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HADRON ENERGY INC.

NRC PUBLIC MEETING
JULY 8, 2025



Hadron Energy

AGENDA

Purpose: To discuss Hadron Energy Inc.'s (Hadron's) Regulatory Engagement Plan, submitted May 10, 2025.

Agenda:

- (1) Hadron's MMR
- (2) Drafting the REP
- (3) Regulatory Pathway
- (4) Tentative Schedule
- (5) Questions for the NRC



A light water-cooled, HALEU-fueled microreactor using a proprietary design built off the **mature, proven technology** used in large nuclear power plants:

No exotic fuels or materials:

- Thermal neutrons
- Rectangular fuel lattice
- Uranium oxide fuel
- Light water coolant

Manufacturable and scalable.

THE HADRON MMR



35 MW_{th}

THERMAL POWER



10 MW_e

ELECTRICAL POWER



10+ Year

FUELING CYCLE



Hadron Energy



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Hadron Energy, Inc.
501 Delancey St. Apt 405
San Francisco, CA 94107

May 9, 2025

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Submittal of the Hadron Energy Microreactor Pre-Application Regulatory
Engagement Plan for Standardized Microreactor Design

Dear Sir or Madam,

Hadron Energy, Inc. (Hadron Energy) hereby submits the enclosed Pre-Application Regulatory Engagement Plan (REP) for the Hadron Energy Microreactor standardized design. The proposed Hadron Microreactor is a 2 MWe light-water microreactor, which will be manufactured at a centralized location and transported to locations where it will be operated. Accordingly, following a standard design approval (SDA) application under 10 CFR Part 52, Subpart E, Hadron is pursuing a manufacturing license application under 10 CFR Part 52, Subpart F, together with a license for fuel loading under 10 CFR Part 70. This approach is consistent with the approach of 10 CFR 52.8, "Combining Licenses; elimination of repetition," as well as the policy position 2b of SECY-24-0008 supported by the NRC staff and pending Commission approval.

This REP serves to inform the U.S. Nuclear Regulatory Commission (NRC) staff of Hadron Energy's proposed pre-application interactions regarding the development and licensing of the Hadron Microreactor. This plan outlines Hadron Energy's proposed regulatory strategy, identifies key technical and regulatory topics for engagement, and delineates the anticipated schedule for future interactions and document submissions. The primary intent of this REP is to enhance communication and reduce regulatory uncertainty by establishing mutual understanding on licensing approach, issue resolution, and schedule expectations early in the regulatory process.

Hadron Energy understands the value of early and ongoing engagement with the NRC staff and seeks input, feedback, and guidance in response to the information outlined in this plan. This feedback will inform decisions and actions during the pre-application process, culminating in the submission of a high-quality license application.

REGULATORY ENGAGEMENT PLAN (REP)

Our business, engineering and regulatory teams collaborated and drafted our REP using NEI's [draft guidance](#) available on the NRC website.



PROPOSED REGULATORY PATHWAY

- **Goal:** The establishment of a manufacturing facility in which Hadron MMRs will be produced, fueled, and shipped to their place of operation.
- **Current approach:** Pursue a manufacturing license (Part 52) and a license to possess special nuclear material for transport (Part 70).

- **What about installing and operating reactors at their place of operation?**
 - Hadron will seek a Part 52 combined licensed in collaboration with the customer.
 - Part 53 may also be an option.



TENTATIVE SCHEDULE

Goal:

- September 2026:
Submit SDA
- February 2027:
Submit MFA, SNM
- December 2028:
Submit first COLA

Plan:

- 16 months of pre-application engagement until SDA
- 2 topical reports
- 5 white papers

Planned Date	Activity	Type
April 2025	Submission of Letter of Intent to Engage in Pre-Application Activities	Submittal (Done)
May 2025	Submission of Initial Regulatory Engagement Plan	Submittal (Done)
July 2025	Submission of Topical Report 1: Quality Assurance Program Description	Topical Report Sub.
July-Sep 2025	Potential Review of Topical Report 1 by NRC Staff	NRC Review (Formal)
August 2025	Public Meeting with NRC on Regulatory Engagement Plan	Meeting
October 2025	Submission of Topical Report 2: Principal Design Criteria	Topical Report Sub.
Oct-Dec 2025	Potential Review of Topical Report 2 by NRC Staff	NRC Review (Formal)
Nov 2025	Submission of Updated Regulatory Engagement Plan	Submittal
Jan 2026	Submission of PSID for Conceptual Design Assessment Request	Request Submittal
Feb-Apr 2026	Potential Conceptual Design Assessment by NRC Staff (PSER issued)	NRC Review
May 2026	Submission of White Paper 1: Transportation Approach Details	White Paper Sub.
May-June 2026	Potential Review of White Paper 1 by NRC Staff	NRC Review
June 2026	Submission of Updated Regulatory Engagement Plan	Submittal
June 2026	Submission of White Paper 2: Siting Strategy / Plant Parameter Envelope	White Paper Sub.
June 2026	Public Meeting with NRC on White Paper 1	Meeting
July 2026	Submission of White Paper 3: V&V Strategy & Digital Twin Qualification	White Paper Sub.
July-Aug 2026	Potential Review of White Papers 2 & 3 by NRC Staff	NRC Review
July 2026	Submission of Readiness Assessment Audit Request (SDAA focused)	Request Submittal
Aug 2026	Public Meetings with NRC on White Papers 2 & 3	Meeting

Planned Date	Activity	Type
Aug 2026	Potential Readiness Assessment Audit (SDAA focused) by NRC Staff	NRC Audit
Sep 2026	Submission of Standard Design Approval Application (SDAA)	Application Sub.
Oct 2026	Submission of White Paper 4: Mfg. Facility Siting & Env. Considerations	White Paper Sub.
Oct-Nov 2026	Potential Review of White Paper 4 by NRC Staff	NRC Review
Nov 2026	Potential Acceptance/Docketing of SDAA	NRC Action
Nov 2026	Public Meeting with NRC on White Paper 4	Meeting
Dec 2026	Submission of White Paper 5: SNM Handling & Part 70 Licensing Basis	White Paper Sub.
Dec 2026-Jan 2027	Potential Review of White Paper 5 by NRC Staff	NRC Review
Jan 2027	Submission of Updated Regulatory Engagement Plan	Submittal
Feb 2027	Submission of Manufacturing License Application (MLA)	Application Sub.
Feb 2027	Submission of 10 CFR Part 70 License Application (SNM for Mfg.)	Application Sub.
Feb 2027	Public Meeting with NRC on White Paper 5	Meeting
Apr 2027	Potential Acceptance/Docketing of MLA	NRC Action
Apr 2027	Potential Acceptance/Docketing of Part 70 License Application	NRC Action
May 2028	Potential Issuance of Standard Design Approval (SDA)	NRC Action
June-July 2028	Potential Issuance of 10 CFR Part 70 License	NRC Action
Dec 2028	Submission of Combined License Application (COLA) - First Site (by Customer/Partner)	Application Sub.
Oct-Dec 2028	Potential Issuance of Manufacturing License (ML)	NRC Action
Feb 2029	Potential Acceptance/Docketing of COLA (by Customer/Partner)	NRC Action



QUESTIONS FOR THE NRC

Regulatory Pathway:

- Are there **gaps**?
- Is it advisable to first seek an approval for a **research reactor** under 10 CFR 50.21(c)?
- Is it feasible to shift to a **Part 53 pathway** if it becomes available?

Schedule:

- It was our intent to establish a schedule that is ambitious, but **reasonable**.
- We would greatly appreciate the NRC's feedback on crunch points or unrealistic expectations.



THANK YOU

Questions for Hadron from the Nuclear
Regulatory Commission



Hadron Energy