

Masterton.—This substation, in conjunction with the Kourarau hydro-electric plant, supplies power to the Wairarapa Electric-power Board. Under agreement with the Power Board the Kourarau plant forms part of the departmental power-supply system.

Accidental interruptions to supply numbered sixteen, of a total duration of 25 minutes. There were also four arranged shutdowns, of 4 minutes duration.

At the beginning of October a very severe gale did an enormous amount of damage to the Power Board's lines. Sheets of corrugated iron, blown on to the main 110 kv. line, caused an interruption of 6 minutes, but power-supply would have been restored sooner had the telephone-line remained in working order. The Power Board, however, were not able to take power for 7 hours 3 minutes, as their lines had been so much damaged by falling trees, broken poles, and broken wires, and several weeks elapsed before their system was restored to a state approaching its normal condition.

Mangamaire.—The Tararua Electric-power Board obtains its supply from this substation and, during the year, had twelve accidental interruptions to supply, of a total period of 41 minutes. In addition, there were three arranged shutdowns of 7 hours 18 minutes total duration.

Woodville.—Satisfactory operation of this switching-station was experienced during the year.

Dannevirke.—This is the point of supply for the Dannevirke Electric-power Board, which experienced four accidental interruptions to supply, of a total duration of 39 minutes.

There were also sixteen arranged shutdowns, of a total time of 9 hours 50 minutes.

Waipukurau.—Supply from this substation to the Central Hawke's Bay Electric-power Board was interrupted accidentally on three occasions for a total period of 1 hour 29 minutes. In addition, there were four arranged shutdowns of 6 hours 43 minutes.

The two 11 kv. transformer pot-heads of an obsolete type were to be replaced by new ones, but one failed before the work could be put in hand. This failure was due to the presence of a bird, which caused a flashover to ground and between phases, and power-supply was interrupted for 55 minutes until the spare transformer could be connected into service.

Napier.—Power is supplied from this substation to the Hawke's Bay Electric-power Board. There was only one accidental interruption to supply, of 1 minute, and there were two arranged interruptions of 2 hours 6 minutes total duration.

The synchronous condenser was dismantled, packed, and forwarded to Stratford.

During a check on the current flowing in the neutral of the transformer-banks it was discovered that currents were present in the tanks and cooling-pipes of the transformers. This was rectified by properly insulating the neutral connection from the tanks and earthing it at one point only.

Wairoa.—The Wairoa Electric-power Board obtains its supply from this substation. There was only one accidental interruption of 1 minute, and six arranged shutdowns of a total duration of 20 hours 41 minutes.

Gisborne.—This substation supplies the Poverty Bay Electric-power Board, and there were six accidental interruptions to supply of a total period of 10 hours 24 minutes and twelve arranged shutdowns of 32 hours 8 minutes total duration.

In order to facilitate the removal of the regulator for repairs or overhaul, the outdoor bus-bars were extended so that the regulator can be speedily by-passed.

The conversion of the transformers from water to air cooling was completed. The original water-cooling system was a source of anxiety owing to the necessity of cleaning the cooling-tubes of scale, which formed in considerable quantities. A design was prepared for converting the transformers to air-cooling, and this has proved a very satisfactory job. The danger from the cooling-system has been eliminated and the transformers can now be left unattended except for the daily routine inspection.

Substations, General.—The regular inspection and maintenance of all apparatus has been maintained and has generally resulted in good operation of all substations. Of the five interruptions caused by 11 kv. apparatus, one was due to an external cause—i.e., a bird. There were none due to 50 kv. apparatus, and of the six due to 110 kv. apparatus three were due to insulator failures at Arapuni.

(c) TRANSMISSION-LINES.

(i) 110 kv.

Mangaore-Khandallah Duplicate Line.—Power is transmitted over this line to Khandallah and Melling Substations, and supply was well maintained during the year, there being one interruption due to a gorse fire under the line and one due to lightning.

A profile survey of this line is in progress, and a considerable amount of maintenance-work has been done reconditioning poles, replacing defective insulators, and overhauling tower structures.

Khandallah-Melling Line.—This line operated very satisfactorily during the year, and there were no interruptions due to trouble on the line.

Mangaore-Bunnythorpe Duplicate Line.—This line gave no trouble during the year. Considerable maintenance was carried out inspecting poles, replacing and overhauling defective poles, cross-arms, &c.

Bunnythorpe-Marton-Wanganui Line.—This line operated satisfactorily during the year, there being only one interruption, due to a flashover.

Wanganui-Hawera-Stratford Line.—Trouble on this line caused an interruption on one occasion, due to a peat fire under the line, which burnt one pole nearly through.

Bunnythorpe-Woodville Line.—This line gave very good service, causing no interruptions during the year.

Woodville-Dannevirke-Waipukurau-Napier Line.—This line gave good service, there being only one interruption due to bird-deposit on an insulator on the Woodville-Dannevirke section.

Woodville-Mangamaire-Masterton Line.—There were four faults on this line, three being due to external causes. Bird-deposit on an insulator caused a flashover, another flashover was caused by a