

19 June 2025

2025-XE-NRC-008

Project No. 99902071

ATTN: Document Control Desk,
Director, Division of Fuel Management,
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

X Energy, LLC, Request for 10 CFR 71, Subpart H, Quality Assurance Program Approval and Intent to Apply Previously Approved 10 CFR 50, Appendix B, Quality Assurance Program to 10 CFR 71 Activities

REFERENCES:

- 1) X Energy, LLC, Letter from S. Vaughn to U.S. Nuclear Regulatory Commission, "Submittal of X Energy, LLC (X-energy) 'X Energy, LLC Topical Report Quality Assurance Program Description' Revision 6, Accepted Version," March 26, 2025 (ML25085A152)
- 2) X Energy, LLC, Letter from S. Vaughn to U.S. Nuclear Regulatory Commission, "Submission of X Energy, LLC (X-energy) Topical Report Quality Assurance Program Description, Revision 6," September 13, 2023 (ML23256A159)
- 3) X Energy, LLC, Letter from S. Vaughn to U.S. Nuclear Regulatory Commission, "Submission of X Energy, LLC (X-energy) Follow-up to July 1, 2024, Public Meeting Regarding 'X-energy, LLC Topical Report Quality Assurance Program Description Topical, Revision 6' Applicability to 10 CFR 71 Activities," July 16, 2024 (ML24198A131)
- 4) U.S. Nuclear Regulatory Commission, "Establishing Quality Assurance Programs for Packaging Used in Transport of Radioactive Material," Regulatory Guide 7.10, Revision 3, June 2015
- 5) U.S. Nuclear Regulatory Commission, "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety," NUREG/CR-6407, February 1996

This letter transmits X Energy, LLC's (X-energy's) request for quality assurance program (QAP) approval under 10 CFR 71. Specifically, X-energy requests Nuclear Regulatory Commission (NRC) approval to apply its previously approved 10 CFR 50, Appendix B, Quality Assurance Program Description (QAPD), Revision 6 (Reference 1), to 10 CFR 71 activities as allowed under 10 CFR 71.101(f). Upon NRC approval of this request, X-energy intends to apply QAPD Revision 6 to important-to-safety 10 CFR 71 activities using a graded approach and quality classification and categorization methodology consistent with that described in NRC Regulatory Guide 7.10 (Reference 4) and NUREG/CR-6407 (Reference 5).

Enclosure 1 to this letter, “X Energy, LLC 10 CFR Part 71 Subpart H Project Quality Assurance Plan” (i.e., Part 71 PQP), provides specific details clarifying X-energy’s use of the graded approach and important-to-safety classification categories (A, B, or C) in applying QAPD Revision 6 to 10 CFR 71 activities. Applying the previously approved X-energy QAPD in this manner fulfils the requirements in 10 CFR 71.101(b), in that it: (1) satisfies the applicable quality criteria in 10 CFR 71, Subpart H; and (2) ensures that each Subpart H quality criterion is executed in a graded approach commensurate with the requirement’s and associated activity’s importance to safety.

Revision 6 of the X-energy QAPD was submitted to NRC as a topical report on Docket No. 99902071 by letter dated September 23, 2023 (Reference 2). By safety evaluation dated February 11, 2025, the NRC accepted QAPD Revision 6 for use by X-energy in the conduct of quality-related activities governed by 10 CFR 50, Appendix B. The accepted version of QAPD, Revision 6, which includes a copy of the NRC’s safety evaluation, was submitted on Docket No. 99902071 by X-energy letter dated March 26, 2025 (Reference 1).

At the time of the initial QAPD Revision 6 submittal (Reference 2), X-energy had been assessing whether 10 CFR 71 transportation activities would need to be conducted in the near term, and if so, the scope and timing of those activities. In response to NRC staff’s questions on this matter as part of the QAPD review, X-energy confirmed that it was not seeking approval to apply QAPD Revision 6 to 10 CFR 71 activities at that time (Reference 3). Accordingly, the NRC imposed a limitation on its acceptance to reflect that the X-energy QAPD, Revision 6, is not approved for 10 CFR 71 activities.

Given that the 10 CFR 71 needs assessment has been completed, X-energy has elected to design, develop, and seek NRC approval for a fissile material packaging suitable for safe transport of fresh unirradiated TRistructural ISOtropic (TRISO) fuel pebbles that are used to fuel advanced high-temperature gas-cooled reactors (HTGRs) such as the Xe-100 design. This packaging would be used by the fuel manufacturer (e.g., TRISO-X) to transport both TRISO low-enriched uranium (LEU) and TRISO high-assay low-enriched uranium (HALEU) fuel pebbles from the manufacturing facility to nuclear power plants employing the Xe-100 or other HTGR designs using TRISO fuel.

Following completion of prerequisite design, analyses, and other activities, X-energy plans to prepare and submit an application to NRC for package¹ approval under 10 CFR 71, Subpart D. To facilitate these activities, X-energy respectfully requests that the NRC approve this request for 10 CFR 71, Subpart H, QAP approval by September 16, 2025.

X-energy further requests that upon NRC approval of this request, the resultant issuance of NRC Form 311 will supersede Limitation No. 1 in the NRC’s February 11, 2025, safety evaluation that prohibits use of

¹ Consistent with 10 CFR 71.4, the package for which approval will be sought comprises the packaging together with its radioactive contents as presented for transport (i.e., “Fresh Fuel Transport Package”).



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QAPD Revision 6 for 10 CFR 71 activities, subject to the clarifications provided in the enclosed Part 71 PQP. Any proposed change to the enclosed Part 71 PQP or to the X-energy QAPD following NRC approval of this request would be subject to evaluation and control pursuant to 10 CFR 71.106.

This letter contains no regulatory commitments. If you have any questions or require additional information, please contact Aixa Belen-Ojeda at abelenojeda@x-energy.com or Matt Featherston at mfeatherston@x-energy.com.

Sincerely,



Stephen Vaughn

Director, Reactor Licensing

X Energy, LLC

Enclosures:

- 1) X Energy, LLC 10 CFR 71 Subpart H Project Quality Assurance Plan – Non Prop (PUBLIC)

cc:

X-energy, LLC:

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U.S. Nuclear Regulatory Commission:

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