

Supply to Horowhenua Electric-power Board.—This supply is given at 11,000 volts over a double-circuit line from Mangahao Power-station, the line being maintained by the Horowhenua Electric-power Board. Two accidental interruptions, totalling 3 minutes, occurred during the year.

Waikaremoana Power-house and Headworks.—The operation of this portion of the scheme was quite satisfactory throughout the year.

Heavy rain early in the year caused considerable damage to the tail-race spillway weir, but this was repaired without affecting continuity of supply, temporary measures being taken to maintain the water-level at the draught tubes while the damage was being made good.

The pipe-lines were thoroughly inspected during the year and the interior surfaces found to be in very good order. The whole of the exterior of the pipes has been painted.

As the turbines have been unable to deliver the guaranteed output, the manufacturers have agreed to supply new runners for both machines. One of these has come to hand and has been installed on No. 2 unit. Owing to the necessity of supplying power, it was not possible to carry out efficiency tests on the machine after the installation of the new runner, but its output is now quite satisfactory.

Heavy rain during the year caused numerous slips in the pipe-lines and roads and at the outdoor station. Ice-plants and other similar vegetation have been planted to make the batters more stable.

General repairs to the cottages and staff quarters have been carried out, and the grounds grassed.

Substations.

Khandallah.—From this substation power is supplied to the Wellington City Council, Hutt Valley Electric-power Board, New Zealand Railway Department, and the Wellington Meat Export Co., Ltd.

During the year there were eight total interruptions to supply, totalling 18 minutes, none of which were prearranged.

Due to bad joints on the rotor of the synchronous condenser, one of the joint plates became loose and damaged the stator coils. This necessitated the dismantling of the machine, and a considerable amount of work had to be done. The machine is now being reassembled, and will be in service again shortly.

The earthing system was overhauled and, to improve its reliability, all soldered connections were replaced by mechanical joints.

A considerable number of insulators have been tested during the year, including those indicated as defective by the buzz stick and those held as spare insulators at substations and telephone huts. A number of tests on special insulators have also been carried out.

Melling.—This substation was put into service in August, 1931, and has since been giving supply to the Hutt Valley Electric-power Board. All apparatus has operated well during the time the substation has been in service, and every interruption to supply was due to external causes.

Bunnythorpe.—From this substation supply is given to the Manawatu-Oroua Electric-power Board. During the year nine accidental interruptions to supply, of a total duration of 57 minutes, occurred.

The prearranged shutdowns numbered eleven, and totalled 4 hours 3 minutes. Seven of these, of a duration of 3 hours 58 minutes, were occasioned by the reconstruction work carried out at this substation during the year. The remaining four, of five minutes, were required for paralleling Mangahao and Tuai after shutdowns.

Marton.—This substation supplies power to the Wanganui-Rangitikei Electric-power Board, and is normally in parallel with Wanganui Substation on the low-tension side—*i.e.*, through the Power Board's lines.

During the year there were ten accidental interruptions to supply, of a duration of 42 hours 7 minutes. The greater part of this time is made up by one interruption of 40 hours 48 minutes, caused by the failure of a bushing in the low-tension switch-gear. The actual interruption to supply at Marton was only 1 minute.

Of the prearranged shutdowns, numbering nine and totalling 35 hours 39 minutes, five, of 12 hours 24 minutes, were required for work on the lines; one, of 4 hours 48 minutes, for the changing of the current-transformers on incoming and outgoing feeders, necessitated by the increase in load; and the remaining three, of 19 hours 7 minutes, were required for repairs to the metering current-transformer chamber, necessitated by the failure of a bushing.

Wanganui.—This substation, in conjunction with Marton, supplies power to the Wanganui-Rangitikei Electric-power Board, and all apparatus has functioned very well throughout the year.

During the year there were thirteen accidental interruptions to supply, of a total duration of 1 hour 26 minutes.

Of the nine prearranged shutdowns, totalling 22 hours 5 minutes, six, of 14 hours 48 minutes, were required for line maintenance; two, of 4 hours 8 minutes, for substation maintenance; and the remaining one, of 3 hours 9 minutes, was necessitated by construction work.

During four of the prearranged shutdowns, totalling 8 hours 36 minutes, supply was maintained by means of Power Board's steam plant and from Marton Substation, and during the remainder, essential load was carried by the Power Board's steam plant.

While construction was in progress, the wiring for the telephones and alarm-bells to the cottages was remodelled.

Hawera.—The construction of this substation was sufficiently far advanced by November, 1931, to enable a temporary supply to be given to the South Taranaki Electric-power Board and, pending the construction of Stratford Substation, to New Plymouth Borough Council at 11,000 volts, temporary measures being adopted to by-pass the structure at Stratford during this period.