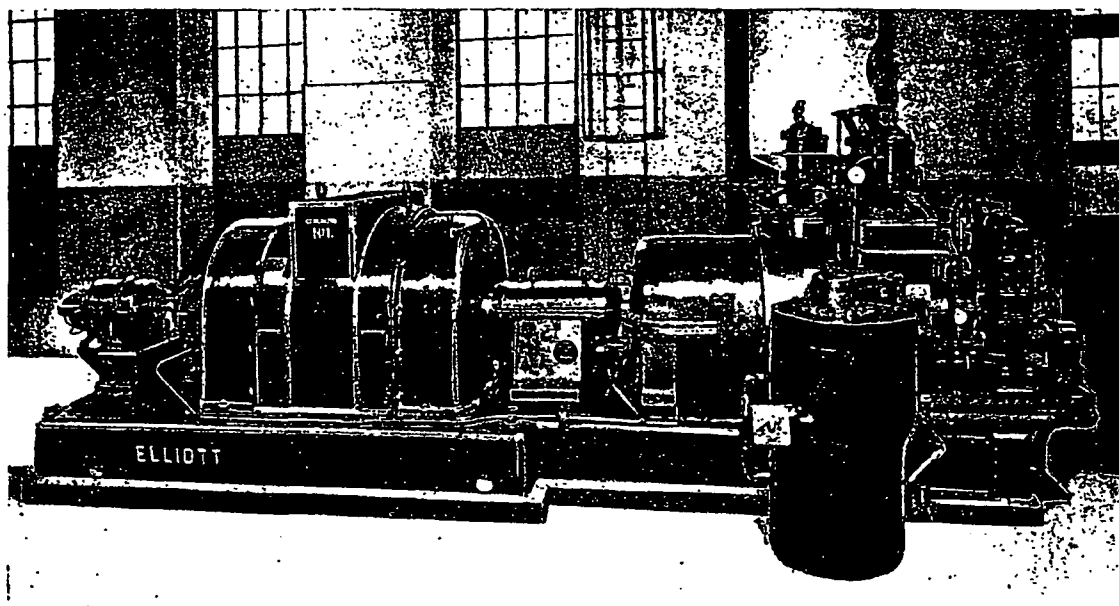




The Elliott 1000-kw. bleeder turbine-generator unit has been running 24 hours a day for more than two years.

of 950 kw. have been recorded. Plant power factor averages 88 per cent.

In manufacturing processes requiring considerable amounts of electrical power as well as process steam, it is frequently determined by means of an engineering analysis of operating costs, that very substantial savings can be made by installing a modern high-pressure boiler plant and turbine-generator units of the bleeder type. Naturally, the characteristics of the various necessary elements of the installation must be very carefully chosen, after considering alternate possible solutions of the problem, to fit the power and process steam requirements of the manufacturing plant.

In 1928, the Philip Carey Manufacturing Company commissioned W. E. S. Dyer, Consulting and Designing Engineer, Philadelphia, to make an engineering survey of the plant at Plymouth Meeting. Previous to this investigation, steam had been generated

at 150 lbs. gauge pressure in seven obsolescent boilers for driving numerous CO₂ compressors, pumps and other equipment, the balance of the low-pressure steam required for process being obtained by means of reducing valves direct from the boilers. Electric power was purchased.

As a result of this survey, Mr. Dyer recommended the installation of a complete new high-pressure boiler plant, generating steam at 350 lbs. gauge, with a small amount of superheat, and a 1000-kw. non-condensing bleeder type turbine-generator unit, designed for 325 lbs. initial pressure, bleeding steam at 145 lbs. and exhausting at 5 lbs. gauge. The new equipment went into regular operation early in 1929.

The new boiler plant is located about 150 feet from the power house, and is thoroughly up-to-date in design and equipment. Screened bituminous coal is dumped from the cars to a conveyor leading to a covered storage

yard equipped with a drag line, and passes through a hopper to the crusher and thence by conveyor to the 550-ton capacity bunker at the top of the boiler house, where it is distributed by a weigh larry. From the bunker, the coal flows to three motor-driven pulverizers on the operating floor. There are two 1000 b.h.p. steam generating units, only one of which is required for the maximum steam load. The boilers are equipped with air preheaters, integral economizers, water-cooled furnaces, steel-clad insulated settings, soot blowers, motor-driven forced and induced draft fans, automatic draft control and feed water regulators. There are two boiler feed pumps, one of which is motor-driven and is ordinarily used, while the other, driven by an Elliott 110-hp. turbine, is held in reserve.

About 55 per cent make-up feed water is required, since a considerable part of the process steam is not available as condensate. The