December 9, 2025

AALO-LL-2025-012
AALO-1-24-US-0001

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

Subject: Submittal of Aalo Holdings, Inc. Presentation, Aalo-1 Design Overview Public Presentation

This letter transmits the Aalo Holdings, Inc. (Aalo) Presentation, Aalo-1 Design Overview Public Presentation, to the U.S. Nuclear Regulatory Commission (NRC) for information purposes.

This letter and the enclosures make no new or revised regulatory commitments.

If you have any questions regarding this submittal, please contact Parthasarathy Chandran at

partha@aalo.com or (205) 582-8425.

Thank you.

Sincerely,

Parthasarathy Chandran

Regulatory Affairs Manager

Enclosure :1 Aalo-1 Design Overview Public Presentation

Enclosure 1 Aalo-1 Design Overview Public Presentation

An Advanced Thermal-Spectrum Nuclear Power Plant

DESIGN OVERVIEW

Aalo Subject Matter Experts

PRESENTATION TOPICS

1. Introduction
2. Manufacturing
3. Aalo's Business Model
4. Systematic Technology Maturation
5. Major Nuclear Island Structures
6. Unit Overview
7. NSDA – NRC and DOE Requirements
8. Safety Overview – Licensing Basis
9. Safety Overview – Fundamental Safety Functions
10. Safety Overview – Defense-In-Depth
11. Functional Containment Strategy – Retaining Radionuclides

11. Reactor Systems and Core Design

12. Fuel and Core Systems

13. Control Rod Drive

14. Reactivity Control

12. Fuel Handling System

13. Spent Fuel Processing System

14. Heat Removal

15. Primary Coolant System

16. Secondary Coolant System

17. ADHRS

18. PDHRS

19. Instrument & Control Systems

20. Cover Gas Systems

21. Primary Process System

22. Secondary Process System

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INTRODUCTION TO AALO

- Overview of the Aalo Reactor
- Plant Safety Overview
- Overview of Systems
- Questions

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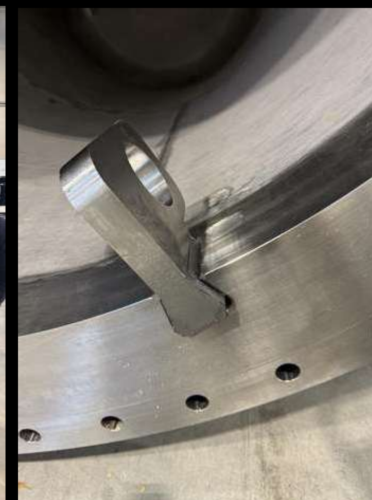
Aalo will make mass manufactured nuclear plants a reality.

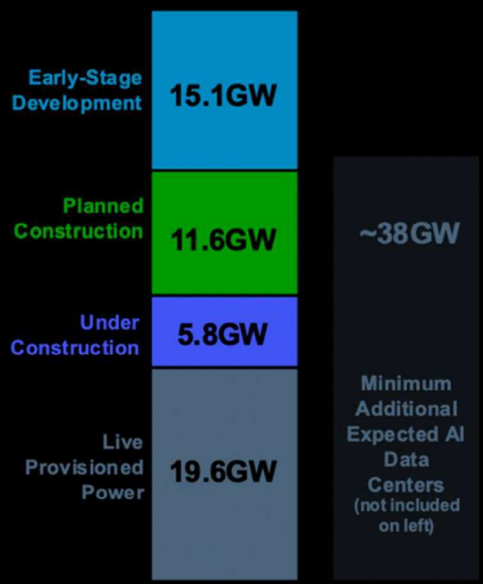
Factory Launched in Texas- April 7th

Aalo Factory Development



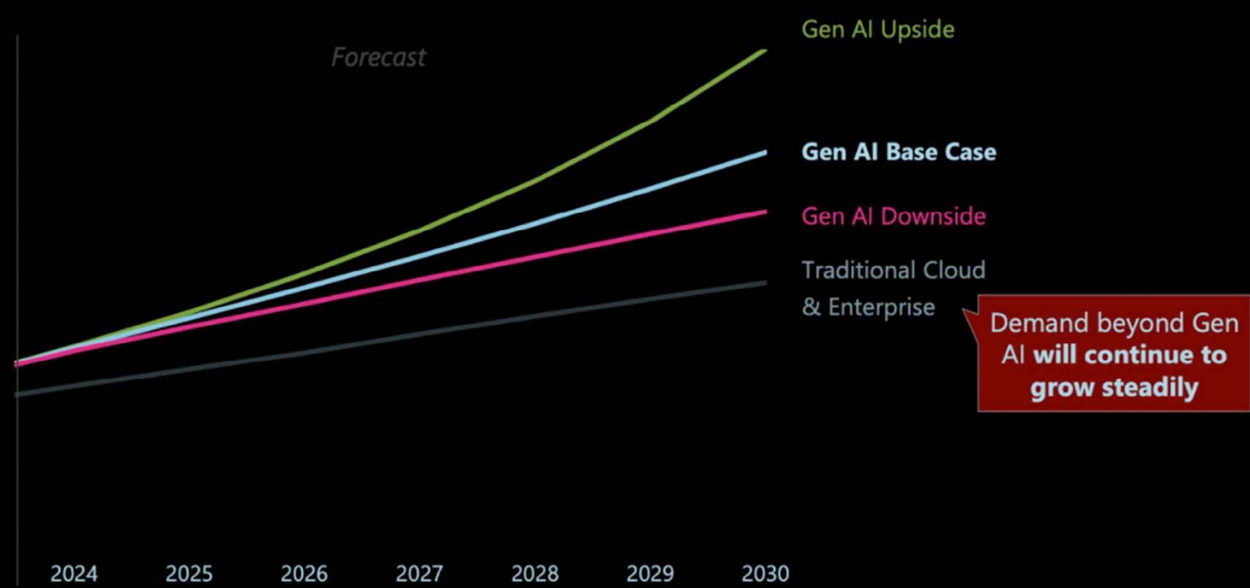

ULINE

AI Data Centers Unlock the Nuclear Factory



US Data Center Market (2024)

Example Demand Curve



Source: DC BYTE

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Datacenters are built in months, not years

A new class of reactor, perfect for data centers: The XMR.

Micro

1-5 MWe

Too small & expensive for data centers. Uses TRISO and / or HALEU, meant for remote diesel.

XMR

10-100 MWe

Fully modular plant, not just the reactor. Optimal balance of economy of numbers, economy of scale.

SMR

100-300 MWe

Scaled-down large reactors, not fully modular, large civil works, are less economical versions of large reactors.


Aalo Pod: 50 MWe
5 reactors, 1 turbine
Aalo

Aalo Pods: Fleets, purpose-built for AI data centers.

50 MWe

5 reactors
1 turbine

250 MWe

5 pods
Turbine redundancy

1 GWe +

20+ pods
Pod redundancy

N+1 config = High availability | **Grid connect optional** | **Scale incrementally w/o T&D** | **Onsite power = charge more**

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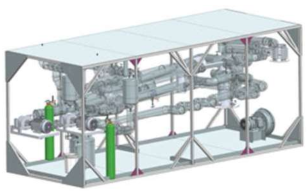
TECHNOLOGY MATURATION

TRL 5 → TRL 6 → TRL 7 → TRL 8 → TRL 9

NaV

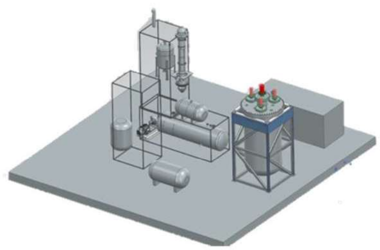
- [x] Proof of Principle setup
- [x] (Research & Dev.)



STL

- [x] Component test loop

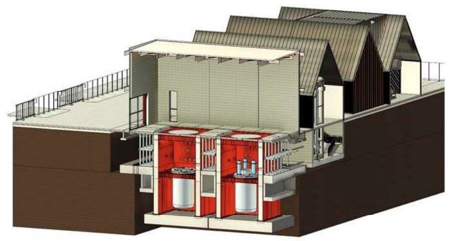
(Separate Effects Test)



Aalo-0

- [x] Non-nuclear Prototype

(Integrated Effects Test)



Aalo-X

Nuclear Experimental Facility

(Pilot Power Plant)

Aalo Pod

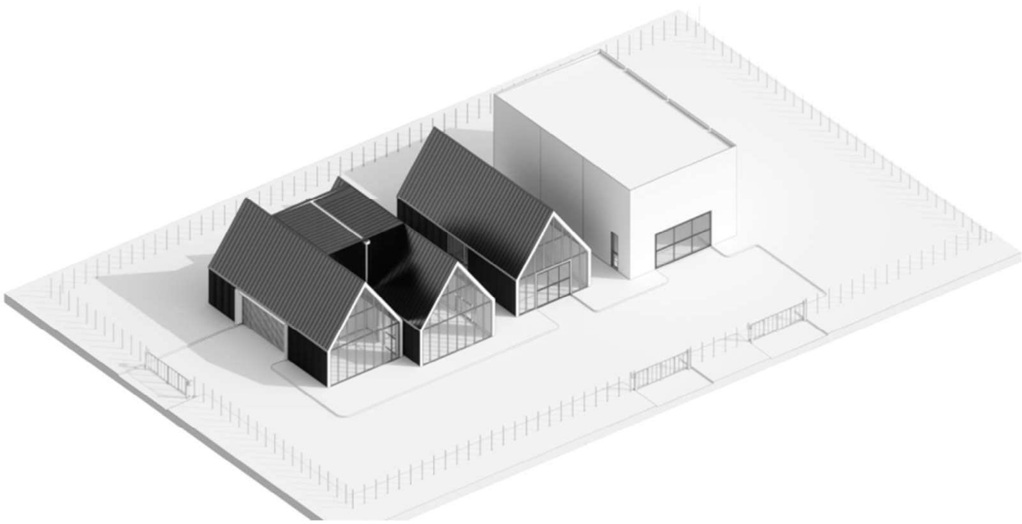
NRC Licensed Facility

(Commercial)

MAJOR NUCLEAR ISLAND STRUCTURES

Reactor Building

- Houses the Reactor Vessel System (RVS) and interfaces with the DHRS air flow paths
- Configuration includes the subgrade RVS area and above-grade superstructure for access and ventilation



Fuel Building

- Conceptual - intended for spent fuel handling and interim storage operations
- Supports sodium-filled spent fuel pits for passive cooling and shielding
- Includes provisions for fuel cleaning (sodium vaporization) and transfer to dry storage

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MAJOR NUCLEAR ISLAND STRUCTURES

Nuclear Island Operations Center:

- **Attached control and support facility located adjacent to the Reactor Building**
- **Provides operational oversight for reactor, coolant, and decay heat removal systems**
- **Interfaces with plant monitoring and safety systems for centralized supervision**
- **Houses control stations for reactivity control, DHRS/ADHRS, and cover gas systems**

UNIT OVERVIEW

Confinement

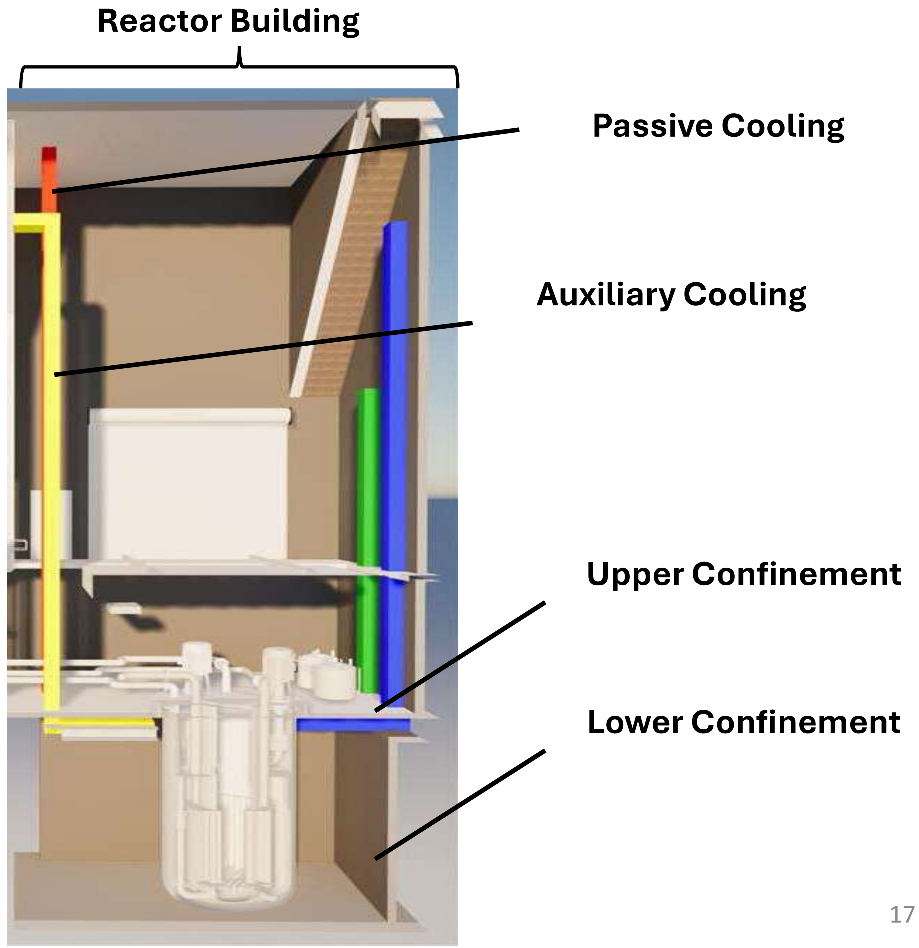
- Lower SC Module
- Upper SC Module

Structurally Independent

- Secondary Annex
- Reactor Building

Air-Based Cooling

- Auxiliary Cooling
- Passive Cooling



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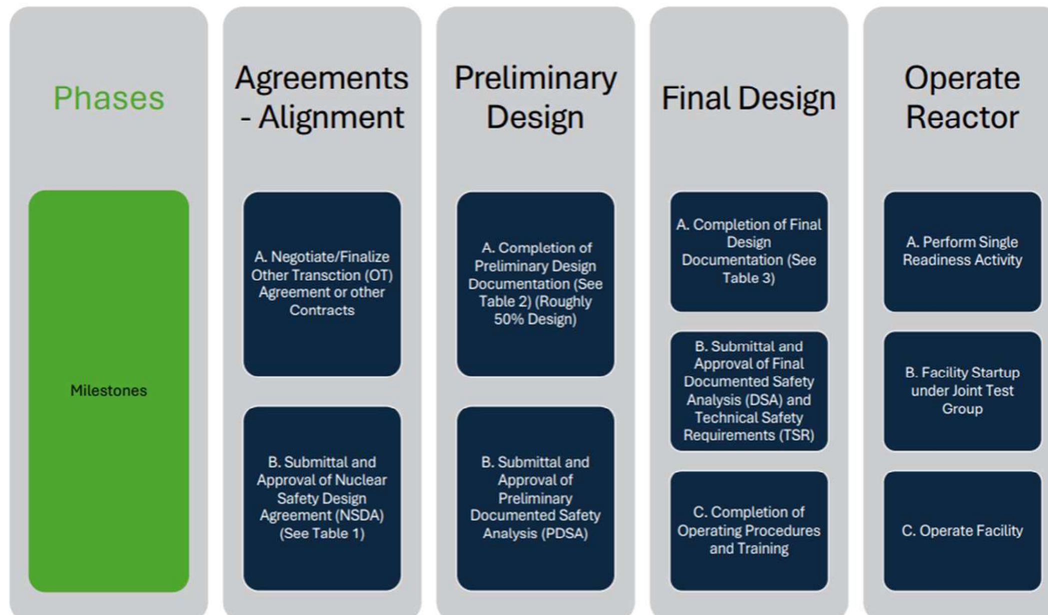
NSDA – NRC AND DOE REQUIREMENTS

- DOE is the primary regulator for the pilot operation, but the ultimate goal is to transition to NRC licensing for commercial deployment
- Insights from NRC's Advanced Reactor Content Guide and the License Modernization Project are influencing the safety documentation approach.
- Any use of NRC frameworks is purely to smooth future licensing, not to replace DOE requirements.
- Where Aalo proposes using an NRC-endorsed method in lieu of a DOE method, this is treated as an equivalency request and documented



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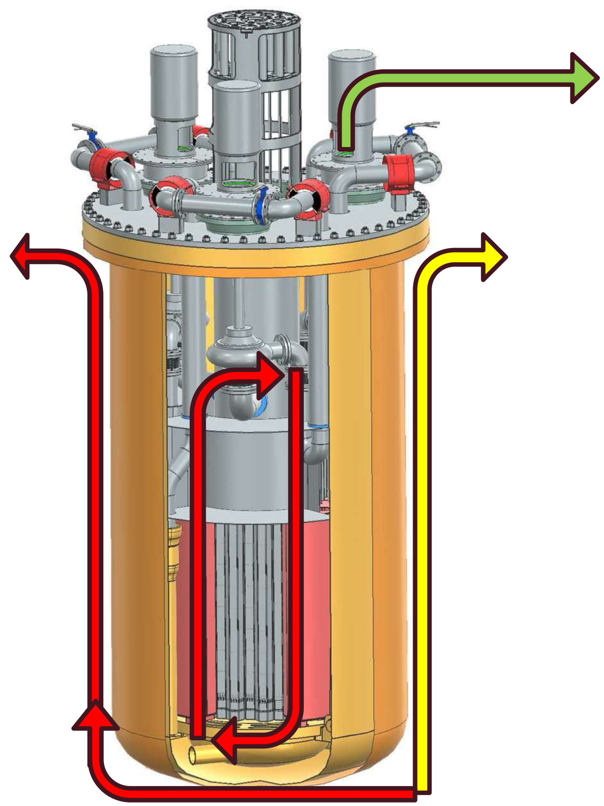
SAFETY OVERVIEW - LICENSING BASIS

- Design aligns with defense-in-depth and functional containment principles rather than reliance on a traditional leak-tight containment
- Safety systems emphasize passive operation and inherent reactor stability consistent with modern DOE/NRC regulatory guidance for advanced sodium reactors
- Reactor Vessel and Guard Vessel form the primary and secondary safety-related boundaries for radionuclide retention

SAFETY OVERVIEW- FUNCTIONAL SAFETY FUNCTIONS

The Fundamental Safety Functions (FSFs) are high-level safety functions to satisfy the public safety objective of regulations

- **Reactivity Control:**
  - **Managed through control and safety rods capable of full shutdown during scram or loss of power**
- **Heat Removal:**
  - **Achieved via PDHRS and supported by ADHRS under powered conditions**
- **Radionuclide Retention:**
  - **Maintained through multi-layer barriers**
- **Preservation of adequate radiation shielding.**



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SAFETY OVERVIEW- DEFENSE-IN-DEPTH

- **Defense-in-depth (DID) provide layers of defense and protective measures.**
- **Layers of defense are determined by the source and hazard posing the threat.**
- **Protective measures are applied to each layer of defense and consist of design, operational, and programmatic features that ensure the functionality of each layer**

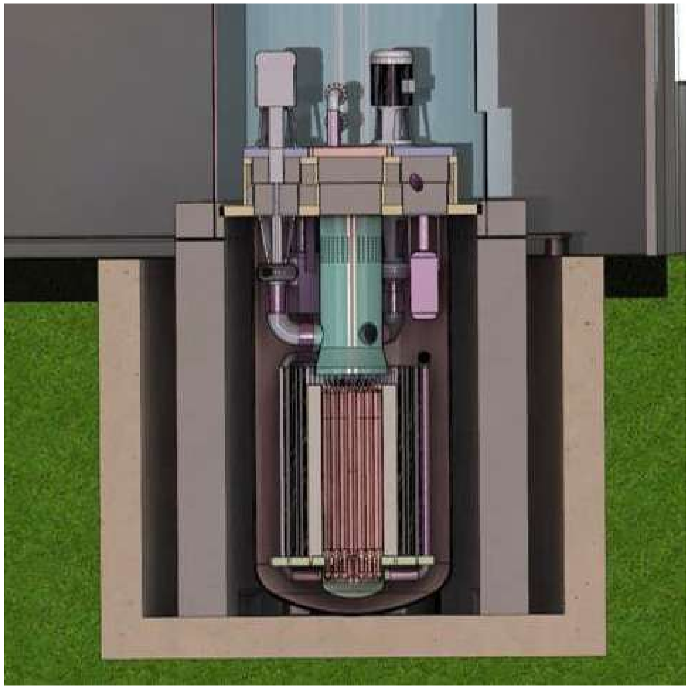
Defense Level	Objective
DL 1 - Prevent	Control of plant disturbances
DL 2 - Control and Detect	Detection and control of abnormal operations
DL 3 - Protect	Control of LBE plant conditions within design basis
DL 4 - Manage	Control of severe accidents through prevention of accident progression
DL 5 - Mitigate	Mitigation of offsite radiological consequences

FUNCTIONAL CONTAINMENT STRATEGY – RETAINING RADIONUCLIDES

Employs a functional containment approach using multiple physical and thermal barriers rather than a single leak-tight containment structure

Diverse Barriers:

- **Fuel and Cladding:**
- **Reactor Vessel (RV):**
- **Guard Vessel (GV):**
- **Confinement Structures (Upper/Lower):**
- **Thermal Barriers:**



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Q&A

THANK YOU

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