

TIMARU SUBSTATION.

Beyond the placing of the auto-transformers on their foundations, the removal and re-erection of the two staff cottages, the acquisition and fencing-in of a larger area to accommodate the new steel structure and the substation building, no construction was undertaken pending the receipt of definite and final decision as to the permanent location of the redesigned substation, the material for which has already arrived and has been sorted out ready for assembling and placing in commission.

OAMARU SUBSTATION.

The building of the steelwork structure was commenced and completed during the year, and the original wood structure was dismantled. Provision has been made in the new structure for two trunk lines to connect the Lake Coleridge system with the Waipori system.

WAITAKI HYDRO SUBSTATION.

Up to the 28th June, 1931, power was supplied to the Waitaki Hydro Works by the Waitaki Electric-power Board from the Lake Coleridge Power-house. The replacing of the overloaded 750 kv.a. and 300 kv.a. 66/11 kv. transformer-banks at Oamaru Substation with a 5,300 kv.a. transformer-bank rendered the construction of a 750 kv.a. Substation at Waitaki Hydro a feasible and sound proposition, and as a result over 2½ million units were delivered direct to the General Branch between the 28th June, 1931, and the 31st March, 1932.

GLENNAVY SWITCHING-STATION.

The Glenavy and Waitaki Hydro Stations were connected to the Lake Coleridge system on the 28th June, 1931. A supply to the staff cottages is given through a special transformer from the potential transformer-bank.

INTERRUPTIONS TO SUPPLY.

(a) Power-house Supply.

There were only three outages, and these affected the whole system, the total period being 19½ minutes, and the longest interruption being 13 minutes. This latter was due to damage to equipment on the 6,600-volt switch-gear and to two 7,500 kw. alternators by a heavy lightning storm.

(b) Addington, Point, and Hororata Supply.

The total number of interruptions during the year corresponded with those at the power-house, being only three in number.

(c) Ashburton Supply.

The total number of outages was six, excluding those that had been prearranged, and the total period was 32 minutes. The longest period corresponded to that at the power-house, being 15½ minutes.

(d) Timaru Supply.

The number of interruptions totalled eight, the longest being 15½ minutes, and the total period 34½ minutes.

(e) Oamaru Supply.

Excluding all shutdowns that had been prearranged, the number of outages for the year was ten, the total period being 1 hour 17½ minutes, and the longest interruption was one of 43 minutes' duration when South Canterbury Power Board's 6.6 kv. lines fouled the Department's 66 kv. line at Glenavy. Apart from the one trouble mentioned above, there were no interruptions on the section of line between Timaru and Oamaru.

Not one of the above interruptions to supply was due to the failure of an insulator on the overhead lines, the systematic testing of insulators under live-line conditions tending to eliminate this source of trouble. Out of 35,250 insulator units tested under live-line methods 531 were located as defective on the 66 kv. lines. This represents a percentage of 1.54 defective to total number in commission.

TESTING.

During the year ending 31st March the number of tests and investigations that had been placed on record amounted to 148, including the test on No. 1 alternator at Lake Coleridge Power-house.

Due to careful adjustment and checking of the master clock at the power-house the frequency of the system has improved in stability, and the variation from standard time as received from Wellington Observatory per 2YA does not exceed ten seconds at any time.

New relay equipment has been installed at Lake Coleridge Power-house, Addington, Hororata, Woolston, and Lyttelton Diesel Station, and is being installed at Ashburton Substation.

The breakdown of the switch-gear and No. 2 and No. 3 alternators at Lake Coleridge Power-house, due to a severe thunder and lightning storm, involved a considerable amount of testing and investigating before repairs were commenced.

GENERAL.

During the year a store to serve the General and Hydro-electric Branches was built at Addington, the existing store buildings were dismantled, and the site they had occupied was cleared for the erection of the new steelwork structure.