



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

March 10 , 2020

Mr. Harlan Bowers
President
X Energy, LLC
801 Thompson Avenue
Rockville, MD 20852

**SUBJECT: X-ENERGY, LLC –NRC FEEDBACK REGARDING XSTERM CODE SUITE
VERIFICATION AND VALIDATION WHITE PAPER (CAC NO. 00431)**

Dear Mr. Bowers:

By letter dated October 7, 2019 (Agencywide Documents Access and Management System Accession No. ML19280B392), X-Energy, LLC (X-Energy), submitted for U.S. Nuclear Regulatory Commission (NRC) staff review letter XE00-R-R1ZZ-RDZZ-L-000215_Rev 1 containing Transmittal of Proprietary White Paper on Mechanistic Source term Verification & Validation (XE00-T-S3-SWN_000144_XSTERM Code Suite Verification and Validation Plan_Rev 1). This white paper describes the physics, phenomena, test data and/or other codes that will be used to support verification and validation (V&V) of each of the models in the XSTERM code suite. The NRC staff was asked to perform a limited review of this paper and provide feedback on the proposed approach for each module. Subsequently, on October 16, 2019, and January 29, 2020, meetings were held between X-Energy and the NRC to discuss the submittal. The NRC staff completed its review of the submittal and is generally aligned with its overall approach to verification and validation. The enclosure of this letter provides the staff's detailed observations for X-Energy to consider.

The staff's comments on "XSTERM Code Suite Verification and Validation Plan" are specific to the source term white paper as submitted. These comments do not imply a staff review of the underlying code modules on fuel performance, thermodynamics, core design, or others for the purposes of safety analyses. The methodologies used for safety analyses during normal operation, anticipated operational occurrences, and postulated accidents is considered a separate effort from source term validation, regardless of similarities in the codes used in the analyses.

The Enclosure to this letter contains Proprietary information. When separated from the Enclosure, this document is DECONTROLLED.
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H. Bowers

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If you have questions about this matter, please contact Lucieann Vechioli at (301) 415-6035 or Lucieann.VechioliFeliciano@nrc.gov.

Sincerely,

/RA/

Benjamin Beasley, Chief
Advanced Reactor Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Project No.: 99902071

Enclosure:
As stated

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ADAMS Accession Nos. Pkg: ML20069E077

Letter: ML20069C346

Enclosure: ML20069E154(Non-public)

***via -email**

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