

continually in service, the new earth wire was installed below the 50 Kv. conductors on the west circuit, and to enable this to be done new telephone cross-arms were fitted and the telephone-line was transferred to the east side of each tower.

A considerable reduction in induced voltage on the telephone-line was effected by transposing the 50 Kv. conductors.

Henderson-Mareretu.—A number of short outages of this line, which was first put into service in December, were caused by flashovers between the telephone-line and the 50 Kv. conductors during stormy weather. This trouble is being overcome by the installation of many additional span-breakers.

Kerepeeki-Waikino.—The only trouble experienced on this line was an outage caused by a cracked insulator.

Mystery Creek-Te Awamutu.—A general overhaul and refitting of pole-tops was carried out under live-line conditions.

Te Awamutu-Hangatiki.—Two outages occurred, one being caused by lightning and the other by a gorse fire.

Arapuni-Ngongotaha.—Five outages were caused by lightning during a thunderstorm on 8th November, 1936; two wires were burned through and several insulators were damaged.

Ngongotaha-Edgecumbe.—The specially treated wire in the sulphur area at Tikitere was examined from time to time, and, apart from a few rusty patches on the telephone-line and a slight discoloration of the paint on the 50 Kv. line, the wire was found in good condition.

A number of insulators on the 50 Kv. line A.B.S.'s at Mourea, Rotoehu, and Karaponga were shattered during a severe thunderstorm on 8th November, 1936, and three line outages occurred. Two other line outages were due to flashovers caused by swans.

Edgecumbe-Waiotahi.—The only trouble experienced on this line was a flashover caused by lightning.

Waiorongomai-Waikino.—A contract was let in November for the dismantling of the old tower-line over the mountain section, and this work was still in progress at the end of the financial year.

(iii) 11 Kv.

Hautapu-Brunnwood.—The remaining single-circuit line on poles 243 to 280 was dismantled. The north and south 11 Kv. lines from Horahora now terminate at the Hautapu A.B.S., but the telephone-line remains intact to Hamilton.

Hamilton-Frankton.—One wire was burned through during a storm on 2nd May, 1936.

Waikino-Waihi.—A number of corroded steel-tower members were replaced by reconditioned parts obtained from the dismantled towers on the old Waiorongomai 50 Kv. line.

(iv) General.

Maintenance.—The usual maintenance work was carried out on the lines and access tracks, and the examination or testing of poles and insulators was carried out according to schedule. Poles were tested for soundness by boring, and holes due to decayed knots or other causes were cleaned out and filled with a bitumen mixture.

The solid telephone wire was replaced at P. and T. crossings on various lines by 7/16 copper to comply with regulations.

Pole Replacements.—Seventy-one poles consisting of five 52 ft., twenty-eight 42 ft., one 38 ft., seventeen 35 ft., four 30 ft., and sixteen 25 ft. poles were replaced during the year. Of this number twenty-one poles had defective heart-wood (dry rot, &c.), thirteen had decayed or extensive knot-holes, twenty-six had both defective heartwood and decayed or extensive knot-holes, and eleven were undersized after desapping.

One 42 ft. pole was replaced with the line alive.

Insulator Replacements.—Two hundred and ninety-eight insulators consisting of eight 110 Kv., 286 50 Kv., and four 11 Kv. insulators were found defective, and were replaced. Of this number eighteen insulators failed in service, 239 were found defective by live-line testing, and the remainder were found defective by inspection.

Of the eighteen insulators that failed in service three 110 Kv. and fourteen 50 Kv. insulators were shattered by lightning during three severe storms on 30th June, 1936, 8th November, 1936, and 30th November, 1936, and one 50 Kv. insulator was badly cracked.

Sixty-four of the defective 50 Kv. insulators were replaced with the line alive.

(D) TESTING.

The routine testing of instruments, meters, relays, &c., throughout the system was carried out according to schedule, and in addition a large amount of work was done for various supply authorities. The construction of four new 50/11 Kv. substations and the installation of new equipment at the existing stations called for a considerable amount of field work by the Test Department, as all equipment was tested prior to being put into service. Among the special tests carried out were tests on a concrete-steel pole, salt-spray tests on suspension insulators, tests on the new stator windings at Arapuni, and extensive tests on the distance relays at Hamilton under actual fault conditions.

(E) RELIABILITY OF SUPPLY.

Excluding the new North Auckland substations, which were first put into service in December, 1936, using temporary equipment, the average number of accidental interruptions to supply at each of the remaining sixteen major supply points was 5.75 of an average duration of 17 minutes. The corresponding figures for the previous two years were 12.5 and 16.9 minutes and 14 and 22 minutes.

The average number of prearranged interruptions was 3.9 of an average duration of 1 hour 54 minutes, compared with 5.9 and 1 hour 48 minutes, and 5.6 and 1 hour 40 minutes for the previous two years.