**X Energy, LLC**
801 Thompson Avenue
Rockville, MD 20852
+1 301.358.5600

**Enclosure 2: U.S. Licensing Xe-100 Pre-application Engagements 2024**
**Non-Proprietary (Public)**

The purpose of this enclosure is to provide an easily maintained list of on-going and planned pre-application engagement activities through calendar year 2024 for use by X-energy and the NRC staff related to the Xe-100 reactor design and Advanced Reactor Demonstration Program (ARDP) project.

X-energy's licensing project manager will ensure this table is referenced during routine engagements and revised when necessary to accurately reflect readiness for the engagements, milestones, and other resource or schedule impacts. This section is divided into the following subsections:

- Planned Licensing and Regulatory Submittals/ Engagements (Table 1)

**Table 1: Planned Licensing and Regulatory Submittals/Engagements**

| Report Type[1]/ Engagement Topic | Target Submission/ Engagement Period[2] | Objective |
|---|---|---|
| (LTR) Xe-100 Licensing Topical Report GOTHIC and Flownex Analysis Code Qualification Rev. 2 | [[ ]]$^{P}$ | Revision 2 of this report will include GOTHIC and Flownex Code Theory & Methods and Verification & Validation Plans and Evaluation Model (EM) structure. |
| (LTR) Xe-100 Licensing Topical Report Xe-100 Mechanistic Source Term (MST) Approach Rev. 2 | [[ ]]$^{P}$ | This report will describe the Xe-100 approach to functional containment, fuel performance criteria, how MSTs are developed on an event sequence basis. Previously submitted and withdrawn as Revision 1, Revision 2 will include MST methods for Xe-100, EM development, and Licensing Basis Event (LBE)-specific methodologies. |
| (LTR) Xe-100 Licensing Topical Report Transient and Safety Analysis Methodology | [[ ]]$^{P}$ | Revision 1 of this topical report will include Safety Analysis LBE-specific methodologies. It is the successor to X-energy's Transient and Safety Analysis Methodologies Framework LTR (2021-XE-NRC-013) reviewed by the NRC staff (ML21288A173). |

[1] Licensing topical report (LTR) and White paper (WP)

[2] All dates are provided as "Week of" with respect to scheduling. Specific dates and/or times will be coordinated with the NRC Project Manager

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| Report Type[1]/ Engagement Topic | Target Submission/ Engagement Period[2] | Objective |
|---|---|---|
| (LTR) Xe-100 Licensing Topical Report Principal Design Criteria Development Rev. 3 | Submission: 2/16/2024 | Provide the overall Xe-100 approach to PDC development and the specific alignment between the Xe-100-specific PDC, which includes required functional design criteria (RFDC) and complementary design criteria (CDC), and the MHTGR-DC from RG 1.232, Appendix C. |
| (LTR) Xe-100 Licensing Topical Report Training Programs Methodology | [[ ]]P | This topical report presents the X-energy approach and methodologies for developing, implementing, and maintaining the initial, continuing, and requalification training programs for Xe-100 plant staff to support the categories of personnel listed in 10 CFR 50.120, as well as control room operations personnel. The approach described in this report focuses on the methodologies used by X-energy to conduct a Systems Approach to Training to produce the suite of Xe-100 Training Programs, train, and qualify personnel as necessary for safe Xe-100 plant operation. |
| (LTR) Xe-100 Licensing Topical Report Reactor Core Analysis and Methods | [[ ]]P | The purpose of this report is to introduce Core Design Steady-state and Transient EM specific methods. This LTR summarizes the normal operations evaluation model for nuclear analysis, maneuvering analysis, and pebble flow of the Xe-100 reactor. Adequate shutdown margin is verified at modes and states. Verification and Validation of these codes are also provided in the LTR. |
| (LTR) Xe-100 Licensing Topical Report Fuel Cycle Criticality Safety Methodology | [[ ]]P | The purpose of this LTR is to provide the NRC with criticality methodology analysis and results for the storage of new fuel and spent fuel and to demonstrate k-effective is within acceptable limits for all stages of the fuel cycle within the Xe-100 design. |
| Security Staffing and Physical Protection System Approach Public Meeting | [[ ]]P | The purpose of this meeting is to engage the NRC in the Xe-100 approach to physical security and staffing to comply with 10 CFR Part 73. |

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| Report Type[1]/ Engagement Topic | Target Submission/ Engagement Period[2] | Objective |
|---|---|---|
| Cyber Security Public Meeting | [[ ]]$^{P}$ | The purpose of this meeting is to engage the NRC in the Xe-100 approach to cyber security to comply with 10 CFR Part 73. |
| (LTR) Xe-100 Licensing Topical Report Emergency Planning Zone (EPZ) Sizing | [[ ]]$^{P}$ | The purpose of this LTR is to obtain approval of the Xe-100 methodology for establishing the plume exposure pathway EPZ size by using the guidance in RG 1.242 to demonstrate compliance with the new Emergency Planning (EP) Rule in 10 CFR 50.160. |
| (LTR) Xe-100 Topical Report TRISO-X Pebble Fuel Qualification Methodology Rev. 4 | Pre-meeting: January 25, 2024<br>[[ ]]$^{P}$ | The LTR revision will include an update to X-energy's fuel mechanical testing plans for both irradiated and non-irradiated fuel. If available, the fuel mechanical analysis methods will also be provided for review. |
| (LTR) Graphite Structural Analysis and Qualification Methodologies | Pre-meeting: January 17, 2024<br>[[ ]]$^{P}$ | This LTR will provide the methodology and background for developing the Xe-100 Graphite Core Assembly (GCA. Specifically, it will encompass the material data planned for use, methods for implementation of that material data in analytical models, and methodologies for required analyses used to evaluate and design the GCA. |