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January 16, 2018

XE00-R-R1-RD-L-000027

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

PRD10818

Subject: UPDATED DESIGN AND LICENSING SUBMITTAL INFORMATION  
NRC REGULATORY ISSUE SUMMARY (RIS)2017-08  
**PROCESS FOR SCHEDULING AND ALLOCATING RESOURCES FOR FISCAL  
YEARS 2020 THROUGH 2022 FOR THE REVIEW OF NEW LICENSING APPLICATIONS  
FOR LIGHT-WATER REACTORS AND NON-LIGHT-WATER REACTORS**

The purpose of this letter is to submit responses to Regulatory Issue Summary (RIS) 2017-08 on behalf of X Energy, LLC ("X-energy"). This submission also updates the prior X-energy submitted responses to RIS 2015-07 (response dated November 23, 2015) and RIS 2013-18 (response dated March 28, 2014). X-energy is a private, wholly-owned U.S. company that is pursuing the commercialization of an advanced high temperature gas-cooled pebble bed reactor (HTGR), designated as Xe-100 (X-energy 200 MW<sub>t</sub>), using U.S.-developed uranium oxycarbide (UCO) TRISO-coated particle fuel, in conjunction with NRC approval. X-energy's design approach leverages over 50 years of research, proven design, and operational experience in HTGR using a pebble bed architecture. In addition to developing the design of the Xe-100 pebble bed reactor, X-energy, through a US DOE cooperative agreement, is actively fabricating UCO based kernels, TRISO particles, and spherical pebble fuel elements in a well-equipped, X-energy operated facility at the Oak Ridge National Laboratory (ORNL). In the future, this work in TRISO-based fuel element production (referred to as our "TRISO-X" program) will be spun off into a separate fuel fabrication company that will ultimately provide fuel for all UCO TRISO-based reactor designs, which may include some Accident Tolerant Fuel (ATF) designs applicable to the existing fleet of light water reactors. The Xe-100 design and TRISO fuel manufacturing are well aligned with, and leverage, the Department of Energy's (DOE) Next Generation Nuclear Plant (NGNP) and Advanced Gas Reactor (AGR) fuel qualification initiatives, with the fuel qualification program established as the number 1 priority by the Energy Policy Act of 2005 (EPACT2005). In fact, the on-going TRISO-based fuel fabrication activities at ORNL take place in the laboratory previously used to produce AGR qualification test articles.

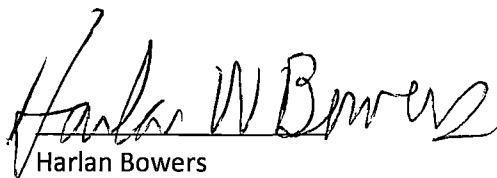
The Xe-100 utilizes intrinsically safe features with a simplified plant design to assure enhanced safety and security. Furthermore, the Xe-100 offers several inherent features reducing proliferation risks and, with the potential to utilize a future thorium-based fuel cycle, has the capacity to recycle spent fuel and reduce current stockpiles of plutonium with the very high burn-ups inherent to the Thorium fuel cycle. X-energy has no affiliation, official or otherwise, with any other company working on the pebble bed approach to HTGRs. X-energy is U.S.-owned and operates out of facilities in Greenbelt, Maryland and Oak Ridge, Tennessee.

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January 16, 2018

X-energy's responses to RIS 2017-08 contains commercially sensitive proprietary information and, as such, we are requesting that this information be withheld from public disclosure in accordance with 10 CFR 2.390, "Public inspections, exemptions, request for withholding," paragraph (a)(4). Since Commercially Proprietary information constitutes much of replies herein, a public version is not being submitted. Accordingly, Enclosure 1 is the Non-Public version of X-energy's responses to RIS 2017-08 which contains non-redacted sensitive information. This proprietary information is appropriately marked and an affidavit providing the basis for this request is provided in Enclosure 2.

Sincerely,

A handwritten signature in black ink, appearing to read "Harlan W Bowers", is written over a horizontal line.

Harlan Bowers  
President  
X Energy, LLC

Cc: Amy Cubbage, NRC, TWFN (NRO/DSRA/ARPB)  
James Hammelman, NRC, TWFN 4 A60  
John Monninger, NRC TWFN 9 F41  
John Segala, NRC, TWFN (NRO/DSRA/ARPB)  
Brian Smith, NRC, RGN-I (R-I/DRP/PB4/BRO)

Enclosures: 1) Response to RIS 2017-08  
2) Affidavit



**Affidavit**



I, Harlan W. Bowers, President of X-Energy, LLC (X-energy) do hereby affirm and state:

1. I am authorized to execute this affidavit on behalf of X-energy. I am further authorized to review information submitted to or discussed with the Nuclear Regulatory Commission (NRC) and apply for the withholding of information from disclosure. The purpose of this affidavit is to provide the information required by 10 CFR 2.390(b) in support of X-energy's request for proprietary treatment of certain commercial information submitted in enclosure 1 to X-energy's letter, XE-X1-LD-G0-L03-100264, from myself to the NRC which provides response to Regulatory Issues Summary (RIS) 2017-08.
2. I have knowledge of the criteria used by X-energy in designating information as sensitive, proprietary, or confidential.
3. Pursuant to the provision of paragraph (a)(4) of 10 CFR 2.390, the following is furnished for consideration by the NRC in determining whether the information sought to be withheld from public disclosure should be withheld.
  - a. The information sought to be withheld from public disclosure in Enclosure 1 is owned by X-energy, its affiliates or third parties to whom X-energy has an obligation to maintain its confidentiality. This information was prepared with the explicit understanding that the information itself would be treated as proprietary and confidential and has been held in confidence by X-energy.
  - b. The information sought to be protected in Enclosure 1 is not available to the public to the best of my knowledge and belief.
  - c. The information contained in Enclosure 1 is of the type that is customarily held in confidence by X-energy, and there is a rational basis for doing so. The information X-energy is requesting to be withheld from public disclosure includes commercial information related to on-going and planned activities associated with our Xe-100 high temperature gas pebble bed reactor design and the X-energy TRISO-X fuel program. X-energy limits access to this privileged information to maintain confidentiality.
  - d. Enclosure 1 contains information about the planned activities of X-energy related to the creation and submittal of licensing activities, forecast design development timeframes, fuel fabrication facility deployment plans, and commercial strategy of our Xe-100 advanced reactor. Public disclosure of the information contained in Enclosure 1 would create substantial harm to X-energy because it would reveal valuable business information regarding X-energy's competitive expectations, assumptions, current position and strategy. Its use by a competitor could substantially improve their competitive position in the design, manufacture, licensing, construction and operation of a similar product.



- e. The Proprietary Information contained in Enclosure 1 is transmitted to the NRC in confidence and under the provisions of 10 CFR 2.390; it is to be received in confidence by the NRC. The information is properly marked.

I declare under the penalty of perjury that the foregoing is true and correct.

Executed on January 17, 2018

[Month Day, Year]

Harlan W. Bowers

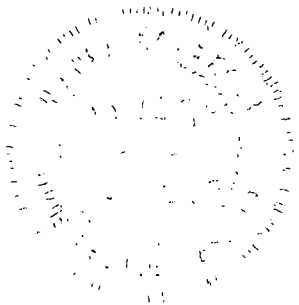
President

X Energy, LLC

Subscribed and sworn to before me,

Notary Public, this 17<sup>th</sup> day of January: 2018

My Commission expires:



WANDA HOLBROOK  
Notary Public  
Anne Arundel County  
Maryland  
My Commission Expires: 5/8/21