2026 UUTR License Amendment Request Supporting Documentation for Changing Periodicity of Fuel Inspection

Description of the Proposed change:

The University of Utah TRIGA reactor (UUTR) facility intends to make the following permanent changes to Technical Specifications:

1) Amendment to Chapter 4.1 of our Technical Specifications that would change the fuel inspection periodicity from "Inspection for transverse bend and length for fuel elements, cladding defect, overall visual inspection shall be performed biennially." to "At least 40 percent of irradiated fuel elements shall be inspected biennially such that all irradiated elements are inspected quadrennially. During the inspection, fuel elements in the core shall be examined for transverse bend, length, and cladding defects as described in **TS 3.1.6**. Irradiated elements in storage shall be inspected for cladding defects only. If, during the inspection, an element in the core is determined to not meet requirements in **TS 3.1.6**, excluding burnup, all fuel elements in the core shall be inspected."

2) Amendment to TS 1.3 Definition of Surveillance Intervals to include: Quadrennial - interval not to exceed 5 years.

Discussion of the current technical specification and effect of the change:

1) The current technical specification under TS 4.1.5 states:
Inspection for transverse bend and length for fuel elements, cladding defect, overall visual inspection shall be performed biennially.

The effect of the proposed change allows for reduced downtime for UUTR during biennial fuel inspection while still adhering to recommended guidance from General Atomics for fuel inspection. Fuel inspection will still be performed biennially to maintain facility proficiency with the procedure (and to inspect the control rods biennially as recommended by NUREG 1537).

UUTR SAR 9.2.6.1 states, "Minimal handling of the fuel is suggested because of the risk of dropping the fuel from the fuel handling tool to the tank floor where damage to the cladding or locator pin may occur." This change would be more in line with the SAR since it will result in less fuel handling while still maintaining General Atomics recommendations of fuel inspection periodicity. UUTR facility will modify its fuel inspection procedure to include inspection of half the elements in storage as well as half of the fuel elements in the reactor. The procedure will direct the inspection of a representative sample of the core configuration to prevent inspection localized to a single area (i. e. outer rings or one side of the core). By inspecting approximately half the elements in the reactor, the procedure would satisfy the 40% surveillance requirement, even if there was an odd number of elements in the reactor or newly added elements in a future power upgrade license amendment.

UUTR facility possesses several irradiated elements in storage that have been retired from reactor use and are awaiting return to DOE. UUTR facility desires to clarify that their inspection of transverse bend/elongation is not required since they will not be irradiated and therefore will

not be subjected to thermal/mechanical stresses that could cause elongation or transverse bending. This clarification prevents unnecessarily transferring elements in storage pits into the reactor tank for measuring their length and transverse bend when the elements have not been irradiated since last inspection nor will be irradiated.

Supporting Safety Analysis:

UUTR facility intends to cite NUREG 1537 guidance as the main justification for supporting safety analysis for changing the inspection periodicity of reactor fuel. UUTR does not have pulsing capabilities and since the facility is licensed to 100 kW with a low operational schedule, the fuel is not subjected to temperatures or burnup conditions that could necessitate more frequent inspection.

Of note, most other TRIGA facilities inspect their fuel less than biennially. The language for this modification is based off Reed Research Reactor's Technical Specification Surveillance Requirement 4.1.c, which states, "Forty percent of the fuel elements in the reactor core shall be inspected visually for damage or deterioration biennially such that each fuel element in the core is inspected quintennially.

Evaluation of proposed changes continuing to meet 10 CFR Requirements, NUREG-1537 guidance, and ANSI/ANS 15.1:

NUREG-1537 section 14.1 4.1.6 Fuel Parameters provides the following guidance regarding fuel inspection, "For non-pulsing TRIGA reactors, the fuel should be inspected and measured on at least a 5-year cycle." The proposed change for UUTR's fuel inspection requirement still falls within this guidance since all fuel elements would be normally inspected every 4 years, which is still more conservative than the recommended guidance. The statement, "such that each fuel element in the core is inspected quadrennially" ensures that UUTR will follow the 5-year recommended cycle.

Requested Time frame for this change: June 2027