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~~**THE ENCLOSURES TO THIS LETTER CONTAIN SECURITY-RELATED, EXPORT CONTROLLED, AND PROPRIETARY INFORMATION – WITHHOLD IN ACCORDANCE WITH 10 CFR 2.390**~~

ELECTRONIC DELIVERY

October 13, 2022

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 Senior Project Manager, Office of Nuclear Material Safety and Safeguards, to Jennifer Wheeler, "Requests for Supplemental Information for the Acceptance Review of the TRISO-X, LLC License Application for a Fuel Fabrication Facility," dated August 9, 2022
4) NRC email from Senior Project Manager, Office of Nuclear Material Safety and Safeguards, to Jennifer Wheeler, "Extension of Due Date for the TRISO-X Response to the Request for Supplemental Information," dated September 16, 2022

Subject: **Response to Requests for Supplemental Information for the Acceptance Review of the TRISO-X Fuel Fabrication Facility License Application Submittal**

TRISO-X, LLC (TRISO-X) hereby submits responses to the subject Requests for Supplemental Information (RSI), regarding the acceptance review of the License Application (LA) to possess and use special nuclear material in the TRISO-X Fuel Fabrication Facility (References 2 and 3). The due date for the responses was extended to October 14, 2022 (Reference 4).

It is the intent of TRISO-X to provide sufficient responses to the NRC RSIs in order for the NRC to accept the application for review and to prepare a review schedule for completion of the review. This project is of very high priority and will be supporting the development of a new advanced

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reactor design which is being reviewed under a separate track within the NRC. On November 15, 2021, the bipartisan Infrastructure Investment and Jobs Act was signed into law, providing more than $62 billion for the U.S. Department of Energy (DOE) to support innovation as a critical component for meeting climate change goals of reaching 100% carbon-free electricity by 2035 and a net-zero-carbon economy by 2050. Within the Act's funding for DOE, the Advanced Reactor Demonstration Program (ARDP) is fully funded for $2.5 billion to help domestic private industry demonstrate two U.S. advanced nuclear reactor designs through cost-shared partnerships with industry by 2028.

In October 2020, DOE selected X-energy under the ARDP to deliver a commercial TRISO fuel fabrication facility and a four-module version of its Xe-100 high temperature gas-cooled reactor by 2027. For project funding to continue as planned, and in order to secure necessary private capital investments, it is important to continue demonstrating forward progress and achievement of project milestones. A key milestone for the TRISO-X facility is acceptance of the LA documents by the NRC and commencement of review activities.

However, based on the breadth, scope, and content of the RSIs, TRISO-X would like to bring to your attention some significant items related to our understanding of the needs for the content of an acceptable LA and Integrated Safety Analysis (ISA) Summary and what TRISO-X believes the NRC is asking for based on the RSIs. In addition to guidance provided in NUREG-1520, *Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility,* Revision 2, the TRISO-X LA is based on historical precedents for new license applications that were established since the revisions to 10 CFR Part 70 in 2000 which required an ISA to be prepared. As discussed further in this letter, many of the items related to our concerns have been previously adjudicated by the NRC considering the application reviews that occurred in the early 2000's.

The following are the general issues which TRISO-X believes warrant further understanding between TRISO-X and the NRC in order to resolve the RSIs and issues related to the RSIs. These items are discussed individually later in this document.

A. The level of detail required in the LA/ISA Summary versus what is included in supporting documents. It should be noted that TRISO-X fully supports the staff need to review supporting documentation that is part of the broader ISA. It is also recognized that supporting documentation is maintained under TRISO-X's configuration management program. Additionally, previous license review experience has demonstrated that the performance of in-office reviews of supporting documentation, site visits, and discussions between both NRC technical reviewers and applicant staff are instrumental in making sure there is an accurate understanding of the technical basis of an application. The use of in-office reviews greatly adds to the effectiveness and efficiency of the review and results in an expedited resolution of any regulatory and technical issues.

B. TRISO-X believes that the level of information available is sufficient for the NRC to perform a programmatic review of the application based on the current stage of design. TRISO-X anticipates detailed final design information and as-built conditions (including specific IROFS components) to be evaluated by the NRC staff during the construction inspection program and an operational readiness review.

C. TRISO-X has performed an evaluation of the basis for a highly unlikely determination for natural phenomena hazards. The TRISO-X Fuel Fabrication Facility process building is being designed and will be constructed according to the 2018 edition of the International Building Code and American Society of Civil Engineers (ASCE) 7-16, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*, which take into account the most severe documented natural phenomena hazards applicable to the Oak Ridge, Tennessee, location of the site. Based on these commitments, it has been determined that it is highly unlikely that the building will collapse due to a seismic or other natural phenomena event. Therefore, TRISO-X has determined that no IROFS related to the process building structure are needed in order to demonstrate compliance with 10 CFR 70.61.

Summary of and Basis for TRISO-X ISA Approach

The ISA conducted and the ISA summary derived from it were conducted in accordance with the information presented below. TRISO-X utilized this process, an experienced regulatory team with over 15 years of NRC regulated ISA-related experience, and the existing NRC Guidance documentation expanded upon below in preparing the documents that comprise the ISA, including the ISA Summary submitted with the License Application (Reference 2). Attachment 1 of Enclosure 2 includes a List of Documents that will be available to the NRC during the licensing review through an online reference portal to support in-office reviews and hard copy during site visits.

1. Process Hazard Analysis

Process Hazard Analysis (PHA) meetings were held in 2020-2021 for each process area where special nuclear material will be stored, handled, or processed. The meetings were conducted, and results of each meeting were documented, per the approved PHA procedure (Enclosure 2, Att. 1, Item 1) in a PHA Report (Enclosure 2, Att. 1, Items 8 through 21). Each PHA Report includes the team members, the process area evaluated, the date range when the PHA was performed, the basis for the analysis technique, checklists used, accident sequence documentation (unique accident sequence number, the upset condition, the cause(s), the potential safety consequence pertaining to the applicable safety discipline(s), and the suggested or existing controls that prevent or mitigate

the upset condition), and a list of drawings and/or other system documents used to perform the PHA.

Guidance used to perform the PHAs and ISA included NUREG-1513, *Integrated Safety Analysis Guidance Document*, and the Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE), *Guidelines for Hazard Evaluation Procedures* and *Guidelines for Process Safety Documentation*. The purpose of NUREG-1513 "is to provide general guidance to NRC fuel cycle licensee/applicants on how to perform an integrated safety analysis (ISA) and document the results." *Guidelines for Hazard Evaluation Procedures* is specifically cited in NUREG-1513 as an industry standard for managing process safety by providing "information on the most common hazard evaluation techniques used for analyzing process systems and identifying potential accidents." Footnote 2 on page 6 of NUREG-1513 further states "There are other references that describe ISA methodologies. However, the AIChE text is clear, comprehensive, and is well-suited to practitioners of hazard analysis." Two TRISO-X team members attended PHA Leader training in December 2019 to enhance previous PHA Leader training and ensure that the latest and best practices were being used. This training was co-led by one of the members of the Hazard Evaluation Procedures Subcommittee of CCPS' Technical Steering Committee responsible for preparation of the 3rd Edition of *Guidelines for Hazard Evaluation Procedures.*

2. Consequence Evaluation, Risk Assessment, and Identification of IROFS

Accident sequences identified by the PHA as having a potential safety consequence are evaluated.

a. Nuclear criticality consequences are documented per the approved Nuclear Criticality Safety Evaluation procedure (Enclosure 2, Att. 1, Item 7) and calculational methods (Enclosure 2, Att. 1, Item 5). NCSE documents (Enclosure 2, Att. 1, Items 32 through 59) and NCS Calculation documents (Enclosure 2, Att. 1, Items 60 through 87) present the evaluations and results.

b. Radiological and chemical consequences are documented per the approved Accident Consequence Evaluation (ACE) procedure (Enclosure 2, Att. 1, Item 2), consequences are calculated using an approved methodology (Enclosure 2, Att. 1, Items 88 and 89), and ACE documents present the evaluations and results (Enclosure 2, Att. 1, Items 90 and 91).

c. As committed to in LA Chapter 7, Section 7.1, Fire Safety, evaluation of fire hazards is documented in a Fire Hazards Analysis (FHA) per National Fire Protection Association (NFPA) 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*, 2014 edition. The FHA (Enclosure 2, Att. 1, Item 92) is supported by several fire modeling reports (Enclosure 2, Att. 1, Items 93 through 95).

Each accident sequence identified by the PHA that could potentially lead to a radiological or chemical consequence of interest, and all accident sequences with the potential of resulting in a criticality, are further evaluated and IROFS are identified per the approved Risk Assessment procedure (Enclosure 2, Att. 1, Item 3) in a Risk Assessment Report (Enclosure 2, Att. 1, Items 96 through 119).

3. Documenting the ISA Results

NUREG-1513, pages 20 and 21, state "The ISA documentation should include not only the results of the analysis (i.e., the description of accident sequences), but other information related to the conduct of the ISA. The amount of information used and generated during the ISA process can be substantial. The process safety information alone can include many detailed drawings and diagrams as well as hundreds of pages of specifications, procedures, etc. In addition to the process safety information, the documentation of the ISA should include a description of the site, the facility, the processes that were analyzed, the method that was used, the people who performed the analysis, the time frame during which the analysis was performed, the potential accident sequences that were identified, and the safety controls and associated management controls that have been identified and implemented to prevent or mitigate the consequences of the identified accidents. The important assumptions made in the analysis should also be documented. All documentation associated with the ISA process should be maintained by the licensee's Configuration Management System to assure that it is representative of the current status of the facility. The information submitted for NRC review along with a license or license renewal application is expected to be a subset of the entire ISA documentation."

4. Level of Information Needed for 10 CFR 70 Licensing

On November 15, 2006, NRC staff members filed a Differing Professional Opinion (DPO-2006-005) concerning the acceptability of the staff's approach to licensing new fuel cycle facilities (ADAMS Accession No. ML063260307). Specifically, the concern related to the licensing approach outlined in an August 4, 2006, memo (Memo) from the Director of the Division of Fuel Cycle Safety and Safeguards that used a reasonable assurance standard focused on the applicant's programmatic commitments and that "consequently, the licensing decision is ultimately based on a sufficient level of detail to understand process system functions and functionally how items relied on for safety can perform their intended function and be reliable" (ADAMS Accession No. ML062160073). The concerns raised in the DPO focused on whether the programmatic review described in the Memo was consistent with the requirements of 10 CFR 70 and the review guidance in NUREG-1520, *Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility*.

An Ad-Hoc Review Panel was established on December 22, 2006, to independently review the concerns raised in DPO-2006-005. The Panel concluded in a report dated March 30, 2007, that a

programmatic review is consistent with the requirements of Part 70, the Statements of Considerations for the rule, and guidance in the Standard Review Plan (SRP) NUREG-1520 (ADAMS Accession No. ML071080145).

Consistency with Part 70

a. Pages 2 and 3 of the Panel report state "The Panel performed an extensive review of Part 70, Subpart H requirements and the rulemaking history of the revisions to Part 70 to determine the scope and intent of Part 70. The Panel concluded from its research that a licensing review based upon a functional level of design detail is consistent with Part 70…Part 70 is a risk-informed, performance-based regulation. Performance-based regulation provides applicants and licensees flexibility in meeting established performance criteria."

b. Page 3 of the Panel report states "The Statements of Consideration (SOC) for the final revisions to Part 70 provide that there must be sufficient information in the ISA summary for the staff to make its determinations required by section 70.66. In the SOC, the Commission indicated that information at a systems level could be sufficient. Specifically, the Commission stated: "The current language permits the description of information at a system level provided that there is enough detail to understand the function of the system in relation to the performance requirements. The degree of detail provided in the ISA Summary, with the other information available to NRC staff, must be sufficient for the NRC staff to make the determination specified in §70.66.""

c. Pages 3 and 4 of the Panel report state "The staff explained its position to the Commission in a meeting on June 20, 2000. There the staff made a number of statements indicating that the applicant (or licensee) had flexibility over how much detail it chose to submit in an ISA summary. For example, in discussing the change process of section 70.72, the staff stated that how often a licensee would need to submit a license amendment request would depend on the level of detail in the ISA summary. The staff stated that a licensee could come in at a "fairly" high level of information and still meet the rule. The staff explained further that licensees have flexibility under the proposed rule. In response to Commissioner questions regarding the change process, the staff indicated that an applicant need only describe an IROFS at the functional level, and not at the component level. The staff explained: "If it's truly at a higher level, this is the system and these are the functions we want that system to do to meet the performance requirements, I would expect there to be less changes to that, because I think you can change components within the system. Not every component in a system would be a safety-related component. Even then, if you don't describe on a component level in your application, changes can be made to components as long as the functions described

in the application and the system don't change." (emphasis added). A review of the staff's comment resolutions for both the proposed rule and final rule express similar views. Thus, it appears that for the ISA summary, a description of the facility, processes, and IROFS could be at the functional level."

d. Page 4 of the Panel report states "Part 70 provides baseline design criteria that must be addressed in the design of new facilities. The baseline design criteria are a set of initial design safety considerations. The design of a facility is then to be further refined by the performance of the ISA. However, for fuel facilities, the NRC does not explicitly approve a design. The inference is that the design need not be final at license application."

e. Page 4 of the Panel report states "Therefore, a reasonable interpretation of the Commission's expectation with respect to Part 70 licensing is that the applicant would perform an ISA and submit an ISA summary for staff review. That summary would, consistent with 70.65(b), contain a "general description" of the facility, among other things. The staff would then review the summary, as well as other aspects of the license application and issue a license with certain commitments to design and operate the facility based on the information in the application and the ISA summary. Prior to operations, the staff would perform an operational readiness review to ensure that the facility had been constructed in accordance with the commitments in the license. Thus, under this scenario, it is not unreasonable for the staff to review the design of the proposed facility at the functional or programmatic level, and then follow up the functional-level review with design-level reviews before approving the facility for operation. Accordingly, following this process, the Memo is consistent with Part 70."

Consistency with NUREG-1520

f. Page 4 of the Panel report states "The Panel has determined that the SRP could, in the areas reviewed (section 3.4.3.2 specifically), be interpreted from a programmatic level in terms of completeness, i.e., the Memo is not inconsistent with the SRP. This is, in general, the argument the staff has made to the Atomic Safety Licensing Board (ASLB) in the USEC American Centrifuge Plant (ACP) hearing. The Panel, however, did not reach this conclusion easily. Only after reviewing the regulatory history and the filings with the Board was the Panel able to reach this conclusion. The original review by the Panel, and arguably a simple reading of section 3.4.3.2, would not obviously lead to an understanding that the review was to be conducted at a programmatic level and not at a detailed design level."

g. Page 5 of the Panel report states "In the staff's February 6, 2007, filing with the ASLB in the USEC ACP hearing, the staff stated that in future revisions to the SRP,

the staff plans to provide clarifying guidance on the necessary level of detail for new facilities. Such a clarification to the SRP would be beneficial for future license application review and eliminate the apparent misunderstanding that occurred among staff in the USEC ACP review. The Panel does not believe this clarification should be limited to new facilities. Part 70 does not distinguish between new and existing facilities in terms of the level of detail necessary for applications, amendments and renewals. There is no apparent regulatory basis for having a different standard for reviews conducted for new versus existing facilities…If different acceptance standards persist for new and existing facilities, confusion as to the appropriate level of detail required for future reviews is more likely to recur."

Conclusions

h. Page 5 of the Panel report states "The Panel concludes that a programmatic review, as described in the August 4, 2006, memorandum, is consistent with the requirements of Part 70. The Panel also concludes that, for the reviewed portions, NUREG-1520 (the SRP) could be interpreted to allow a programmatic review although that conclusion is not readily reached by relying solely upon the language in the SRP. The Panel has concluded that it would be of benefit for the staff to modify the SRP to be clear that a programmatic review is acceptable, and establish this as the sole standard in the SRP for both new and existing facilities, as opposed to only applicable to new facilities as the staff indicated it planned to do in its filing with the USEC ACP Hearing Board."

A memo dated July 24, 2007, from the Director of the Office of Nuclear Material Safety and Safeguards (ADAMS Accession No. ML12205A170), and a memo dated January 9, 2008, from the Executive Director for Operations (ADAMS Accession No. ML12205A168) both concurred with and supported the conclusions made by the Panel that independently reviewed DPO-2006-005. The Panel concluded that a programmatic review, as described in the August 4, 2006, memorandum is consistent with the requirements of Part 70. In addition, the SRP can be interpreted to allow a programmatic review when considered along with the rule itself and the Statements of Considerations for the rule. The January 9, 2008, memo further states "The intent of the rule change was to create a performance based rule to allow flexibility and lessen the burden on affected internal and external stakeholders by providing the necessary design and ISA information commensurate with the risk of the facility. This conclusion is supported by the Statements of Consideration for the final revisions to Part 70 and during the staff's explanation on their position to the Commission in a meeting on June 20, 2000."

5. May 2010 Revisions to NUREG-1520 as a Result of DPO-2006-005

As a result of recommendations from the DPO Panel report, the following items were added in Revision 1 of NUREG-1520 in May 2010.

a. NUREG-1520, Revision 1, Page 2, paragraph 4. "In reviewing 10 CFR Part 70 license applications, the staff uses a reasonable assurance paradigm and focuses on the programmatic provisions of the applicant's proposed activities. Consequently, the licensing decision is ultimately based on information with a sufficient level of detail that permits reviewers to understand process system functions, and functionally, how items relied on for safety (IROFS) can perform as intended and be reliable. This staff review method is intended to ensure that the staff decision is based on a reasonable assurance that the submitted ISA Summary is complete and that the licensee will comply with the ISA and maintain it consistent with the regulations. The level of detail required for a licensing decision generally does not require a final facility design; however, identification of all IROFS and possible accident sequences is necessary to make a licensing decision."

   [NUREG-1520, Revision 2, page 2, paragraph 3]

b. NUREG-1520, Revision 1, Page 3, paragraph 1. "Furthermore, for significant modifications to existing fuel cycle facilities, such as the licensing and construction of new processes, the staff may impose a license condition that specifies that an operational readiness review (ORR) inspection be conducted before operation to verify that the new part of the facility has been constructed in accordance with the requirements of the license."

   [NUREG-1520, Revision 2, page 3, paragraph 1]

c. NUREG-1520, Revision 1, Page 3-9, Section 3.4.3, paragraph 1. "The acceptance criteria are thus intended to support the ultimate finding of the license review that, based on the information submitted and reviewed, there is reasonable assurance that the proposed facility, IROFS, safety programs, and management measures conforming to the commitments in the application comply with the regulations and provide adequate protection of public health and safety."

   [NUREG-1520, Revision 2, page 3-9, Section 3.4.3, paragraph 1]

d. NUREG-1520, Revision 1, Page 3-9, Section 3.4.3, paragraph 2. "A high level of detail describing the process designs and IROFS might not be submitted with the license application or ISA Summary. In other words, the applicant might not provide information about all the components in a system, because not every component would be a safety-related component. In particular, for proposed new facilities, the level of detail may be limited since the hardware has not actually been fabricated. …The NRC staff may obtain

additional details for processes selected for the vertical slice review by visiting the applicant's site."

[NUREG-1520, Revision 2, page 3-9, Section 3.4.3, paragraph 2]

e. NUREG-1520, Revision 1, Page 3-9, Section 3.4.3, paragraph 3. "The purpose of the review, and its acceptance criteria, for most facilities, is primarily to permit a finding that the applicant's safety program, including the ISA program as described, provides reasonable assurance that compliance will be achieved. However, to generate the ISA Summary, which is a required submission, the applicant must first perform an ISA. This in turn requires that the applicant identify process designs, accident sequences, and IROFS. These latter items are not programmatic, but are elements of design and analysis of design. Attainment of reasonable assurance that the ISA program is and will be effective does not usually require that all safety elements and IROFS be reviewed in full detail, nor is it required that the applicant's description of IROFS and process designs be at the level of detail that will eventually exist at the time of operations (see the discussion of vertical slice review in Section 3.5)."

   [NUREG-1520, Revision 2, page 3-9, Section 3.4.3, paragraph 3]

f. NUREG-1520, Revision 1, Page 3-15, Section 3.4.3.2(3)a. "Hence, all process designs must be described in sufficient detail to reasonably permit identification of all accident sequences and IROFS to prevent or mitigate them. The level of detail in process safety documentation held at the site would normally be greater than the descriptions in the ISA Summary and may include some or all of the information listed as items i through iv below, as needed."

   [NUREG-1520, Revision 2, page 3-15, Section 3.4.3.2(3)a.]

g. NUREG-1520, Revision 1, Page 3-16, Section 3.4.3.2(3)c. "The level of detail required in describing accidents is closely related to the level of detail in describing IROFS, as many events leading to consequences of concern in 10 CFR 70.61 are failures of IROFS. It is not usually necessary to specify all modes and mechanism by which the IROFS failure could occur in order to understand the role that the IROFS plays in preventing or mitigating the accident."

   [NUREG-1520, Revision 2, page 3-16, Section 3.4.3.2(3)c.]

6. June 2015 Revisions to NUREG-1520

The following items were further added or edited in Revision 2 of NUREG-1520 in June 2015.

a. NUREG-1520, Revision 2, Page 2, paragraph 1. "The staff uses a "reasonable assurance" paradigm and focuses on the programmatic provisions of the applicant's proposed

activities. To carry out this responsibility, the staff focuses on the descriptive commitments of the safety program in the license application and the description of processes, hazards, controls, and management measures in its ISA Summary and onsite ISA documentation."

b. NUREG-1520, Revision 2, Page 2, paragraph 4. "For new facilities or new processes at existing facilities, there may not be complete detail or a final design available at the time of licensing."

7. Site Visits to Review ISA Documentation

Furthermore, NUREG-1520 has included the following guidance beginning with Revision 0, through Revision 1, and continuing to the current Revision 2.

a. NUREG-1520, Revision 0, page 3-6, Section 3.3.2, paragraph 5. "The NRC review of the applicant's example accident sequence evaluations included in the ISA Summary is not a substitute for the "vertical slice" and "horizontal" reviews that should be performed using detailed information at the site. This onsite evaluation of ISA documentation and processes must be NRC-selected in order to confirm that the ISA was actually performed as described in the ISA Summary.

[NUREG-1520, Revision 1, page 3-7, Section 3.3.2, paragraph 2]
[NUREG-1520, Revision 2, page 3-7, Section 3.3.2, paragraph 3]

b. NUREG-1520, Revision 0, page 3-29, Section 3.5.2.2, paragraph 4. "After a preliminary team review of the ISA Summary, a visit to the facility would normally be made for familiarization with the 3-D geometry of process equipment, to review components of the ISA, and to address any issues that arose during review of the ISA Summary."

[NUREG-1520, Revision 1, page 3-33, Section 3.5.2.2, paragraph 3]
[NUREG-1520, Revision 2, page 3-34, Section 3.5.2.2, paragraph 3]

c. NUREG-1520, Revision 0, page 3-30, Section 3.5.2.3, Onsite ISA Review. "The reviewer(s) should plan on visiting the applicant's facility at least once as part of the application review process. This visit should be scheduled after the applicant's ISA Summary has received a preliminary review. The visits will enable the reviewer(s) to confirm through detailed examination of the ISA and ISA documentation that the ISA method(s) were selected and applied in a reasonable and thorough manner to all facility processes, that all credible high and intermediate consequence accident sequences were correctly identified, that accident sequence consequences and likelihoods were reasonably determined, and that appropriate IROFS and supporting management measures have been proposed. By means of a "horizontal" review and several "vertical" slice reviews (defined below) of processes selected by the reviewer(s), the completeness and adequacy of the applicant's ISA method(s) can be established. The reviewer(s) may use the ISA documentation to perform independent evaluations of process hazards and accident

sequences using methods selected from NUREG-1513, Appendix A to this SRP chapter, or other NRC guidance."

[NUREG-1520, Revision 1, page 3-33, Section 3.5.2.3]
[NUREG-1520, Revision 2, page 3-34, Section 3.5.2.3]

d. NUREG-1520, Revision 0, page 3-30, Section 3.5.2.3, Onsite ISA Review. "The site visit will also afford the reviewer(s) an opportunity to seek answers to questions from the applicant (or possibly the ISA team) that may have arisen in the preliminary review of the ISA Summary."

   [NUREG-1520, Revision 1, page 3-34, Section 3.5.2.3]
   [NUREG-1520, Revision 2, page 3-35, Section 3.5.2.3]

e. NUREG-1520, Revision 0, pages 3-30 through 3-32, Section 3.5.2.3, Onsite ISA Review. The three facets of the onsite ISA review – 1) ISA Methods Review, 2) Horizontal Review, and 3) Vertical Slice Review – are each discussed in detail.

   [NUREG-1520, Revision 1, pages 3-33 through 3-36, Section 3.5.2.3]
   [NUREG-1520, Revision 2, pages 3-34 through 3-37, Section 3.5.2.3]

Conclusion

TRISO-X believes that the level of information available in the ISA Summary, together with the supporting ISA documentation, is sufficient for the NRC to accept the application for review and to perform a programmatic review of the application based on the current stage of design. For fuel facilities, the NRC does not explicitly approve a design. The inference is that the design need not be final at license application. TRISO-X believes that any outstanding questions can be resolved during the technical review and/or will be evaluated and confirmed (as appropriate) during an operational readiness review.

TRISO-X believes that the performance of in-office reviews of supporting documentation, site visits, and discussions between both NRC technical reviewers and applicant staff are instrumental in making sure there is an accurate understanding of the technical basis of an application, and greatly adds to the effectiveness and efficiency of the review and results in an expedited resolution of any regulatory and technical issues.

The TRISO-X Fuel Fabrication Facility process building is being designed and will be constructed according to the 2018 edition of the International Building Code and American Society of Civil Engineers (ASCE) 7-16, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*, which take into account the most severe documented natural phenomena hazards applicable to the Oak Ridge, Tennessee, location of the site. Based on these commitments, it has been determined that it is highly unlikely that the building will collapse due to a seismic or other

natural phenomena event. Therefore, TRISO-X has determined that no IROFS related to the process building structure are needed in order to demonstrate compliance with 10 CFR 70.61.

A revised ISA Summary that incorporates changes referenced in the RSI responses will be submitted by November 4th, 2022.

This project is of very high priority and is vital to the development of a new advanced reactor design which is being reviewed under a separate track within the NRC. For project funding to continue as planned, and in order to secure necessary private capital investments, it is important to continue demonstrating forward progress and achievement of project milestones. A key milestone for the TRISO-X facility is acceptance of the LA documents by the NRC and commencement of review activities.

Requests for Withholding

Portions of the enclosed submittal contain information that TRISO-X requests be withheld from public disclosure. The following regulations and guidance were consulted to develop the document markings and specific withholding requests as noted in the description of each enclosure's contents.

- 10 CFR 2.390, *Public inspections, exemptions, requests for withholding*
- 10 CFR 110, *Export and Import of Nuclear Equipment and Material*, and other related regulations 10 CFR 810 and 15 CFR 730-774
- NRC Regulatory Issue Summary 2005-31, Revision 1, *Control of Security-Related Sensitive Unclassified Non-Safeguards Information Handled by Individuals, Firms, and Entities Subject to NRC Regulation of the Use of Source, Byproduct, and Special Nuclear Material*

Summary of this Submittal

The following Enclosures and Attachments are included with this letter.

Enclosure 1 – Affidavit, as required by 10 CFR 2.390(b) to support TRISO-X requests to withhold the below-mentioned proprietary information.

Enclosure 2 – Responses to Requests for Supplemental Information to Support the TRISO-X License Application (Non-proprietary)

Attachment 1 – List of Documents

Attachment 2 – Geological Cross Section Based on Soil Borings

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Enclosure 3 – Responses to Requests for Supplemental Information to Support the TRISO-X License Application (Proprietary, Security-related, and/or Export Controlled Information)

Attachment 1 – Examples from ISA Summary, Risk Assessments, IROFS List, and Chemical Accident Consequence Evaluation

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

Sincerely,

Robert Maurer, for

Jennifer K. Wheeler, P.E.
Director, Regulatory Affairs

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

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