

2. SUBSTATIONS

Normal operating conditions obtained and the usual maintenance work continued throughout the year. At both Hawera and Melling a phase of an 110 kV. lightning arrester blew up, and the arresters were taken out of service. A magpie caused a short circuit by getting across transformer bushings at Pahautanui, which resulted in damage to 11 kV. bushings and cable-end boxes. At Takapuna a cat climbed through the protection screen on the Power Board structure and got between phase and earth, which resulted in severe damage to a new 11 kV. switch. 11 kV. cables on 50/11 kV. banks failed at Hamilton, Edgecumbe, and Kerepechi due to the entry of moisture through a defect in the lead sheathing. Interruptions to supply were caused by accidental tripping of a relay during alterations to a panel at Henderson, the breakdown of an 110/11 kV. transformer unit at Bunnythorpe following a severe Power Board fault, a fault in the 3,500 kVA. induction regulator at Maungatapere, and the burning-out of a starting auto-transformer for a synchronous condenser at Kaitaia. The following details are also recorded regarding specific 110 kV. substations:—

Masterton.—Transformer units of the original 4,500 kVA. bank were overhauled and fitted with Buchholz relays, and a new local service panel and transformer were commissioned.

Mangamairi.—A 1,500 kVA. transformer was overhauled and fitted with Buchholz relays.

Dannevirke.—The 1,500 kVA. transformer returned from Waipawa was put on load. Another 1,500 kVA. transformer overhauled at Napier was assembled and also placed on load, but following fault symptoms, repairs were effected, temporary Buchholz protection was installed, and then it was forwarded to Waverley.

Stratford.—The original corrugated-iron gantry house was dismantled and transferred to Auckland. The synchronous condenser and associated equipment have also been dismantled and are being forwarded to Auckland.

3. TRANSMISSION AND DISTRIBUTION

Routine maintenance and inspection work including pole and insulator testing was carried out on the various lines. Repairs were effected, where necessary, when outages were caused by lightning, gorse fires, wind, and normal line defects. On the Napier-Tuai 110 kV. line a conductor had to be repaired when strands were broken 20 ft. from the tower by rifle-fire, whilst four insulators on the 50 kV. Waibou-Paeroa line and two telephone insulators damaged by rifle-fire had to be replaced. Although the usual notices were distributed drawing attention to the danger of moving haystackers near electric lines, one haystacker fouled a 110 kV. line but fortunately no one was injured. The following incidents are also of interest.

(a) 110 kV. Lines

Woodville-Napier.—On the north bank, the Ngaruroro River scoured to within 12 ft. of a 70 ft. tower. Protection work was completed on the upstream side of the tower.

Tuai-Bunnythorpe.—Climbing patrols were instituted and an officer of the Wildlife Branch of the Internal Affairs assisted in an attempt to discover the causes of numerous outages. It is almost certain the outages could be attributed to birds, either shags or magpies, or both.

Bunnythorpe-Ongarue.—The Department of Scientific and Industrial Research found that the cause of excessive rust on underground members in certain sections was due to the combination of very high rainfall and exceptionally acid soil.

Mangahao-Khandallah.—Special investigation was made into the incidence of vibration breaks of conductor strands and of the amount of abrasive wear on line hardware on the tower section.