

been obtained, while the equipment is in keeping and comprises both hydraulic and electrical machinery of the most efficient type. The same, unfortunately, cannot be said of many of our small plants and, particularly in the older ones, there is undoubtedly great room for improvement. The old wooden dams are usually very leaky and, especially on small streams, a considerable proportion of the flow is wasted, while the remaining water is often lost in a vain effort to operate an obsolete and inefficient water-wheel, installed years ago and never properly repaired and adjusted. In many cases, we find in these defects the real cause of a shut-down from lack of water in winter.

The same comment applies to our steam plants; the large ones, although a number of them are only used as auxiliaries, are very efficiently equipped and operated, but many of our small plants show much room for improvement. It cannot be expected, however, that a small plant will show the same efficiency and economy of operation as a large one. As auxiliary plants only operate intermittently, the question of economical operation, while most desirable, naturally does not receive the same consideration as in plants operating continuously, and the latter can stand much heavier overhead charges, so long as such charges result in increased efficiency and reduce operating costs. There are many small plants in the prairie sections, where the price of fuel is high, the majority of them using oil, gasolene or producer-gas. Considering such municipalities, and others in their vicinity which desire electric service, it would seem to be worth while to generate energy in large steam plants, situated at suitable distribution centres, and thus supply transmission systems extending to the various communities within economic radius. The larger the plant, the greater the economy, up to plants of some 50,000 k.w. or more.

In a paper read before the Institution of Civil Engineers, Mr. E. M. Lacey states* that there is considerable difference in plants up to 12,000 k.w., while the ultimate limit, beyond which no appreciable advantage would accrue by reason of concentration of plant in large power houses, may be taken at 40,000 to 50,000 k.w., but such ultimate capacity must be governed largely by the length of the transmission lines necessary to serve the area of supply.

In an article in the *Electrical World*, for May 26, 1917, Mr. Earl D. Jackson makes a comparison in economy between small local oil-engine plants and energy received from distant large steam plants, and concludes that, under the conditions that usually obtain, a transmission line 20 miles in length can compete advantageously with a small local plant.

The ownership of the various plants included in the report is divided into 207 municipal or publicly-owned plants of 452,508 h.p. total capacity, and 358 privately-owned plants of 1,655,235 h.p. total capacity.

* *Times Engineering Supplement*, March 30, 1917, p. 76.

† See Table V, page 281.

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