TERRAPOWER'S LABORATORY:
INVESTING IN GROUNDBREAKING RESEARCH

TerraPower maintains **state-of-the-art laboratory facilities** to support and accelerate the company's nuclear technology research and engineering work. Starting with 10,000 square feet when the company began, TerraPower has expanded to 65,000 square feet of facilities in 2019. With success in demonstrating aspects of its energy systems, components and materials validation, TerraPower began adding to its laboratory facilities in 2017. The expansion accommodates growth in needed testing capabilities to demonstrate key components and physical properties of materials.

FROM CONCEPT TO COMMERCIALIZATION

TerraPower's Laboratory supports a variety of research areas, including the verification and validation of codes and models, and the development of equipment, instrumentation and processes. TerraPower's materials development and innovation programs also rely on the facilities in the lab.

Testing at the TerraPower Laboratory follows Technology Readiness Level methodology. This operational testing approach originated at NASA and has a long history of use by the Department of Defense; TerraPower uses it to estimate technology maturity of critical elements. During the development process, Technology Readiness Assessments help keep work focused. Selected reactor components, fuels and materials technologies go through a four-step process summarized below:

- Bench testing to determine which processes or materials should be tested further;
- Scaled-up testing using larger-scale components, which helps further develop and refine testing and analytical techniques to ensure they will be valid for prototype testing;
- Prototype testing of scaled and full-sized components or final testing of materials; and
- Integration with other technologies, components and/or materials being developed, tested and analyzed in the lab.

Each step of this process may include testing in increasingly difficult media (air to water to liquid sodium) and temperatures (low to elevated) on the path to a final technology.

TerraPower's 10,000-square-foot laboratory space in Bellevue, Washington.

PRIMARY ACTIVITIES AT THE LAB

Component Testing – finding where small changes can produce great results

Model Validation – proving out new codes and models

Instrumentation – developing and fabricating custom, cutting-edge testing equipment

Innovation – performing first-rung research on new nuclear-related technologies

Materials Exploration – developing or adapting metal alloys and coatings

TerraPower

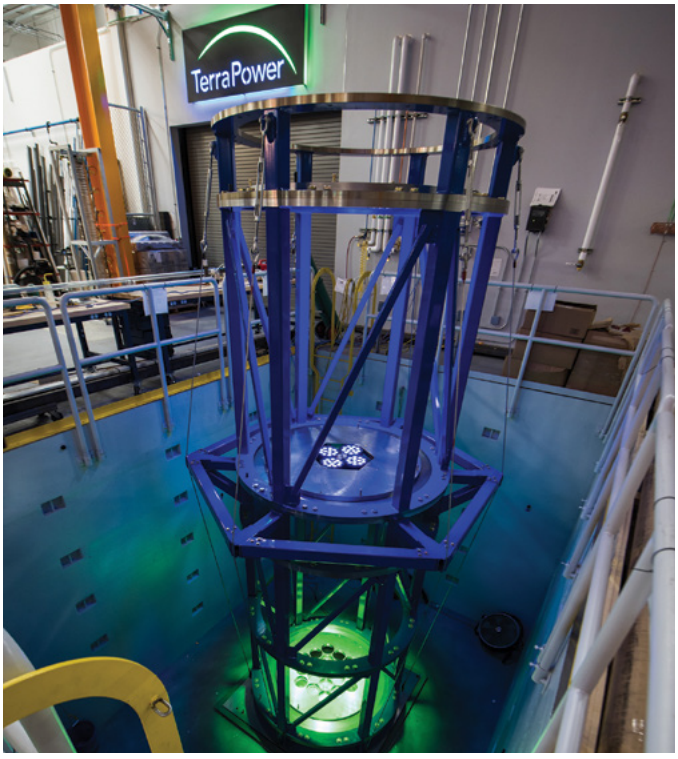
TerraPower LLC | 15800 Northup Way | Bellevue, WA 98008 | (425) 324-2888 | www.terrapower.com

BRINGING NEW TECHNOLOGIES TO LIFE

TerraPower's thermal hydraulic flow loop uses water to test the flow of liquid in the Traveling Wave Reactor's core components. This simulation test helps TerraPower's engineers refine the flow characteristics for the fuel assemblies as well as adjacent areas.

A TerraPower engineer runs a test on a prototype vacuum quench furnace. The full-sized equipment will be used to heat-treat uranium metal to be used in fuel rods.

A technician places a full-size test fuel pin bundle in TerraPower's pin duct interaction test apparatus. TerraPower manufactures bench- and full-scale fuel pins and pin bundles for testing in the lab.



This full-scale fuel assembly test stand provides data on the metal-on-metal interactions that take place in a reactor's core. Tests provide data on thermal-mechanical behavior of the fuel inside the reactor core, a critical step in benchmarking experiments against design models.

A TerraPower engineer performs chemical experiments in a fume hood. This equipment allows engineers to safely conduct experiments in an air atmosphere.

TerraPower

TerraPower LLC | 15800 Northup Way | Bellevue, WA 98008 | (425) 324-2888 | www.terrapower.com