after having passed through the condenser is discharged into the other pipe. Tunnels leading from the turbine and pump-room are used to run the power and lighting circuits, the flow and return pipes of the forced hot water heating system, the house service water lines, and the high-pressure steam lines for manufacturing purposes.

The turbine-room has been laid out for two 2,000 K.W. and two 1,000 K.W. turbo-generators, two 460 K.W. rotary converters and two 75 K.W. turbo-driven exciters. Of these, 1,000 K.W. and one 2,000 K.W. turbo-generators and two rotary converters will be installed now. The generators are 3-phase, 60-cycle, 440-volt, star-wound, with neutral connection brought out to the switchboard. The exciters are 125-volt, and generator voltage will be controlled by Tyrrill regulator.

Air for the ventilation of the generators will be taken from a duct in the foundations of the generators and forced through the windings and air passages by fans integral with rotors. Screens will be provided in the pent-house of this duct to exclude dust, etc.

The connected load will be approximately 550 h.p., d.c. at 115 volts, and 4,000 h.p. a.c. at 440 volts. For the supply of the former, two 460-K.V.A. rotary converters, with necessary transformers and starting switches, will be installed, the neutral being brought out from each transformer bank for the neutral of a 115/230 volt, 3-wire, d.c. system.

The switchboard for the control and distribution of this power will consist of a main board of 25 Blue Vermont marble panels on the turbine-room floor. On this board will be mounted the meters for measurements of outputs of generators and loads on the feeders; also the d.c. bus-bars, both for exciters and d.c. factory load, and control equipment for 25 solenoid operated feeder switches for a.c. distribution. These switches will be mounted on Monson slate panels on a mezzanine floor under the turbine-room floor. The a.c. 440-volt bus-bars and generator switches will also be located here.

Generator switches will be non-automatic, with bell-ringing attachment, and feeder switches automatic, as mentioned above. All feeders will leave the turbine-room in a tunnel, from which they will branch off to the various buildings in 3-in. fibre conduits. These fibre conduits will lead to cable-pits, from which risers of 3-in. conduit will be carried to distributing panels. All a.c. cables will be 3-conductor paper insulated, leaded, direct current cables being single-conductor, leaded. For lighting factory area, 4-light clusters, wired in series-parallel, will be used. As mentioned above, the neutral point of generator windings will be brought out. The lead sheath of the lighting feeder cables will be bonded to the neutral bus and lighting circuits will connect one wire to one of the three conductors, the other to the sheath, giving approximately 266 volts across two lamps in series. Lighting feeder cables will lead to distributing boxes on the third floor of each section, from which circuits will run to the panel boxes on the different floors. Power feeders will run to distributing boxes on the third and fifth floors, from which circuits will run to power loops on each floor.

All wiring except that in general offices will be open conduit. The general offices will have outlets for fans, dictographs, annunciator and telephones, all wiring concealed in conduit. A large number of 3-phase, 60-cycle motors will be used for direct-connected, belt and group drives. L. K. Comstock & Company have the contract for wiring the lighting and power circuits.

An artesian well is being drilled by Wallace Bell Company, Limited, and will be used for drinking water and for manufacturing purposes.

In addition to the fibre protection system, a regular watchman's service system will be installed, so that the building will be patrolled at all times outside of the regular working hours. For the convenience of watchmen and to avoid the use of oil lanterns in the plant, a certain number of electric lights will be kept burning all night to form a pilot system, so that in cases of emergency the workmen in the building can easily locate the fire apparatus and also the exits.

The following features in connection with the building are of interest:—

The total excavation amounts to some 50,000 cu. yds. Over 14,000 cu. yds. of concrete have been used for foundations. 1,500 carloads of building material have been received up to the present time. 100,000 sq. ft. of glazing has been used, and approximately 100,000 sq. ft. hot water radiation service will be required.

The work has been executed under the direct supervision of Mr. E. F. Sise, President of the Northern Electric Company, Limited; Mr. J. D. Hathaway, General Superintendent; Mr. J. S. Cameron, Plant Engineer, and Mr. W. J. Carmichael, Architect.

USE OF POWDERED FUEL.

Fuel economy and the intimately associated problem of smoke abatement are receiving much attention. Among the methods discussed none perhaps is of greater interest than the burning of powdered coal The experiments made in this direction are of especial value to all who are interested in the utilization of peat. The work done by Lieutenant Ekelund in Sweden, according to the Journal of the Canadian Peat Society, has already demonstrated that peat has very great possibilities when used in powdered form. Its composition and physical properties make it in some respects superior to coal for this purpose.

The requirements for best results in burning powdered coal are thus stated by an authority.

(1) Coal must be dried to contain not over 1 per cent. of moisture.

(2) It must be pulverized to a high degree of fineness.

(3) It must be projected into a chamber hot enough to cause instant ignition.

(4) It must be supplied with sufficient air for complete combustion.

The standard of fineness given by the same authority is:—90 per cent. through a 400 mesh screen; 2½ per cent. to 5 per cent. through a 200 mesh screen, and the balance through a 100 mesh screen.

The cost of preparation of coal is variously estimated at from 32½ to 36½ cents per ton, with power at 1½ cents per k.w. hr.

It must be kept in mind that there is present in powdered fuel a certain percentage of extremely fine material, depending on the character of the fuel, its moisture content, and method of pulverization. The character of the flame is materially influenced by this impalpable dust which gasifies instantaneously.

The physical structure of peat is such that a large percentage of very fine powder would be more easily obtainable than in the case of coal, thereby increasing the rapidity of combustion.

Another point in favor of peat powder is the usual high content of volatile matters in peat. There is much divergence of opinion as to the amount of volatile matter required in coal to render it suitable for burning as powdered fuel. The majority of writers seem to think that 30 per cent. of volatile matter is a prerequisite, but some report satisfactory conditions with but 20 per cent. The higher the volatile the larger amount of the combustible will be converted into gas by the mere application of heat, and the more rapid and perfect the combustion. Ontario peats examined contain as high as 60 to 70 per cent. volatile matter, and should produce a highly efficient powdered fuel.

As in the production of peat fuel generally the important question is the removal of the moisture at such cost as to render the fuel economic.