

# International collaboration aims to lower construction costs of new reactors

The Nuclear AMRC is part of a new US-led collaboration to develop advanced construction technologies that can together reduce the cost of new nuclear builds by more than 10 per cent.

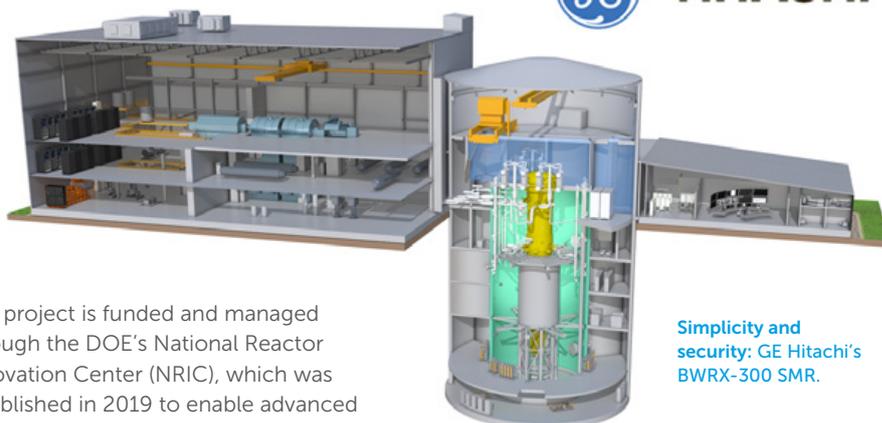
**The project, referred to as the Advanced Construction Technology initiative, is led by GE Hitachi Nuclear Energy and backed by the US Department of Energy (DOE) with \$5.8 million funding.**

Researchers will demonstrate three technologies (see box), leveraging promising developments from other industries which have not been tested within a nuclear energy context. These technologies can be applied to a variety of advanced reactor designs to significantly improve the economics of bringing advanced reactors to market.

The Nuclear AMRC is bringing its expertise in sensor development and welding, including weld simulation, to the project. The research will involve close collaboration with the US-based Electric Power Research Institute (EPRI), a tier one member of the centre.

"We are delighted to support GE Hitachi and our member EPRI on this exciting project," says Dr Li Li, head of the Nuclear AMRC's control & instrumentation group. "The assurance of construction integrity is a vital consideration for advanced nuclear reactors, and we are seeing more reactor designs using below-ground construction to provide additional protection from natural or man-made hazards.

"By applying sensor-based structural health monitoring and real-time condition monitoring techniques, we will help bring the digital replica alive to optimise the cost of construction, operation and maintenance, and to improve the safety of advanced reactors over decades of low-carbon power generation."



**Simplicity and security: GE Hitachi's BWRX-300 SMR.**

The project is funded and managed through the DOE's National Reactor Innovation Center (NRIC), which was established in 2019 to enable advanced reactor demonstration and deployment.

"Construction costs and schedule overruns have plagued new nuclear builds for decades," said Dr Kathryn Huff, acting assistant secretary for nuclear energy at DOE. "By leveraging advanced construction technologies, we can drive down costs and speed the pace of advanced nuclear deployment – much-needed steps to tackle global climate change and meet the President's goal of net-zero carbon emissions by 2050."

GE Hitachi Nuclear Energy is currently developing the BWRX-300 small modular reactor (SMR), for potential deployment by 2028. Based on proven boiling water reactor technology, the BWRX-300 is designed for simplicity, with a variety of passive safety systems for the secure provision of clean, flexible baseload electricity.

"We are excited to work with DOE, NRIC and the outstanding team we have assembled to help evaluate how innovative construction methods and technologies can reduce the cost of advanced reactor construction," said Jon Ball, executive vice president of GE Hitachi Nuclear Energy. "We know this funding will significantly benefit the commercialisation of SMRs and pave the way for other advanced reactors."

The Advanced Construction Technology consortium also includes UK companies Caunton Engineering and Modular Walling Systems, US engineering group Black &

Veatch, utility group Tennessee Valley Authority, Purdue University, and the University of North Carolina at Charlotte.

The project will be conducted in two phases. The first will focus on technology development and preparation for a small-scale demonstration. Pending its successful completion and future appropriated funds, a second phase is planned to carry out the demonstration within three years.

[nric.inl.gov/advanced-construction-technologies-initiative](http://nric.inl.gov/advanced-construction-technologies-initiative)

## The Advanced Construction Technology initiative focuses on three areas:

- **Vertical shaft construction**, a best practice from the tunnelling industry which could reduce construction schedules by more than a year.
- **Steel Bricks**, modular steel-concrete composite structures which could significantly reduce the labour required on site.
- **Advanced monitoring and digital twins**, which can create a detailed virtual replica of the nuclear power plant structure.