

in bleachery for hot water showers. Instrumentation and controls are very complete for this system.

### Recovery Furnace

The concentrated black liquor after further strengthening and addition of salt cake make-up is fed by means of variable speed pumps through oscillating nozzles after increasing its temperature by passage through primary and secondary heaters. Variance in operating pressure, size of nozzles, temperature of liquor, furnace drafts, rate of salt cake feed etc., effect type of spray used and operational rate of furnace unit. Close control must be exercised on the above (to mention a few) by the steam plant crew in such a cyclic recovery process.

This recovery unit one of largest in operation was supplied by Combustion engineering Corp. and was designed to burn 960,000 lbs of dry solids per 24 hours-- a nominal capacity of 320 tons of pulp daily and will produce steam at 225 p.s.i. The average steam production approximates 140,000 #/hour or to put it another way-- produces sufficient steam in a day to heat 15 homes the year round.

The sprayed liquor is concentrated in the furnace due to heat from burning carbon products, the sticky flakes fall to the bed where reduction reactions take place and smelt is produced. The molten chemicals issue forth through two smelt spouts into a dissolving tank where weak wash liquor as called for by gravity and level controllers unites with explosive force in a shattering spray to form "green" liquor (principally sodium carbonate and sodium sulphide).

Located directly above the furnace is a Bottrell precipitator through which the furnace exhaust gases are directed before issuance into the boiler house stock. Gas at 300°F and of approximately 120,000 c.f.m. is cleared of almost all the entrained solids and vapours by means of rod and curtain type electrodes operated at some 60,000 volts. Rapping devices discharge the salts collected on the rods into screw conveyors thence to the furnace via the liquor feed.

### Causticizing System

Raw Green liquor from the smelt dissolving tank is pumped continuously to storage whence by flow controller and recorder the liquor is metered to the green liquor clarifier for removal of grits, insolubles, refractory etc., where total volume is split equally and fed to 4 setting compartments in parallel. The overflow from each compartment flows thence by gravity through a green liquor heat exchanger (using steam or cooling water depending upon conditions) to obtain desired initial reaction temperature before entering a Dorrco slaker and classifier.

Reburned lime from the kiln or fresh make-up pebble lime are fed separately into the slaker by means of screw conveyors with variable speed drives for metering. At boiling temperatures due to heat of reaction, the lime and green liquor constituents unite, producing calcium carbonate sludge and white liquor (caustic soda and sodium sulphide). Grits and insolubles settle out and are raked to the sewer for disposal while the partially causticized liquor at approximately 215°F overflows to a head box where by means of a pump it is elevated to a cascade series of tanks termed causticizers. Here detention time is sufficient to effect equilibrium for all practical purposes.

The caustic liquor containing the precipitated calcium carbonate sludge is fed into a 4 compartment thickener where clarification is accomplished. The clear "white" liquor (somewhat yellow or reddish tinge) is stored for use as cooking liquor while the settled sludge is removed by diaphragm pumps to a dilution head box prior to rewashing in the white mud washer.