Lake Coleridge Power-station.—Due to the parallel operation of the system, it has been possible to keep up the level of Lake Coleridge throughout the year, and there were no difficulties on this account.

The Harper River diversion gates are showing pronounced signs of the wear due to prolonged operation with heavy flow, and proposals are being formulated for the construction of a new set of diversion gates and intake works.

The Acheron diversion was in use for about five months of the year. Further losses of screen-bars have occurred, and the screen-supporting structure is being redesigned accordingly.

On the 18th November, 1935, a disastrous accident occurred, No. 3 pipe-line had been drained for a month in order to permit of the usual scraping and painting. This work was almost complete when the accidental opening of the surge-chamber gate filled the pipe-line with water and caused the death of three men. A small amount of damage was done in the powerhouse itself, and No. 1 generator winding had to be repaired.

Early in December, 1935, an unusual leakage started in the No. 2 tunnel adit. On examination it was found that a small section of the tunnel-lining had been scoured near the surge-chamber. This was repaired, and then it was decided to take advantage of the shut-down to grout the tunnel-lining. This was last done in 1927–28, and since then there has been no opportunity for further work.

Grouting operations were still in progress at the end of March, 1936.

Various repairs and modifications to the Larner Johnson valves of Nos. 2 and 3 units were made, with the result that the remote control of these valves became possible.

Apart from the above the usual maintenance has been necessary.

Waitaki Power-station.—This station has now been in continuous operation since January, 1935, and, on the whole, very little trouble has been experienced. The main difficulty was in connection with the excitation system, which is of a new type. Extensive testing was necessary before stable conditions were reached, but the desired end has now been attained.

Lyttelton Diesel Station.—There has been no occasion to call upon this plant during the past year, but it has been maintained in good condition.

A new automatic pump was installed to cope with the leakage of storm water into the basement.

(*b*) *Substations.*

The new metal-clad 11 kv. switch-gear at Addington has performed satisfactorily, the oil-circuit breakers dealing with any faults without showing signs of distress. The old metal-clad switch-gear has been heat-treated as far as the oil-circuit breakers are concerned, while all the auxiliary wiring has been standardized to permit of the interchange of oil-circuit breakers.

At Ashburton and Hororata substations arrangements are in train for the installation of 110-volt batteries and for altering the 66 kv. oil-circuit breakers to make them suitable for remote control.

The telephone-exchanges at all substations, except Addington and Point, were replaced by a standard type developed by the test department.

Routine maintenance work was carried out at all substations during the year.

(*c*) *Transmission-lines.*

Generally, the condition of the transmission-lines is good, and there were few interruptions due to actual line trouble, with the exception of the interruptions due to the phenomenal snowstorm on the 9th and 10th of June, 1935. On the 10th June, during the thaw, there was a total interruption to the Addington supply of 17½ minutes, this being the first severance of the supply to Addington since 1933.

Fortunately the storm was restricted to the coastal area in the Canterbury Province. The most serious damage was done to the 33 kv. line to North Canterbury Power Board, the supply being interrupted from Sunday night to the following Tuesday evening.

A summary of all interruptions (lasting over one minute) to the 110 kv. and 66 kv. supply (exclusive of pre-arranged shut-downs), is as follows:—

Point Substation.—A failure of the 66/11 kv. transformer caused an outage of seven days, while on the 10th June an outage of seven minutes occurred.

Hororata Substation.—On 10th June an outage of seven minutes occurred as for Point. This was the only accidental interruption at this substation.

Addington Substation.—The only interruption was one of 17½ minutes on 10th June.

Ashburton Substation.—There were eight accidental interruptions totalling fifty-three minutes, of which twenty-nine minutes were taken up on the 9th and 10th June, and were due to trouble on the local feeders during the snowstorm.

Timaru Substation.—Six accidental interruptions here totalled 57½ minutes, the two longest being due to relay trouble and line trouble respectively.

Oamaru Substation.—There were six accidental interruptions totalling sixty-seven minutes, the causes being as for Timaru.

Half Way Bush Substation.—There were fifteen interruptions here, with a total time of eighty-eight minutes. Eight of these occupying fifty-six minutes were due to line trouble, six occupying twenty-eight minutes were due to the faulty operation of relays, and the remaining one was due to regulator trouble at Waitaki.

Line Maintenance.—During the year a careful inspection was made of all poles with a view to determining how far decay has progressed, and to find out how many poles needed replacement. The condition of the timber even in poles that have been in service for over twenty years is surprisingly good, and most of the unsound poles were found to have decayed at points other than the ground-line. Twenty-four poles were replaced following the tests, while two more actually broke in service.