

*Mangamaire-Masterton Section.*—Apart from shutdowns at convenient times arranged for work on the lines and substations this section experienced twenty-nine interruptions for the year, of a total duration of 11 hours 44 minutes. Of these, twenty-three were from the same causes as those on the Woodville-Mangamaire section, and accounted for 11 hours 23 minutes, leaving six interruptions, of 21 minutes' duration, due to other causes. Of these, one, of 1 minute, was due to a surge originating on the Waipukurau Napier section causing the oil circuit-breaker at Mangamaire to open; one, of 1 minute, was due to a switching mistake at Mangamaire; and the remaining four, of 19 minutes, had their origin in troubles on Power Board systems.

This section has also been brought up to standard during the year in the matter of weights, clearances, &c.

*Woodville-Dannevirke Section.*—Apart from shutdowns, arranged at convenient times, this section sustained forty-three interruptions during the year, of 12 hours 37 minutes duration. Seventeen of these were as for the Bunnythorpe-Woodville line, those accounting for 10 hours 59 minutes, as against 8 hours 16 minutes for the same interruptions on that section, most of the extra time being required to remove a broken rotating insulator at Dannevirke and to resume service at and beyond that point. Of the remainder, one, of 3 minutes, was due to a broken jumper on the Dannevirke-Waipukurau section; eleven of 50 minutes, were due to troubles originating on the 11,000-volt Power Board systems. The remaining fourteen interruptions, of 45 minutes, were due to some unknown transient trouble between Woodville and Napier, ten of these occurring in one day during a violent gale.

From a study of conditions, it has been thought that in sudden squalls, the cables have blown close enough to pole steps to arc over to earth, so insulator-strings have been shortened and pole-steps removed where these tended to lessen clearances of cables to earth. Since this work has been carried out no further troubles of this nature have occurred, but, possibly the wind has not reached the same velocity since as when the interruptions occurred.

*Dannevirke-Waipukurau Section.*—The forty-three interruptions recorded for the section above accounted for a total interruption time of 17 hours 34 minutes on this section. The extra time was taken in patrolling the line and repairing a broken jumper, and also by holding this section out during a violent storm when the interruptions occurred on the Woodville-Napier section while endeavouring to locate the fault. A further five interruptions, of 49 minutes, probably had their origin on the 11,000-volt Power Board lines.

*Waipukurau-Napier Section.*—A total of forty-eight interruptions of 26 hours 41 minutes duration were from the same causes as those on Dannevirke-Waipukurau section, with which this line is in series, the difference in time being mainly due to this line being held out of service for 8 hours while being patrolled in an endeavour to find a fault, which ultimately proved to be in the overload relays at Dannevirke, a coil on one phase being burnt out. Of a further three interruptions, one, of 19 minutes, was probably due to a surge caused by trouble on Bunnythorpe-Wanganui section. The other two, of 12 minutes duration, were probably due to Power Board troubles.

#### *Transmission-lines—11,000-volt Lines.*

*Mangaore-Shannon Section.*—The number of interruptions to supply over this line during the year was two. Of these, one, of 13 minutes, was due to faulty switching at the power-house, and the other, of 1 minute, was due to a faulty relay opening the oil circuit-breaker.

Supply is now taken over two feeders in parallel, the load being too great for one line.

*Khandallah-Hutt Power Board Section.*—Supply is taken by the Hutt Power Board over two feeders, Nos. 1 and 2.

Apart from trouble on the Power Board's own main lines there were twenty-nine interruptions to supply, amounting in all to 6 hours 36 minutes, during the year. One, of 12 minutes, was due to a switching mistake at the power-house, four, of 12 minutes, were due to Mangaore-Khandallah section being out of commission, seven, of 28 minutes, were due to faulty relays at Khandallah. Nine interruptions, amounting to 5 hours 20 minutes, were necessary to extinguish three fires on poles and to effect repairs, one, of 15 minutes, was due to the breakdown of a trifurcating-box at Khandallah end of line; three, of 3 minutes, were due to flash-overs of a L.T. air-break switch; two of 3 minutes, to linemen switching in the good line to a faulty line when trouble had been experienced on one feeder; while two, of 3 minutes, were due to some unknown causes.

Leakage-relays have been installed on these feeders in an endeavour to prevent sustained short circuits to earth setting fire to the poles and cross-arms in the event of failure of insulators, broken tie-wires, &c.

*Khandallah-Petone Railway Line.*—Six interruptions to supply have occurred during the year, lasting 2 hours 40 minutes. Two of these, lasting 6 minutes, were due to interruptions on the Mangaore-Khandallah 110 kv. line. The cause of the remaining four interruptions have not been located. On one of these occasions the Khandallah switch came out under such a heavy overload that it was deemed advisable to patrol the line before attempting to put it back into service. In addition to these, a good number of shut-downs were arranged on this section at times when no power was required by the Railway Department.

*Khandallah-Wellington Meat Export Co. Section.*—Three interruptions to service occurred on this line, all due to power being cut off from Khandallah on 110 kv. lines.

#### *Transmission-lines—General.*

The first testing of insulators by the buzz-stick method was completed over the whole system during the year. All units reported defective were replaced and forwarded to Khandallah for tests on the oscillator set.