

(iii) *400 Volt Lines.*

Tuai-Onepoto.—A two-phase line was run from the surge chamber to the power-house for pipe-line and street lighting.

Tuai Village.—Both service and street-lighting lines have been extended.

Lower Development Camp 1.—The line to the camp has been completed, and house-servicing and street-lighting is proceeding.

Lower Development Camp 2.—In the course of erection.

Kaitawa Control Line.—Extra cable was run from the surge chamber to the weir.

Mangaore Village.—Extensions have been made to the service lines and street-lighting of this village.

(c) GENERAL.

Accommodation.—In general, building-construction as carried out during the year comprised work in garages as complementary to the various staff houses built the previous year.

Land is being leased for single men's quarters at Wairoa, and a site has been investigated for cottages at No. 1 dam, Mangahao.

Palmerston North.—A two-stall private garage was built for the departmental cottages in Cuba Street.

2. OPERATION AND MAINTENANCE.

(a) POWER-STATIONS.

Waikaremoana.

Headworks.—Two periods of flooding occurred in the early part of the year, and high-lake levels persisted until the rainy season in July, when the level reached 2024·2—the highest level recorded since 1922, when the recording of levels was first commenced.

The rainfall for the year registered at Onepoto was 99·73 in. and the evaporation 40·33 in.

During the period of high lake-levels 2 ft. of the timber bulkheads at the Kaitawa spillway were removed for the entire 100 ft. and were replaced later when the river flow decreased.

Trouble was experienced due to driftwood, but was overcome by placing an extra net of 2 in. mesh across the tunnel entrance.

The integrating meter for measuring waste water over the Kaitawa weir was replaced during the year.

No. 3 surge-chamber gate was overhauled and painted in preparation for use on the new pipe-line.

Power-house.—The cooling water header boxes were replaced on all the main transformers, and two 6,666 kVA. and two of the main 50 kV. transformers were completely overhauled.

Overhaul of all 110 kV. bushings and current transformer bushings is proceeding.

Explosion vents were fitted to all transformers.

The erection of new 400 volt switchgear, which replaced the original equipment, was completed, and new exciters were installed on Nos. 4 and 5 auxiliary machines.

Reliability of Generating-units.—The operation of the main generating-units at Tuai was satisfactory throughout the year. Minor trouble was experienced for a short period due to driftwood entering the turbines during the flood period and affecting the balance of the machines.

Mangahao.

Headworks.—No serious floods occurred during the year, but heavy rain on several occasions brought down minor slips which necessitated a certain amount of work in keeping access roads clear.

The total rainfall recorded at No. 1 dam was 144·47 in., rain being recorded on 221 days. Rainfall recorded at other points for the year was No. 2 dam, 129·68 in.; No. 3 dam, 98·06 in.; and at the power-station 48·50 in. The total amount of surplus water recorded at No. 2 dam was 8,879,000,000 cubic feet.

General repairs of buildings and painting and maintenance of all apparatus has been carried out.

Check Survey of Sedimentation: Upper Mangahao Basin.—This was carried out in February while the lake was at a low level.

A previous check was made in 1935 for the 1933–35 period, but since this investigation intensive storms and record floods in 1936 and 1937 have occurred, uprooting considerable areas of forest in the Mangahao watershed, and materially increasing the total deposits.

Results show that this basin will be approximately half full in 1947 if the average rate of sedimentation over the last six years is maintained in the next eight.

Power-house.—Operation of all equipment in the power-station has been satisfactory during the year.

Following tests on all 110 kV. bushings, one bushing was removed from the Wellington West line O.C.B. and forwarded to Bunnythorpe for reconditioning.

New 11kV. switchgear of increased rupturing-capacity, which is to replace the original switchgear, arrived at the end of the year, and a start has been made on the installation of this equipment.

The ship telegraph signalling-system was dismantled in preparation for the installation of a loud-talking telephone system for communication between the control-room and other parts of the station building.

Reconstruction prior to rewiring of the main control board was completed.

All generator reactances were cleaned out and new breathers fitted. Two transformers of the main 110/11 kV. banks were overhauled.