

VALLECITOS

ATOMIC POWER PLANT



Electric Power from
NUCLEAR FUEL



ATOMIC ELECTRICITY

is here!



SERVING CALIFORNIA

AMERICA'S FIRST all-privately-financed atomic electricity is now being generated and distributed to customers of Pacific Gas and Electric Company from the developmental Vallecitos Atomic Power Plant, built by General Electric Company and P. G. and E. The plant is one of the major components at the General Electric Vallecitos Atomic Laboratory, America's largest privately-financed atomic research facility.

VALLECITOS ATOMIC POWER PLANT

AMERICA'S FIRST ALL-PRIVATELY FINANCED NUCLEAR ELECTRICITY

In the sun-drenched Livermore Valley of California, the scientific ingenuity of American industry is helping unlock the secrets of the atom to reveal an inexhaustible source of energy for the service of mankind. Here, the Vallecitos Atomic Power Plant, built by the General Electric Company and Pacific Gas and Electric Company, is producing the first privately-financed nuclear electricity in America.

The Vallecitos plant is not a giant, but neither is it a toy. Its size, however, is of little importance in comparison with the giant stride forward it represents in man's beneficial use of atomic energy. With it scientists and engineers are solving problems to enable more economic and efficient construction of vastly larger atomic-electric power plants.

Atomic electricity costs more to produce in the United States today, where fossil fuels (oil, gas or coal) and falling water are available in quantity, but plants such as Vallecitos are helping scientists and engineers learn how to build economically competitive atomic power stations.

The ultimate depletion of known deposits of fossil fuels is inevitable. The electric industry is hard at work on sound business development of atomic plants to assure that the constantly increasing power needs of the nation are served. It has not undertaken a crash program to develop atomic electricity at any price, because there is plenty of electricity in America now for every need and at lower cost to the public.

At Vallecitos, General Electric and P. G. and E. have joined forces to gain the experience and know-how that come with building an atomic plant and operating it for everyday commercial service.

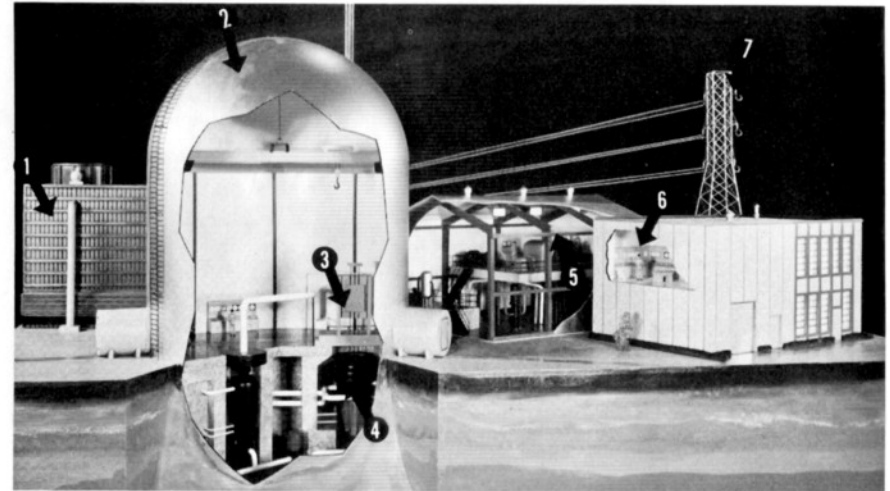
THIS IS HOW VALLECITOS WORKS

Vallecitos is an atomic power plant. The chief difference between it and a conventional steam-electric power plant lies in the fuel that is used. Conventional plants burn natural gas, oil or coal to generate steam. In an atomic plant the heat is obtained from splitting atoms of uranium by bombarding them with neutrons. This heat generates steam, which drives a turbine generator, producing electricity.

The atomic fuel is in the form of pellets of slightly enriched uranium oxide, sealed in tubes of zirconium or stainless steel. These tubes vary from

$\frac{3}{8}$ to $\frac{1}{2}$ inch in diameter and are about three feet long. Groups of tubes are bundled together to form fuel elements. It takes several hundred tubes to make up the reactor core.

Control rods containing boron are spaced throughout the core. Boron absorbs neutrons and prevents the uranium atoms from being split. When the control rods are withdrawn, a chain reaction starts and heat is given off. Water which surrounds the core is heated to form high-pressure steam used to drive the turbine. The amount of steam produced is regulated by adjusting the position of the control rods. To shut down the plant, the rods are fully inserted in the core. There they act to quench the chain reaction, stopping the production of heat.

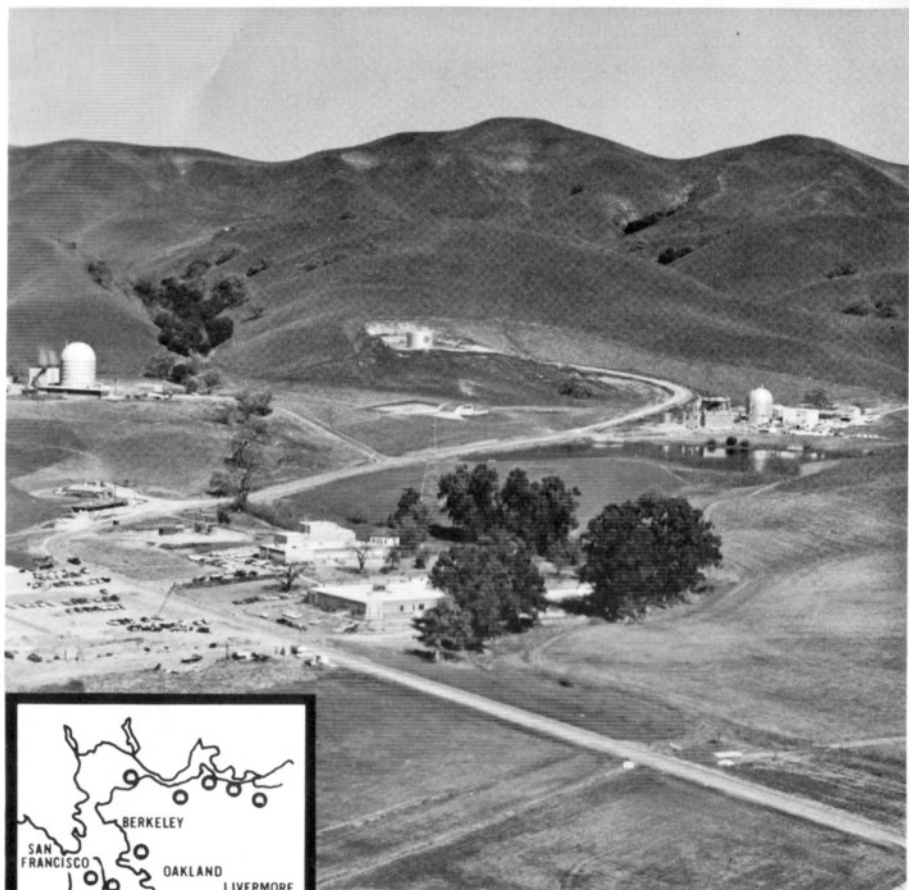


CUTAWAY MODEL OF VALLECITOS ATOMIC REACTOR AND POWER PLANT

1. Water-Cooling Tower.
2. Reactor Containment Vessel.
3. Reactor Control Rods.
4. Boiling Water Reactor.
5. Electric Turbine-Generator.
6. Power Plant Control Room.
7. Electric Transmission Tower.

The reactor is below ground level and is contained in the silver-colored silo-like building. It is shielded by a thick wall of concrete to prevent exposure of operators or visitors to radiation. The turbine plant and the control building are free of radiation.

Conventional plants burn large amounts of gas, oil or coal to produce electricity, but atomic-electric plants like Vallecitos will use only a few pounds of uranium each year. Atomic electricity is no different than other electricity, and it is just as safe because kilowatts are not radioactive. The difference is only in the generating process.



The General Electric Company—Pacific Gas and Electric Company Vallecitos Atomic Power Plant, located midway between Livermore and Pleasanton, is the ninth P. G. and E. generating station in the San Francisco Bay area. It is one of 77 plants on P. G. and E.'s interconnected electric system serving Northern and Central California.

Vallecitos Atomic Power Plant, America's first all-privately-financed nuclear electric station, is an important component of the Vallecitos Atomic Laboratory where it is located. Here at this research center, the General Electric Company has brought together men and women of science with the single objective of making the energy of the atom serve mankind better. In addition to the power plant (top right), facilities of the laboratory include the Radioactive Materials Laboratory and Experimental Physics Laboratory (foreground) and the General Electric Test Reactor (top left).



PG&E ATOMIC POWER PROJECTS

1. Member of one of original nuclear power feasibility study teams, appointed by Atomic Energy Commission in 1951.
2. Member of Nuclear Power Group, associated in building Dresden Nuclear Power Station near Chicago.
3. Partner with General Electric in building and operating Vallecitos Atomic Power Plant, Alameda County, California.
4. Constructing 60,000-kilowatt Humboldt Bay Nuclear Unit near Eureka, California, for service in 1962.
5. Member High Temperature Reactor Development Associates, to build 40,000-kilowatt helium-cooled advance-design reactor power plant at Peach Bottom, Pennsylvania.
6. Preparing to build 325,000-kilowatt Bodega Bay Atomic Park at Bodega Bay on the Sonoma County coast 50 miles north of San Francisco. This \$61 million station will be completed in 1965, one of the largest atomic power plants in the world.