ENGINEERING

Larger Mercury Vapor Electric Generating Unit Being Built

Success of Boiler and Turbine Using Mercury Instead of Steam Leads to Building of 20,000 Kilowatt Plant

See Front Cover

A NEW and larger turbine electric generator that will use mercury vapor instead of steam and will consume less fuel than corresponding modern steam plants is being constructed in the General Electric Company plant at Schenectady, N. Y.

This 20,000 kilowatt turbine will have twice the output of the mercury vapor engine and generator which General Electric engineers claim has already proved its superior efficiency over steam turbines during a year's test at Hartford, Conn. The new plant will be even more efficient than the Hartford station, it is said.

The mercury is boiled over a fire and the vapor is played on the blades of a turbine wheel as in a steam generator, but at a much higher temperature. The advantage of the quicksilver over water is due, in the first place, to its higher boiling temperature. This allows the engineer to use his mercury at as high as 950 degrees Fahrenheit without producing unusually high pressures in the boiler.

One of the most fundamental principles of physical science, the second law of thermodynamics, has been used in this invention by W. L. R. Emmet, who devised the first mercury turbine. According to this law, the greater the temperature range of a heat engine, the greater the efficiency. The difference between the temperature of the vapor coming from the boiler and the temperature of the condenser determines the temperature range of the engine.

The hot mercury vapor in the exhaust of the turbine, instead of being condensed by water, is used to evaporate water into steam for other steam turbines. This effects a further economy in fuel.

The high pressure steam thus produced is to be conveyed to steam turbines elsewhere in the plant. A 110,000 volt transmission system will be supplied by the electric generator coupled with the mercury turbine.

A quarter of a million pounds of mercury will be used in this installation, though on account of the great density of the liquid it is 13 times less bulky than the same weight of water. The world is squandering its supply of this metal, which comes from Italy, Spain and the United States, very lavishly just now. The advantages of the new turbines are so great, however, that some of the supply will certainly be diverted to constructing mercury power units to replace existing steam plants.

Fortunately none of the mercury is lost in the operation of the boiler and turbine. All joints are vacuum tight. The vapor is a very insidious poison even if breathed in small amounts.

The picture on the front cover is taken at the generator end of the unit in the South Meadow station of the Hartford Electric Light Co. It shows the electric generator, which is the dark object in the lower right, and two condenser-boilers that condense the mercury after it comes from the turbine by absorbing its heat to change water to steam for operating auxiliary steam turbines.

Science News Letter, June 27, 1931

GENERAL SCIENCE

Science's Growth Indicated By Increase in Literature

A TWELVE-PAGE weekly publication deposited with the Chemists' Club library in New York, once kept up with progress in all fields of science. Now this same library catalogues 30,000 volumes of magazines each year to cover scientific literature.

The abundance of publications devoted to scientific research is becoming a serious problem, according to a report presented the American Chemical Society by Fred B. Kilmer, of New Brunswick, N. J. At the end of a century, Mr. Kilmer said, a scientist who wants to find out what has already been done on a research problem will have to search through 3,000,000 volumes.

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