

Arapuni—Penrose 110 kv. Pole Line.—A 60 ft. tower was erected at Maungatautari, to provide greater clearance from earth and at the 50 kv. line crossing.

Waihou—Waikino 50 kv. Line.—This line being no longer necessary since the completion of the Waihou—Paeroa Section, it was partly dismantled, and maintenance work on it was stopped in June, 1931.

On other lines the usual live-line testing, sap-testing, scrub and tree cutting, and improvements to access by means of tracks and bridges were continued.

(c) *Substations (110 kv. and 50 kv.).*

Penrose (Capacity: 110/22 kv. 60,000 kv.a., 22/50 kv. 5,000 kv.a.).—"Earthquake stops" were fitted to the transformers to prevent movement in case of an earthquake.

Henderson (Capacity: 50/11 kv. 1,000 kv.a.).—New guide-pieces supplied by the manufacturers, to replace guide-pieces which were liable to damage from electrical leakage, were fitted.

Matamata (Capacity: 50/11 kv. 2,250 kv.a.).—The cable-boxes on the transformers were provided with oil-drains.

Waihou (Capacity: 50/11 kv. 2,250 kv.a.).—A porcelain bushing in a single-core cable sealing-box at the transformers broke down on 19th May. The solid-copper rod-connections from these bushings to the transformers were replaced with stranded copper, to obviate undue stresses.

Waikino (Capacity: 50/11 kv. 6,000 kv.a.).—A mouse caused a flash-over on No. 4 11 kv. O.C.B.

Bombay (Capacity: 110/50 kv. 5,000 kv.a., 50/11 kv. 3,000 kv.a.).—Bushing current-transformers on the O.C.B.s were rewound for a different ratio.

Hamilton (Capacity: 50/11 kv. 3,000 kv.a.).—An 11,000 v. current-transformer on No. 2 feeder broke down.

Te Awamutu (Capacity: 50/11 kv. 1,500 kv.a.).—A cracked porcelain cone in the 50 kv. O.C.B. was replaced, also a potential transformer that had broken down. Two cracked 11 kv. bushings on the main transformers were replaced.

Hangatiki (Capacity: 50/11 kv. 750 kv.a.).—Telephone-code-ringing relays were installed. An 11 kv. trifurcating-box at the main transformers broke down.

Mamaku (Capacity: 50/11 kv. 150 kv.a.).—A rat came into contact with an 11 kv. transformer (50/11 kv.) terminal, and caused the 50 kv. fuses to blow.

Ngongotaha (Capacity: 50/6.6 kv. 750 kv.a.).—Wooden operating-handles were provided for the 50 kv. A.B. switches. A Landis and Gyr maxigraph was installed to record maximum demand.

Edgecumbe (Capacity: 50/11 kv. 750 kv.a.).—Telephone-code-ringing relays were installed. Cable-box compound in which a slight noise of arcing, due apparently to cracks in the compound, was replaced by softer compound.

Waiotahi (Capacity: 50/11 kv. 750 kv.a.).—Telephone-code-ringing relays were installed.

Takapuna, Kerepechi, Huntly.—Nothing to report.

(d) *11,000 v. Lines and Substations.*

A total of twenty-one 35 ft. poles have been found defective on these lines, and have been replaced during the year. Service generally has been satisfactory.

(e) *Restoration of Arapuni and Operation up to the 30th June, 1932.*

The filling of the lake at Arapuni was commenced on 24th March, and completed on 6th April.

During the filling period King's Wharf supplied a total of about 3,200,000 units, with a maximum of 14,680 kw., and the Diesel plant about 250,000 units, with a maximum of 3,460 kw., and over the same period the Horahora output was about 2,650,000 units less than normal.

Nos. 1, 2, and 3 units were all started up on 3rd April, 1932, and were run on short circuit for drying out until the 10th, when Nos. 2 and 3 were put on load, supplying with Horahora all the system except Auckland, until the 15th April, on which date Auckland recommenced taking power, but continued to run King's Wharf station to give assistance at peak-load periods. No. 4 unit was put in service on 16th May, and King's Wharf station ceased supply on 27th May, 1932.

The restoration of Arapuni to service enabled the Penrose Diesel and Huntly steam plants to be shut down.

MANGAHAO-WAIKAREMOANA ELECTRIC-POWER SUPPLY.

I. FINANCIAL RESULTS.

At the close of the year 1931-32 the capital outlay amounted to £3,659,304. The net revenue for the year was £300,022, and working-expenses, £48,900. After paying interest, totalling £202,775, a net surplus of £48,347 was shown. Depreciation charges amount to £65,681, which leaves a deficiency on the year's working of £17,334.

The financial results and load records are analysed in Table IX, whilst Tables X and XI give an analysis of the capital outlay and working-expenses. The gross financial results of the system are given in Table XIII.

II. OPERATION AND MAINTENANCE.

The operation of the Mangahao portion of the scheme was quite satisfactory throughout the year.

The generators and turbines have operated well, and at no time was a unit under repair while in demand.