June 21, 2016

Dr. Steven Reese, Director
Radiation Center
Oregon State University
100 Radiation Center
Corvallis, OR 97331-5903

SUBJECT: OREGON STATE UNIVERSITY - REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED AMENDMENT TO THE TECHNICAL SPECIFICATIONS FOR FUELED EXPERIMENTS

Dear Dr. Reese:

By letter dated August 18, 2014 (Agencywide Documents Access and Management System (ADAMS Accession No. ML14233A412), Oregon State University requested an amendment to the Technical Specifications, Appendix A of Facility Operating License No. R-106, for the Oregon State University TRIGA Reactor. This amendment request is associated with fueled experiments.

The U.S. Nuclear Regulatory Commission staff has reviewed the information provided in your application and determined that additional information is needed in order to complete our review. Please provide responses to the enclosed request for additional information within 30 days from the date of this letter.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.30(b), "Oath or affirmation," 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." Following receipt of the additional information, we will continue our evaluation of your renewal request.

If you have any questions about this review, or if you need additional time to respond to this request, please contact me at (301) 415-2856 or by electronic mail at Michael.Balazik@nrc.gov.

Sincerely,

/RA by Alexander Adams for/

Michael Balazik, Project Manager
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-243
License No. R-106

Enclosure:
As stated

cc: See next page

Oregon State University Docket No. 50-243

cc:

Mayor of the City of Corvallis
Corvallis, OR 97331

Division Administrator
Nuclear Safety Division
Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

Dr. Ronald Adams
Interim Vice President for Research
Oregon State University
Administrative Services Bldg., Room A-312
100 Radiation Center
Corvallis, OR 97331-5904

Mr. Todd Keller
Reactor Administrator
Oregon State University
100 Radiation Center, A-100
Corvallis, OR 97331-5903

Dr. Andrew Klein, Chairman
Reactor Operations Committee
Oregon State University
100 Radiation Center, A-100
Corvallis, OR 97331-5904

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

If you have any questions or need additional time to respond to this request, please contact me at (301) 415-2856 or by electronic mail at Michael.Balazik@nrc.gov.

Sincerely,

/RA by Alexander Adams for/

Michael Balazik, Project Manager
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-243
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Enclosure:
As stated

cc: See next page

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ADAMS Accession No.: ML15044A334 *concurrence by e-mail NRR-088

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DATE	6/9/2016	6/20/2016	6/21/2016	6/21/2016

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OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ADDITIONAL INFORMATION

REGARDING PROPOSED AMENDMENT TO TECHNICAL SPECIFICATION

FOR FUELED EXPERIMENTS

OREGON STATE UNIVERSITY TRIGA REACTOR

LICENSE NO. R-106; DOCKET NO. 50-243

By letter dated August 18, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14233A412), Oregon State University requested an amendment to the Technical Specifications (TSs), Appendix A of Facility Operating License No. R-106, for the Oregon State University TRIGA Reactor (OSTR). The U.S. Nuclear Regulatory Commission staff's review used the guidance in NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content," and NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria," and supporting information from the American National Standards Institute/American Nuclear Society (ANSI/ANS)-15.1-2007, "The Development of Technical Specifications for Research Reactors." During our review, the following questions have arisen for which additional information is needed. We request that you provide responses to this request within 30 days from the date of this letter.

1. ANSI/ANS-15.1-2007, Section 3.8.2, "Materials," states that special requirements shall be established for significant amounts of special materials such as fissionable materials.

   The proposed addition to OSTR TS 3.8.3, "Failures and Malfunctions," Specification b, is to allow irradiation of fissile material limited to the analyzed amount of iodine-131 during a maximum hypothetical accident as documented in OSTR's safety analysis report (SAR) (ADAMS Accession No. ML073250128), Section 13.2.1. The current OSTR TS 3.8.3, Specifications a through d, are assumptions that ensure conservatism in the safety analysis of experiments.

   Justify including the proposed changes in OSTR TS 3.8.3 and not in OSTR TS 3.8.2, "Materials," which limits reactor operation to material specific quantities in experiments or propose changes to TS 3.8.2.

2. NUREG-1537, Part 2, Section 10.3, "Experiment Review," identifies areas to be assessed regarding the release of radioactive material from an experiment. An important factor in determining a potential release is the methodology for calculating a release fraction for a particular fissile experiment.

   ANSI/ANS-15.1-2007, Section 6.4, "Procedures," requires written procedures be prepared, reviewed, and approved prior to initiating certain activities. One activity listed is administrative controls for the conduct of irradiation and experiments that could affect reactor safety or core reactivity.

Enclosure

Provide the methodology for determining the release fraction for an experiment containing fissile material. Additionally, state which OSTR procedure(s) is used to determine the release fraction for fissile experiments.

3. ANSI/ANS-15.1-2007, Section 6.2.3, "Review Function," lists several items that shall be reviewed by the licensee. Item (3) states that all new experiments or classes of experiments that could affect reactivity or result in the release of radioactivity.

   The OSTR SAR states that experiments are classified according to potential impact on the facility and potential radioisotope production. The OSTR SAR identifies three classes of experiments as Class A, Class B, or Class C.

   Identify and justify which class of experiments (A, B, or C) applies to experiments containing fissile material.

4. ANSI/ANS-15.1-2007, Section 3.4.1, "Operations that require containment or confinement," states that movement of irradiated fuel or fueled experiments with significant fission product inventory outside of containers, systems, or storage areas requires confinement be in operation.

   The proposed OSTR TS 3.8.3, Specification b, is for irradiation of fissile material, regardless of experimental location in the OSTR. The objective of OSTR TS 3.5, "Ventilation System," is to assure that the ventilation system shall be in operation to mitigate the consequence of possible releases of radioactive materials resulting from reactor operations. TS 3.5, Specification a, restricts reactor operation unless the facility ventilation system is operating.

   Justify not having the facility ventilation system in operation, as stated in OSTR TS 3.5, when transferring a fissile experiment from an experimental location or propose a TS to require ventilation operation.

5. NUREG-1537, Part 1, Chapter 14, "Technical Specifications," Appendix 14.1, "Format and Content of Technical Specifications for Non-Power Reactors," Section 3.7.1, "Monitoring Systems," states that the specified fission product monitor could be the continuous air monitor or the primary coolant monitor, depending on the release scenarios analyzed in the safety analysis report. Release of fission products from both fuel and fueled experiments should be included.

   The proposed OSTR TS 3.8.3, Specification b, is for irradiation of fissile material, regardless of experimental location. The objective of OSTR TS 3.7, "Radiation Monitoring Systems and Effluents," is to specify the minimum radiation monitoring channels that shall be available to the operator to assure safe operation of the reactor. TS 3.7.1, Specifications, restricts reactor operation unless the minimum number of radiation channels listed in Table 4 are operating.

   Justify not having the minimum radiation monitoring channels in operation, as stated in OSTR TS 3.7.1, when transferring a fissile experiment from an experimental location or propose a TS to require minimum radiation monitoring channels.