

sides this each customer would have to pay a fixed charge per month for meter rent, transformer rent, if furnished, and the cost of meter reading, billing, etc., and also an initial fixed guaranteed repayment charge for any special material and labor furnished specially to connect up the individual customer and not commonly usable for other customers. This repayment charge could be made to extend over a greater or less

shown by Commissioner Thelen, the company is entitled to a return on a judicious investment only. The per cent of profit a company is entitled to should vary therefore, with the degree of skill and judgment shown in their investment and management. For example, referring to Figs. 1 and 3, if the generating plant consisted of a single unit, the average efficiency during the year would hardly exceed 40 per cent; if it consisted of two equal units, the efficiency would be about 55 per cent, while if this plant consisted of a 1200 kw., a 2600 kw. and a 2000 kw. unit, the efficiency would be made nearly 70 per cent with proper operation. Certain plant costs vary inversely with the obtainable efficiency, and therefore a good and skillful investment should be encouraged and entitled to better returns than a poorer one.

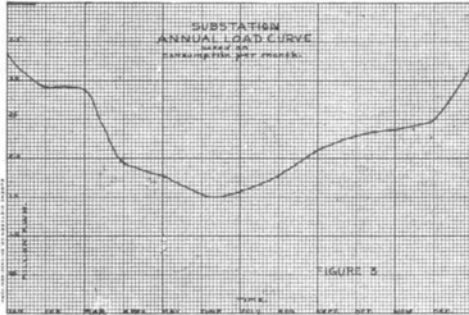


Fig. 3.

The above outlined system of rating is simply a method of properly apportioning the charges to the costs taking into consideration the different classes of service to be rendered. It would tend to load the power plant as nearly uniformly as physically possible. It will increase the power load, because of reduced rates during the day, especially during the summer, and by making the intermittent use of power possible. Especially now that the railroad and public utilities commission are taking up this subject, it is desirable that an equitable basis for power rating be found, instead of a temporary makeshift, so that these commissions will not one day find themselves in an untenable position.

period to suit, but once completed, neither the customer nor the public generally should be chargeable with interest on this investment. It may be objected that the determination of the power used with reference to the time and the rating accordingly would be difficult and expensive. But after careful analysis of this subject, the writer came to the conclusion that a comparatively inexpensive meter could be devised to do both at once.

The cracking of reinforced concrete due to electric current has resulted in numerous theories being advanced by way of explanation. That one which attributes it to oxidation of the iron anode has been fully established. The oxides formed occupy 2.2 times as great a volume as the original iron, and the pressure resulting from this increase in volume causes the concrete to crack open.

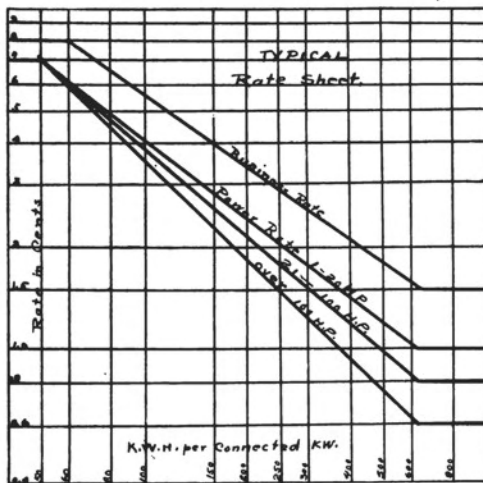


Fig. 4.

Partial electrification of the Rocky Mountain Division of the Chicago, Milwaukee & Puget Sound Railroad has been definitely decided by the management. The Deer Lodge-Three Forks section, to be first electrified, contains 113 miles of main line, or the equivalent of 168 miles of single track including sidings and yard tracks. Overhead trolley, suspended from mast arms on wooden poles, will be used on tangent track and span-wire construction on wooden poles over curves. This type of construction will be changed to steel poles and overhead bridge trolley construction in yards containing four tracks or more. It also has been definitely decided that the transmission voltage will be 100,000 volts a.c., feeding five substations ranging in capacity from 3000 kw. to 4500 kw., depending on their relative location to heavy grades. The operating current will be 2400 volt d.c. Essentially, the entire electrification, including the rolling stock, will conform to that installed by the Butte, Anaconda & Pacific Railroad. C. A. Goodnow, assistant to the president Chicago, Milwaukee & St. Paul Railway, authorizes the statement that no contract for the equipment has been let.

The power company is entitled to a fair profit on their investment, but are not entitled to charge for the power per se, as this is a public resource, unless the public, i.e., the government makes a charge on the power company, in which case they would be entitled to pass the charges on, to their customers. Again, as