been continuously carrying a current which will heat it to its maximum safe temperature, then any increase in current will heat it beyond its maximum safe temperature,—that is to say, theoretically there is no overload capacity. To be sure if the increase is but a small amount and the time of but short duration in the aggregate, the deterioration produced will be relatively slight. The more that the maximum safe temperature is exceeded, the less is the aggregate length of time required to show appreciable deterioration of the insulation. For instance, if the insulation should be heated up to 300 degrees Fahr, it would be considerably depreciated in the course of only a few hours.

It is nevertheless possible to so rate cables as to carrying capacity that they will have an overload capacity, and that is by rating them at a figure less than the current which they can safely carry continuously without over heating. Under these conditions the temerature of the cable at the beginning of an overload period will be lower than its maximum safe temperature; it can then be operated for a limited period of time at a current which is greater than it can safely carry continuously, provided this current is carried only for a period of time during which the temperature of the cable does not rise beyond the maximum safe temperature, and that the overload current is at once removed as soon as the maximum safe temperature has been reached. The amount of overload permissible under these conditions depends, first, on the amount by which the initial temperature of the cable is lower than its maximum safe temperature, and second, on the length of time during which the overload obtains.

HYDRO ELECTRIC POWER VERSUS STEAM POWER.

By C. B. King, Manager, London Street Railway Co.

In this paper I shall endeavor to review our investigations of the proposed use of hydro electric power and show why we decided to continue the use of steam rather than in favor of hydro. In 1906, when it became necessary to have some slight additional power, the hydro proposition had been fairly well started and looked as though it might succeed; and in anticipation of being able to use this power and realizing that a storage battery would be of advantage in connection with the use of hydro electric power, it was decided at that time to instal a storage battery. After due investigation it was decided that one of 320 amperes capacity was about the right size for us, and so the installation of a battery of this capacity was made during the summer of 1907. This storage battery has been used simply to steady the load on the engines and has worked very satisfactorily. We figured that by the installation of this battery, we had really increased the capacity of our power plant about 300 horse power as the momentary loads were taken care of by this method.

After several votes and the passage of bylaws, hydro electric power was finally brought to London by Dec. 1, 1910, when it was immediately put into service for street lighting; the old contract for street lighting with the London Electric Co. expiring at that date. We thought that we would then be able to get a proposition from the Hydro Electric Commission, but were unable to do so until well into the summer of 1911. Fortunately our power requirements had not materially increased during these four years so that we had been able to get along with the power available.

When hydro electric power was first voted on, the proposed rates for London were $28 per horse power on a 20 minute peak load basis, but when we finally got a proposition from the Hydro Electric Commission, the rate proposed was $32, which it was claimed also included the capital charges necessary on account of the local distributing plant. In the Commission's proposal, however, it was stated that we were to get the current at 13,000 volts, which did not come through the local distributing plant, so we thought this additional amount should not have been added. This proposal also