



JORDAN RIVER MAY SOON COME ALIVE AGAIN as workers seek reconstruct hydro plant, pictured here under construction in early 1900s.

Pioneers of Jordan River Hydro Had Courage to Dream and Dare

By PATRICIA SKOWAISA

The Jordan River power house is a record of vision, enterprise, organization and engineering—a lasting monument to a handful of men who in the early 1900s realized the potential of an almost entirely unknown mountain stream.

The average light or power consumer can have very little idea of what tremendous resources, in the form of plant and equipment, has to be assembled and put into action before a single kilowatt of electricity can be transmitted over the wires so we can enjoy its wealth of uses from driving machinery in factories to having our toast and coffee in the morning with "the juice."

Preliminary investigation of Jordan River as a possible source of new power was undertaken by the late G. M. Tripp, Vancouver Island general superintendent, who realized as early as 1906-7 that the Goldstream hydro-electric plant, together with the steam plant in the Rock Bay substation would soon be insufficient to meet the rapidly growing demands placed on the B.C. Electric Company by Victoria and the surrounding districts and that the Company would, in keeping an eye to the future, have to consider the development of hydro-electric power on a scale which, at that time, seemed almost fantastic.

Work commenced on the Jordan River development in September, 1909. This venture as authorized included the construction of a dam

and storage reservoir on, respectively, Bear Creek and Alligator Creek; a main diverting works on the Jordan River, two storage reservoirs, a diverting works on Y Creek, a flume or ditch, a regulating reservoir, a power house and the installation therein of electrical machinery, a pipeline, and a transmission line. Specifications on the permanent diverting dam called for concrete mixed to the consistency known as "slippy."

All heavy equipment and supplies had to be transported to Jordan River by water, and this was quite a problem in itself because there was no harbor and the water was too shallow to allow the tugs to bring the scows alongside the wharf. This necessitated running raw lines ashore and pulling the scows alongside by hand, where they were unloaded by an electric derrick.

Payrolls were calculated in the Victoria office and the men were paid on the job once a month. The men carried brass tags with a number that corresponded on the payroll and "no tag no pay" was the rule.

Berry Porter was appointed hydro supervisor for Jordan River in 1906. He explained how from the physical aspect alone the construction of this plant must have been a tremendous task.

In the early 1900s there were as many as 500 men working on the Jordan River hydro project. In a few years to come there may be just one. But before that Jordan River may hum again with activity as hundreds of workmen arrive on the scene later this year to start reconstruction of Jordan River's hydro operations. A final plan has not yet been decided upon, but they may call for diversions of the river, new flumes, and establishment of a remote central power station.

Patricia Skowaisa tells about the vision that led to the establishment of the Jordan River power plant.

The magnitude and difficulty of this work can only be appreciated when it is explained that more than 6,000,000 feet of timber was used in the rebuilding and that the flume had to be kept in full commission throughout the four years the work was in progress.

Next on the agenda was the construction of a flashboard structure in the spillway of the diversion dam to increase the storage capacity of the reservoir by some 20

per cent, or an amount equivalent to 1,620,000 kilowatt hours.

Following this a single unit power plant was installed within the diversion dam structure (that operated by utilizing the head of water stored behind the dam and is automatically controlled). It operates at varying loads according to the water requirements of the main Jordan River plant, as the water, after passing through the turbines of this plant, empties into the flume



START OF BEAR CREEK DAM.



FLUME AND FLUME RAILWAY.

and is controlled by the demands of the flume in accordance with the requirements of the turbines in the main powerhouse. This work was completed in 1929.

In order that there might be sufficient storage capacity to carry the power plant, including the new unit, over the peak load periods two earth-filled dams were raised at Forebay. These dams provide the storage of balancing reservoir into which the flume empties and the penstocks draw their supply of water.

Field gangs assembled for the full installation of the fourth unit in March, 1930. More than 3,000 tons of heavy materials and supplies were transported to Jordan River without a single loss being recorded.

The work crews had to chop through virgin forest and had to contend with rugged terrain using only horses and hard work.

The first two generating units were installed and placed in operation in 1912, developing a total of 11,000 horsepower. About this time too, there was a narrow gauge railway laid, measuring approximately 20 inches wide and five and a quarter miles long, to carry supplies up the mountain.

In 1914 it was decided to double the capacity of the Jordan River plant and a third generating unit of 10,500 horsepower was installed and placed in operation. At this time provision was made for the reception of the fourth unit together with its step-up transformers and control machinery. Additional tail-races, concrete machinery foundations, and a permanent operating floor together with the installation of the generating machinery, wiring, and the erection of the switch gear was carried out by the company construction crews.

The present and future power requirements of Victoria and districts were again placed under consideration in 1925, and a carefully prepared plan of development was drawn up, having as its objective, an additional 18,000 horsepower to that already being developed at Jordan River.

The reconstruction and enlargement of the main flume was the first item on this program. The flume is a timber box, five and a quarter miles in length, which conveys the water from the main diversion and storage dam to the balancing reservoir at Forebay, from which the huge penstocks, or pressure pipelines, leading to the turbines in the powerhouse at scoulevol, draw their supply.

Contracts for the fourth unit construction were awarded to Vancouver Engineering Works, Ltd., English Electric Company of Canada, Ltd., Canadian Westinghouse Company, and the Canadian General Electric Co.

The English Electric Company of Can. Ltd., headquartered at Northampton, England, manufactured and furnished the 18,000 horsepower waterwheels and the 15,000 k.v.a. generator and one 250 k.w. motor generator set.

The Canadian Westinghouse Company supplied four 5,000 k.v.a. single phase transformers.

The Canadian General Electric Company provided the switchgear and control panel.

The supply and erection of the penstock was handled by the Vancouver Engineering Works, Limited.

The new pressure pipeline, or No. 4 penstock, graduated in diameter from 48 to 60 inches, is approximately 0.250 feet in length, and was the heaviest ever built in B.C. The weight of steel making up the entire

pipeline was 2,517½ short tons and contained riveted steel throughout, with 307,000 rivets that had to be driven in its fabrication in the shop and when it was sent in its present position. It is interesting to note that the rivets were driven by a machine capable of exerting a pressure of 150 tons a square inch. The total weight of the penstock was approximately 4,000,000 pounds, the heaviest section of pipe to be handled being about 11 feet.

The pipe is entirely above ground and exposed to temperature changes so in order to take care of the expansion and contraction of the metal in this long length of pipe, 20 expansion joints were provided. The other pipelines are below the ground for their entire length, and therefore, are protected from any variation in temperature.

All clearing and grading work for

the penstock was carried out by the company's forces, the excavation work, for the most part, being done by gasoline shovels. The heavy grade behind the powerhouse was excavated by drag line.

Additional modifications were incorporated in 1932-3, including the installation of new oil circuit breakers.

The Jordan River project was pioneered by men who had the courage to dream and dare. The exploits of some frontiersmen are tinged with an aura of romance and adventure when reminiscing but they believe the fact that in the earlier years when so much was untried and new — when there was no precedent to follow — no sign posts left by others to point the way — almost any undertaking could be approached in the light of a new and exciting adventure.



JORDAN RIVER POWER HOUSE AND TAILRACE.



DOWNSTREAM SIDE OF JORDAN RIVER DAM, 1915.