



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

August 4, 2022

Travis Chapman
Lead Licensing Engineer
X-Energy, LLC.
801 Thompson Avenue
Rockville, MD 20852

SUBJECT: X ENERGY, LLC. - SAFETY EVALUATION FOR X ENERGY, LLC - XE-100
LICENSING TOPICAL REPORT XE00-R-R1ZZ-RDZZ-L, "RISK-INFORMED
PERFORMANCE-BASED LICENSING BASIS DEVELOPMENT,
REVISION 2" (EPID L-2021-TOP-0019)

Dear Mr. Chapman:

By letter dated July 7, 2021, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21196A069), X Energy, LLC (X-energy) submitted its Xe-100 Licensing Topical Report (TR) XE00-R-R1ZZ-RDZZ-L, "Risk-Informed Performance-Based Licensing Basis Development," Revision 1 dated June 25, 2021, for the U.S. Nuclear Regulatory Commission (NRC) staff's review. This TR provides a description of the approach taken by X-energy to develop a technology-inclusive, risk-informed, and performance-based process for the selection of licensing basis events, safety classification of structures, systems, and components to include associated risk-informed special treatments, and a determination of defense-in-depth adequacy that will form a portion of the Xe-100 licensing basis. As part of its review, the NRC staff developed a set of preliminary questions and sent them to X-energy on November 5, 2021 (ML21312A166). On November 17, 2021, the NRC staff held a public meeting with X-energy representatives to discuss these questions. The meeting summary can be found at ML21347A947. Subsequently, on March 15, 2022, X-energy submitted Revision 2 of its TR to the NRC staff, addressing the set of preliminary questions (ML22074A288).

On June 17, 2022, the NRC staff provided X-energy a draft of the safety evaluation (SE) for the purpose of identifying proprietary information (ML22131A068). On June 27, 2022, X-energy confirmed that the SE did not include proprietary information (ML22181B117). The final NRC staff's SE for "Risk-Informed Performance-Based Licensing Basis Development, Revision 2" is enclosed.

In accordance with the NRC's published information for Topical Reports available at <https://www.nrc.gov/about-nrc/regulatory/licensing/topical-reports.html>, the NRC staff requests that X-energy publish an accepted version of this topical report within 3 months of receipt of this letter. The accepted version should incorporate this letter and the enclosed SE. Also, the accepted version must contain historical review information, including requests for additional information (RAIs) and/or preliminary questions and respective responses. The accepted version should include a "-A" (designated accepted) following the topical report identification number.

As an alternative to including the RAI and RAI responses (or preliminary questions), if changes to the topical report were provided to the NRC staff to support the resolution of RAI responses,

and the NRC staff reviewed and approved those changes, there are two ways that the accepted version can capture the RAIs:

1. The RAIs and RAI responses (or preliminary questions) can be included as an Appendix to the accepted version.
2. The RAIs and RAI responses (or preliminary questions) can be captured in the form of a table (inserted after the final SE) which summarizes the changes as shown in the accepted version of the topical report. The table should reference the specific RAI and RAI responses (or preliminary questions) which resulted in any changes, as shown in the accepted version of the topical report.

If you have any questions or comments concerning this matter, please contact Lucieann Vechioli Feliciano at (301) 415-6035 or via e-mail at or Lucieann.VechioliFeliciano@nrc.gov.

Sincerely,



Signed by Jessup, William
on 08/04/22

William Jessup, Chief
Advanced Reactor Licensing Branch 1
Division of Advanced Reactors and Non-power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Project No.: 99902071

Enclosure:
As stated

cc: inordby@x-energy.com
tchapman@x-energy.com

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(EPID L-2021-TOP-0019) DATED: AUGUST 4, 2022

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