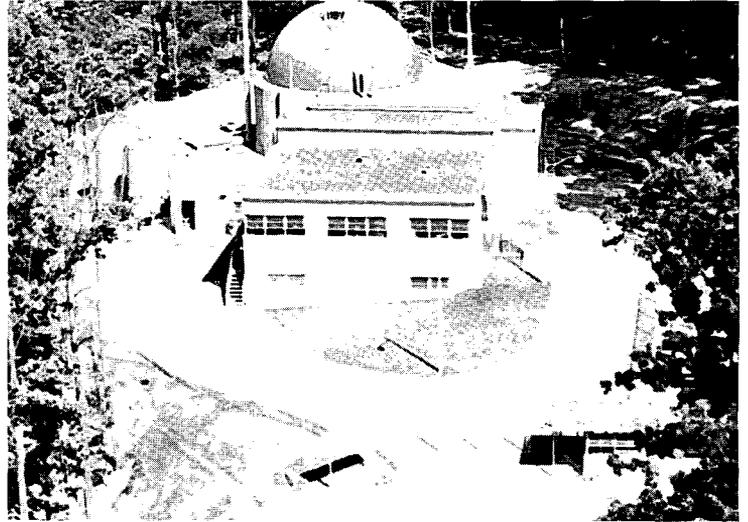


full-scale homogeneous power breeder. British and Dutch scientists studied similar reactors, and the Los Alamos Scientific Laboratory built a high-temperature homogeneous reactor using uranyl phosphate fluid fuel. If the Laboratory's pilot plant operated successfully, staff at Oak Ridge thought that homogeneous reactors could become the most sought-after prototype in the intense worldwide competition to develop an efficient commercial reactor. Proponents of solid-fuel reactors, the option of choice for many in the AEC, would find themselves in the unenviable position of playing catch-up. But this was not to be.



Aerial view in 1957 of the Army Package Reactor building at Fort Belvoir, Virginia.

Army Package Reactor

Similar initial success flowed from studies at the Oak Ridge School of Reactor Technology, where a study group in 1952 proposed a compact, transportable package reactor to generate steam and electric power at military bases so remote that supplying them with bulky fossil fuels was too difficult and costly.

The AEC and Army Corps of Engineers expressed a great deal of interest in this concept, and in early 1953 Laboratory management met with Colonel James Lampert and Army Corps of Engineers staff to initiate planning for such a mobile reactor. Alfred Boch and a team including Harold McCurdy and Frank Neill in the Electronuclear Division were given responsibility to design this small reactor. They selected a heterogeneous, pressurized-water, stainless steel system design that could use standard components wherever possible for easy replacement at remote bases. Walter Jordan led a Laboratory team that drew up specifications for a package reactor capable of generating 10 MW of heat and 2 MW of electricity. General Samuel Sturgis, chief of the Army Engineers, decided to build the reactor at Fort Belvoir, Virginia, where his officers could be trained to operate it.

“With a core easily transportable in a C-47 airplane, the Army Package Reactor could generate power for two years without refueling.”

The Army Package Reactor was the first reactor built under bid by private contractors. The Army Corps of Engineers, in fact, received 18 bids that ranged from \$2.25 million to \$7 million. The Corps awarded the contract to Alco Products (American Locomotive Company) in December 1954, and Alco completed the reactor in 1957.

With a core easily transportable in a C-47 airplane, the Army Package Reactor could generate power for two years without refueling; a small oil-fired plant would consume 54,000 barrels of diesel fuel over the same period. The Army later built similar package reactors for power and heat generation in the Arctic and other remote bases.

Purification

Ancient athletes considered the Olympics a purifying experience. Purification was also a preoccupation of scientists who participated in the nuclear olympics of the 1950s—not personal purification, but fuel purification to enable nuclear reactors to operate more efficiently.

Although designers of the homogeneous reactor hoped to achieve simultaneous reactor operation and fuel purification, other Laboratory technologists led successively by M. D. Peterson, Frank Steahly, and