

News and views

AEC's Reactor Program

A SUMMARY of the Atomic Energy Commission's plans for future work in reactor development has been given by Commissioner Henry D. Smyth in an address on March 9th before the American Institute of Chemical Engineers at its meeting in Washington, D. C. The AEC, according to Dr. Smyth, has decided that six programs should be pursued during the next several years in order to arrive at an economical solution of the problems of nuclear power.

One of these is simply a continuation of the general program of research on fundamental properties of materials, on nuclear reactions, on components that might go into the reactors of the future, and on chemical processes.

In addition to this general research and development work, Dr. Smyth continued, the Commission plans to build five reactors of varying size and cost, of which the first is the so-called PWR (Pressurized Water Reactor) authorized last July. Designed to generate at least sixty thousand kilowatts of electric power, it will use slightly enriched uranium as fuel and ordinary water as a moderator and coolant. According to the AEC's 15th Semiannual Report, submitted to Congress January 30th, "It is recognized that power from this first nuclear central station may not be competitive with power from modern conventional plants. However, nuclear power costs will really never be known until this and perhaps several large nuclear plants are built and operated." Preliminary estimates indicate that the plant should be in operation in three or four years. Development, design, and construction of the reactor have been assigned to the Westinghouse Electric Company. The generating plant is to be built and operated by the Duquesne Light Company of Pittsburgh.

The second proposed new reactor mentioned by Dr. Smyth is a breeder of intermediate size (essentially a scaled-up version of the existing breeder reactor in Idaho) which will have a capacity of fifteen thousand kilowatts of electrical power. Temperatures and steam pressure will be increased to values appropriate to a full-scale power breeder reactor.

The third reactor (5000 kilowatts) is an outgrowth of an experiment carried out last summer at the Idaho Test Site where a small reactor was built with the deliberate intention of making the water coolant boil. "When it was set up at the Idaho testing station," Dr.

Smyth reported, "it had an arrangement in it which suddenly ejected the control rods so that the power generated by the chain reaction went up in a fraction of a second from a few watts to many thousands of watts. This had the expected effect on the water. It boiled. It boiled so violently in fact that it was ejected from the reactor in a small geyser. Repeated trials showed that in every case the boiling reduced the power of the reactor so rapidly that no serious damage was done." The proposed reactor would represent "an attempt on an intermediate scale actually to use boiling of the water as a method of heat extraction. We hope in this way to get a very cheap method of getting the heat out of the reactor and possibly eliminating one step between the coolant in the reactor and the turbines which turn the generator. It is planned to feed the steam generated in the reactor directly to the turbines."

The fourth reactor is to be a larger version of the Oak Ridge homogeneous reactor, described as a step in the direction of a practical power-producing unit. The ultimate goal calls for 65 000 kilowatts of heat in a homogeneous reactor that will breed uranium 233 in a blanket of thorium surrounding the chain-reacting core.

The fifth reactor experiment will test the feasibility of combining graphite as the moderator and a sodium-potassium alloy as the coolant in order to have the advantage of high temperature without high pressure from the sodium coolant.

"In addition to these new proposals," Dr. Smyth said, "we shall continue several other programs already under way. These include the so-called intermediate submarine reactor now under construction at West Milton, New York, near Schenectady, and the development of a reactor to propel aircraft. Though the aims of both of these projects are special, they will undoubtedly contribute to the general technology."

An independent announcement from the AEC in March revealed that the Commission is also studying the possibility of building a small nuclear power plant as the prototype of a "package" power plant for military use. The project is being undertaken at the request of the Department of Defense and with the collaboration of the Army Corps of Engineers. Fueled with enriched uranium and cooled and moderated by water, the reactor is to be built at some appropriate military base or at an installation of the AEC.

Manpower Resources

FUNDAMENTAL reorganization of the nation's military reserves has been urged in a report entitled "Manpower Resources for National Security" which was prepared for the Office of Defense Mobilization by its Committee of Resources for National Security under the chairmanship of Lawrence A. Appley, president of the American Management Association. The Appley Committee study, conducted in response to a request made on August 1, 1953, by President Eisenhower, was concerned with "the availability of man-