

were replaced under live-line conditions. In addition, one 66 kv. pole was changed without interruption to supply.

On the 33 kv. lines similar work has been carried out with good results.

On the 11 kv. lines location of faulty insulators has been carried out on the live lines by means of special telephone-receiver method for some time, and this year 544 insulators, mostly the original type, were located as faulty. Replacing of poles on these feeders has been successfully accomplished with conductors alive, even with duplicate circuits.

The adoption of the live-line methods has resulted in a distinct reduction in interruptions due to insulator failures and to repair work.

66 KV. SUBSTATIONS.

The following table shows the installed capacity of each substation, together with the maximum demand and units output:—

Substation.					Installed Capacity.	Maximum Demand.	Units Supplied.
					Kw.		
Addington	..	..	..	..	22,000	16,088	70,796,553
Timaru	..	..	..	..	5,000	1,616	6,853,176
Ashburton	..	..	..	..	5,000	1,306	4,848,543
Oamaru	..	..	..	..	750	581	2,574,966
Hororata	..	..	..	..	295	239	821,142

Addington Substation.

A 12,000 kv.a. bank of transformers was received from the makers and installed in May, finally being put into operation on the 3rd June. Considerable trouble has been experienced with leakage of oil on these transformers, and it was found necessary to take each unit out of service and reweld the joints. Pressure-relief valves were installed during the work. Since the above repairs the bank has operated quite satisfactorily.

The 6,000 kv.a. condenser was shut down in July owing to trouble with the field spool insulation becoming loose. The makers sent out new insulation, and work is still proceeding on the repairs.

The erection of the final section of the ironclad switch-gear was completed and put into operation at the end of August. Considerable trouble was experienced with faulty switch-bushings, and large numbers have been replaced. Regular tests are carried out on all bushings in order to note any deterioration in their insulation value.

The completion of the ironclad switch-gear enabled the original open-type switch-gear to be dismantled, thus decreasing the electrical hazard and providing additional space.

A new storage battery for operation of oil circuit-breakers, 20-ton crane, and general lighting was installed and put into operation in December.

The telephone system has been rearranged, and all transmission- and distribution-line telephone circuits are now brought on to an annunciator-board in the operator's sound-proof cabinet.

A contract was let on the 24th November, 1927, for an additional 12,000 kv.a. bank of transformers to replace one of the original 5,000 kv.a. banks. This bank will be installed during the ensuing year, and will bring the transformer-capacity of Addington Substation up to 29,000 kv.a.

INTERRUPTIONS TO SUPPLY.

Christchurch Lines.

The total number of interruptions to supply during the year exceeding 1 minute was seven, and the total time of same was 29 minutes. The longest period occurred on the 2nd March, of 15½ minutes' duration, and was due to the governor on one of the new machines going out of action. It is only fair to the operating staff at the power-house to state that the governors of both new machines were still in the hands of the makers' representative. Of the remaining six interruptions, totalling 13½ minutes, four were due to trouble with the power-station voltage regulator—one owing to a horse opening an air-break switch under load at the Point, and one due to a magpie causing a flash-over. There were no interruptions during the year due to defective insulators.

Timaru-Oamaru Lines.

The total number of interruptions on these lines, excluding those prearranged, was sixteen, and the total time of same was 1 hour 57 minutes. The longest period occurred on the 11th March, of 31 minutes, due to operating-rod on one phase of the oil circuit-breaker at Hororata breaking and the difficulty in discovering the fault. As the seven interruptions on the Christchurch lines also affected the Timaru lines, the actual number of outages on the Timaru-Oamaru section only was nine. Of these, five were due to direct overload, two were due to breakdown in Waitaki Power Board's cables, and two to causes unknown. No fault was actually traceable to defective insulators.

LAKE COLERIDGE DUPLICATION.

This work was practically completed last year, but there still remained the completion of the cross-drive between the old and new tunnels at the intake end. This was undertaken in October,