

The station equipment consists of three 250-kv.a. single-phase transformers. The connections are star-delta. The power factor is kept at 90 per cent. by two 125-kv.a. condensers. In addition there is a 30-kw. single-phase transformer for lighting purposes. The load factor is about 25 per cent.

Fort William Elevator Co.—This plant was built in 1913 and is of reinforced concrete with brick panelling. The plant, which has a grain capacity of 1,500,000 bushels, is operated by both steam and electric power. The boiler capacity (four boilers) is 500 h.p. The engine capacity is 800 h.p. These operate at a steam pressure of 120 lb.

The electric plant consists of a 300-h.p. marine engine direct connected to a 225-kw., 600-volt, 60-cycle, three-phase alternator supplying current to three 100-h.p. motors operating three shipping legs, four 15-h.p. motors operating four shipping conveyer belts, and one 20-h.p. motor operating a reversible conveyer belt.

The plant uses 2,000 tons of coal per annum at a cost of \$4 per ton. Below is given the cost of operating the plant for one year.

Coal	\$ 8,000.00
Oil	250.00
Waste	32.00
Packing	200.00
Wages	4,000.00

Total per annum\$12,482.00

This makes an average of \$34.194 per day. Average load for 365 days = 300 h.p. Average cost per h.p. per annum = \$41.606. As this plant also supplies steam for the drier, the actual cost is somewhat below this amount, the actual cost not being known.

The storage capacity of the plant is 48 tanks, each containing 27,000 bushels, and 35 intermediate tanks, each containing 7,000 bushels. There are six receiving pits capable of handling 12 cars or 13,200 bushels per hour. Also nine wheat cleaners and two flax cleaners of 1,000 bushels capacity per hour.

The shipping capacity is about 45,000 bushels per hour, and each conveyer belt of 15 h.p. capacity handles 20,000 bushels per hour. Two extra features of this plant are a separator, for separating various grains, and a drying plant. The capacity of the drier is 1,000 bushels per hour.

Consolidated Elevator.—The total grain capacity of this plant is 1,750,000 bushels. Power is delivered at 2,200 volts on a contract basis of 700 h.p. The average load is 600 h.p. The total number of motors is 37, ranging from 2 h.p. to 75 h.p., delivering 1,007 h.p.

The transformer station consists of 2,200 to 600-volt transformers, a synchronous condenser, necessary switch gear, and motors. All other characteristics correspond to the plants previously described.

Canadian Pacific Railway Co.—As before stated, the C.P.R. was the pioneer in the use of electric power for elevator purposes. This plant, which is the only one operated by this company in this city, has a total grain capacity of 8,000,000 bushels, and is the second largest plant in the world. The shipping capacity is 80,000 bushels per hour.

The company discontinued the use of its own power plant and purchased power from the Kaministiquia Power Co. in 1907. Power is purchased at 2,200 volts and stepped to 600 volts at its own transformer station. The

transformer capacity is three single-phase, 588-kv.a., or a total of 1,764 kv.a. The power factor is maintained at 90 per cent. by a 750-kv.a. condenser. The total motor capacity is 2,100 h.p., while the average load is 1,400 h.p.

Canadian Northern Railway Elevator.—This plant is a double one; that is, there are two work houses with the storage tanks between. It has a storage capacity of 9,500,000 bushels and is the largest plant in the world. This plant was first started in 1900, and has been added to at various times, the last addition being made in 1913. Up to that time it was a steam plant throughout, but when the annex was built in 1913, a 200-kv.a. three-phase generator was installed to supply power for it alone.

The total engine capacity of the plant is 2,000 h.p. supplied by a 1,250-h.p. and a 750-h.p. unit. The coal consumption of this plant is 7,000 tons per annum, 950 tons of which are used in the driers. The average horsepower (steam) is about 1,700. The cost of producing power is 0.9 cent per kw.-hr. figured on a basis of 3½ lb. of coal per h.p.-hour. Statistics of this plant also show that the cost for one year was \$22.56 per h.p. for steam power, which is an exceedingly low rate.

The average amount of grain handled in one year is 40,000,000 bushels.

In January, 1914, the elevator was remodelled, necessitating the installation of additional power. As the company was considering using electric power throughout in the near future, it was deemed advisable to erect a sub-station to accommodate the extra power needed, which could be enlarged as more power was required.

The transformer station is a separate building of brick and tile construction, and was built in 1913. The equipment was put in operation in April, 1914. Power is purchased from the City of Port Arthur at 22 kv. and stepped to 600 volts by three 150-kv.a. transformers connected to a six-panel board.

The total capacity of the switchgear is about 2,000 h.p. while the capacity of the transformers is only 450 kv.a. These, of course, can be added to at any time. The transformers are delta-delta connected. The station is protected by three electrolytic lightning arresters. The total motor capacity at present is 765 h.p., while the average load is 385 h.p.

Grand Trunk Pacific Elevator.—This elevator has a grain capacity of 5,750,000 bushels. The motor capacity is 1,800 h.p. It was the first in this district to purchase power at 22 kv., having contracted for it in 1909. The sub-station is large and roomy with a maximum of safety. The building is three stories high. The top-floor contains the choke coils, lightning arresters and high-tension switchgear. The arresters are the electrolytic type. The second floor contains the light and power transformers. There are three single-phase, 22-kv. to 600-volt transformers with a total capacity of 2,025 kv.a., and three lightning transformers of 60 kv.a. each. The ground floor is taken up with the condenser and switchboard. The condenser is self-starting and has a capacity of 750 kv.a. It draws about 800 amperes at starting, and takes about 1½ minutes to get it on the line. The switchgear and busses are mounted directly on the board. An extra feature of this station is a fire pump of 500 gallons per min. capacity, driven by a 50-h.p. motor.

The Horn Elevator.—This plant, better known as "King's Elevator," was built in 1883 and is the oldest elevator in this part of the country. This elevator, which is an exclusive cleaning and drying plant, is called a "hospital." The grain capacity is 800,000 bushels.