Brookhaven Graphite Research Reactor

The graphite research reactor was the first nuclear reactor constructed solely for the peaceful use of atomic energy. It operated from 1950 to 1969. Final decommissioning is now under way.

The Brookhaven Graphite Research Reactor (BGRR) was the world's first nuclear reactor constructed solely for the peaceful use of atomic energy. For nearly 20 years, it was the center of neutron research in the United States, and, in 1986, was designated a Nuclear Historic Landmark by the American Nuclear Society. The reactor is now in the process of being decommissioned.

The Brookhaven Graphite Research Reactor

History

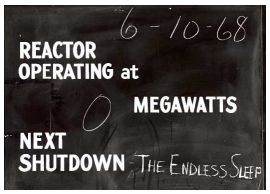
The graphite reactor was the first "big machine" to be built at Brookhaven National Laboratory.

Scientists used the BGRR, which operated from 1950 to 1969, to produce large quantities of neutrons that were used for research in numerous scientific fields. Nuclear physicists used neutrons to probe the centers of atoms. Solid-state physicists used neutrons to study the locations and motions of atoms in materials. Chemists used neutrons to examine many properties of matter. Biologists and medical physicists used neutrons to study the effects of radiation on organic tissues and to create radioisotopes for medical research and treatment.

Discoveries

The graphite reactor supplied 270 radioisotopes for use by 26 different research organizations. Other research highlights included the development of multigrade motor oils, authentication of artworks, improvement of grain crops and determination of nuclear cross sections.

In 1965, much of the neutron research at the Lab shifted to the newly-built High Flux Beam Reactor, and work at the BGRR began to wind down. The reactor was shut down in 1968, although it operated intermittently for another year.



A status board tells the story.

Legacy

Many precautions were taken and some cleanup work was done immediately after the reactor was shut down. For example, all of the fuel elements and much of the machinery were removed from the reactor. The experiments were dismantled, and the reactor pile itself was isolated and protected.

The Laboratory is now moving forward with a major decommissioning project at the BGRR. Steps that have been taken to date include:

- Removal and off-site disposal of a leaking underground sump
- Excavation and disposal of 300 cubic yards of contaminated soil and asphalt
- Removal of five sections of above-ground air ducts
- Removal and off-site disposal of reactor cooling fans
- Sampling and analysis of the reactor core (currently under way)
- Completion of a study of alternatives for the final disposition of the reactor.

Brookhaven and regulatory agencies are currently studying several options for completing the project.

Community

The Laboratory will continue to involve interested community members in the decision-making process. Roundtable meetings, tours, open houses, public comment periods, and an up-to-date web site all help to get project information out to the public.

A working group, formed to enhance dialogue among the community, regulators and the Lab, will also continue to meet as the project moves forward toward completion in 2006. Visit the BGRR website at http://www.bgrr.bnl.gov for more info.