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THE HIGH TENSION TRANSMISSION SYSTEM OF THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

THIRD ARTICLE.

Telephone System.

A private telephone system connects and provides a means of instant communication between the transforming stations of the system. The Niagara, Dundas, Toronto and London stations are what might be termed "terminal stations," since the telephone lines terminate on the individual drops in these exchanges, while Port Credit, Guelph, Preston, Berlin, Stratford, St. Marys, Woodstock and St. Thomas are through stations with exchanges bridged across the the main line and operated as party-line stations. All exchanges are located on a loop circuit and can be sectionalized without interfering with other exchanges by means of specially installed switches in case of trouble. The telephone circuits are erected on separate poles paralleling the high-tension system. Considerable inconvenience was at first experienced from induced potential on the telephone circuits, which was found to be sufficiently high to strain the insulation of the standard potential equipment beyond safe limits. Various types of protective equipment were at first employed, but were unsatisfactory. After careful consideration and study of the conditions and requirements, an entirely original equipment, designed by the engineers of the commission, was installed and the operation of the telephone system since then has been entirely satisfactory. The equipments (Fig. 21) are mounted on special slate panels and consist of indicating fuses, vacuum type lightning arresters, auxiliary gap arresters, specially wound open-core choke coils, accurately balanced bleeding inductances and condensers.

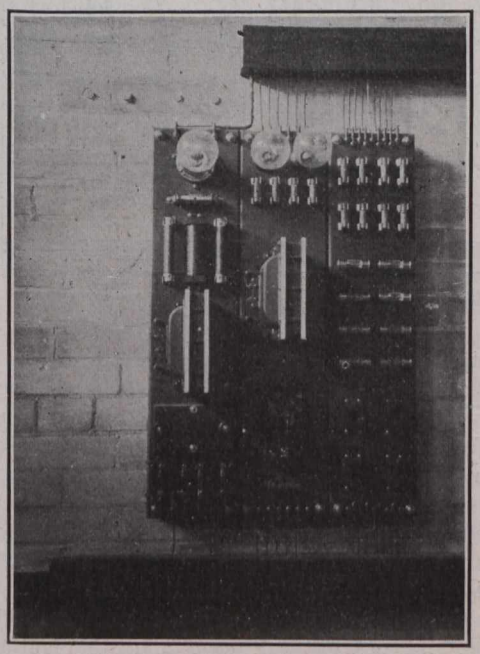

Fig. 21.—Telephone Protective Equipment Panel.

Description of Stations.

Niagara Falls Station.—Power is received at the Niagara Falls station (Fig. 22) from the Ontario Power Company's distributing station at a potential of 12,000 volts over three conductor, 300,000 cm., paper-insulated, lead-sheathed cables 2,200 feet in length, placed in tile conduits. Each cable has a carrying capacity of 4,500 kw., and since the individual transformer banks have a rating of 9,000 kw., the incoming power cables feeding these banks are connected in parallel. The ends of each pair of cables are protected by automatic oil circuit breakers connected to auxiliary buses, which in turn, are connected by similar breakers to the main buses, or directly to banks of transformers as desired.

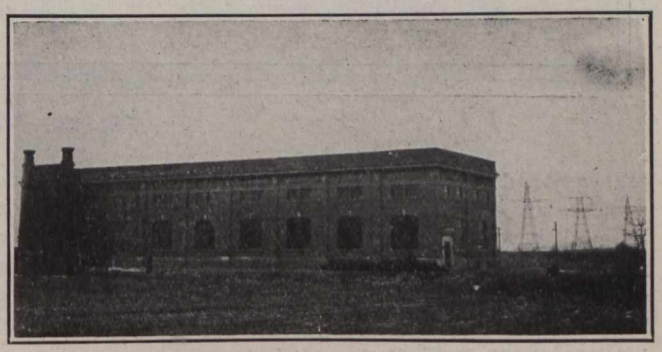

Fig. 22.—Niagara Falls Step-up Transformer Station.

At present there are nine 3,000 kv-a. single-phase transformers installed, although the building has been made sufficiently large to contain an additional bank of three.

From the high-tension side of the transformers the current is carried through disconnecting switches, and high-tension oil switches to the high-tension busbars, here it passes again through disconnecting switches and oil circuit breakers to the line outlets of the two 110,000 outgoing lines,