



# The NRIC-LOTUS test bed

## Overview

The National Reactor Innovation Center (NRIC) is establishing the Laboratory for Operations and Testing in the United States (LOTUS) test bed to accelerate the development of advanced nuclear energy technologies.

Located at the Idaho National Laboratory (INL), the NRIC-LOTUS test bed will be a state-of-the-art facility where advanced nuclear reactor developers can conduct experiments within a secure facility. These experiments are essential for advancing the understanding of next-generation nuclear technologies and for validating their safety, reliability and performance.

By enabling rigorous testing and evaluation of advanced reactor concepts, NRIC-LOTUS will accelerate the commercialization of these technologies, paving the way for a reliable nuclear energy landscape.

The NRIC-LOTUS test bed will serve as a vital hub for developers, offering the ability to test and refine their technologies within a safe, secure and controlled environment.

## Benefits of testing in NRIC-LOTUS

- **Real-world testing:**  
The NRIC-LOTUS test bed offers a platform for collecting empirical data through experiments with a diverse range of fuel compositions. This data aids developers in expediting the licensing process, enabling the rapid deployment of advanced reactors.
- **Flexible and versatile testing environment:**  
NRIC-LOTUS can accommodate various advanced small modular reactor and microreactor designs allowing multiple developers to use the facility to test different technologies and fuel types, including experiments related to

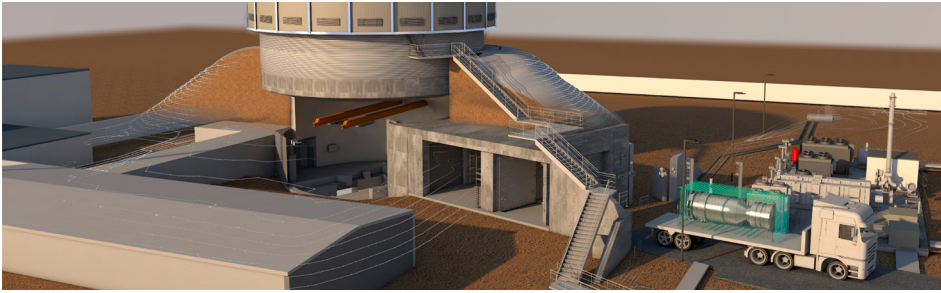
space and maritime applications.

- **World-class resources:**  
NRIC-LOTUS is located at INL's Materials and Fuels Complex, providing developers with access to world-class support facilities and expertise in fuels synthesis, post-irradiation examination and other analysis capabilities.

## Status

The final design for NRIC-LOTUS was completed in 2024, and construction is expected to begin during FY 2026. The Department of Energy (DOE) continues to support the development of the test bed.

The anticipated first user of the NRIC-LOTUS test bed is the Molten Chloride Reactor Experiment (MCRE) being developed by Southern Co.,



*The NRIC-LOTUS test bed includes a tunnel to facilitate loading and unloading experiments.*



*The 50-foot diameter cell provides space for small experimental reactor demonstrations.*

TerraPower and INL.

The NRIC-LOTUS test bed leverages the infrastructure of the Zero Power Physics Reactor building, a historic facility in which the original reactor provided large amounts of detailed data to support a variety of reactor core designs.

### Key features:

- **Capacity:**  
Supports reactor experiments with designed power outputs up to 500 kilowatts thermal (kWth).
- **Cell heat removal system:**  
Designed to provide two fully redundant split heating, ventilation and air-conditioning packages made up of an air handling unit and condensing unit, each capable of rejecting 50 kWth.
- **Cell access and material handling:**  
The tunnel entering the cell is designed with a 13-by-13-foot clearing to facilitate material ingress/egress, and the cell also features a five-ton polar crane.
- **Cell details:**  
NRIC-LOTUS provides radiological confinement within a 50-foot diameter room with a recessed pit area. The usable height is 13 feet, 11 inches from the main floor of the cell to the bottom of the crane hook.
- **Fuels:**  
The NRIC-LOTUS test bed provides the ability to collect empirical data through experiments utilizing a more diverse fuel composition.

### NRIC-LOTUS CONTACT

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20-50250-06\_R5

**About NRIC:** The U.S. Department of Energy's National Reactor Innovation Center is enhancing national laboratory infrastructure and capabilities by engaging with regulators and stakeholders to identify and fill gaps that hinder advanced nuclear energy. This program is led by Idaho National Laboratory.



NRIC



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