X Energy, LLC
801 Thompson Avenue
Rockville, MD 20852
+1 301-358-5600

XE00-R-R1ZZ-RDZZ-L-000217_Rev 1
10 CFR 2.390

November 12, 2019

Docket No: 99902071

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Subject: Follow-up on Mechanistic Source Term (MST) Verification & Validation (V&V) Meeting of October 16, 2019

On October 7, 2019, X-energy submitted 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) to the NRC. Subsequently, on October 16, 2019, a meeting was held between X-energy and the NRC to discuss that submittal. As a follow-up to that meeting, X-energy requests the NRC staff perform a limited review of X-energy's proprietary white paper on MST Verification & Validation Plan as described below.

The approach of X-energy's proprietary white paper on MST Verification & Validation Plan is to identify physics, phenomena, test data, and/or other codes to support the Verification and Validation (V&V) of the XSTERM code suite. The white paper is organized by modules, each addressing certain physical phenomena and/or transport mechanisms. It proposes a V&V methodology for each module based on the availability of test data and alternative benchmark calculations. These methodologies are described below:

- Methodology 1 – In cases where applicable test data exists, some of the data may have been developed under legacy programs and may not have a traditional quality program pedigree.
- Methodology 2 – In cases where no data exists, independent benchmark calculations are proposed. In some cases, NQA1 codes such as Flownex, STAR-CCM+ or MELCOR will be used.
- Methodology 3 – Where possible, validation is proposed using measured data, such as that obtained from Advanced Gas Reactor (AGR) Fuel Development test results. In these cases, the individual sub-models will not be validated, but an integrated effect will be validated at the level where test measurements correlate.

X-energy would like the NRC to review the identified physics, phenomena, test data, and/or other codes to support the Verification and Validation (V&V) as proposed for each module of our code suite. We request this feedback be documented as a written response to X-energy to assist with gaining NRC alignment on our MST V&V Plan. The projected level of effort for this review is ~250 hours as per X-energy submitted letter XE00-R-R127-RĐ22-L 0002L0 Rev 1 containing Regulatory Engagement Plan Revision for X-energy's Xe-100 Reactor to the NRC.

Sincerely,

Harlan W. Bowers

_____

Harlan Bowers
President
X Energy, LLC

X Energy, LLC
801 Thompson Avenue
Rockville, MD 20852
+1 301-358-5600

Cc:

Nuclear Regulatory Commission
Benjamin Beasley
Amy Cubbage
Lucieann Vechioli Feliciano
Michelle Hart
Kerri Kavanagh
Steve Lynch
Stuart Magruder
John Monninger
Jason Schaperow
John Segala

X Energy, LLC
Kim Lester
Eben Mulder
Martin van Staden
Clint Medlock (Southern)
Brandon W. Waites (Southern)