

TX0-LTR-0021

ELECTRONIC DELIVERY

August 18, 2023

Director, Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

- References:
- 1) Docket No. 70-7027
 - 2) TRISO-X letter from Jennifer Wheeler to Director, Office of Nuclear Material Safety and Safeguards, "TRISO-X Fuel Fabrication Facility License Application Submittal," dated April 5, 2022
 - 3) NRC letter from Matthew Bartlett, Senior Project Manager, Fuel Facility Licensing Branch, to Jennifer K. Wheeler, "Request for Additional Information (Set 1) for the TRISO-X, LLC License Application for a Fuel Fabrication Facility (Enterprise Project Identification Number L-2022-NEW-0005)," dated May 31, 2023
 - 4) TRISO-X letter from Jennifer Wheeler to Director, Office of Nuclear Material Safety and Safeguards, "Response to Request for Additional Information (Set 1) for the TRISO-X, LLC License Application for a Fuel Fabrication Facility," dated July 28, 2023

Subject: **Supplemental Response to Request for Additional Information Question 3-2 (Set 1) for the TRISO-X License Application**

TRISO-X, LLC (TRISO-X) hereby submits a supplemental response to Request for Additional Information (RAI) question 3-2 *Evaluation for Local Intense Precipitation*, regarding the review of the License Application for the TRISO-X Fuel Fabrication Facility (Reference 2). This response is for the RAI set transmitted by letter dated May 31, 2023 (Reference 3) and supplements the response transmitted by letter dated July 28, 2023 (Reference 4).

Requests for Withholding

None. The enclosed submittal contains public information.

Summary of this Submittal

This submittal includes a response to RAI question 3-2 *Evaluation for Local Intense Precipitation*. There are no associated enclosures or attachments to this letter.

If there are questions or if additional information is required, please contact me at (865) 850-0893 or jwheeler@triso-x.com.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer Wheeler".

Jennifer K. Wheeler, P.E.
Vice President, Regulatory Affairs

TRISO-X, LLC
801 Thompson Avenue
Rockville, MD 20852

Copy: Mr. Matthew Bartlett, US NRC, NMSS
TRISO-X Regulatory Records File

Response to RAI 3-2

RAI 3-2 – Evaluation for local intense precipitation

Regulatory Basis:

This information is necessary to demonstrate compliance with the regulations in 10 CFR 70.61 which states, in part, in sections (b) and (c) that the risk of credible high- and intermediate- consequence events must be limited, and section (e) which requires the implementation of items relied on for safety. The guidance in NUREG-1520, Revision 2, describes, in part, one acceptable approach to demonstrate compliance with the regulation and includes the acceptance criteria used for the NRC staff's review.

Description of Issue:

Section 1.1.1.3, "Hydrology," of the LA and Sections 1.4.1, "Flood," and 4.2.5.5, "Design Basis Flood," of the ISA Summary describe and evaluate the effects of flooding due to nearby water bodies (e.g., river, wetland, creek, etc.). However, the application does not evaluate the effects of flooding due to other flood-related events like local intense precipitation and local storm runoff at the site. As discussed in Appendix D of NUREG-1520, Revision 2, flooding hazards may also be related to local intense precipitation/runoff, storm surge, and other similar events. Therefore, additional information is necessary to demonstrate how the facility was evaluated to prevent or mitigate the consequences of flooding events not related to nearby water bodies, and if additional items relied on for safety need to be identified to demonstrate compliance with the performance requirements in 10 CFR 70.61.

Information Needed:

Provide an evaluation of the effects of flooding due to local intense precipitation and local storm runoff.

TRISO-X Response:

TRISO-X evaluated local intense precipitation (LIP) and local storm runoff at the site following the guidelines specified in USNRC NUREG/CR-7046 for estimation of a design basis flood. National Oceanic and Atmospheric Administration (NOAA) Hydrometeorological Report No. 56 (HMR 56) recommended probable maximum precipitation (PMP) values were used for the site. NUREG/CR-7046 defines LIP as a measure of the extreme precipitation at a given location. LIP values were determined using the data provided in NOAA HMR 56.

Using HMR 56, Figure 23, and identifying the TRISO-X site location, the 6-hour, 1-mi² PMP value is 36.3 inches. The LIP analysis uses this PMP value to conclude that a maximum water depth of 19 inches above the top of the floor elevation of 811 feet could possibly be reached within the facility.

NUREG/CR-7046, Section 1.1 states, "a probable maximum flood (PMF) is the hypothetical flood generated in the drainage area by a probable maximum precipitation (PMP) event". NUREG/CR-7046, Section 5.6 states, "the cause of the flood is assumed to be a worst-case event that cannot be exceeded in terms of severity; however, at the same time, the PMF is defined to be the most severe, reasonably possible flood at a site." NUREG/CR-7046, Section 5.6 also includes reference to an additional study that concludes the "probability of occurrence of a PMF is less than 10⁻⁵." Based on these bounding conditions, the methodology followed in NUREG/CR-7046 corresponds to a highly unlikely event.

Nuclear criticality safety evaluations demonstrate that all individual components, vessels, and storage arrays remain subcritical when reflected and moderated with water; except for storage of fuel products in drums. The nuclear criticality safety

Response to RAI 3-2

evaluation for drum storage arrays demonstrates that up to 50 drums remain subcritical when reflected and moderated with water in each array. This flooding event also remains subcritical since 19 inches of water is less than the drum height such that water cannot reach the lid to enter the drums. A water depth of 19 inches will also not reach uranium materials located within bench top hoods or glovebox operations. As such, this flooding event will not lead to intermediate chemical/radiological exposures, nor to environmental effluent consequences due to only low contamination levels present on the building floor. This demonstrates compliance with the performance requirements in 10 CFR 70.61 since the highly unlikely LIP and local storm runoff does not lead to an ISA consequence level.

References

1. Design Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America, U.S. Nuclear Regulatory Commission (USNRC) Regulatory Guideline CR-7046, PNNL-20091, November 2011.
2. Hydrometeorological Report No. 56 (HMR 56), Probable Maximum and TVA Precipitation Estimates With Areal Distribution for Tennessee River Drainages Less Than 3,000 Mi² in Area, National Oceanic and Atmospheric Administration (NOAA), Tennessee Valley Authority (TVA), October 1986.
3. NCSE-TRISO-023, Rev. 1, Nuclear Criticality Safety Evaluation for Shipping Container Loading and Storage.

License Application Changes

None.