SOLO Reactor Module and Containment Report

NRC Pre-Submittal Meeting

September 29-30th 2025 | USNRC HQ

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Outline

- Purpose and Review Request
- Applicable Regulations and Regulatory Guidance
- SOLO System Overview
  - Reactor Key Features
- Reactor Parameters
- Description of the reactor
  - Reactor Module
    - [[

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  - Biological Shield
    - Concrete Shielding (Monolith)
- Topical Report Submittal Schedule

Purpose and Review Request

- To engage NRC staff in a pre-submittal meeting for a Topical Report that describes the Nuclear Design of SOLO Microreactor
  - To introduce the Reactor Core and Biological Shield of the SOLO microreactor
  - Elicit NRC staff early feedbacks on completeness of information for PSAR sections 4.1 to 4.4 following NUREG 1537
- **TINN is requesting NRC review and approval of "SOLO Reactor Module and Containment" for the SOLO Micro Modular Reactor FOAK Project**
  - **To anticipate sections 4.1 to 4.4 of PSAR**

**The topical report does not address the operating limits. Those limits will be addressed in the operating license application.

Applicable Regulations and Regulatory Guidance

The following documents can be applied:

- NUREG 1537 Part 1&2

SOLO Micro Modular Reactor Key Features

- Power class: 1 MWe / 5 MWth
- Fuel Rods: UO2 Rodlets (4.95% U235), Zircalloy Clad (same as operating LWRs)
- Operating cycle: ≥15 years w/o refueling (EOL)
- Moderator: [[ ]]
- Coolant: Helium
- Assembled in a factory and transportable by track, train, ship - total weight less than [[ ]]
- Off-grid use case (behind the meter application)
- Constant reactor power
  - Load follow possible through dispatch mechanisms from the secondary side

Reactor Parameters

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S1 Reactor Module

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S1.1 Reactor Core

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Includes:

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S1.1.1 Nuclear Fuel System

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S1.1.1 Nuclear Fuel System

Fuel Assemblies

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S1.1.2 Moderator System

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Includes:[[

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S1.1.2 Moderator System

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iii. Moderator Cylinders

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Cross-section 1

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S1.1.3 Reflector System

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S1.2.1 Upper Plenum

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S1.2.2 Lower Plenum

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S1.3 Reactivity Control System

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S1.3.1 Reactor Control System

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S1.3.2 Reactor Shutdown System

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S1.3.2.1 Shutdown Drums and Mechanisms

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S1.3.2.2 Shutdown Rods and Mechanisms

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S1.3.2.3 Absorber Rodlets System

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S1.4 Integrated Radiological Containment

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S1.4.1 Stainless-Steel Vessel

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S1.4.2 Instrumentation Channels

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S1.4.3 Safety Channels

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S1.4.4 Irradiation Channel

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S1.4.5 Gas makeup system

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Top View

S2 Biological Shield

Includes:

S2.1 Concrete Shielding (Monolith)

- Provides radiological containment, confinement, shielding and external hazards protection.

S2.1 Concrete Shielding (Monolith)

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2.1.1 Concrete Walls

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Topical Report Submittal Schedule

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Questions


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Thank You!
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