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

U.S. NUCLEAR REGULATORY COMMISSION STAFF FEEDBACK REGARDING X ENERGY, LLC "XE-100 LICENSING TOPICAL REPORT: XE-100 TRAINING PROGRAM METHODOLOGY" (EPID NO. L-2022-TOP-0012)

By letter dated December 29, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22364A278), X Energy, LLC (X-energy) submitted "Xe-100 Licensing Topical Report: Xe-100 Training Program Methodology," for review by the U.S. Nuclear Regulatory Commission (NRC) staff. As part of the acceptance review process, the NRC staff performed a completeness review to determine if the document is sufficiently complete to initiate an effective technical review and then met with X-energy to discuss their initial feedback in a public meeting held on March 14, 2023 (ML23067A236). As a result of the meeting, the NRC staff is providing the following feedback on the topical report (TR) to X-energy.

1. The TR does not define which portions of the referenced guidance documents are applicable or provide a justification for selecting portions of the guidance documents.

   Section 3.2 of the submittal states, in part, that the Xe-100 training programs utilize the listed guidance documents as applicable and to the extent that the documents align with the specific Xe-100 design and the X-energy staffing approaches. The NRC staff noted the following examples from comparing the listed guidance documents to the TR submittal:

   - NEI 06-13A, "Template for an Industry Training Program Description," Revision 2, describes an accredited training program, but X-energy's submittal is silent on whether accreditation will be sought.

   - American National Standard Institute (ANSI)/American Nuclear Society (ANS)-3.1-2014, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants," states, in part, that "initial training programs are developed for individuals with prerequisite entry level qualifications," and goes on to provide guidelines for education and experience requirements for various positions. The X-energy submittal does not contain information on education and experience requirements for most positions and prerequisite entry level qualifications.

   - Regulatory Guide (RG) 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," Revision 4 (ML19101A395), contains the following discussion:

     > NRC review of applications for operator licenses in accordance with 10 CFR Part 55, "Operators' Licenses," Subpart D, "Applications" (Ref. 18), and public comment on this RG 1.8 revision has revealed conflicts between ANSI/ANS-3.1,

> NUREG-1021, “Operator Licensing Examination Standards for Power Reactors” (Ref. 19), and National Academy for Nuclear Training (NANT) qualification standards. The NANT qualification standards, revised November 2016, and NUREG-1021 qualification standards meet or exceed ANSI/ANS-3.1-2014 for operator licensing in accordance with 10 CFR Part 55. In addition, the NANT qualification standards better align with facility licensee training programs that use a systems approach to training, as defined in 10 CFR Part 55. Following consideration of public comment and a public meeting on February 13, 2019, the NRC staff removed the applicability of 10 CFR Part 55 from this revision of RG 1.8 so that NRC staff guidance for operator license qualifications will be located solely in NUREG-1021, which references the NANT qualification standards.

The submittal describes the guidance of ANSI/ANS-3.1-2014, as endorsed by RG 1.8, as addressing the definition of systems approach to training found in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55.4, “Definitions.” The NRC staff concluded that the guidance may still be used with justification, but that the RG did not endorse ANSI/ANS-3.1-2014 for that purpose.

As noted above, the NRC staff notes that the TR references but does not address all portions of the referenced documents. Office of Nuclear Reactor Regulation Office Instruction LIC-109, “Acceptance Review Procedures for Licensing Basis Changes” (ML20036C829) states, in part:

> The licensee should identify the regulatory criteria used to determine that the [request for licensing action (RLA)] is acceptable. The NRC staff may utilize guidance documents such as the standard review plan or any specific review standards for Guide for Performing Acceptance Reviews specific RLAs (e.g., [extended power uprates]). When the licensee proposes an alternative to an approved approach described in a guidance document, the NRC staff should verify the completeness of the scope and logic of the alternate methodology. From the information contained in the application, the NRC staff should be able to identify the applicable criteria by which to evaluate the proposed action.

The NRC staff concluded that the submittal did not fully identify the applicable criteria by which to evaluate the proposed action. To accomplish this, the NRC staff concluded that X-energy may need to provide a description of which portions of the referenced documents were used, a justification for any exclusions or departures from the referenced documents, and a justification for why the selected documents and criteria satisfy the applicable regulations if used in a manner different than the described purpose of the document.

2. Section 3.2 of the submittal references three Nuclear Industry Standard Process (NISP) standards. These documents are not available to the NRC staff and may not be an approved approach outside of a training program accredited by the National Nuclear Accrediting Board (NNAB).

   The NRC staff does not have access to the referenced documents in Sections 2 and 3.2 of the TR: NISP-TR-01, “Systematic Approach to Training Process,” Revision 3; NISP-TR-02, “On-The-Job Training and Task Performance Evaluation Process,” Revision 1; and NISP-TR-03, “Engineering Training Program Description,” Revision 1. Section 3.2 of the TR states, in part, that the Xe-100 Training Programs utilize the NISP documents.

Therefore, the NRC staff concluded that the TR could not be reviewed using the referenced documents at this time. Access to the NISP standards could be provided to the NRC staff as part of an audit if the documents can be legally shared.

The NRC staff also noted that the referenced NISP guidelines may not be an approved approach outside of NNAB accreditation of a training program. While the NISP documents are unavailable to the NRC staff, the NRC staff understands that the NISP documents are authored and provided by the National Academy for Nuclear Training (NANT). As stated in the Statement of Considerations for the 1987 final rule amending 10 CFR Part 55, "Operators' Licenses," (Volume 52 of the Federal Register (FR), page 9456 (52 FR 9456); March 25, 1987), subject to continued Commission endorsement of the industry's accreditation process under the Final Policy Statement on Training and Qualification of Nuclear Power Plant Personnel (50 FR 11147; March 20, 1985), a facility licensee's training program would be considered a "Commission-approved training program" if it is accredited by the NNAB. It is the NRC staff's understanding that to be accredited by the NNAB, a facility licensee's training program must, among other things, implement the NANT guidelines. However, the TR does not state if X-energy facilities will pursue NNAB accreditation. Therefore, the NRC staff concluded that the submittal could not be reviewed without further information.

LIC-109 states, in part, that the NRC staff should be able to identify the applicable criteria by which to evaluate the proposed action. LIC-109 also states, in part, that use of unapproved guidance may be acceptable if the licensee has provided a full analysis to justify that the proposed use satisfies the NRC staff's regulations and is appropriately conservative. The NRC staff concluded that X-energy may need one or more of the following to provide for the review: a statement indicating whether an approved training program would be accredited by the NNAB; submit the referenced documents and provide a justification for their use; or remove reference to the documents.

3. The "Xe-100 Control Room Operator Qualification Methodology" TR is not available to the NRC staff, and it was used to develop the submittal.

   Section 3.2 of the TR states, in part, that the Xe-100 Training Programs are developed in accordance with TR "Xe-100 Control Room Operator Qualification Methodology." The NRC staff concluded that it may not be able to review the Xe-100 Training Programs at this time because the "Xe-100 Control Room Operator Qualification Methodology" TR is unavailable to the NRC staff.

   Further, the staff may need to review the unsubmitted "Xe-100 Control Room Operator Qualification Methodology" TR as well as the "Xe-100 Eligibility Requirements for Control Room Operators" TR due to their descriptions within the submittal. Specifically, the submittal describes both unsubmitted TRs as describing the training and qualifications of control room operators. Section 1.3 of the submittal states that:

   > The Xe-100 Control Room Operator Qualification Methodology topical report and Xe-100 Eligibility Requirements for Control Room Operators topical report R provide additional details related to control room operator training and qualifications.

   The submittal does not describe the overlap with the other unsubmitted TRs. The TR submittal states that the purpose of the report is to:

Describe the approach and methodologies for the Xe-100 reactor plant staff training and qualification to meet categories of personnel listed in CFR §50.120 (10 CFR 50.120), as well as control room operations personnel, for safe and reliable Xe-100 plant operations in a multi-unit plant configuration across various modes, states, and operating conditions.

Section 3.1.2 of LIC-109 states that simply referencing an unapproved TR is not acceptable. However, use of an unapproved TR may be acceptable if a full analysis is provided to justify that the proposed use satisfies the NRC staff's regulations and is appropriately conservative. Based on the guidance in LIC-109, the NRC staff concluded that X-energy may provide a clarification or justification that the submittal may be reviewed prior to the review of the "Xe-100 Control Room Operator Qualification Methodology" and "Xe-100 Eligibility Requirements for Control Room Operators" TRs.

Project No. 99902071