

HEADWORKS AND PIPELINES.

Additional groynes were constructed on both banks of the Harper to prevent erosion. Repairs were carried out to the steelwork protection at the gateways of the Harper inlet. The bridge on the Lake Lyndon Road giving access to the Acheron diversion works was reconstructed with an additional span. The original fluming which provided a supply of water for Murchison's woolscour was replaced with an inverted syphon arrangement.

An extension of approximately 67 chains is being added to the Harper Road by means of a co-operative contract, utilizing unemployed relief workers under the supervision of the General Branch. While the Glenthorne Sheep-station will benefit principally by this provision of better roadway facilities, access to the Harper diversion works will be improved.

A detailed inspection of all the pipe-lines was carried out and the ladders into Nos. 1, 2, and 3 pipe-lines were stiffened as vibration caused by the water was responsible for the displacement of a number of the rungs. Rust spots on Nos. 1, 2, and 3 pipe-lines were painted.

POWER-HOUSE.

The "hunting" experienced in No. 1 governor was rectified after investigation. Both efficiency and heating tests were carried out on the No. 1 unit. All the four 1,500 kw. units now have the new type of liner rings fitted to their main valves. New shaft glands were fitted to Nos. 2 and 3 units, as the original type provided proved unsatisfactory. Considerable cavitation was observed in the bronze runners of Nos. 2 and 3 turbines, and the runner of No. 5 turbine was welded where cavitation had taken place.

Due to lightning on the 10th October extensive damage was done to Nos. 2 and 3 alternators. After repairs, which were carried out in shifts, No. 2 unit was replaced in service after seventeen days, and No. 3 unit was not ready for recommissioning for forty-five days. To assist in the repairs assistance was obtained from the North Island in the matter of additional armature winders.

A new ironclad switch for testing purposes was added to the 6.6 kv. switch-gear, and the water rheostat, after alterations had been effected, was permanently connected up.

Repairs were carried out to the station storage-battery, and included the removal and straightening of all the positive plates.

New control and meter connections were made between the new 66 kv. line O.C.B.s and the switch-board, and the old line panels were replaced with a new set made up by the Testing Department, Addington, incorporating mimic bus system. The new system of relay protection was put into service in September, and the 66 kv. outdoor equipment has been fenced in.

ADDINGTON SUBSTATION.

The new 12,000 kv.a. bank of 66/11 kv. transformers was connected to the system on the 23rd May, and, as a consequence, the capacity of this station was increased from 29,000 kv.a. to 36,000 kv.a.

A two-bay extension to the building was commenced and completed during the year, and erection of the new 10,000 kv.a. synchronous condenser and its control-board was immediately put in hand and completed early in April, 1932. Connecting cables for this condenser have not yet arrived, and the machine will not be ready for service for some time yet. The original 5,300 kv.a. south transformer-bank has been altered from indoor to outdoor type for erection at Timaru Substation.

A 150 kv.a. transformer was rewired for Lyttelton Diesel Station, and repairs were carried out on a current-transformer for a 110 kv. O.C.B. for Glenavy Substation. The earthing reactor was rewound for the 33 kv. substation at Stoddart's Corner for the second time.

Since the beginning of the present financial year considerable progress has been made in the erection of the outdoor steel-work structure which, when completed, will bring this substation into line with the modern type adopted and erected in recent years by the Department.

Additional work has been carried out on the layout of railway sidings which have been utilized extensively and advantageously.

POINT SUBSTATION.

No alterations were carried out at this substation during the year.

HORORATA SUBSTATION.

Structural alterations, consisting of increasing the number of O.C.B.s from four to seven, replacing the stick-operated isolating switches with gang-operated type, and the independently operated earthing devices with a simpler method of grounding the lines, and providing a potential transformer-bank and a complete set of relay protection equipment, which had been commenced in February, 1931, and stopped temporarily to enable the construction gang to concentrate on the early completion of the Lyttelton Diesel Station and its feeders, were recommenced and completed satisfactorily during the year. This important station should now function more satisfactorily until the extensions of the system necessitate steelwork replacing the wood-pole structures.

ASHBURTON SUBSTATION.

Extensive alterations were commenced at this substation, and to date have practically been completed. Previously the station was provided with two O.C.B.s. It now has five O.C.B.s, gang-operated isolating switches of the latest type, a potential transformer-bank, an induction-voltage regulator, and a complete set of relay protection equipment. The earthing system has not yet been finalized, and the old type of earthing device for grounding the four sections of the transmission-lines has been retained. This station now operates efficiently.