

REQUEST FOR ADDITIONAL INFORMATION

LICENSEE: OREGON STATE UNIVERSITY
LICENSE NO.: SNM-2013
DOCKET NO.: 07007019

Regulatory Basis:

By letter dated July 29, 2021 (Agencywide Documents Access and Management System [ADAMS] Accession Number ML21211A614), Oregon State University (OSU), submitted an application for renewal of its Special Nuclear Material License (SNM) SNM-2013 (ADAMS Accession Number ML15082A215).

The following request for additional information is necessary to facilitate the U.S. Nuclear Regulatory Commission (NRC) staff's review of OSU's request to renew the SNM license.

RAI 1: Title 10 of the *Code of Federal Regulations* (10 CFR) 70.61(d) states that the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical, including use of an approved margin of subcriticality for safety. OSU's submittal included a description and analysis of the material and a request for exemption from 10 CFR 70.24 criticality accident requirements based on the findings of the safety analysis.

Section 5.4.3.1.7.1 of NUREG-1520 "Standard Review Plan for Fuel Cycle Facilities License Applications" states, in part, that the NRC staff should review the applicant's computer code validation report to obtain reasonable assurance that applicants' processes are actually subcritical. It further states that a description of the applicant's software including cross-section libraries is necessary to validate the calculations.

The safety analysis provided in Appendix 8 of OSU's license renewal request contains results of Monte Carlo N-Particle 5 (MCNP5) calculations conducted to show the subcriticality of the facility under normal and credible abnormal conditions.

Provide a description of the cross-section library used in the MCNP5 calculations, and justify how it supports the validity of the calculations.

RAI 2: In accordance with 10 CFR 70.22(a)(8), applications need to include a description of "proposed procedures to protect health and minimize danger to life or property".

- (a) Clarify if OSU has determined if the activities that would be conducted under SNM-2013 involve any chemical or fire hazards that are under NRC's regulatory jurisdiction, and could impact health or present a danger to life or property. Clarify if OSU has a procedure for reviewing its proposed activities to determine if there are chemical hazards that are under NRC's regulatory jurisdiction
- (b) Please explain if OSU's process for creating new procedures or modifying existing procedures that involve licensed material, which is discussed in Section 7 of the application, includes a determination as to whether the new or revised activity

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would involve chemical or fire hazards under NRC's jurisdiction. Clarify how OSU assures there is adequate expertise for making such determinations.

RAI 3: 10 CFR 70.22(a)(7) states that an application must contain a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property (such as handling devices, working areas, shields, measuring and monitoring instruments, devices for the disposal of radioactive effluents and wastes, storage facilities, criticality accident alarm systems, etc.)

(a) The application describes in Section 7.iii of the application that both rooms, D104 and F106, in the Radiation Center Building are each installed with four rate-of-rise/fixed temperature detectors. With locations of the detectors in room D104 provided in Section 7.iii, the application should also provide locations of detectors in room F106 for information. With a smoke detector in room D104, clarify whether there is a smoke detector installed in room F106. If not, explain the rationale why the smoke detector is not needed in room F106 per view on fire safety.

(b) The application states in Section 7.iii there is no sprinkler or automated fire suppression system in rooms D104 and F106. Explain why there is no need for a sprinkler or automated fire suppression system in rooms D104 and F106 and their neighboring areas. Provide information of sprinkler and fire suppression systems, if existed, in the RC building. If a building or a room is equipped with sprinklers and fire suppression system, the potential impacts of a fire can be dramatically reduced.

RAI-4: 10 CFR 72(a)(8) states that an application must include proposed procedures to protect health and minimize danger to life or property (such as procedures to avoid accidental criticality, procedures for personnel monitoring and waste disposal, post-criticality accident emergency procedures, etc.).

(a) The application states in Section 7.iii that movement of combustible materials into the storage room D104 is strictly controlled/inventoried, but generally prohibited. Provide the procedure of control and inventory for movement of combustible materials into the storage room D104 to prevent fire incidents.

Provide the criteria or conditions to allow movement of combustible materials into the storage room.

(b) Clarify if OSU has determined if the activities that would be conducted under SNM-2013 involve any fire hazards that are identified as potential consequence from chemical process under NRC's regulatory jurisdiction and could impact health or present a danger to life or property. Clarify if OSU has a procedure for reviewing its proposed activities to determine if there are fire hazards that are identified as potential consequence from chemical hazard (if existed) under NRC's regulatory jurisdiction.

RAI-5: 10 CFR 73.67(f) addresses the physical protection measures required for the fuel elements containing SNM of low strategic significance (Category III) when stored/used in Room F106; OSU must apply the measures in 10 CFR 73.67(f) to Room F106

(when the fuel elements are stored/used) to provide reasonable assurance that the SNM will be adequately protected.

The requirements of 10 CFR 70.53 and 70.54 are addressed in Section 8 of the license renewal application, "Material Control and Accountability." The application indicates that the Radiation Center maintains a special nuclear material inventory and reporting program in accordance with 10 CFR 74.13 for OSU. In addition, annual material status reports are made to the Nuclear Materials Management and Safeguards Systems (NMMSS) as required by 10 CFR 74.19(c). Transfers and receipts of special nuclear materials are reported in accordance with 10 CFR 70.54 and 10 CFR 74.15 to the NMMSS.

The Material Control and Accountability (MC&A) requirements formerly contained in 10 CFR 70.51, 70.53, and 70.54 were moved to 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material" (see *Federal Register* 67 FR 78142; December 23, 2002). Licensees who possess, transfer, or receive SNM in a quantity of 1 gram or more of contained uranium-235, uranium-233, or plutonium are subject to the general reporting and recordkeeping requirements of 10 CFR 74 Subpart B, "General Reporting and Recordkeeping Requirements."

The licensee states (application page 8, Section 9) that the physical protection measures for the SNM within the fuel elements (described in Section 4 of the renewal application) is found in the same section (9) of the original 2010 application (ADAMS Accession No. ML101790338; non-public) and is incorporated by reference without any changes.

Please revise the physical security plan dated July 29, 2021 (Subj: Modification to the OSTR Physical Security Plan to Close Out Confirmatory Action Letter No. NRR-04-001) to address how OSU plans to implement the physical protection measures within 10 CFR 73.67(f) for the fuel elements when stored/used in room F106. Specifically, address the following issues within the security plan:

- (1) Clarify how OSU will use the fuel elements only once a controlled access area (CAA) has been established in Room F106?
- (2) Clarify how OSU will monitor the CAA established in Room F106 when the fuel elements are present to detect unauthorized penetrations or activities?
- (3) Clarify how OSU will assure that an off-sight response force will respond to all unauthorized penetrations or activities in Room F106 when the fuel elements are stored/used?
- (4) Clarify how OSU will include, in their current response procedures, how to deal with threats or theft of the fuel elements when in Room F106?

RAI-6: (a) 10 CFR 74.11(a) requires each licensee who possesses 1 gram or more of contained uranium-235, uranium-233 or plutonium to notify the NRC Operations Center within 1 hour of discovery of any loss or theft or other unlawful diversion of SNM which the licensee is licensed to possess, or any incident in which an attempt has been made to commit a theft or unlawful diversion of SNM. Instead of discussing in Section 9, 10 CFR Part 73, "Physical Protection of Plants and Materials," this requirement should be discussed in 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material."

Provide a description of the MC&A activities that are performed or the measures in place that ensure compliance with this reporting requirement.

(b) 10 CFR 74.13(a) requires each licensee possessing SNM in a quantity totaling 1 gram or more of contained uranium-235, uranium-233, or plutonium to complete and submit, in computer-readable format Material Balance Reports concerning SNM that the licensee has received, produced, possessed, transferred, consumed, disposed, or lost. The Physical Inventory Listing Report must be submitted with each Material Balance Report.

Provide a description of the MC&A activities that are performed or the measures in place that ensure compliance with this reporting requirement.

(c) 10 CFR 74.15 requires each licensee who transfers or receives SNM in a quantity of 1 gram or more of contained uranium-235, uranium-233, or plutonium to complete, in computer-readable format, a Nuclear Material Transaction Report. In addition, each licensee who adjusts the inventory in any manner, other than for transfers and receipts, shall submit a Nuclear Material Transaction Report, in computer-readable format, to coincide with the submission of the Material Balance Report. Each licensee who transfers SNM shall submit a Nuclear Material Transaction Report no later than the close of business the next working day. Each licensee who receives SNM shall submit a Nuclear Material Transaction Report within 10 days after the material is received.

Provide a description of the MC&A activities that are performed or the measures in place that ensure compliance with this reporting requirement.

RAI-7: 10 CFR 74.19(a) requires each licensee to keep records showing the receipt, inventory (including location and unique identity), acquisition, transfer, and disposal of all SNM in its possession regardless of its origin or method of acquisition. Each record relating to material control or material accounting must be maintained and retained for the period specified by the appropriate regulation or license condition. Each record of receipt, acquisition, or physical inventory of SNM must be retained as long as the licensee retains possession of the material and for 3 years following transfer or disposal of the material. Each record of transfer of SNM to other persons must be retained by the licensee who transferred the material until the Commission terminates the license authorizing the licensee's possession of the material.

Provide a description of the MC&A activities that are performed or the measures in place that ensure compliance with this recordkeeping requirement.

RAI-8: 10 CFR 74.19(c) requires certain licensees who are authorized to possess SNM in a quantity greater than 350 grams of contained uranium-235, uranium-233, or plutonium, to conduct a physical inventory of all SNM in its possession under license at intervals not to exceed 12 months. The results of these physical inventories shall be retained in records by the licensee until the Commission terminates the license authorizing the possession of the material.

Provide a description of the MC&A activities that will be performed or the measures in place that ensure compliance with this physical inventory requirement.

RAI-9: 10 CFR 70.4 includes the categorization of special nuclear material according to strategic significance. In the renewal application (section 8) the licensee indicates that the total inventory (this material under SNM-2013 and R-106) of special nuclear material at the Radiation Center would exceed the definition of moderate strategic significance per 10 CFR 70.4 (or Category II quantity of SNM). However, it stated that the University controls the total quantity of materials such that the facility does not exceed the Category III quantity of SNM of low strategic importance.

Provide a description of the MC&A activities that will be performed or the measures in place that ensure compliance with the license possession limits within the Category III quantity of SNM.