Utah TRIGA Reactor, dated March 25, 2005, and superseded in its entirety by an Updated Safety Analysis Report (SAR), dated June 1, 2009 (a redacted version is available on the NRC's public website, www.nrc.gov, in the Agencywide Documents Access and Management System [ADAMS], Accession No. ML092090027).

During our review, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information within 45 days after the date of this letter. In accordance with Title 10 of the *Code of Federal Regulations* Part 50.30(b), your response must be executed in a signed original document under oath or affirmation.

If you have any questions regarding this review, 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,

/RA JQuichocho for/

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

Docket No. 50-407

Enclosure:
As Stated

cc w/encl: See next page

University of Utah TRIGA Reactor

Docket No. 50-407

cc:

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Test, Research, and Training
Reactor Newsletter
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*via e-mail

NRR-088

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Date	7/13/10	7/15/10	7/15/10	7/15/10

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OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR ADDITIONAL INFORMATION REGARDING
THE RENEWAL OF FACILITY OPERATING LICENSE FOR
THE UNIVERSITY OF UTAH TRIGA REACTOR
LICENSE NO. R-126; DOCKET NO. 50-407

The U.S. Nuclear Regulatory Commission (NRC) is continuing the review of your application for renewal of Facility Operating License No. R-126, for the University of Utah TRIGA Reactor (UUTR), as documented in the UUTR updated Safety Analysis Report (SAR), dated June 1, 2009 (a redacted version is available on the NRC's public website, www.nrc.gov, in the Agencywide Documents Access and Management System [ADAMS], Accession No. ML092090027).

The NRC staff's review of the UUTR Technical Specifications (TSs) was performed in accordance with the method described in the "Interim Staff Guidance (ISG) on the Streamlined Review Process for License Renewal for Research Reactors" (ADAMS ML092240244). The review of UUTR TS Section 6.0, Administrative Controls, was done to the UUTR Request for TS Amendment 7 (ADAMS ML100550827). During this review, we have identified areas needing additional information. Please provide responses to the following requests for additional information:

1. NUREG-1537, Chapter 14, Appendix 14.1, "Format and Content of Technical Specifications for Non-Power Reactors," follows the format of ANSI-15.1-2007, "The Development of Technical Specifications for Research Reactors." UUTR TS did not identify a previously approved TS format. Please provide TS format.
2. ANSI-15.1-2007, Section 1.3, provides definitions commonly used in Research and Test Reactor (RTR) TSs. The UUTR TS definitions noted below were inconsistent, lacked required detail, were used interchangeably, or were missing. Please explain:
 - 2.1 "Abnormal Occurrence" is defined in the UUTR TSs where ANSI-15.1-2007 uses "Reportable Occurrence." Both terms are used in the TSs.
 - 2.2 "Reactor Shutdown" does not implement the definition in ANSI-15.1-2007.
 - 2.3 "Cold Critical" is used but does not implement the definition in ANSI-15.1-2007 "Reference Core Condition."
 - 2.4 "Reactor Secured" does not implement the definition in ANSI-15.1-2007.
 - 2.5 "Shutdown Margin" does not implement the definition in ANSI-15.1-2007.
 - 2.6 "Fuel rod" is used where ANSI-15.1-2007 uses "fuel element," and both terms are used in the TSs.
 - 2.7 "Experiment" does not implement the definition in ANSI-15.1-2007.
 - 2.8 "Channel Calibration" does not implement the definition in ANSI-15.1-2007.

ENCLOSURE

- 2.9 "Limiting Safety System Settings" does not implement the definition in ANSI-15.1-2007.
- 2.10 "Control element" is used where ANSI-15.1-2007 uses "control rod." Both terms are used in the TSs.
- 2.11 "Circuit" is used where ANSI-15.1-2007 uses "channel."
- 2.12 In addition the following ANSI-15.1-2007 terms are not defined in the UUTR TSs:
 - 1.12.1. Channel
 - 1.12.2. Reactivity Worth of an Experiment
 - 1.12.3. Excess Reactivity
 - 1.12.4. Scram Time
 - 1.12.5. Reactor Operator
 - 1.12.6. Senior Reactor Operator
 - 1.12.7. "Should, Shall, and May"
- 3. ANSI-15.1-2007, Section 3 identifies Limiting Conditions of Operations (LCOs). The following issues were noted in comparison to the UUTR TS LCOs. Please explain.
 - 3.1 ANSI-15.1-2007, Section 3.1 "Reactor Core Parameters" recommends LCOs for: 1) core configurations; 2) fuel burnup; and 3) fuel inspection not found in the UUTR TSs.
 - 3.2 ANSI-15.1-2007, Section 3.3 "Coolant Systems" recommends an LCO for the means to accomplish monitoring pool leaks or loss-of-coolant, which was not found in the UUTR TSs.
 - 3.3 ANSI-15.1-2007, Section 3.7 "Radiation Monitoring Systems and Effluents" recommends LCOs for monitoring environmental conditions and radioactive effluents, which were not found in the UUTR TSs.
 - 3.4 UUTR TS LCO 3.1, "Normal Operation," specifies a power limit not consistent with the UUTR SAR.
 - 3.5 UUTR TS LCO 3.2, "Reactivity Limitations," (1) requires the highest worth rod to be fully withdrawn for the shutdown margin evaluation. However, the definition in ANSI/ANS-15.1-2007 states that non-scrammable rods must be in their most reactive position. Since UUTR Design Feature (DF) 5.3 item (2) states that the regulating rod "need not have scram capability," please explain how the UUTR shutdown margin is evaluated and indicate which control rods are credited in the calculation. (Note: See RAI 4.3 for additional Basis information needed.)
 - 3.6 ANSI-15.1-2007, Section 3.8, "Experiments," provides recommendations in Sections 3.8.1, 3.8.2 and 3.8.3, which were not found in the UUTR TSs.
 - 3.7 UUTR TS LCO 3.5, "Engineered Safety Features – Ventilation System," title (ESF) does not appear consistent with SAR designation for the ventilation system.

4. ANSI/ANS-15.1-2007, Section 4, identifies Surveillance Requirements (SRs) for LCOs. The following UUTR SRs issues were identified. Please explain:
 - 4.1 UUTR TS LCO 3.2, "Reactivity Limitations," items (2) through (5) have no corresponding SRs.
 - 4.2 UUTR SR 4.3.2, "Control and Safety Systems," items (1) and (2) appear to correspond to TS LCO 3.3.1, "Scram Time," and LCO 3.3.2, "Reactor Control System." The numbering and titles are not consistent with ANSI-15.1-2007.
 - 4.3 UUTR LCO 3.4, "Argon-41 Discharge Limit," has no corresponding SR.
 - 4.4 UUTR SR 4.3.4, "Ventilation System," has no channel check or channel test.
 - 4.5 UUTR SR 4.4, "Reactor Fuel Elements," items (1) and (2) have no corresponding LCO.
 - 4.6 UUTR SR 4.5, "Primary Coolant Conditions," does not have a corresponding LCO for coolant activity.
5. ANSI/ANS-15.1-2007 Section 1.2.2, "Format," recommends that the Basis "provides the background or reason for the choice of specification(s), or references a particular portion of the Safety Analysis Report." The Bases listed below lack specific reference and need additional information:
 - 5.1 UUTR TS 2.2, "Limiting Safety System Settings," Basis temperature limit of 800 °C does not match SAR Table 4.6.2.
 - 5.2 UUTR TS 3.1, "Normal Operation," Basis has information that has not been established by the SAR or other reference.
 - 5.3 UUTR TS 3.2, "Reactivity Limitations," Basis for items (1), (2) and (5) do not have an explanation or SAR reference for the reactivity worth; and the Basis for item (4) does not include data for all components of the excess reactivity evaluation including control rod worth, nor demonstrate how this value was evaluated.
 - 5.4 UUTR TS 3.3.1, "Scram Time," Basis contains conclusions that have not been established by the SAR or other reference.
 - 5.5 UUTR TS 3.3.2, "Reactor Control System," Basis does not address all channels.
 - 5.6 UUTR TS 3.3.3, "Reactor Safety System," Basis scram setpoint of 120% of full power does not match the UUTR SAR setpoint of 110%.
 - 5.7 UUTR TS 3.5, "Engineered Safety Feature – Ventilation System," Basis does not discuss all modes of operation.
 - 5.8 UUTR TS 3.8, "Primary Coolant Conditions," Basis does not provide the basis for the numerical values cited.
 - 5.9 UUTR SR 4.2, "Safety Limit – Fuel Element Temperature," Basis does not address the items (1) through (3) in the SR.
 - 5.10 UUTR SR SR 4.5, "Primary Coolant Conditions," Basis does not provide the basis for the numerical values cited.

- 5.11 UUTR DF 5.5, "Fuel Storage," Basis but does not provide the basis (e.g. NUREG-1537).
- 5.12 UUTR DF 5.7, "Reactor Pool Water Systems," Basis indicates a power level up to 2700 kW without a reference to a supporting analysis.
- 6. ANSI/ANS-15.1-2007, Section 5.0, "Design Features" provides information, identified below, regarding content and format that was not found in the UUTR TSs. Please provide additional detail:
 - 6.1 ANSI/ANS-15.1-2007, Section 5.1, "Site and Facility Description," recommends a general description of the site and of the facility.
 - 6.2 ANSI/ANS-15.1-2007, Section 5.3, "Reactor Core and Fuel," recommends providing a description of: 1) the normal core configuration; 2) core parameters; 3) conditions for operation of the reactor with damaged or leaking fuel elements; and 4) fuel burnup limits.
- 7. ANSI/ANS-15.1-2007, Section 6, "Administrative Controls," provides information regarding content and format. UUTR TS differences are noted below. Please provide additional information:
 - 7.1 ANSI-15.1-2007, Section 6.2.2, "Charter and Rules" recommendations are listed as "Operation" in UUTR TS Section 6.2.3.
 - 7.2 ANSI-15.1-2007, Section 6.2.3, "Review Function," of ANSI-15.1-2007, items (5) and (8), are not identified in the UUTR TS Section 6.2.4.
 - 7.3 ANSI-15.1-2007, Section 6.2.4, "Audit Function" recommends an administrative control that establishes: the retraining and requalification program for the operating staff (at least once every other calendar year); the interval between audits (not to exceed 30 months); the results of actions taken to correct those deficiencies that may occur in the reactor facility equipment, systems, structures, or methods of operations that affect reactor safety (at least once per calendar year); and the reactor facility emergency plan and implementing procedures (at least once every other calendar year). These recommendations are not found in the UUTR TSs.
 - 7.4 ANSI-15.1-2007, Section 6.4, "Procedures," recommends procedures for items (1) through (8). Items (2) and (4) through (8) could not be identified in the UUTR TSs.
 - 7.5 ANSI-15.1-2007, Section 6.5, "Experiment Review and Approval," recommends items (1) and (2) that are not described in UUTR TS 6.5.
 - 7.6 ANSI-15.1-2007, Section 6.6, "Required Actions," recommends actions 6.6.1 for violations of safety limits and 6.6.2 other violations that are not of safety limits. UUTR TS Section 6.6.1 does not fully implement Section 6.6.1 and no corresponding section was identified for Section 6.6.2.
 - 7.7 ANSI-15.1-2007, Section 6.7, "Reports," provides recommendations for reporting activities. The UUTR TS Section 7.6, Reports departs significantly from those recommendations.

- 7.8 ANSI-15.1-2007, Section 6.8, "Records," provides recommendations for record retention. The UUTR TS Section 6.8 Records does not implement the full content or structure of those recommendations.
 - 7.8.1 Section 6.8.2 of the guidance recommends an administrative control that retraining and requalification records for operators be retained for at least one certification cycle and be maintained at all times while the individual is employed or until the certification is renewed. Per 10 CFR 55.55(a) this period is 6 years.
- 7.9 UUTR TS 6.9, "Quality Assurance," refers to an outdated standard (ANSI 402).