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Enclosure 1
REPLOY Power Response to the NRC Regulatory Issue Summary for FY 2026-2028

Revision 0

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1.0 Introduction

This document communicates REPLOY Power's responses to the NRC Regulatory Issue Summary voluntary response section. This document includes the applicable questions to applicants and licensees from RIS 2020-02 (ML20202A496) with REPLOY responses in *italics*. These responses provide high level detail related to REPLOY's design and licensing plans, which are described in greater detail in other documents, most notably the REPLOY Regulatory Engagement Plan (REP) (ML25115A172). In any case where the details in this document conflict with the current or future versions of the Regulatory Engagement Plan, the REP controls. Unless otherwise noted, calendar dates are used throughout this document.

1.1 Contact Information

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Director of Licensing, Safety, and Quality Assurance
REPLOY Power Inc.

1.2 Responses to Licensing Process Questions

1. (a) What types of NRC interactions do you plan to seek (e.g., pre-application, focused review, permit, license, design approval, amendment, renewal, certification)? This may be in the form of a white paper; topical report; CP, DC, ESP, LWA, COL, OL, SDA, ML, or LAR.

   REPLOY is currently engaged in Pre-application activities and plans to submit its first white paper in June of 2025. Approximately 20 other white papers and topical reports are planned with approximately three documents submitted per quarter through 2027.

   REPLOY expects to submit the following applications:

   - *CP for the Central Fuel Facility in Late 2027 or Early 2028*
   - *ML for the Prototype SPS-300 in Late 2027 or Early 2028*
   - *CP for the Prototype SPS-300 in Late 2027 or Early 2028*
   - *ESP and/or LWA for the first production SPS-300 in Early-to-Mid 2028*

   Each of these construction permits, if approved, will be followed closely by an associated OL application. The application for several MLs for the first several production SPS-300s is expected to be submitted in late 2029. An associated COL will be submitted for these when appropriate in 2030.

   (b) If you plan to request an ESP, will you seek approval of either proposed major features of the emergency plans in accordance with 10 CFR 52.17(b)(2)(i) or with 10 CFR 52.17(b)(2)(ii)?

   This is yet to be determined.

2. In which month and year do you expect to submit your applications or other documents?

   See response to question 1.(a).

3. (a) If applicable at this time, is there a designated reference COL applicant?

   (b) In what order would you like the NRC to review the subsequent applications?

4. (a) Where will the facility be located?

The location of the Central Fuel Facility is not yet determined, but will be along the Texas coast in or near one of several major ports. Prototype SPS-300 unit is expected to be co-located with the Central Fuel Facility. The deployment location of the first several SPS-300 production units are not yet determined, but are expected to be within the U.S. Exclusive Economic Zone waters along the Texas gulf coast.

(b) How many units or modules will the design, or a specific facility, contain, if known?

Each SPS-300 unit is intended to operate independently of other units, however several units may be collocated on one site. The number of units supported at one site will depend on the site characteristics, but is expected to be on the order of 4-6 units.

5. (a) Will you be part of an organized Design Centered Working Group (DCWG) or Technical Working Group (TWG)?

This is to be determined.

(b) Who are the other members of the DCWG or TWG?

This is to be determined.

(c) Who will be the primary point of contact for each DCWG or TWG?

This is to be determined.

1.3 Responses to Technical Questions

1. (a) What type of reactor design will be used?

A Generation III+ Passive Modular Pressurized Water Reactor will be used.

(b) What type of coolant and fuel will be used?

Standard PWR LEU Oxide fuel in 17x17 assemblies with light water coolant.

2. (a) What is the current status of the development of the facility design (e.g., conceptual, preliminary, or final)?

REPLOY is nearly complete with the conceptual design of the SPS-300 and is beginning conceptual design of the Central Fuel Facility.

(b) Have you established a schedule for completing the design?

A schedule has been developed and is progressing towards final design completion by approximately mid-2029.

3. (a) Do you plan to submit white papers or technical and topical reports related to the features of your design or for the resolution of policy or technical issues?

Yes. Approximately 20 whitepapers or topical reports are planned during the preapplication phase.

(b) Do you have a schedule for submitting such papers or reports?

The schedule for submitting these whitepapers and topical reports has been submitted to the NRC as the REPLOY Power Regulatory Engagement Plan (ML25115A172) and will be periodically updated.

4. (a) Are you interested in licensing and testing a first-of-a-kind plant under the prototype provisions of 10 CFR 50.43(e)?

REPLOY is interested in licensing and testing the SPS-300 under applicable and necessary provisions of 10 CFR 50.43(e).

(b) If so, to the extent practical, describe milestones, plans, and intended tests.
These details are still in development and will be submitted to the NRC in a dedicated regulatory engagement plan for the prototype plant.

5. (a) Are vendors or consultants assisting you in preparing the application?
Vendors, consultants, and contractors are being used to prepare engineering and regulatory documents at all stages.

(b) If so, please describe their roles and responsibilities for the design and licensing activities. *Vendors, consultants, and contractors are subject to oversight by REPLOY personnel and REPLOY personnel provide final review and approval authority and direct interaction with regulators.*

6. (a) Are the U.S. Department of Energy, national laboratories, universities, or other institutions assisting you in developing the design or preparing the application?
The DOE and other federal agencies are currently not involved in REPLOY design and licensing functions. REPLOY is currently seeking a variety of federal and state funding opportunities for design and licensing work. REPLOY has partnered with professors at Texas A&M University to progress particularly novel portions of the plant design.

(b) If so, please describe their roles and responsibilities for the design and licensing activities.
See response to 6.(a).

7. Have you established a schedule for qualifying fuel and other major systems and components?
Fuel and most major components will be qualified under the NSSS vendor's program. REPLOY will perform qualification on major SSCs not covered by the NSSS vendor program. A schedule for this qualification has yet to be established.

8. (a) Have you developed computer codes and models to perform design and licensing analyses?
REPLOY will make use of industry standard codes to the fullest extent possible. A limited number of computer models are in the process of development for the design and licensing analysis.

(b) Have you established a schedule for completing the design and licensing analyses?
A schedule specific to design and licensing computer analysis has not been developed, but such activities are included in scheduling for overall design and licensing.

9. Describe, to the extent practical, your schedule for defining principal design criteria, licensing-basis events, and other fundamental design and licensing relationships.
Principle design criteria, licensing-basis events, and other fundamental design and licensing relationships are currently being defined and will be completed during the conceptual and preliminary design phases. Because the SPS makes use of a standard PWR design, it is anticipated that most principal design criteria will be derived from 10 CFR 50 Appendix A.

10. (a) Have you developed procedures for the use of thermal fluidic testing facilities and for use of the results of their tests to validate computer models?
No such procedures have been developed at this time.
(b) Have you established a schedule for completing the thermal fluidic testing?
No such schedule has been developed at this time.
(c) Have you established a schedule for the construction of testing facilities?
No such schedule has been developed at this time.

11. (a) Have you identified system and component suppliers (including fuel suppliers), manufacturing processes, and other major factors that could influence design decisions?
Several key suppliers have been identified and we are working to identify the remainder. Selection of a NSSS vendor is currently underway and is expected to be completed this year. This is the most critical of our vendors and will result in a number of subcontractors and suppliers being chosen.
(b) Have you established a schedule for identifying suppliers and key contractors?
See the response to 11.(a).

12. Do you have a quality assurance program or a schedule to develop one?
A quality assurance program is currently under development in line with 10 CFR 50 Appendix B and making use of ASME NQA-1 standards. A whitepaper describing the QA program development is expected to be submitted to the NRC in June of 2025 with a subsequent topical report submitted later in the year.

13. (a) Have you developed the probabilistic risk assessment (PRA) models needed to support your applications, including the information needed to support risk-informed licensing approaches (for Chapter 19)?
No PRA models have yet been developed, however plans are being made to do so in the coming months.
(b) Do you plan to use the PRA for any risk-informed applications (e.g., risk-informed technical specifications, risk-informed inservice inspections, risk-informed categorization and treatment, risk-informed inservice testing)?
It is expected that PRA will be used for some portions of the SPS-300 applications and will be detailed in subsequent submissions to the NRC.
(c) Do you plan to use the PRA models in the development of the design?
It is expected that PRA models will be used in some elements of the SPS-300 design.
(d) At what level will the PRA be prepared, and at what point during the application process will it be submitted?
This information is yet to be determined but will be made available as soon as possible.

14. Have you developed the plans for the construction and use of a control-room simulator?
No specific plans have been developed related to a control-room simulator, however this has been identified as a need and will be addressed in the coming months.

15. (a) Do you have a staffing plan?
This information is not yet available.

(b) What is your current staffing level for the execution and testing of the reactor design?
REPLOY currently employs a small engineering team of approximately 10.

(c) Do you plan to increase staffing?
REPLOY intends to grow the size of the engineering and licensing teams significantly over the next two years.

16. (a) Which systems, structures, and components, including fuel, do you foresee will be fabricated off site and delivered for the manufacturing, fabrication, and site construction of a completed operational nuclear power plant?
The REPLOY model involves assembly of the entire plant at a central facility and deployment as a fully assembled facility to the operating site. All major components will be manufactured at vendor facilities and shipped to the central assembly facility for final assembly. Fueling, refueling, and most maintenance is performed at a central fuel facility. Only limited site preparation such as the driving of piles, emplacement of footings, and laying of cable is done at the operation site.

(b) What is intended to be assembled and constructed on site versus at a remote facility?
See response to 16.(a).

(c) In addition, and as applicable, provide the construction plans and schedules for the fabrication of large components and modules of the applicable SMR or non-LWR designs when available.
Such plans and schedules will be made available to the NRC when available and appropriate.