

Arapuni-Bunnythorpe 110 kV. Tower-line (Arapuni-Mangaturuturu Section).—Final pegging of the Arapuni-Ongarue section has been completed. Tower erection was commenced on the Ongarue-Mangaturuturu section in May, and by the end of March 112 towers had been erected, leaving 56 to complete.

Karapiro-Hamilton 110 kV. Tower-line.—Final pegging of tower positions was completed.

Hamilton-Waihou 110 kV. Line.—Survey work was commenced in February, 1941.

Henderson-Takapuna 50 kV. Line.—A survey was made of a deviation to eliminate the harbour crossing near Hobsonville Air Base, following which a decision was made to rebuild the whole line using heavier conductors. Plans and profiles have been completed.

Takapuna-Belmont 50 kV. Tower-line.—Plans and schedules have been completed. The towers for this line will be obtained from the existing Penrose-Henderson 50 kV. line, which is to be dismantled.

Kaikohe-Kaitia 50 kV. Line.—Construction was completed, and the line was livened on 30th June, 1940.

Bombay-Waiuku 50 kV. Line.—Possible routes were inspected, line costs estimated, and materials ordered.

Edgecumbe - Te Puke 50 kV. Line.—Detail survey was commenced in March, 1941.

Te Puke - Aongatete.—An exploratory survey was made in February to fix the location of a proposed line.

(2) OPERATION AND MAINTENANCE.

(a) POWER-STATIONS.

Arapuni.—Four 50 kV. O.C.B.'s and two 110 kV. O.C.B.'s were overhauled, new bushings, contacts, and explosion pots being fitted. The bushings on Nos. 7 and 8 transformer banks were fitted with new caps designed to relieve the joints of thermal stresses. The low-pressure coils on two of the original 11/110 kV. transformers were burned out.

Air-conditioning plant was installed in the control-room.

Work was carried out by the General Branch over the greater part of the year on dragging operations to lower the level of the tail-race.

Horahora.—The station was run to full capacity throughout the year, giving very satisfactory service.

Penrose Diesel Plant.—The two units available for service were run five days a week during the winter months, and at such other times as required. Flashovers occurred in the 6.6 kV. O.C.B.'s of these units in January, causing some damage.

Huntly Steam Plant.—A start was made in May on the recommissioning of this station to enable supply to be given if and when required. The plant was given a trial run in September, and was then shut down and left available for use in emergency. Preparations were made in March, 1941, for the regular operation of the station, and supply was commenced in April.

(b) SUBSTATIONS.

(i) 110 kV.

Penrose.—An external water-cooling system was installed on the 22/50 kV. banks of transformers to reduce the temperature pending the installation of additional transformer capacity. New windings were fitted to the unit which was damaged by lightning on 12th June, 1939. All H.T. bushings in a 110/22 kV. bank were rejointed on account of oil leaks. Temporary by-pass lines are being erected to connect up the new Penrose-Henderson 110 kV. line to the east and west 50 kV. circuits.

Bombay.—A large amount of work was carried out on levelling, turfing, and drainlaying about the H.T. enclosure. The automatic T.C.O.L. equipment on the 50/11 kV. banks of transformers was put into service in December.

Hamilton. A flashover occurred in a tank of an 110 kV. O.C.B. due to moisture gaining entry through defective jointing-material. Six defective insulators were replaced on the 50 kV. structure. Water-mains were laid for three hydrant plugs for fire-fighting purposes, and three 1 in. hose reels were installed.

Ongarue.—Three 110 kV. fuses were shattered by lightning. The 750 kVA. transformer that was damaged by lightning on 30th July, 1939, has been fitted with a new H.T. winding.

(ii) 50 kV.

Hangatiki.—A new relay system was fitted to the 11 kV. feeder switch. All insulators on the 50 kV. line A.B.S. were replaced.

Henderson.—A flashover on a 50 kV. isolator was caused by nesting-material carried by a bird. The structure has been made bird-proof with netting, as far as possible.

Huntly.—A 7½ ton chain block was fitted to the gantry in place of a 4 ton block. A cable-box breakdown due to moisture occurred.

Kaikohe.—The 11 kV. cubicle switch was damaged by a flashover caused by a bird on 15th January, 1941, and two 250 kVA. transformers in the 50/11 kV. bank were burned out at the same time.

Kaitia.—Two H.T. bushings on the 50/11 kV. bank were shattered and others were chipped by a flashover caused by lightning on 6th November, 1940. Burnouts occurred in two of the 250 kVA. transformers on 17th March, 1941, when the 11 kV. cubicle switch failed to clear a feeder fault. Oil-storage tanks were installed and a temporary store was built.

Karapiro.—A breakdown of a 50 kV. string of insulators occurred shortly after the substation had been livened on 26th October, 1940. Three defective 50 kV. insulators were replaced.