

Further work has been done on standard specifications for New South Wales timber poles and cross-arms, with a view to a more uniform inspection. Several other Government Departments have co-operated in this work.

General.

With the modern practice of housing the control equipment for a power-station in a control-room designed to exclude all extraneous noise, the heat from the control apparatus frequently makes conditions unsatisfactory for the operating staff. To remedy this, air-conditioning equipment is being provided for Waikaremoana Power-station control-room, and is under consideration for Arapuni.

Specifications were prepared for rectifier-charging equipments for Bombay, Arahura, Gore, Dobson, and Half-way Bush substations.

With the growing scarcity of suitable supplies of hardwood poles, an investigation of various types of reinforced-concrete poles was undertaken to ascertain the most suitable design for transmission-line work. Preliminary work carried out includes tests of various grades of concrete, trials of types of reinforcement, method of vibratory placing, manufacture of sections of full-size poles, design of moulds, and manufacturing-equipment.

Specifications were prepared, and design work for electrical equipment carried out as required for Mechanical Branch and other Departments.

Registration certificates were prepared and draughting-work carried out as required for the Wiremen's Registration Board.

The plotting of operating data for the various systems, including lake-level and river-flow data, maximum loads, and weekly output for generating-stations, maximum demands and consumption of energy for Local Supply Authorities, and other major consumers was continued throughout the year.

The reorganization of the plan recording and filing system was undertaken, and a cross-indexing card-system was inaugurated. Approximately three thousand prints of contractors' drawings and eight hundred departmental drawings were indexed and recorded.

B. Hydraulic Section.

Investigation of Power Resources.

Proposals for further development of the South Island system during the next ten years have been prepared. These comprise:—

- (1) A power-station in the Rakaia Valley opposite Methven, to develop approximately 20,000 kW. with water from the Rangitata River, conveyed by irrigation canals during the irrigation off-season;
- (2) A power-station about 20,000 kW. at Tekapo, combined with a low-regulating dam to conserve water for the winter season. This conservation will permit of further development of the Waitaki scheme; and
- (3) Completion of the Waitaki Power-station to 75,000 kW.

Investigations in the Waikato River basin, which were suspended on account of lack of staff, have been resumed. When completed a schedule for further development will be prepared for the North Island.

New Development.

During the year testing for foundations and the physical properties of the country were so far advanced that recommendations were submitted for a further development at Waikaremoana, taking the water discharged from the main station and generating power in a new station about two miles downstream. The various features of the scheme have been worked out and the general features of design prepared.

Arnold River Development.

When the Department took over this development from the Grey Electric-power Board some erosion had taken place below the dam, and the Board had prepared places and were engaged on remedial measures. This work was taken over and redesigned, and construction is well advanced. The Department has also taken over the erection of gates on the dam, raising pondage-level a further 10 ft. Before these can be utilized, however, some alterations are required at the surge chamber.

River-flow Statistics.

Collection and recording of river-flow data has been continued, and study has been given to the characteristics of the discharge from catchments of different types, and of the frequency and intensity of floods and droughts.

ELECTRIC-POWER BOARDS.

There are now forty-five electric-power districts constituted, and forty-one Electric-power Boards (including Westland Power, Ltd., operating under delegated license) are actually carrying out the distribution and sale of electrical energy (August, 1938). The total area covered is 71,816 square miles, or 69.4 per cent. of the total area of the Dominion (103,415 square miles); the total population under this form of control is 1,060,977, or 66.6 per cent. of the total population (1,591,974) of the Dominion; and the unimproved value of the land included in the electric-power districts and outer areas is £231,317,557, or 78 per cent. of the total unimproved value of the Dominion (£295,695,574).