

PHYSICS

Building Atomic Submarine

Foundation now completed for steel sphere that is to house nuclear power plant. Submarine hull will be built outside and then skidded in.

See Front Cover

► THE SAUCER-SHAPE foundation for the 225-foot steel sphere that is to house a nuclear submarine power plant being built by the Atomic Energy Commission for the U. S. Navy has been completed, and work on assembling the hull of the land-based prototype submarine is underway. The saucer is shown on the front cover of this week's SCIENCE NEWS LETTER.

Known as the Submarine Intermediate Reactor (SIR), this project is under the direction of the Knolls Atomic Power Laboratory in Schenectady, N. Y., operated for the Atomic Energy Commission by the General Electric Company. The reactor, and the sphere enclosing it, are being built on a 4,000-acre site at West Milton, N. Y., about 18 miles north of Schenectady.

The spherical design of the reactor building was adopted to give additional protection to operating personnel and to off-site areas during test operations beyond the many safety controls of the reactor itself.

Similar structures are widely used in the chemical and petroleum industries, but the West Milton sphere will be the largest ever constructed. In the remote event that simultaneously all other controls failed, the resulting release of radioactive material would be contained in the sphere which will have a net "free" space of more than 5,400,000 cubic feet.

The outer periphery of the building will be 706 feet. The sphere will rest on the concrete saucer just completed which is 179 feet in diameter and 42 feet deep. A ring of steel columns set on concrete outside the structure and reaching to the middle of the sphere will give further support to the building. Welded steel plates will make up the skin of the ball. The plates will be hoisted into position by a derrick mounted on top of a temporary central steel tower. The derrick, now in place, reaches up 424 feet above ground level.

Every weld in the structure must be X-rayed to be sure that there are no leaks. To do this on the bottom, a four-foot space is provided temporarily between the base of the sphere and the concrete saucer. After testing is completed, this space will be filled with concrete and aggregate. Inside, the concrete floor on which the reactor will rest will be slightly above ground level and the well of the saucer beneath the floor will be filled with compacted mixture of aggregate and earth. The reactor building will be air conditioned.

As soon as the columns are in place, the first ring of plates will gird the sphere at its center and assembly will proceed both upwards and downwards.

Meanwhile the hull of the submarine will be assembled just outside the building and when the latter is completed and tested, the hull will be skidded into the huge ball through a special wall section and the sphere again sealed.

The Submarine Intermediate Reactor is one of two nuclear science approaches being made to the problem of utilizing atomic fuel for underwater ship propulsion. The other is incorporated in a project at the National Reactor Testing Station in Idaho. The reactor designed for the West Milton site will use liquid sodium metal to take the heat out of the reactor core and into an exchanger or "boiler" where water will be converted to steam. The steam will then drive the turbines that propel the submarine.

Design, testing and scientific support of the SIR comes from the Knolls Atomic Power Laboratory in Schenectady. The Electric Boat Division of the General Dynamics Corporation of Groton, Conn., is

erecting the hull and power plant. The sphere-shaped building for the reactor is being built by the Chicago Bridge and Iron Company.

Science News Letter, November 1, 1952

Do You Know?

A jet airliner able to whisk 150 persons daily between London and New York on a "three-hops-a-day" schedule now is on British drawing boards.

The earth's average population density is 47 persons per square mile.

Many of today's flat wall paints are easier to apply because of new alkyd resins they contain.

Moles live on a diet of insects and can be somewhat controlled by efficient insect control program; but trapping the moles is the best practical way to get rid of them.

When clothes having zippers are sprinkled, then rolled up before ironing, electrolysis sometimes take place between different metals in the zipper which causes enough acid to be given off to stain the cloth brown.

Dairy cows now can be noseprinted for positive identification just as human beings can be fingerprinted.

Pleated paper umbrellas can be treated with a special vinyl coating that sheds water.

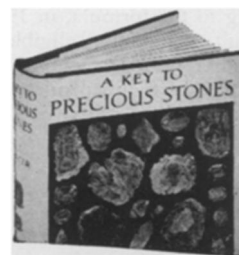
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