

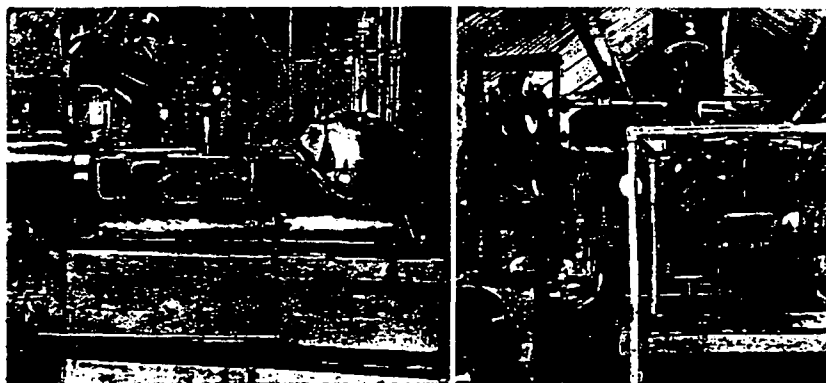
R EXPANSION PROGRAM

by FRANK H. COLDWELL, Manager of Mill Power

THE Nekoosa-Edwards Paper Company has been manufacturing paper for over 60 years. Its main offices are at Port Edwards, with mills at both Port Edwards and Nekoosa, Wisconsin. These mills are situated on the Wisconsin River, and in the early days power was developed at power sites at the mills and transmitted to various pieces of equipment by shafting, belts, and pulleys. The only steam power used was from engines driving paper machines where the steam could be used for paper drying, and some steam engines for mechanical power where water power could not be transmitted.

As time went on, the plants grew, and electric power became common in the industry. About 1913, a power site on the Wisconsin River at Centuria was obtained where 2000 kw (later increased to 3600-kw capacity) of hydroelectric generation was installed, and a 1000-kw steam turbine was purchased for Port Edwards. The power sites on the Wisconsin River at Port Edwards and Nekoosa were still used primarily for mechanical power and for the production of ground wood pulp used directly in the paper process.

Later, additional paper machines were installed to bring the capacity of each plant up to four paper machines each. Changes in the paper industry and the products of the company eliminated the use of mechanical pulp made by grinding wood with water wheels, this pulp being replaced by chemical pulps. As this trend progressed, the Port Edwards and Nekoosa power sites on the Wisconsin River were converted to the production of hydroelectric power. Under this condition in the early 20's, two steam turbines were installed to stabilize the power output of the hydro plants under varying river conditions. In 1929, the first 400-lb boilers were installed at the Port Edwards plant and a 400-lb



Two Elliott single-valve steam engines have been driving paper machines at Nekoosa-Edwards for many years. The engine at left has been driving the No. 5 paper machine since 1930. The Elliott steam engine at right drives the No. 1 paper machine.

turbine-generator was installed, exhausting at 150-lb back pressure to obtain by-product power.

As power demands grew, additional 475-lb boilers and a 3500-kw turbine-generator were installed at the Nekoosa plant, with the turbine extracting steam at 150 lb and exhausting at 30-lb back pressure.

This was the status of the property in 1950 when plans were made for a new paper machine and expansion of pulp-making facilities at the Nekoosa mill, necessitating a large block of new power.

At this time the average electrical load had reached 13,000 kw, made up largely of hydro and by-product steam power, with some mechanical water power still being used for the driving of stock preparation equipment for the paper machines.

At that time the boiler house of the Nekoosa mill had one 450-lb pulverized fuel boiler rated at 110,000 lb per hr, one chemical recovery boiler of the same design characteristics which produced about 60,000 lb of steam per hour, and five low-pressure boilers acting as stand-by for the pulverized-fuel boiler and used mainly for the disposal of waste wood.

Basic Data

The basic data indicated that the power expansion program should be sufficient to care for an increase in production from 156 tons to 200 tons of pulp per day and an increase from 140 tons to 253 tons of paper per day at the Nekoosa plant. No expansion of the Port Edwards mill was contemplated and no increase in steam or electrical demand at that plant was assumed. The plan as set up, was designed to facilitate the installation of future equipment.

The paper industry uses large amounts of steam in process requirements. Hence, by-product electrical power is possible, and the plant was designed to produce the maximum amount of this power. Since coal is relatively expensive in the plant area, it was decided to continue the use of pulverized coal in order to utilize the extremely small size coal available at lowest prices. Accordingly, refinements in methods of soot blowing, burner arrangement, ash- and coal-handling were incorporated in the boiler design to facilitate the use of this type of coal.

The steam necessary at the Nekoosa mill alone was studied but as the