

(c) Transmission-lines.

Half-way Bush—Gore 110 kV. Line.—This line was completed and put into service on 20th December, 1938. Clean-up work is proceeding and some weights require hanging.

Monowai—Winton 66 kV. Duplicate Lines.—Complete new crossings were constructed at the Aparima River for these lines.

(d) Telephone System.

The trunk-telephone system existent in the Waitaki-Coleridge system was extended into this district and is complete as far as Invercargill office and substation. The majority of the line is run on the Railway Department's poles, except for the Half-way Bush—Wingatui and the Crichton—Waipahi sections, which were constructed by this Department. The Invercargill—Winton section on the Railway Department's lines is under way, and material is ordered for the Winton—Monowai section, which will be across country.

Test boxes and watertight phone-boxes have been installed between Half-way Bush and Invercargill.

(e) Distribution.

Thirty-four miles of 11 kV. lines were erected and 5 miles 32 chains removed. Fourteen miles forty chains of 3.3 kV. line were removed. Twenty-six miles of 400/230 volt lines were erected, and 20 miles 72 chains removed. Forty-five new transformers were erected of a total capacity of 746 kVA.

(2) OPERATION AND MAINTENANCE.*(a) Power-station and Headworks.*

In April, 1938, a floating log caused damage to the flash boards and about half the length of the crest of the spillway weir.

Continued dry weather throughout the late summer and autumn resulted in a very low level being reached with Lake Monowai, being 7 ft. 11 in. below normal on the 24th May, 1938. In the middle of April restrictions were found necessary, even though the Invercargill City steam-plant was in full operation. The restrictions were continued until the end of June and consisted generally of the daily cutting-out of 11 kV. feeders at the substations for scheduled periods. Several of the industries co-operated by working night shifts instead of during the day. Street lighting was dispensed with except on the tram routes in Invercargill, and a very fine response was received from shopkeepers to an appeal for a reduction in display lighting.

The low lake-level produced a twofold effect in that not only was the unit consumption required to be kept down, but the maximum demand on the station was considerably reduced owing to the fact that the flow through the control gates was insufficient for the full capacity of the plant.

Trials were made of paralleling the Waitaki-Coleridge system with the Monowai system late in December, but as voltage adjustments on the two systems were necessary it was decided that until these could be made Waitaki should carry the Gore Substation load only in this district. This was taken over by Waitaki on 4th January. Parallel running of the two systems was not accomplished until 8th May, 1939.

An improvised system of frequency control at Monowai was instituted in January and proved quite satisfactory. The master clock ordered has since been delivered and is to be installed shortly.

General routine maintenance of the Monowai plant has been carried out and switchgear numbering completed.

(b) Substations.

Complete overhauls of the 11 kV. switchgear in Winton, Gore, and Invercargill Substations have been carried out. The supply to Ohai Substation was interrupted on the 8th February when a 66 kV. bushing failed on the main bank. On the 18th two 66 kV. fuses were blown at this substation, apparently by lightning.

On the 7th February the 11 kV. switchgear at Gore failed to clear a heavy feeder fault, with, fortunately, very little damage. The old 66/11 kV. bank has been connected in as a set of current-limiting reactors pending the delivery of new 11 kV. switchgear. Improved tanks were fitted meanwhile.

(c) Transmission-lines.

Extensive overhaul work has been carried out on the Gore—Winton 66 kV. line, a number of poles being replaced. The Winton—Invercargill 66 kV. line was also given urgent attention in the matter of pole replacements, as three poles broke between October and January, two of them causing outages. Fires caused outages on the Winton—Gore section in October and November, and one pole required replacement as a result.

The Half-way Bush—Gore 110 kV. line tripped once in January as a result of a riser working loose and falling on the line side of the Gore structure. Fire damaged the Monowai—Winton south line in May.

(d) Distribution-lines.

Overhaul work on a section-by-section basis has been commenced on the 11 kV. and low-tension lines. New constructions giving better wire-spacing have been adopted, and also a new method of mounting transformers. A large number of the 11 kV. fuse-bases have been replaced with a consequent reduction in the number of feeder interruptions from fuse-base faults. Regrouping of consumers is being carried out as opportunity offers to give improved voltage conditions, in most cases extra transformers being erected.