



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

January 17, 2019

MEMORANDUM TO: Margie A. Kotzalas, Chief  
Fuel Facility Licensing and Oversight Branch  
Division of Fuel Cycle Safety, Safeguards,  
and Environmental Review  
Office of Nuclear Material Safety  
and Safeguards

FROM: David H. Tiktinsky, Sr. Project Manager */RA/*  
Fuel Facility Licensing and Oversight Branch  
Division of Fuel Cycle Safety, Safeguards,  
and Environmental Review  
Office of Nuclear Material Safety  
and Safeguards

SUBJECT: MEETING SUMMARY: MEETING WITH X-ENERGY TO  
PROVIDE PRE-APPLICATION INFORMATION RELATED TO  
CRITICALITY SAFETY REGARDING THE TRISO-X FUEL  
FABRICATION FACILITY LICENSE APPLICATION

PURPOSE:

The purpose of the meeting was for X-Energy to provide a pre-application discussion of criticality safety related to an application for a first of a kind commercial TRISO-X fuel fabrication facility. X-Energy is planning to apply for a license for a Category II fuel fabrication facility as defined in Title 10 of the *Code of Federal Regulations* Part 70, "Domestic Licensing of Special Nuclear Material".

MEETING SUMMARY:

The meeting took place on December 12, 2018, at the U.S. Nuclear Regulatory Commission Two White Flint Building in Rockville, Maryland. Attendees included X-Energy, Paschal Solutions (an X-Energy contractor) and staff from the Office of Nuclear Material Safety and Safeguards.

DISCUSSION:

X-Energy discussed their approach to integrating criticality safety into their anticipated application for a TRISO-X fuel fabrication facility. X-Energy is currently developing its preliminary design and nuclear criticality safety evaluations.

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301-415-8740

They also discussed the qualifications of the team that is performing the criticality analyses and level of experience the team members possess. The design philosophy they are following is intended to assure that double contingency is met in the process design and that nuclear criticality safety is integrated into the design from the onset of the project.

There was a discussion of the establishment of nuclear criticality safety design requirements through the development of preliminary criticality safety evaluations. The calculational methods and validation of criticality models that are being used were described at the meeting. There was a further discussion of the development of the upper subcritical limit and the area of applicability.

X-Energy also stated that the integrated safety analyses (ISA) is scheduled to start in the fourth quarter of 2019 and criticality will be addressed in the ISA. The ISA will also identify criticality scenarios and items relied on for safety.

#### ACTION ITEMS

No regulatory decisions were made at the meeting.

If you have any questions or comments, please contact me at (301) 415-8740 or via e-mail at [David.Tiktinsky@nrc.gov](mailto:David.Tiktinsky@nrc.gov).

Docket No. 070-07027

Enclosures:  
Attendees List  
Meeting Attachment

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DATED: January 17, 2019

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<b>DATE</b>	01/16/2019	01/16/2019	01/16/2019	01/17/2019

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INFORMATION RELATED TO CRITICALITY SAFETY REGARDING THE TRISO-X FUEL  
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**December 12, 2018**

**Attendees List**

Pete Pappano	X-Energy
Mark McClure	Centrus
Tracy Henson	Paschal Solutions
Clint Gross	Paschal Solutions
James Hammelman	NRC/NMSS
Yawar Faraz	NRC/NMSS
April Smith	NRC/NMSS
Jeremy Munson	NRC/NMSS
Samantha Crane	NRC
Annie Ramirez	NRC/NMSS
David Tiktinsky	NRC/NMSS

Enclosure