

Timaru Substation.—The 11 kv. switch-gear transferred from Addington was completed and put into service on 23rd June, 1935, the old substation being disconnected on the 30th June.

The old 11 kv. switch-gear was dismantled and part forwarded to Oamaru and the balance to Ashburton.

The 66 kv. relay system was finally completed and put into service.

The two original cottages were connected to the sewerage system, and are being supplied with power from the new substation.

Glenavy Substation.—A third concrete cottage was erected during the year for the accommodation of a lineman.

All overhead services were replaced with underground cables.

The fencing round the structure was completed, while the layout and levelling of the section were further improved.

Oamaru Substation.—Two further cottages were erected, and the storm-water drainage was extended.

The 11 kv. switch-gear from Timaru was re-erected, together with the necessary control panels. Control panels for the 110 kv. lines were installed.

Two more 110 kv. oil-circuit breakers were put into service.

An induction-regulator, transferred from Addington, and the new 11 kv. switch-gear were put into service on 9th February, 1936.

Half-way Bush Substation.—This station was essentially complete and was ready to supply power on 1st April, 1935, but the Dunedin City Corporation did not take load until the 28th April. Minor work was done, including the erection of local service panels, extensions to drainage, fencing, and levelling of section.

(c) *Transmission-lines.*

The old 11 kv. southern feeder from Addington to Stoddart's Corner was replaced by a 33 kv. line. This line is built for a double circuit, but only one set of conductors has been run at present. The Banks Peninsula Power Board is now supplied direct from Addington at 33 kv.

This year saw the removal of part of the first 66 kv. transmission-line to Timaru—the section between Point Substation and Ashburton. A new 110 kv. line (operating at 66 kv.) was built from Hororata to Ashburton, and this necessitated the removal of the Point-Ashburton line, which it was designed to supersede. The new line has been completed, but has not yet been put into service.

(d) *Telephone System.*

This year has seen the development of the trunk telephone system, which runs, wherever possible, on railway poles. The circuits brought into operation are as follows :—

Addington-Bankside-Hororata-Lake Coleridge.

Addington-Ashburton.

Ashburton-Timaru.

Timaru-Glenavy—Oamaru (previously in service).

Oamaru-Dunedin.

The result is that clear speech is possible from one end of the system to the other, and there is freedom from the noise usually associated with power-line telephones.

Another innovation is the use of weatherproof telephones instead of the usual huts and telephones. The absence of high induced voltages on the telephone system also permits the omission of insulating transformers and drainage coils, with a consequent improvement in speech transmission.

(e) *Testing.*

This branch of the Department's activities has had a heavy year, due to the fact that construction work was proceeding right through the system, and has been responsible for the design and development of the substation control panels, transformer tapping switches, and for the testing of all equipment prior to its being put into service. This latter work has involved much travelling and long hours for the staff, as their work is of a very specialized nature and cannot be delegated.

(f) *Survey.*

The plans of the Oamaru-Dunedin 110 kv. line were finally corrected and traced.

A complete survey of the 110 kv. Hororata-Ashburton line was made, and also of the Addington-Stoddart's Corner 33 kv. line.

The Bankside-Lake Coleridge telephone-line was located and pegged.

Some survey work was done in connection with the taking of further land at Ashburton.

Apart from the above, general office work and a considerable amount of work relating to easements on the Oamaru-Dunedin line was undertaken.

Preliminary data was obtained for the Coleridge to Arthur's Pass 66 kv. line.

(2) OPERATION AND MAINTENANCE.

General.—During the first few months of parallel operation a certain amount of trouble was experienced, due to difficulties with the voltage-regulators and excitation system at Waitaki. This, combined with the incomplete state of the relay system and with the lack of direct telephonic communication between Coleridge and Waitaki, resulted in several interruptions to the southern substations, but with the correction of the regulators, the completion of the relay scheme, and particularly the completion of the trunk telephone, the number of interruptions dropped in a most marked manner.