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Nuclear Science & Technology Leadership In Nuclear Energy

Idaho State Capitol, Lincoln Auditorium, Boise, ID

Battelle Energy Alliance manages INL for the
U.S. Department of Energy's Office of Nuclear Energy

 Idaho National Laboratory

Nuclear News

The New York Times
22 Countries Pledge to Triple Nuclear Capacity in Push to Cut Fossil Fuels
The group, including Britain, France and the United States, said the agreement was critical to meeting nations' climate commitments.

President Emmanuel Macron of France at the United Arab Emirates, on Saturday. He said nuclear energy is an "indispensable solution" in efforts to curb climate change.

Bloomberg | [Subscribe](#)
Nuclear Energy Revival: Why Fusion Is So Hard | Two Approaches to Fusion
Green | Cleaner Tech
The Future of Nuclear Energy Will Be Decided In Idaho
An Idaho lab central to global nuclear energy has waited more than a decade to test a new nuclear technology. An end to the wait could come after a recent industry setback.

POWER
Nuclear
UAMPS and NuScale Power Terminate SMR Nuclear Project
Utah Associated Municipal Power Systems (UAMPS) and NuScale Power Corp. (NuScale) have mutually agreed to terminate the Carbon Free Power Project (CFPP), a small modular reactor (SMR) project that was planned for the Idaho National Laboratory.

THE HILL
THE VIEWS EXPRESSED BY CONTRIBUTORS ARE THEIR OWN AND NOT THE VIEW OF THE HILL
A nuclear energy imperative: US technical leadership must continue
BY SEN. JIM RISCH (R-IDAHO) AND JOHN WAGNER, OPINION CONTRIBUTORS - 11/29/23 2:30 PM ET

FILE - Poland's Prime Minister Mateusz Morawiecki talks to journalists as he arrives for the third EU-CELAC summit in Brussels, Belgium, Tuesday, July 18, 2023. Polish and U.S. officials signed an agreement Wednesday, Sept. 27, 2023 in Warsaw for the construction of Poland's first nuclear power plant, part of an effort by the Central European nation to move away from polluting fossil fuels. (AP Photo/Geert Vanden Wijngaert, File)

ArcaMax
NASA feels a 'sense of urgency' to get to Mars. Idaho scientists could help us get there
Michael Wilner, Idaho Statesman on Nov 25, 2023
Published in Science & Technology News

WASHINGTON — China has repeatedly stunned the U.S. intelligence community in the last five years with rapid progress in its space exploration program, landing a rover on the far side of the moon and completing its very own space station orbiting Earth. Their advances have established that a new space race is on between Washington and Beijing — this time with the ultimate goal of sending a crewed mission to Mars, each vying to be the first to land humans on another planet.

NUCLEAR ENGINEERING INTERNATIONAL
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TRIGA International to supply fuel for MARVEL microreactor
8 December 2023

The US Department of Energy (DOE) has awarded a contract to TRIGA International, a joint venture between Framatome International and General Atomics, to supply fuel for the MARVEL microreactor at Idaho National Laboratory (INL). The TRIGA fuel fabrication facility (TRIGA FAF) at INL, which operates INL Framatome fuel fabrication reactors, will supply the TRIGA fuel used in the MARVEL microreactor. Framatome's dedicated TRIGA manufacturing facility at CERCA in Romania was selected to fabricate the TRIGA fuel for the MARVEL microreactor. CERCA is the world's only manufacturer and supplier of uranium-zirconium hydride fuel for research reactors.



Nuclear Energy Research and Development Objectives

- Sustain and optimize the light-water reactor fleet for national energy security and low-carbon energy production
- Design, demonstrate, and rapidly deploy advanced reactors
- Accelerate the development and qualification of nuclear fuels and materials
- Design, demonstrate, and rapidly deploy innovative and sustainable integrated fuel cycle solutions
- Realize the Next-level INL and foster a high-performing research organization



<https://inl.gov/content/uploads/2023/12/INL-FY23-Impacts-Report.pdf>

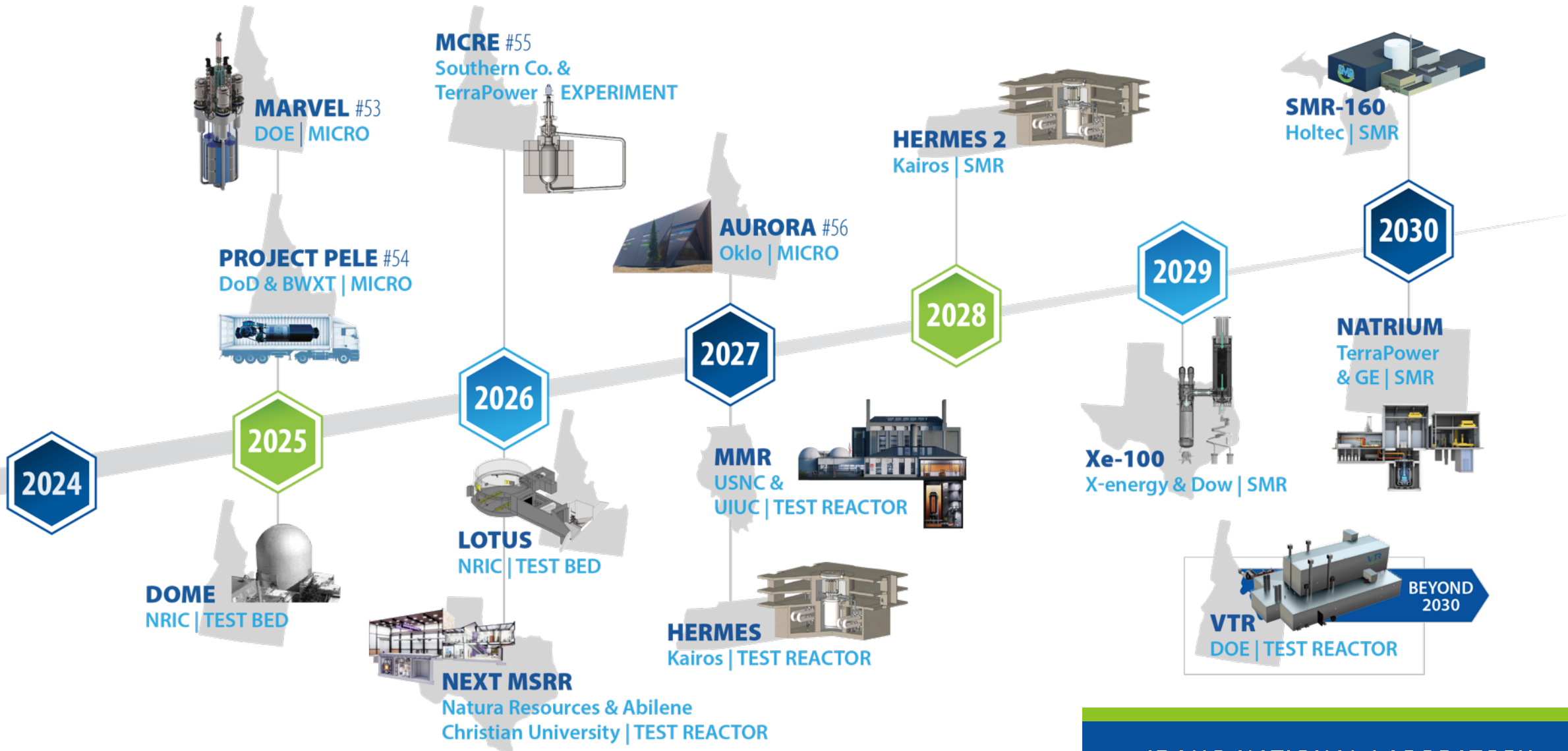
INL research having real-world impact to sustain the current fleet

- Bringing digital technologies to existing reactors key to reducing operations costs.
- INL provided licensing basis input for modernization to newer digital technologies that is enabling the safety-related digital instrumentation and control upgrade at Constellation's Limerick Generating Station.
- INL reports provided to the U.S. Nuclear Regulatory Commission by Constellation Energy in support of the Limerick digital upgrade License Amendment Request.



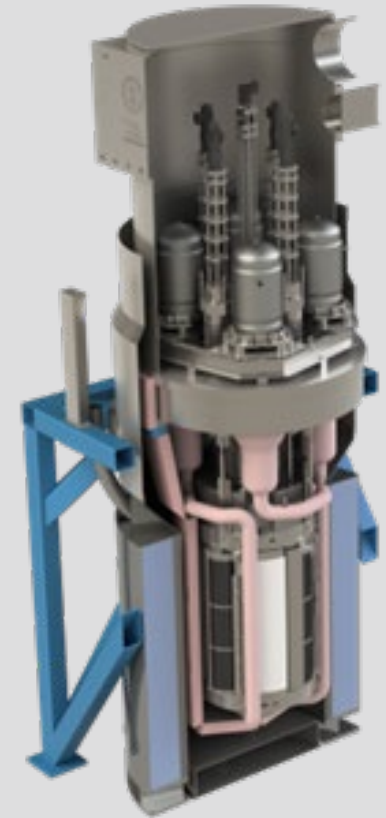
Constellation's Limerick Generating Station in Pottstown, PA

Accelerating advanced reactor demonstration & deployment



Critical milestones achieved for advanced reactor demonstrations and Experiments

- **MARVEL:** completed 90% final design
- **Molten Chloride Reactor Experiment (MCRE):**
 - INL achieved ~98% yield of uranium feedstock into harvested fuel during a fuel salt synthesis scale-up run for MCRE, exceeding the project requirement for a 90% yield and previously achieved yield of 83%.
 - Performed the first full-scale fuel salt synthesis demonstration, supporting completion of final design of the fuel salt synthesis line.
- **PELE:** draft preliminary safety analysis report (PSAR) for PELE was completed by BWXT and INL



MARVEL will be the first modern microreactor ever to be designed, built, authorized, and operated.

National Reactor Innovation Center Selects Three Developers for Studies for testing in DOME

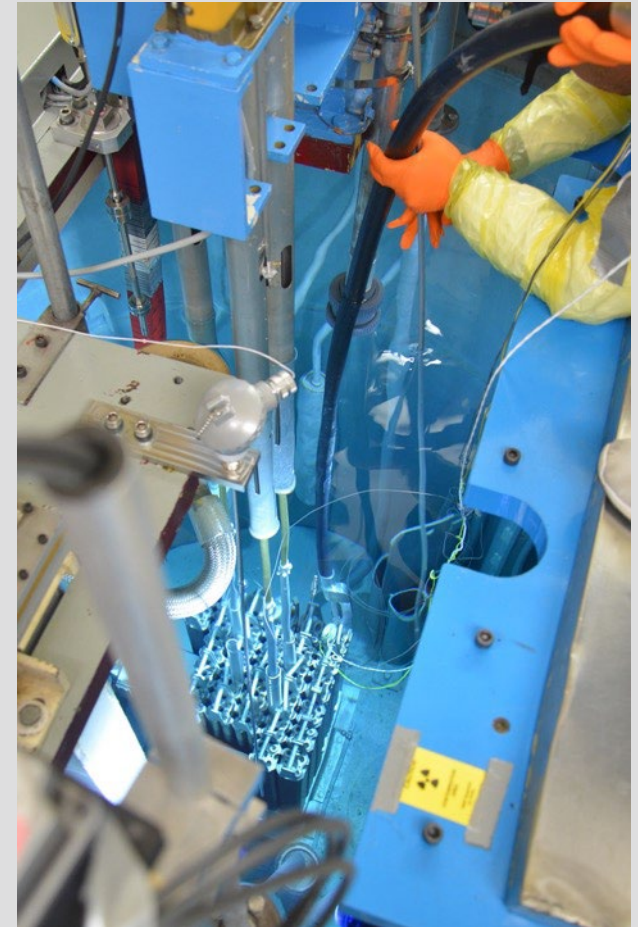
- Westinghouse: eVinci
- Radiant Nuclear: Kaleidos
- Ultra Safe Nuclear Pylon
- NRIC working with each company on Front End Engineering and Design Studies
- Testing could begin as early as 2026



The Experimental Breeder Reactor-II (EBR-II) containment vessel has been used to create the DOME testbed.

First in history irradiation of Uranium Chloride Salt Performed at INL

- Molten-salt Research Temperature-controlled Irradiation experiment in the Neutron Radiography Reactor (NRAD).
- First uranium-fueled chloride salt irradiation in history and the first enriched uranium salt irradiation in the US in over 50 years
- Only existing enriched-uranium salt irradiation capability in the world and will lead to the licensing and deployment of future molten salt reactor systems.



Researchers using NRAD to irradiate enriched uranium bearing chloride salt with neutrons to study the effects of radiation

Pacific Basin Nuclear Conference Coming to Idaho Falls in October 2024

Honorary Chair: John Wager
Technical Chair: Jess Gehin

~400 Anticipating
Attendees

Blue Cross of Idaho
Conference Center,
Mountain America Center



IDAHO NATIONAL
LABORATORY



**TH
ANNIVERSARY**

Battelle Energy Alliance manages INL for the U.S. Department of Energy's Office of Nuclear Energy. INL is the nation's center for nuclear energy research and development, and also performs research in each of DOE's strategic goal areas: energy, national security, science and the environment.



Idaho National Laboratory

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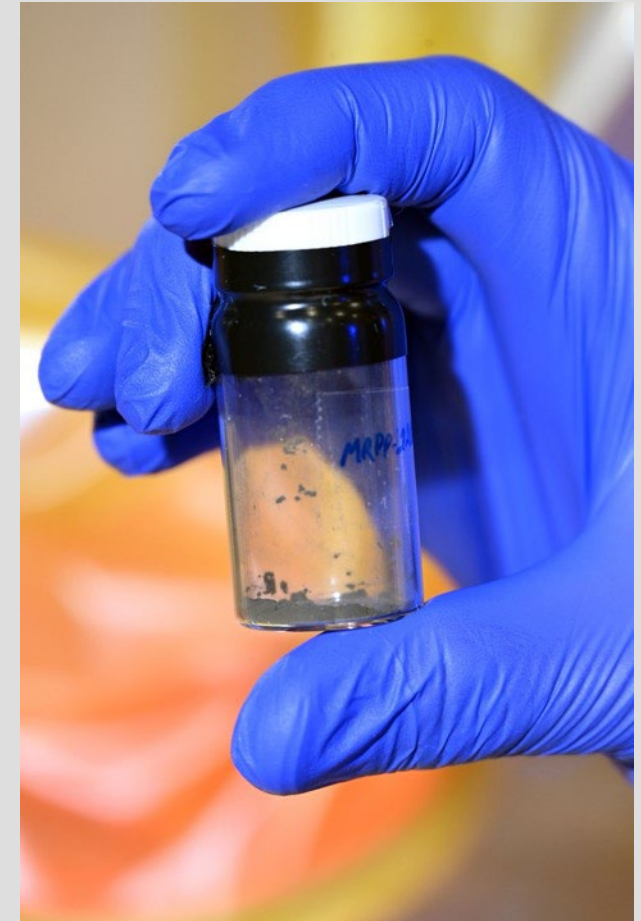
FY23 Highlight: *First ever down-blending expanded fuel availability for demonstrations*



The effort involved a team of researchers, operators, and technicians.

The Material Recovery Pilot Plant for the first time successfully demonstrated in situ down-blending of highly enriched uranium fuel to support INL and Department of Energy's commitment to the high assay low enriched uranium (HALEU) production technologies.

This was a groundbreaking achievement providing a method to expand HALEU supply for advanced reactor programs.



U₃O₈ sample, the product of the down-blending.