

2. OPERATION AND MAINTENANCE.

(a) POWER-STATIONS.

Mangahao Power-house and Headworks.

A record flood was experienced towards the end of December, when 13.36 in. of rain were recorded at No. 1 dam in twenty-four hours, and Arapeti dam overflowed to a depth of 6 in. The total rainfall at No. 1 dam for the year was 187.22 in., rain being recorded on 225 days.

Considerable damage was done to the access road during the heavy rain in December. Between the top of the hill above No. 2 dam and No. 1 dam there were thirteen major slips including three large washouts.

The concreting-work in No. 2 dam cushion pool was completed, and advantage was taken of a low level in No. 1 dam to pump out No. 1 cushion pool. This was found to be in good order.

Permanent pegs were placed in the Arapeti land boundary, and the ragwort in this vicinity was attended to.

The automatic tripping-devices were installed on the pipe-lines at the surge-chamber, but have not been put into service pending further adjustments to the gate winches, which have been fitted with new gearing.

To further improve conditions on the switchboard gallery, the motor-generator ringing-set was placed outside the partition wall.

On the 19th February a complete shut-down of the station was experienced. Following the clearing of a fault on the Mangahao-Khandallah lines, all generators tripped on over-voltage.

Reliability of Generating-units.—The following table shows the reliability of the generating-units during the period for which records are available:—

(PERIOD: APRIL, 1927, TO MARCH, 1937.)

Unit.	Time on Load.		Time Idle.		Time under Repair.				Total Time.	
					Not in Demand.		In Demand.			
	Hours.	Per-centage.	Hours.	Per-centage.	Hours.	Per-centage.	Hours.	Per-centage.	Hours.	Per-centage
1	78,719	89.76	7,376	8.41	1,595	1.82	6	0.01	87,672	100
2	79,573	90.74	6,427	7.33	1,689	1.92	6	0.01	87,672	100
3	80,550	91.85	5,574	6.36	1,538	1.75	34	0.04	87,672	100
4	79,494	90.65	5,280	6.02	2,906	3.31	16	0.02	87,672	100
5	79,544	90.71	5,999	6.84	2,151	2.45	1	0.001	87,672	100

Available Time = Time on load plus time idle.

Reliable Time = Available time plus time under repair and not in demand.

Unit.	Availability.	Reliability.
	Per Cent.	Per Cent.
1	98.17	99.99
2	98.07	99.99
3	98.21	99.96
4	96.67	99.98
5	97.55	100.00

Sedimentation: No. 1 Dam Basin, Mangahao.—A series of observations and measurements have been taken as follows:—

January, 1931: Transverse and cross-sections fixed in upper reaches of Mangahao Lake.

March, 1933: Sedimentation checked on above sections and line of soundings made on Main Lake.

March, 1935: Further checks taken over whole lake.

March, 1937: No further field work done, but plans brought up to date. Analysed results indicate that further checks should be made about 1938 to fix rate of sedimentation over five-year period, 1933–38.

The rate of sedimentation observed to date indicates that the dam will be completely silted in a period of approximately fifty years from the date of completion of the dam.

Waikaremoana Power-house and Headworks.

A drier season than usual has been experienced, the rainfall for the year being 47.93 in. The lake-level has shown a steady drop during the year, from 2,018.70 ft. to 2,010.60 ft.

The operation of the turbines and generators has been very satisfactory during the year.

On the outdoor structure barriers have been erected to prevent access aloft from one bay to another, and the transformer neutrals have been insulated from the transformer tanks.