

(f) GENERAL.

(1) *Load*.—The maximum load on the system was 76,250 kW., as compared with 61,120 kW. for last year and 55,160 kW. for the year ending 31st March, 1937. However, if the output of Evans Bay Power-station is included, this year's maximum demand was 85,550 kW., as compared with 71,730 kW. last year and 63,100 kW. the previous year. The total output for the year was 434,016,391 units, or 435,594,691 units including Evans Bay output.

The following table gives a comparison of output and demand for the past three years:—

	Year ended 31st March,		
	1939.	1938.	1937.
System maximum demand (kW.)	76,250	61,120	55,160
System maximum demand, including Evans Bay Power-station	85,550	71,730	63,100
Percentage increase over previous year	19·3	13·7	14·5
System output (units)	434,016,391	359,173,934	305,808,079
System output, including Evans Bay output (units)	435,594,691	362,274,223	307,580,890
Percentage increase over previous year	20·2	17·8	12·0
Annual load factor	58·1	57·7	55·6

The Mangahao-Waikaremoana system was operated in parallel with the Arapuni system throughout the year, and the following table gives details of the interchange of power for the past three years:—

	Year ended 31st March,		
	1939.	1938.	1937.
From Arapuni—			
Maximum demand (kW.)	36,000	27,190	20,840
Units supplied	106,042,550	108,730,936	52,858,752
To Arapuni—			
Maximum demand (kW.)	15,720	13,920	6,620
Units supplied	329,000	53,727	98,788

(2) *Reliability of Supply*.—During the year, with the exception of the period 17th to 28th January, when there were extensive interruptions to supply due to salt-spray trouble on the Mangahao-Khandallah lines, there were a total of forty faults on the Department's system which caused interruptions to consumers' supply. There were also fourteen faults on the Department's system during the same period that were cleared without interruptions to consumers.

The average number of accidental interruptions to each of the twenty consumers was 4·75 and the average duration was 11·3 minutes. The total average duration to each consumer was 53·8 minutes.

During the period 17th to 22nd January, 1939, inclusive, practically continuous westerly winds of gale force were experienced, and a considerable number of interruptions, due to flash-over on the main lines south of Mangahao, were caused by accumulation of salt deposit on the insulator units. During this period there were twelve major shutdowns, which resulted in a total of eighty-four interruptions of a total duration of 44 hours 15 minutes. There were also four faults caused by the same trouble that were cleared without interruptions.

In view of the serious inconvenience and considerable expense caused by this trouble, a careful investigation has been made into the performance of insulators under salt-spray conditions, and it has been decided to reinsulate both Wellington lines. This, combined with the fact that probably before the end of this year the Melling-Masterton section of the main line will be completed, should reduce the possibility of future trouble from this source.

With reference to prearranged interruptions, the total average duration of such interruptions to each consumer was 6 hours 3 minutes.

In practically every case of both prearranged and accidental interruptions the New Plymouth Borough Council and South Taranaki Electric-power Board were able to carry all or portion of their own load.

(3) *General*.—The load during the winter months of the year under review was very heavy, and for the year the percentage increase in maximum demand and output set new record levels for the district.

Heavy loadings during the winter months, severe floods in the Hawke's Bay Province early in the year, salt-spray trouble in January of 1939, and continued dry weather resulting in low lake-levels at Mangahao and Waikaremoana have called for careful attention and considerable effort on the part of both operating and maintenance staffs in the discharge of their duties. The staff are to be complimented on the service that they gave during these times, and special mention can be made of those who worked long hours under trying conditions during the Hawke's Bay flood and the salt-spray trouble.