

## Old reactor gets new lease on life

*Upgrades totaling \$70M should keep it humming for next 30 years*

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Oak Ridge National Laboratory's "other" neutron source will return to action this summer.

The High Flux Isotope Reactor, a research stalwart since the 1960s, has been shut down since January so workers could install new equipment to expand and improve the reactor's scientific capabilities.

ORNL has spent nearly \$70 million in recent years to refurbish the reactor's infrastructure, replace key components and add research tools, including a new cold source that will slow the movement of neutrons and enhance the study of biological materials.

The high flux reactor will complement the Spallation Neutron Source, Oak Ridge's \$1.4 billion pride and joy. The accelerator-based SNS recently produced its first neutrons, and it's supposed to provide researchers with unprecedented bursts of neutrons for decades to come.

A neutron sciences users group will evaluate proposals for research experiments at each of the ORNL research facilities.

Jim Roberto, the lab's deputy director for science and technology, said the High Flux Isotope Reactor would remain a special place for certain types of experiments.

Initial tests of the reactor's cold source should begin within the next month, Roberto said.

Testing of cryogenic systems will be done in four stages, with the first work involving liquid helium, which is less hazardous than the liquid hydrogen that ultimately will be used to chill the research chambers to -420 degrees Fahrenheit.

The Oak Ridge reactor, which provides the world's highest, steady state concentration of thermal neutrons for experiments, also will undergo safety reviews throughout the summer. Expert teams from the lab and outside institutions will evaluate the 40-year-old nuclear facility to ensure that systems are up to snuff and ready to long-term operations.

Roberto said it's important to confirm that none of the new research equipment affects the operational safety.

The ORNL reactor was shut down for four years, 1986-1990, to evaluate concerns about the integrity of the reactor's carbon-steel pressure vessel. Those issues were later resolved to the satisfaction of multiple review teams, although when the reactor operations resumed the power level was dropped from 100 megawatts to 85 megawatts.

Lab officials have said they expect the recent upgrades to prepare the reactor for another 30 years of use. Full operations should resume sometime in the fall, according to Roberto.

The Oak Ridge reactor still has only four ports that open to the nuclear core, but lab engineers have increased the capabilities for delivering those neutrons to research sites and monitoring the interaction with material samples.

New beam lines have been installed, as well as new analytical equipment – such as a triple-axis spectrometer.