PHYSICS

Reactor Produces Power

Useful amounts of electric power have now been produced by experimental homogeneous reactor at Oak Ridge National Laboratory. About 150 kilowatts were generated.

➤ THE PRODUCTION of useful amounts of electric power by nuclear energy has been achieved by successful operation of an experimental homogeneous reactor at Oak Ridge National Laboratory.

At 1 a.m. on Feb. 24, scientists brought a pilot model of the unique reactor system up to its full design power of 1,000 kilowatts of heat output. The reactor steam then was switched to a turbine-generator and about 150 kilowatts of electricity was produced.

This is enough electricity to meet the estimated needs of 50 average five-room dwellings, the Atomic Energy Commission says.

Although capable of producing both fissionable material and electric power, the small homogeneous reactor was not designed to produce economic electric power, and many problems in that field remain to be solved.

The demonstration of the feasibility of homogeneous liquid-fuel reactor systems is, however, an important milestone toward economical production of electricity by means of nuclear reactors.

The first demonstration of electric power production by a reactor occurred in December, 1951, at the National Reactor Test Station in Idaho with the operation of the experimental breeder reactor. (See SNL, Jan. 12, 1952, p. 24.)

In the homogeneous reactor, a single homogeneous solution serves as fuel, moderator and coolant. The heat generated by the nuclear reaction of the uranium fuel in the solution is removed by pumping the hot radioactive liquid through a heat exchanger, or boiler, which produces steam to drive a turbine-generator.

A homogeneous type reactor was built in 1944 at Los Alamos Scientific Laboratory in New Mexico, and another is nearing completion at North Carolina State College. These units, however, are low-power research reactors. The one at Oak Ridge is the first to operate at a temperature and power high enough for production of steam to run a standard industrial turbine-generator.

Construction of this Oak Ridge reactor was started in March, 1951, following two years of development and design by Oak Ridge National Laboratory scientists. The reactor "went critical," or first achieved a nuclear chain reaction, on April 15, 1952. Following the low-power operation, the experimental work will continue at higher power to acquire information regarding the feasibility of this type for full-scale reactors.

Successful operation of the homogeneous reactor climaxed a two and one-half year effort by a group of scientists of Union Carbide and Carbon Corp., which operates the Oak Ridge Laboratory for the A.E.C.

Science News Letter, March 21, 1953

Questions

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CHEMISTRY—What is "Suzie Q"? p. 180.

How could chlorophyll have been formed on a lifeless earth? p. 181.

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PHYSICS

X-Rays Not Bomb Trigger

➤ IT "JUST isn't possible" to set off an atomic bomb, or any other kind, by peering through it with X-rays, the Atomic Energy Commission says.

Neither does it appear that the United States has some cloak-and-dagger gadget that will explode an A-bomb in an enemy plane approaching this country.

When the United Nations bought a portable X-ray machine recently on the advice of a New York Police Department bomb expert, some observers wondered whether the X-rays might accidentally trigger a concealed bomb. The portable machine is to be used by U.N. guards to examine all packages brought to headquarters of the United Nations.

Bomb-piercing X-rays seem harmless enough when used on all known kinds of explosives, including nuclear explosives. To trigger an A-bomb, atomic particles called neutrons are needed.

X-rays are similar to light. They can be reflected, they can be bent as they dart at an angle through lenses and other materials, and they can be polarized like light. X-rays are much shorter in wavelength than light rays, and they have thousands of times more energy than light waves.

With their portable machine, U.N. guards may see the size and shape of objects brought there in sealed boxes. They also may be able to tell whether the object is made of wood or steel. But an X-ray machine will not tell the guards whether nuclear matter is inside the package.

Clicking Geiger counters could do that, however. The more radioactivity the counters detect, the more frantically the devices chatter to their operators.

But nuclear matter can be shielded by lead even from Geiger counters. Dr. J. Robert Oppenheimer, director of the Los Alamos laboratory at which the atomic bomb was perfected, once remarked that a screwdriver is the best tool to use when examining a package that might contain an A-bomb.

"Open the package and look at what's inside," he said in effect.

Other bombs, not of a nuclear type, do not depend upon neutrons to explode them. It takes something more familiar to do the trick, such as fire or a good stiff jolt.

Rumors are unfounded that have said from time to time the U. S. had some hush-hush gadget that can be aimed at an airplane to explode any A-bombs the plane might be carrying, the AEC reports. Radar will not trigger nuclear bombs.

And no Flash Gordon cosmic ray gun has yet been revealed that will disintegrate an object into a batch of miscellaneous atomic parts wandering around in space.

Science News Letter, March 21, 1953

The *bomb bay* of a modern heavy bomber has the capacity of two five-room houses.