

ATOMIC POWER

at Indian Point

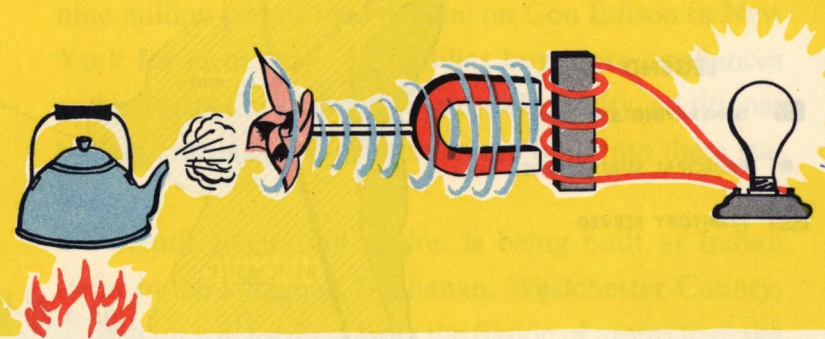
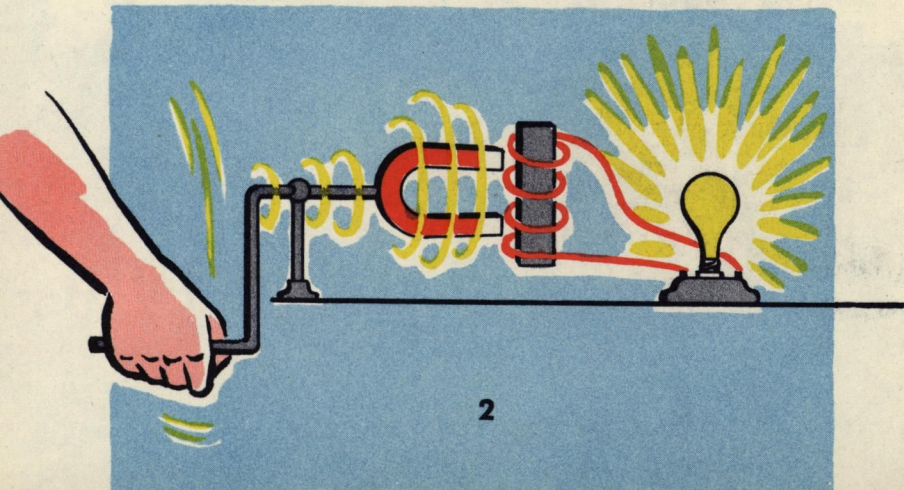
ATOMIC POWER, ELECTRICITY AND *Con Edison*

at Indian Point, Buchanan, Westchester County, N. Y.

Electricity is made by turning a generator. A hand crank can be used, but even a strong man's arm quickly tires in keeping a 50-watt bulb lit. Natural forces such as wind and falling water can be used to turn the generator, but there are days when the wind doesn't blow and places where the water doesn't fall.

People turn electricity off and on, but they expect it to be available all the time even though it cannot be stored in sizable amounts.

Dependable electricity to supply these off and on requests can be made by using the energy stored in fuels such as coal, oil and natural gas. Fires can be lit and put out as the electric generators are started and stopped.

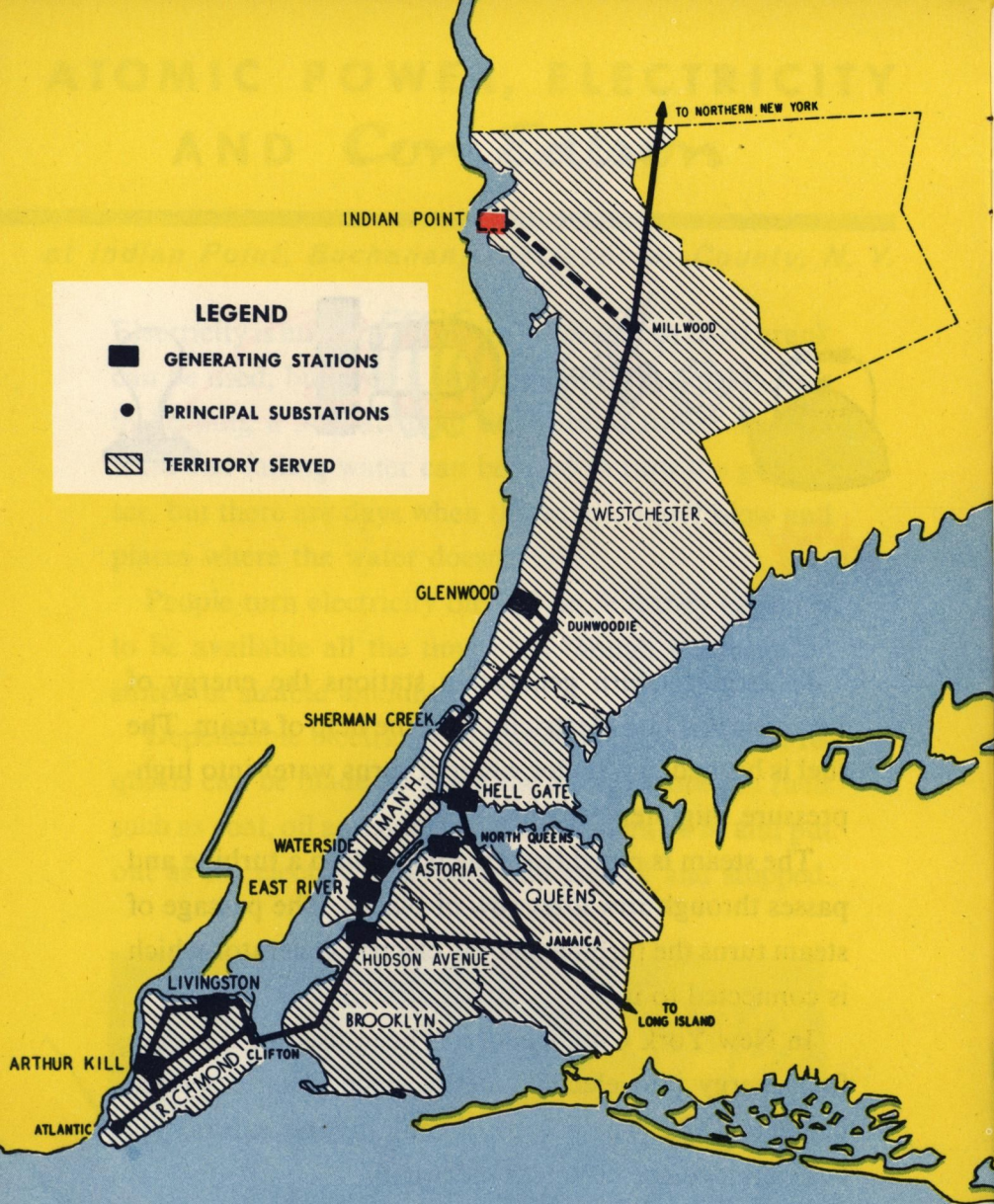


In large modern generating stations the energy of fuel is turned into electricity with the help of steam. The fuel is burned in a boiler where it turns water into high-pressure, high-temperature steam.

The steam is piped from the boiler into a turbine and passes through row after row of blades. The passage of steam turns the turbine and the electric generator which is connected to it.

In New York City, steam has been used to translate fuel energy into electric energy since electric service began in 1882. The energy of coal, oil and natural gas has provided the city with electricity.

Now it is planned to use atomic energy to make steam.



CONSOLIDATED EDISON SYSTEM
ELECTRIC GENERATING STATIONS
PRINCIPAL SUBSTATIONS AND HIGH VOLTAGE LINES

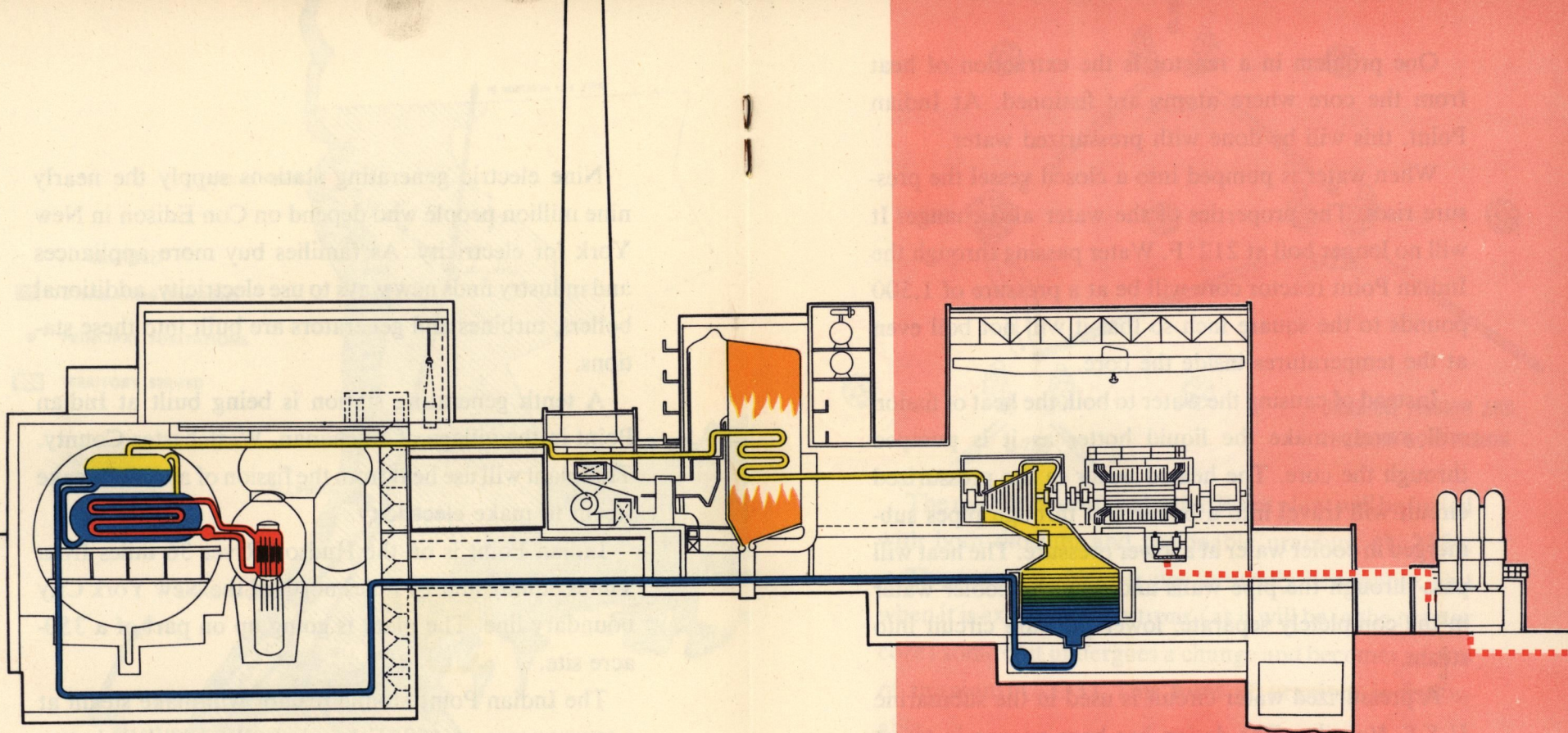
Nine electric generating stations supply the nearly nine million people who depend on Con Edison in New York for electricity. As families buy more appliances and industry finds new ways to use electricity, additional boilers, turbines and generators are built into these stations.

A tenth generating station is being built at Indian Point in the village of Buchanan, Westchester County. This plant will use heat from the fission of atoms to make steam to make electricity.

Indian Point is on the Hudson River 36 miles from Times Square and 24 miles north of the New York City boundary line. The plant is going up on part of a 350-acre site.

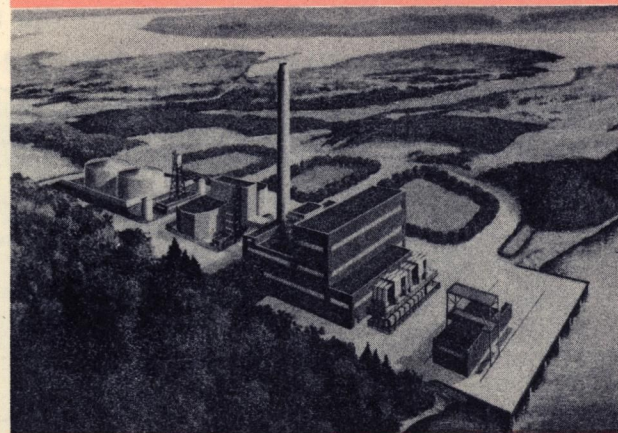
The Indian Point atomic reactor will make steam at a temperature of 450° Fahrenheit. While this is hotter than steam from a teakettle, it is not hot enough for most efficient use by turbines.

So the Indian Point reactor-produced steam will be put through a separate, oil-fired superheater which will raise its temperature to 1,000°F.



LEGEND

- Pressurized water—heated in reactor; gives up heat in boiler.
- Boiler water—heated by pressurized water; turns to steam.
- Steam—from boiler at 420 pounds to the square inch, 450° Fahrenheit.
 - from superheater at 380 psi., 1000°F.
 - condensed back to water after spinning turbine
- Electricity—unit will produce 236,000 kilowatts

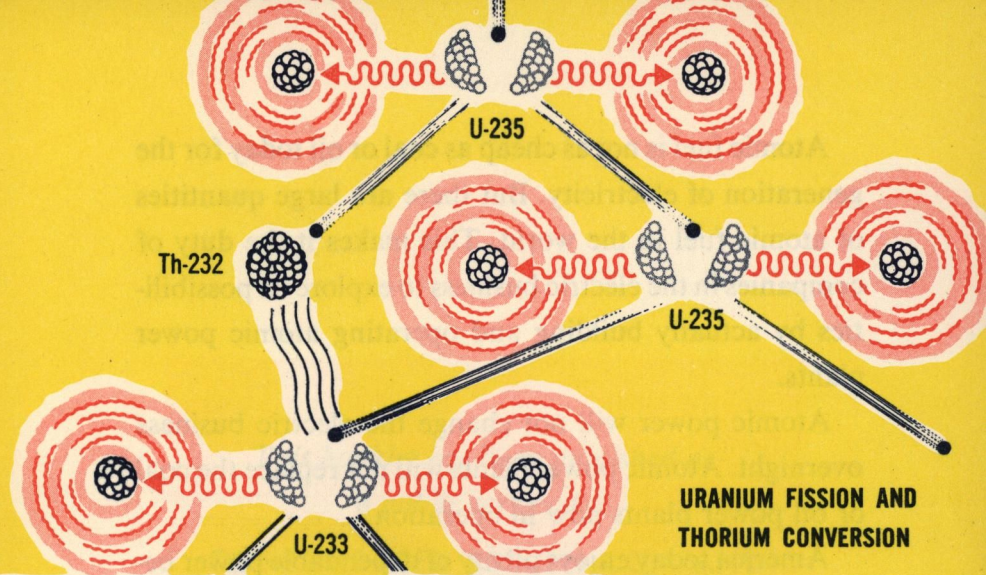
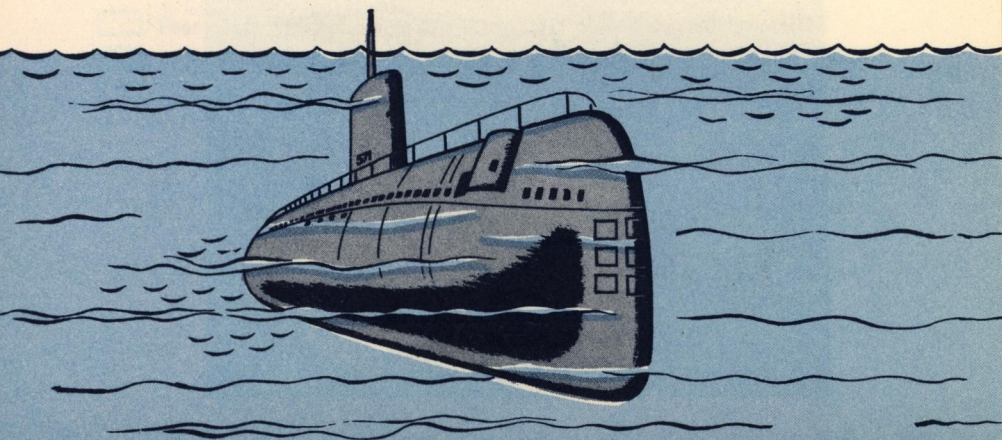


One problem in a reactor is the extraction of heat from the core where atoms are fissioned. At Indian Point, this will be done with pressurized water.

When water is pumped into a closed vessel the pressure rises. The properties of the water also change. It will no longer boil at 212°F. Water passing through the Indian Point reactor core will be at a pressure of 1,500 pounds to the square inch so that it will not boil even at the temperatures inside the core.

Instead of causing the water to boil, the heat of fission will merely make the liquid hotter as it is pumped through the core. The heated water in the pressurized circuit will travel into a boiler and through pipes submerged in cooler water at a lower pressure. The heat will pass through the pipe walls and turn the cooler water in the completely separate, lower pressure circuit into steam.

A pressurized water circuit is used in the submarine *U.S.S. Nautilus*. The design has been proven in terms of safety and dependability.



The reactor core of the Indian Point plant will be fueled with both thorium and fissionable uranium (U-235).

Thorium (Th-232) is not naturally fissionable. But when it is exposed to neutrons (as it will be in the reactor core) some of it undergoes a change and becomes a form of uranium (U-233). This form of uranium is fissionable.

It is estimated that when Indian Point is fully at work it will consume in a year's operation about 350 pounds of uranium and about 140 pounds of thorium. The oil-fired superheater will burn about 30,000,000 gallons of oil.

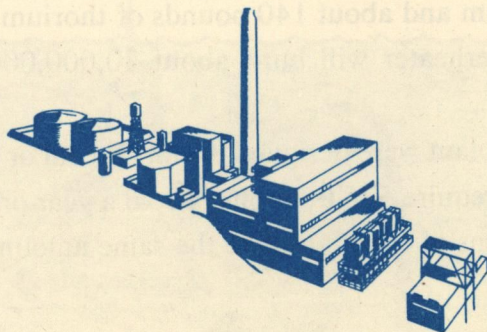
If the plant were designed to run on coal or oil alone, it would require 525,000 tons of coal a year or 96,000,000 gallons of oil to produce the same amount of electricity.

Atomic fuel is not as cheap as coal or oil today for the generation of electricity. But there are large quantities of atomic fuel in the world. This makes it the duty of companies in the electric business to explore its possibilities by actually building and operating atomic power plants.

Atomic power will not change the electric business overnight. Atomic power plants will not replace the coal or oil power plants now in operation.

America today enjoys plenty of dependable power because the electric business has been eager and financially able to test new methods thoroughly and put efficient new systems to work ever since the industry began in 1882.

Con Edison believes in the future of atomic power. This is why the company is investing \$55,000,000 in the Indian Point plant.



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