



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

June 8, 2021

MEMORANDUM TO: William Kennedy, Acting Chief  
Advanced Reactor Licensing Branch  
Division of Advanced Reactors and Non-Power  
Production and Utilization Facilities  
Office of Nuclear Reactor Regulation

FROM: Lucieann Vechioli, Project Manager  
Advanced Reactor Licensing Branch  
Division of Advanced Reactors and Non-Power  
Production and Utilization Facilities  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JUNE 7, 2021, MEETING BETWEEN THE U.S.  
NUCLEAR REGULATORY COMMISSION STAFF AND X-  
ENERGY, LLC TO DISCUSS THE DEVELOPMENT OF A RISK-  
INFORMED PERFORMANCE-BASED LICENSING BASIS  
APPROACH

On June 7, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. [ML21152A221](#)), U.S. Nuclear Regulatory Commission (NRC) staff held a virtual observation public meeting with representatives from X-Energy, LLC (X-energy). The purpose of the meeting was to communicate X-energy's Nuclear Energy Institute (NEI) 18-04 implementation and the development of a Risk-Informed Performance-Based Licensing Basis approach to support the Xe-100 design, analysis, and license application development. The presentation slides can be found at ADAMS Accession No. [ML21187A108](#). The meeting attendees are included as an enclosure to this document.

The meeting began with X-energy providing an overview of their implementation of NEI 18-04 "Risk-Informed Performance-Based Technology Guidance for Non-Light Water Reactors" (ADAMS Accession No. [ML19241A336](#)) and the development of a risk-informed performance-based licensing basis. X-energy plans to not deviate from NEI 18-04 guidance and to optimize the organization of licensing and design bases results to maximize traceability and to maintain an effective communication. The integrated decision-making process (IDP) allow for a multidisciplinary teams to identify and iterate a set of licensing bases events (LBE), safety functions systems, structures and components (SSCs) classifications, and functional design criteria while the Probabilistic Risk Assessment (PRA) continues to be developed.

CONTACT: Lucieann Vechioli, NRR/DANU/UARL  
(301) 415-6035

X-energy stated that it used NEI 18-04 guidance to identify an initial set of licensing basis events (LBEs) and a preliminary set of required safety functions (RSFs) and PRA safety functions (PSFs). The list will be revised after PRA Phase 1 is complete, which is expected by fall 2021.

During the presentation, X-energy also went over their preliminary required functional design criteria for each of the identified RSFs and the framework for the defense in depth (DID) adequacy evaluation. The LBE selection, SSC classification and DID adequacy will be refined as the Xe-100 design continues to be mature. X-energy plans to submit a topical report about this topic in the next upcoming months.

The meeting ended with an open discussion among the participants. X-Energy will continue discussions with NRC staff related to this topic and other pre-application activities.

Project No.: 99902071

Enclosure:  
List of Attendees

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**NRC-001**

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NAME	LVechioli	SLent	WKennedy	LVechioli
DATE	7/8/2021	7/8/2021	7/8/2021	7/8/2021

**OFFICIAL RECORD COPY**

### List of Attendees

<b>NAME</b>	<b>ORGANIZATION</b>
Lucieann Vechioli	U.S. Nuclear Regulatory Commission (NRC)
Ian Jung	NRC
John Segala	NRC
Amy Cubbage	NRC
Travis Boyce	NRC
WKennedy	NRC
Michele Hayes	NRC
Julie Ezell	NRC
Travis Chapman	X-Energy LLC (X-energy)
Martin Van Staden	X-energy
Ethan Deters	X-energy
Steve Vaughn	X-energy
Raymon Wang	X-energy
Glen Lawson	X-energy
Ingrid Nordby	X-energy
Kyle Metzroth	X-energy
Luke McSweeney	Self
Harry Llao	Self
Jana Bergman	Self