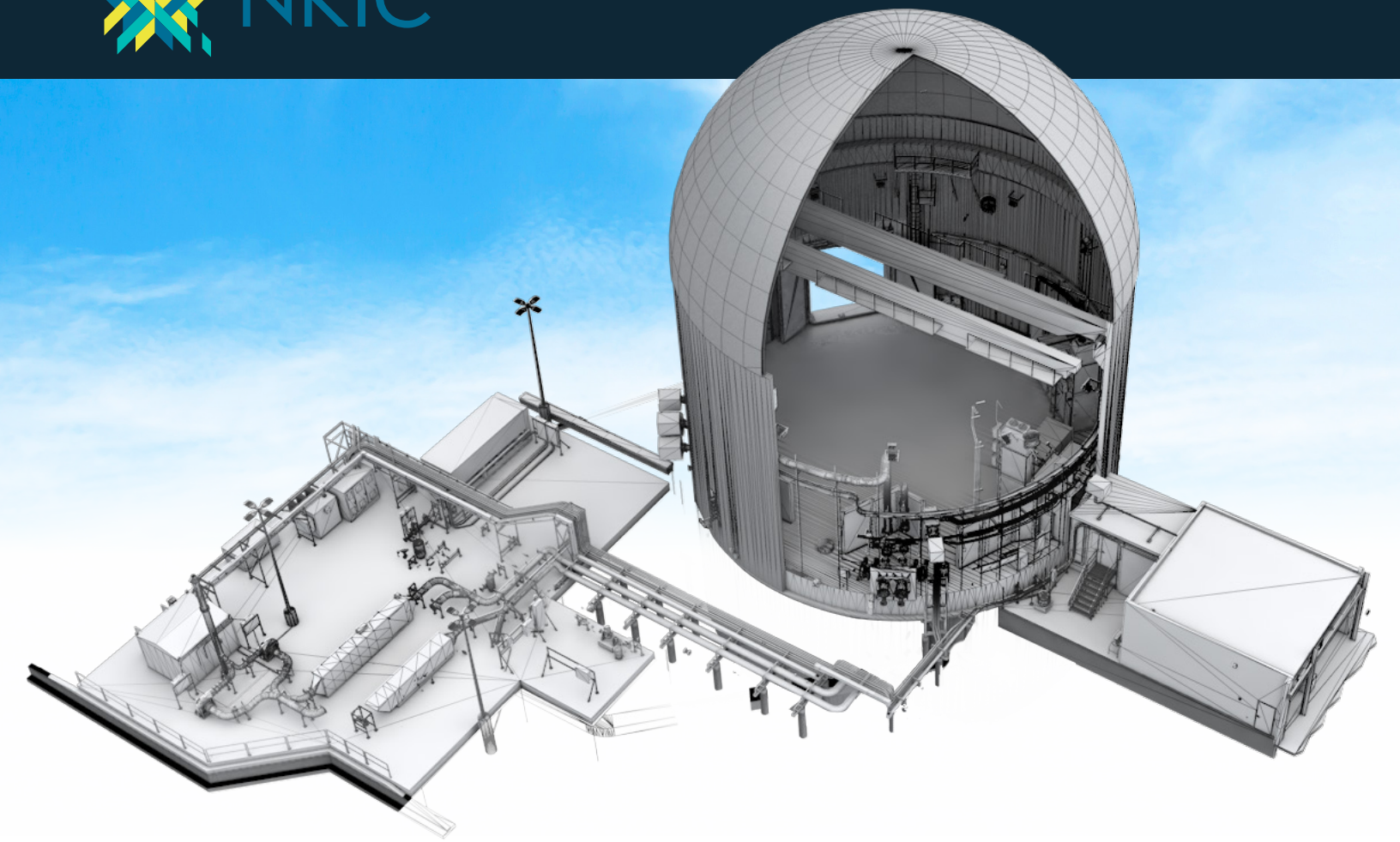

The NRIC-DOME test bed

The National Reactor Innovation Center's Demonstration of Microreactor Experiments (NRIC-DOME) test bed is a facility designed to accelerate the testing and development of advanced reactor technologies. Located at the Idaho National Laboratory (INL), NRIC-DOME provides a unique environment for developers and companies to test, demonstrate, and refine various nuclear technologies and fuel types in a safe and controlled environment.

By testing in NRIC-DOME, industry can prove nuclear technology concepts and generate data to support design verification and licensing activities, which will significantly reduce deployment timeframes and costs.

Design features

NRIC-DOME will support testing of experimental reactors that produce up to 20 MWth that uses less than 20% enriched fuels, including high-assay low-enriched uranium. Other reactor designs and fuel types can be considered if their design analyses are bounded by the DOME safety posture.

The test bed features a containment building to house reactor experiments, a control room area, and a yard with ancillary equipment such as power and radiological ventilation. The NRIC-DOME has penetrations that connect utilities, electricity, instrumentation and controls wiring, and ventilation in the yard and in the control room area to systems and equipment inside the NRIC-DOME. One set of penetrations is for developers. An equipment hatch allows installation and removal of reactor experiments.

In addition to the NRIC-DOME facility, INL has capabilities, infrastructure and options available to support the full cycle from fueling to decommissioning the reactor.


NRIC DOME construction images.

Status

NRIC plans to complete NRIC-DOME in 2026. NRIC is collaborating with multiple reactor developers in preparation for NRIC-DOME experiments.

NRIC-DOME benefits

Real-world testing:
The test bed provides empirical data under conditions, providing valuable data for reactor optimization and safety analysis.

Flexible and versatile testing environment:
NRIC-DOME can accommodate various experimental reactor designs, allowing each developer to use the facility to test their different technologies and fuel. Careful schedule planning will enable rapid turnover for developers with different technologies, increasing efficiency and improving economics. NRIC-DOME can potentially host nuclear experiments related to land, space and maritime applications.

Safety:
NRIC-DOME is a safe environment for reactor demonstrations and provides structures, systems, and components that prevent potential reactor events and protect the public and environment.

World-class resources:
NRIC's team of experts provides comprehensive support throughout the testing process from permitting and licensing, to data analysis and stakeholder engagement.

Accessing NRIC-DOME:
NRIC plans to issue a notice of opportunity to apply for testing time in the NRIC-DOME on an annual basis. Developers must meet key milestones and safety protocols with their design to gain access. NRIC-DOME can accommodate one reactor at a time and priority access will be given to reactor developers whose designs have a strong likelihood of success due to technology maturity and other factors. Developers must plan to fund their entire test campaign, including fuel cycle costs as agreed to with DOE.

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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 the Idaho National Laboratory.

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