

TerraPower circles 2023 for Natrium construction permit

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TerraPower hopes to apply for a construction permit in August 2023 and an operating licence in March 2026 for its Natrium fast reactor, according to a regulatory engagement plan (REP) it has sent to the US Nuclear Regulatory Commission (NRC).



How a Natrium plant may appear (Image: TerraPower)

The company said it favours separate applications over a combined licence for "the ability to start construction earlier". The plan, which was submitted together with a letter dated 8 June from Ryan Sprengel, TerraPower's license application development manager, was made public on 16 June.

Sprengel wrote that the plan was provided for information and outlines proposed interactions with the NRC associated with the Natrium reactor, which is a TerraPower and GE-Hitachi (GEH) technology. The primary purpose of the REP is "to reduce regulatory uncertainty", TerraPower said, "to facilitate the NRC's understanding of Natrium technology and its safety case as early in the regulatory process as possible".

"TerraPower was founded a decade ago by Bill Gates and a group of like-minded visionaries that decided the private sector needed to act in developing advanced nuclear energy to meet growing electricity needs, mitigate climate change, and lift billions out of poverty," the plan says.

"An expert group of scientists and engineers was formed to analyse all energy generation technology options from a total systems perspective. After a thorough examination of all known and some heretofore unknown reactor concepts, including lead-cooled reactors and small modular helium cooled reactors, TerraPower decided to focus development on improving the sodium cooled reactor design that met all of the stated objectives of TerraPower's founding principles," it adds.

TerraPower and GE-Hitachi Nuclear Energy Americas joined forces in 2019 to develop the Natrium technology, which features a sodium-cooled fast reactor combined with a molten salt energy storage system. The ratings for the Natrium reactor will be 840 MWt and the energy island will have the capability to produce up to 500 MWe.

TerraPower and GEH are backed by Bechtel Power Corporation and utility partners Energy Northwest, Duke Energy, and PacifiCorp.

Earlier this month, TerraPower and PacifiCorp announced plans to construct a Natrium reactor demonstration project at a retiring coal plant in the state of Wyoming. They expect to announce the specific site by the end of this year.

The demonstration project in Wyoming will be a fully functioning power plant and is intended to validate the design, construction and operational features of the Natrium technology, TerraPower said. The next steps include further project evaluation, education and outreach, and state and federal regulatory approvals prior to acquisition of a Natrium facility.

Along with Berkshire Hathaway Energy subsidiary PacifiCorp and GEH, members of the demonstration project team include engineering and construction partner Bechtel, Energy Northwest, Duke Energy and nearly a dozen additional companies, universities and national laboratory partners.

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