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April 15, 08

Scientists Increase Burn Rate of Gas Reactor Uranium Fuel by 3x

Advanced gas reactors offer more efficient operation, less waste disposal and other benefits over water-cooled reactor designs used in U.S. nuclear power plants.

But creating fuel that burns efficiently and reliably in the higher temperatures of advanced gas reactors has been a challenge -- until now.

Fuel fabricated at Oak Ridge National Laboratory, in cooperation with Idaho National Laboratory and the Babcock & Wilcox Company, has demonstrated the most successful performance ever for U.S. advanced gas reactor fuel.

In recent tests at the Advanced Test Reactor at INL, the ORNL fuel achieved 9 percent burn-up, a significant milestone on its way to a target of 16-18 percent.

Higher burn-up allows for more efficient use of uranium and less waste compared to the 3-4 percent rate of standard fuel at U.S. power plants.

his experiment is the first of eight planned to qualify fuel as part of the Department of Energy's Next Generation Nuclear Power Plant project.

The fuel elements are built from thousands of tiny uranium-containing spheres coated with carbon and silicon carbide to contain the radioactive fission products. The coated particles are compacted by a special process into fuel sticks and loaded into a graphite form.

The fuel work for this first test was conducted in ORNL's Materials Science and Technology Division and funded by DOE's Office of Nuclear Energy.



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