

No. 2 generator, the rotor and thrust-bearing being assembled and the stator-windings placed in position. It is expected that it will be ready for service by September, 1929. During the year a contract was let for the supply of the fourth generator of 15,000 kw. capacity.

#### *Transformers.*

The assembling and drying-out of the main transformers was completed, and an extra set of service transformers installed in connection with No. 3 generator. The assembly and drying-out of the testing-transformer was also completed during the year.

#### *Switch-gear.*

The 110-000-volt switch-gear was completely checked for connections prior to placing in service. The 11,000-volt isolating-switches and supporting steelwork were erected in the cable-room, and a start made with the steelwork for the 11,000-volt switches. As the building was not sufficiently advanced to permit of the installation of these 11,000-volt oil switches, temporary arrangements were made in connection with the operation of No. 3 generator. The foundations, steelwork, and switches for the 50,000-volt structure for the Horahora tie-line were completed. In the control-room the steel and marble work in connection with the operating-bench was assembled and erected, also the low-tension and watt-hour meter boards completed. Three panels of the control benchboard, the low-tension and the signal board were connected up and placed in service.

#### *Motor-generators.*

The motor-generator set was removed from the temporary shed to its permanent position in the power-house and placed in service.

#### *Cables and Wiring.*

A large amount of this work has been completed, the whole of the system at the outdoor substation, including interlocking, signal, power, and miscellaneous cables being laid and connected up. The main transformer-cables for Nos. 1, 2, and 3 generators have been completed and boxed, and generator, auxiliary, and pilot cables have also been completed for Nos. 2 and 3.

#### *Heating and Lighting.*

The lighting installations at the main dam, outdoor substation, 110,000-volt structure, penstock-intakes, and pump-house have been completed, while similar work at the power-house is being completed in the control-room, transformer and cable rooms, and also below No. 3 generator.

### WAIKAREMOANA ELECTRIC-POWER SUPPLY.

During the year practically all civil construction work has been completed under the direction of the Engineer-in-Chief.

#### DESIGN WORK.

The design and drawing work to cover the layout of the generating plant and switch-gear was completed. The work included the design of the foundations for two 20,000 kv.a. units and the necessary piping for the forced-lubrication system and water-cooling system in connection with the plant. The design of an artificial loading-tank for testing the main generating units was prepared for tendering purposes, and drawings issued for erection of same in the field.

The necessary layout drawings for Gisborne and Wairoa Substations were prepared in the design office and issued for the erecting staff.

#### POWER-STATION.

With the completion of the power-station building, the erection of the 80-ton crane was pushed ahead, so as to facilitate the erection of No. 2 unit.

Work on the installation of the 11 kv. switch-gear, control boards, control and main cables, &c., was pushed on at the same time as the erection of No. 2 unit, so as to have all the apparatus ready when it was ready for service.

On the 6th December, 1928, water was admitted into No. 2 pipe-line, but, due to water leaking through the bolt-holes at the Larner-Johnson valve, the pipe-line had to be emptied and welding of bolt-heads done to prevent leaking.

On the 21st December, 1928, the pipe-line was again filled, and No. 2 unit turned over for the first time at 11.23 a.m., on the above date and run for a short while, and again later in the afternoon, when it was again found necessary to shut down, due to the seating of the Larner-Johnson valve giving trouble. The Larner-Johnson valve was dismantled and all the holding-bolt holes in the seating-ring filled with spelter, redrilled, and tapped.

This unit was again ready for running on the 5th January, and after several hours' running, trouble was experienced with the governor. Trouble was experienced off and on with the governor for some days, but by the latter end of January this unit started to carry commercial load, Napier being the first station to receive power from this station. It is also worthy of note that this unit was placed urgently into service without any preliminary testing, and, except for small troubles, the generator has been in constant service since the above date.

Work on No. 1 unit was held up pending the arrival of the turbine, which did not arrive until the second week in February. On arrival of the turbine, erection of No. 1 unit was pushed rapidly ahead, and by the 26th May, 1929, the generator was ready for drying out.