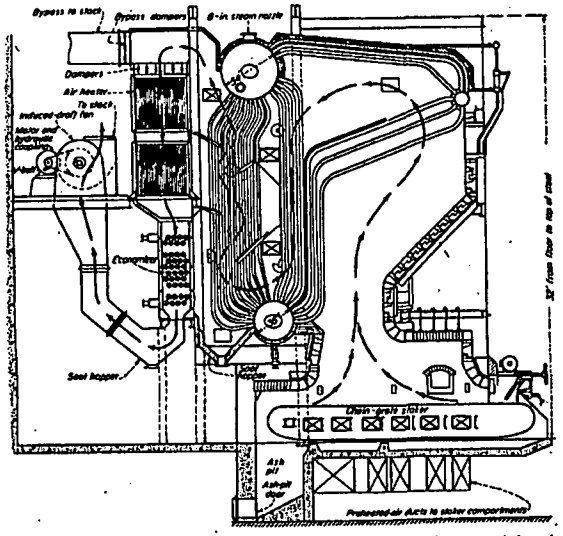
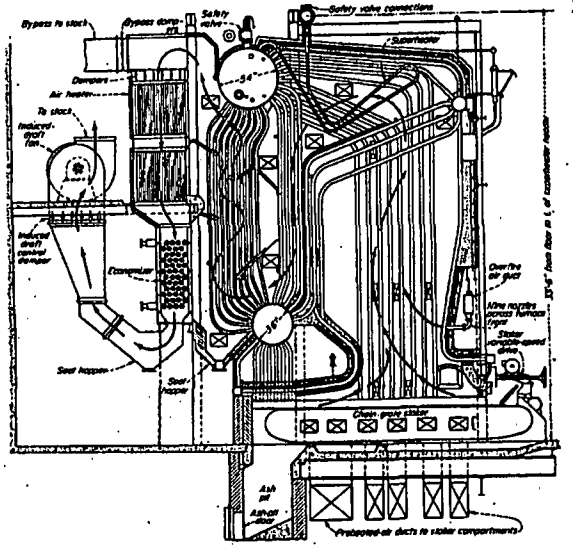


BOILER NO. 1 was installed first. It has an economizer, air heater and forced- and induced-draft fans. The unit is fired with lignite on a traveling grate stoker. The furnace is equipped with a long ignition arch and refractory walls



BOILERS NO. 2 AND 3 have furnaces with a more open throat than No. 1. Furnaces are designed for rear-arch firing to burn coals other than lignite if this should become necessary. Nine nozzles between the front-wall tubes supply overfire air

grate into an ashpit with a steeply sloped floor and run by gravity to the ashpit doors that open into the basement. When the doors open, a few strokes with a hoe pull the ashes out into a hopper. From there, they are blown through a vacuum conveyor to a cyclone collector set on steel legs at one side of the power house. Ashes drop directly from collector into a dump truck to be hauled away.

A steam venturi tube discharging into a dust washer provides the vacuum for the ash-handling system. Fine dust which escapes from the cyclone collector, is washed out by water sprays. Branches from the ash conveyor to each boiler front remove ash droppings that accumulate at front of traveling grates. A line also extends to the foot of the stack to handle flyash.

To eliminate coal dust, an exhaust duct runs the length of the boiler-room ceiling with intakes beside every bunker gate and along the top of each coal hopper (photo page 98). A powerful exhaust fan is connected with mercoid tilt switches on the arm of each bunker gate and on the lever operating the weigh-larry gate. Opening any coal gate starts the fan automatically, setting up a strong draft over the coal being discharged and sucking any fine airborne dust into the exhaust system. This fan discharges to the atmosphere above the boiler-room roof. A vacuum cleaner encourages good housekeeping.

For ventilation, an 11,000-cfm fan draws fresh air from outside and discharges it through a distributing duct into the basement. This air passes upward through stairwells and other openings into the boiler room, and, as it becomes warmer, rises to the ceiling where it enters the intakes of the forced-draft fans. Air at intakes to these fans averages 80 F in winter and 100 F in summer, adding a little to efficiency as well as helping to make the working levels more comfortable.

Feed-water System. Two closed deaerating heaters supply feed at 200 F to the centrifugal feed pumps. These units are driven by steam turbines and one by a 3500-rpm electric motor.

Condensate returns from packing-house processing equipment are often contaminated with animal fats. Accordingly, these returns are collected in a vacuum-return system and pumped through a diatomaceous earth filter before entering the feedwater heater.

Firemen check boiler-water conditions twice each shift with a test kit, and feedwater treatment supplied by continuous chemical feeders is regulated accordingly. Each boiler is fitted with a continuous surface blowdown system, whose setting the firemen regulate manually in accordance with boiler-water conditions. Induced-draft fans are powered both with electric motors and steam turbines. The turbines are connected to the fan shaft through automatic over-running clutches.

Steam-generating plant now has a capacity, including the electric-steam generator, of 148,000 lb per hr, coupled with a high degree of flexibility which permits efficient operation at any load. The electric-steam generator is operated on off-peak power only, but is useful, notably on summer weekends when steam demand is low, or when quick steam increase is required.

Duplication of practically all equipment has greatly facilitated maintenance work, and resulted in a marked reduction in weekend and overtime repairs.

A large measure of dependability and flexibility has been obtained without sacrifice in efficiency. The new units on 8-hr trial runs developed efficiencies as high as 79%. The whole coal-burning plant over a 28-day period with widely fluctuating loads has shown over-all efficiencies of 75% and 76%. These percentages, a little better than expected, are excellent for this high-moisture refuse coal.

Efficiencies and costs are worked out daily in the chief engineer's office and all charts checked to make sure firemen are using all aids to the best possible advantage. Some retraining was necessary, as the new units need a slightly different firing technique for best results. The firemen have real interest in developing the new ideas in these units, and have a growing enthusiasm for them.

PRINCIPAL STEAM AND ELECTRICAL EQUIPMENT

Steam Plant of Canada Packers, Ltd

STEAM-GENERATING EQUIPMENT:

Electric steam generator.....Canadian General Electric Co, Ltd
One, 6000 kw, 4000 v, 60 cyl, 3 ph, 3 cast-iron electrodes, design pressure 250 psi, working pressure 130 psi saturated
Circulating pump.....Canadian Allis-Chalmers, Ltd
One, 500 gpm, 20-ft head, 680 rpm, centrifugal
Circulating-pump motor & starter....Canadian General Elec Co, Ltd
One, 30 hp, 550 v, 680 rpm, squirrel cage, line start
Feed pump.....Canadian Allis-Chalmers, Ltd
One, 100 gpm, 403-ft head, 3550 rpm
Feed-pump motor & starter.....Canadian General Elec Co, Ltd
One, 30 hp, 550 v, 3550 rpm, squirrel cage, line start
Steamflow recorder.....Bailey Meter Co, Ltd
Coal-fired boiler No. 1, economizer, air heater...Foster Wheeler, Ltd
One, 2 drum, bent tubes, air cooled, steel-incased furnace; 4673 sq ft heating surface; *economizer* 1020 sq ft; *air heater* 2940 sq ft; rated continuous steaming capacity 58,000 lb per hr saturated; design press 160 psi, working press 130 psi; 1342 cu ft furnace volume, 50,000 Btu full-load heat release per hr per cu ft effective furnace volume 50,000 lb steam per hr
No. 2 and 3 boilers.....Foster Wheeler, Ltd
With economizers, air heaters, superheaters and waterwalls. 2 drum, bent-tube watercooled furnace and arches; steel incased; 3072 sq ft heating surface including waterwalls; *economizer* 1020 sq ft; *air heater* 2940 sq ft; rated continuous steaming capacity 45,000 lb per hr, design pressure 160 psi, operating pressure 130 psi at superheater outlet, 403 F total steam temperature; 1685 cu ft furnace volume; 34,800 Btu heat release per hr per cu ft of total furnace volume at 45,000 lb of steam per hr
Structural steel and breechings.....Dominion Bridge Co, Ltd
Boiler refractories.....Bigelow Liptak Corp
Boiler heat insulation.....Winnipeg Supply & Fuel Co
Soot blowers.....Diamond Power Specialty Corp
Chimney.....Custodis Canadian Chimney Co, Ltd
One, concrete, 9 ft inside dia, 160 ft high
Building construction and boiler settings...Winnipeg Supply & Fuel Co
Boiler-room ventilating fan.....Canadian Sirocco Co, Ltd
One, motor driven, 830 rpm, 11,000 cfm, 10 in. wg
Ventilating-fan motor & starter.....Canadian General Electric Co
One, 25 hp, 550 v, 850 rpm, squirrel cage, line start

COMBUSTION EQUIPMENT:

Automatic combustion control.....Bailey Meter Co, Ltd
Stokers, motor driven.....Foster Wheeler, Ltd
Herrington chain grate, 9x16 ft, 140 sq ft effective grate area
Stoker motors.....English Electric Co of Canada
1, 2 hp, 550 v, 1135 rpm, squirrel cage, line start
Stoker motor starters.....Canadian Controllers, Ltd
Stoker variable-speed drives.....Reeves Pulley Co
Forced-draft fans.....Canadian Sirocco Co, Ltd
One, motor driven, 17,000 cfm at 51 in. wg and 165 F; 2, motor driven, 23,000 cfm, 6.04 wg at 20 F
Fan motors.....English Electric Co of Canada, Ltd
One, 25 hp; 2, 30 hp, 550 v, squirrel cage, line start
Fan motor starters.....Square D Co Canada, Ltd
Induced-draft fans.....Canadian Sirocco Co, Ltd
One, motor driven through hydraulic coupling, 27,000 cfm, 337 F, 6.8 in. wg; 1, motor & turbine driven, 35,000 cfm, 356 F, 8.02 wg
Fan motors.....English Electric Co of Canada, Ltd
One, 30 hp; 2, 30 hp, 550 v, squirrel cage, line start
Fan motor starters.....Square D Co Canada, Ltd
Fan turbines.....Coppus Engineering Corp
1, 45 hp, 3385 rpm, fitted with Coppus 4.11 to 1 reduction gear
1-d-fan hydraulic coupling.....Canadian Sirocco Co, Ltd
Turbine automatic clutches.....British Liquid Meter Co, Ltd
Overfire air fan.....Sheldons, Ltd
One, motor driven, 10,000 cfm, 11 in. wg
Overfire-air fan motor.....Commonwealth Electric Corp, Ltd
One, 15 hp, 550 v, 1200 rpm, squirrel cage, line start
Overfire-air-fan motor starter.....Canadian Cutler-Hammer, Ltd

COAL AND ASH-HANDLING EQUIPMENT:

Coal elevators and conveyors..Stephens Adamson Mfg Co of Canada
Continuous flow, 25 tons per hr
Coal bunker, suspended steel.....Dominion Bridge Co, Ltd
Coal gates on bunker.....Stephens Adamson Mfg Co of Canada
Coal weigh larry.....Canadian Fairbanks, Morse Co
Coal-dust collecting fan.....Robbins & Myers Co
Coal-dust fan motor.....Commonwealth Electric Corp, Ltd
One, 15 hp, 550 v, 1150 rpm, squirrel cage, line start
Coal-dust fan-motor automatic control.....Canadian Controllers, Ltd
Ash conveyors, pneumatic.....United Conveyor Corp
Cyclone ash collector.....United Conveyor Corp

VALVES, PIPING AND TRAPS:

Safety valves.....James Morrison Brass Mfg Co, Ltd
Nonreturn valves; h-p and l-p valves.....Crane, Ltd
Blowdown valves.....Yarnall-Waring Co
Electric valve operators.....Minneapolis Honeywell Regulator Co
Pressure-reducing valves.....James Morrison Brass Mfg Co, Ltd
Pipe fabricator or contractor.....Standard Plumbing & Heating
Pipe insulation.....Western Asbestos Co, Ltd
Steam traps and strainers.....Yarnall-Waring Co

FEEDWATER SYSTEM:

Feed treatment, internal; chemical feeders...Aluminate Chemicals, Ltd
Water columns.....Reliance Gauge Column Co
Feedwater heaters.....Canadian Allis-Chalmers, Ltd
2, Cochrane, deaerating, 80,000 lb per hr, from 160 to 200 F
Continuous blowdown system.....Aluminate Chemicals, Ltd
Blowdown tank.....Manitoba Bridge and Iron Works
Feed pumps, 3 turbine-, 1 motor-driven..Canadian Allis-Chalmers, Ltd
2, 100 gpm, 403-ft head, 3500 rpm; 2, 200 gpm, 500-ft head, 3500 rpm
Feed-pump turbines.....Coppus Engineering Corp
One, 6 nozzles, 24 hp; 2, 10 nozzles, 46.5 hp, 3300 rpm
Feed-pump motor and starter.....Canadian General Electric Co
One, 30 hp, 550v, squirrel cage, line start
Turbine governors.....Fisher Governor Co
Feedwater regulators.....Bailey Meter Co
Condensate-return pumps.....Nash Engineering Co
2, motor driven, 100 gpm, 20-ft head, 1200 rpm
Condensate-ret-pump motors & starter....Canadian General Elec Co
2, 5 hp, 550 v, 1200 rpm, squirrel cage, line start
Condensate-return filter.....Infilco, Inc
Filtering medium, Calilite.....Canadian Johns-Manville Co, Ltd

METERS:

Boiler meter and control panels; steamflow-airflow meters, economizer and air-heater temperature recorders, steam-press & temp recorders, 9- and 12-point draft gages.....Bailey Meter Co, Ltd
Pressure gages.....Peacock Bros, Ltd
Thermometers, industrial..Taylor Instrument Companies of Canada, Ltd
Gas indicators and recorders.....Hays Corp