

Arapuni.—An 11 kv. bushing broke down and was replaced in November. The maximum load on the substation was 640 kw.

Mamaku.—A 50 kv. 11,000/400-volt transformer was installed by the Tourist Department in October, replacing a smaller one.

Ngongotaha.—An induction-regulator and overload and earth-leakage relays were installed in January.

Te Awamutu.—A bird caused a flash-over on the Burke arrester in August. Two 11 kv. compression chamber arresters broke down and were replaced with oxide-film pellet type in August. Overload and earth-leakage relays were installed in November.

Hangatiki.—A fault occurred in April in No. 1 feeder current-transformer chamber, and a similar fault occurred the following February on No. 2 feeder. These faults were in the Power Board's switch-gear. In February also a bushing in the trifurcating-box on the transformer end of our incoming cable broke down.

Henderson.—The permanent equipment was put into service on the 22nd November. Connections were made at this substation and at Takapuna to give 11,000-volt supply from Takapuna over one circuit of the 50 kv. line to Henderson in case of breakdown of the main transformer at Henderson, pending provision of a spare transformer.

Takapuna.—A trifurcating-box on the 1,000 kv.a. transformer broke down in June, requiring the spare transformer to be placed in service. 15/5 current-transformer on No. 3 feeder and 20/5 on No. 4 feeder were put in to replace others of 3/5 and 4/5 amp. capacity. One of the 3/5 amp. capacity had broken down.

Grand Junction Plant.

This plant has been in regular operation throughout the year, running two shifts on five days a week and one shift on Saturdays at the beginning of the year, and two shifts on six week-days at the end of the year.

Considerable attention has been required to the boilers, which were rather badly pitted, and in repairs to the brickwork. The mechanical stokers have also on several occasions required adjustment.

Repairs to the boiler-house roof have also been necessary, and also to the pipe-line for condensing water from the Ohinemuri River.

A new rotor is on order for one steam turbine, and on its arrival it is expected that the plant will be capable of generating 2,500 kw. for short periods, the capacity of the boilers and the supply of condensing water being the limiting factors.

New copper cooling-coils were substituted for the iron cooling-coils on the four 500 kv.a. transformers. One of these transformers broke down on the 16th December due probably to water from a leak in the improvised cooling-coils getting into the transformer. A new winding was ordered to replace this.

Two additional transformers, and the additional switch-gear necessary to provide and to control two separate transformer-banks, one for each main turbo-generator were ordered, and erection of these commenced in March.

11,000-volt Lines and Substations.

Little trouble has been experienced on these during the year. On the Horahora-Leamington-Frankton line eight decayed poles were replaced, and single-unit strain insulators, two of which broke down during the year, were replaced with two-unit insulators of the same type. At the New Zealand Co-operative Dairy Co.'s substation, Frankton, building operations above the 11,000-volt cable necessitated placing about 50 ft. of this in earthenware ducts.

Power purchased.

Power purchased during the year amounted to 8,604,078 units, at a cost of £11,268 8s. 7d., including 7,379,095 units from McLaren's Falls for £7,690 7s. 2d. 3,612,720 units were generated by the Grand Junction plant, now owned by the Department. This compares with totals for the previous year of 7,398,942 units purchased for £8,787, which included 7,217,830 from McLaren's Falls and 162,700 from the Grand Junction plant.

General.

The Okere plant has been run regularly at certain hours of the day throughout the year, by arrangement with the Tourist Department.

Owing to the difficulty at Horahora, Waitoa factory was cut off for the March quarter of the year, and supply to some other factories was reduced under the agreements, which provide for this.

For the first two weeks in January it was necessary fairly frequently to cut off feeders to reduce load. This necessity recurred occasionally afterwards, but not to any serious extent.

For the two weeks ending 8th and 15th January Horahora supplied only 629,810 units and 921,750 units or about one-third and one-half of its output previously. The Auckland Power Board, as well as taking no power from us during the three weeks ending 22nd January, supplied to us 129,610, 124,750, and 4,220 units respectively in the three weeks, and by making the most use possible of the Grand Junction and McLaren's Falls plants the system total units for these three weeks were brought up to 1,110,760, 1,374,516, and 1,567,620.

The completion of the Bombay-Waikino line, which completes the ring Horahora-Hamilton-Bombay-Waikino-Horahora, has been of considerable use on occasions. Thus Penrose has been supplied once or twice during the year via Waikino and Bombay, and in emergency Waikino has been supplied via Hamilton and Bombay. Telephone communication also from Horahora to Waikino has occasionally had to be carried out via Bombay.

INTERRUPTIONS TO LINES.

During the year there were fifty-nine interruptions in system, of which sixteen were prearranged and totalled 133 hours 36 minutes. Of the remaining forty-three accidental interruptions, totalling 57 hours 12½ minutes, fifteen were due to unknown causes and totalled 1 hour 39 minutes; the