

# What's in a name?

The U.S. Department of Energy (DOE) has proposed building the **Versatile Test Reactor** to support research and development of innovative nuclear technologies. Not sure what **test reactors** are or how they differ from **power reactors** and **demonstration reactors**? Read on to learn about these different reactors.

| ?   | ⚡ Power Reactors  | ✔ Test/Research Reactors  | 🔬 Demonstration Reactors  |
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| <b>Who operates them?</b>                       | Utilities.  | Private companies, national labs, government agencies and universities.   | Developers and national labs.   |
| <b>What are they used for?</b>                  | To generate thermal energy to produce electricity and hydrogen or drive industrial processes.   | Scientific research and training. Test reactors maximize production of neutrons, which are used to test fuels, materials, and sensors. Universities also use them for training purposes.                                      | To validate new reactor concepts for commercial use and assess performance. This data is important and helps ensure reactor systems operate as intended – a critical step on the path to commercialization.   |
| <b>How many are there in the United States?</b> | Currently, there are 95 operating power reactors. Two new units are under construction at Georgia's Plant Vogtle.                           | More than 35. Most are located at universities though several national labs also house test reactors. DOE is proposing to build the <u>Versatile Test Reactor</u> , which would be its first new research reactor in decades. | None yet. DOE launched the <u>National Reactor Innovation Center (NRIC)</u> in 2019 to help reactor developers demonstrate technologies. NRIC provides resources for testing, demonstration, and performance assessment to accelerate deployment of new advanced nuclear technology concepts. |
| <b>How are they operated?</b>                   | Nuclear power plants run continuously for 18-24 months before refueling.  | Test reactors are shut down and restarted frequently for change out of experiments and refueling which ensures the neutron flux, or number of neutrons available for testing, is high.  | Depends on the design and validation protocol.  |
| <b>Interesting fact</b>                         | Nuclear power supplies the United States with 20% of its total electricity production, and accounts for 55% of its carbon-free electricity. | Research conducted in test reactors results in better nuclear fuels, materials, and sensors. Because of these improvements, power reactors produce more electricity than they did 30 years ago.                               | The Nuclear Regulatory Commission requires all new nuclear technologies to undergo various licensing steps. Operating a "demonstration" plant – either a small-scale or full-size reactor at low power – helps support this process.  |

## Did you know?

The Versatile Test Reactor is a one-of-a-kind scientific user facility capable of performing large-scale tests and experiments simply not possible today.

