

Napier-Tuai Duplicate Line.—This line gave good service during the year, except for the damage sustained in the earthquake on the 3rd February, which is reported more fully elsewhere.

A further interruption was caused by an earthquake on the 13th February, which shook open the isolating-switches.

Transmission-lines (50,000 Volt).

Tuai-Gisborne Line.—Considerable trouble has been experienced on this line during the year in heavy gales, by failure of insulators and pins, and by the telephone-line blowing up into the transmission-line. Twelve outages, totalling 22 hours 46½ minutes, being attributable to these troubles.

Further telephone-poles have been put in to reduce the spans, and more work will be done in this connection during the coming year.

This line was not put out of action during the earthquake, but on the telephone-line the wires were twisted.

Tuai-Wairoa Line.—Some trouble has been experienced on this line during the year with broken binders, insulators, and pins. Four outages, lasting 3 hours 30½ minutes, were attributable to this cause.

The earthquake on the 3rd February did some minor damage to the line, which, however, was quickly remedied.

Stratford-New Plymouth Line.—This line has been maintained and operated at 33 kv. during the year by the New Plymouth Borough Council.

Transmission-lines (11,000 Volt).

Tuai-Lake House and Thomas's Mill.—The line to Thomas Bros.' Mill has been connected in to the Lake House line during the year, and has operated well.

Mangaore-Shannon.—This line has been operated and maintained by the Horowhenua Power Board throughout the year.

Khandallah-Hutt Valley Power Board: Duplicate Circuit.—This line delivers power to the Hutt Valley Power Board, and suffered forty-three outages, totalling 2 hours 31½ minutes.

Khandallah-New Zealand Railways: Duplicate Circuit.—This line, delivering power to the railway workshops, had thirty-two outages during the year, totalling 2 hours 59½ minutes.

These lines were operated for some part of the year in parallel with the Hutt Valley lines.

Khandallah-Wellington Meat-export Co.—This line has suffered eight outages during the year, totalling 13½ minutes.

Transmission-lines.—General.

During the year all the insulators have been cleaned, with the result that no interruptions have occurred due to salt-deposit on insulators.

The fifth year's series of tests on insulators has practically been completed, these generally bearing out the results of previous years' tests.

A live-line-testing class was again held at Tuai.

Pole-testing for depth of sap has been continued, and a fair amount of work done in strengthening and replacing weak poles where necessary.

Further earthwire has been removed from lines during the year, to enable use to be made of the insulation resistance of poles in preventing flash-overs.

Further vibration troubles have been experienced on A.C.S.R. lines, and vibration-dampers and special clamps have been installed to prevent failures from this cause.

Lightning storms recorded during the year numbered four. One of these was responsible for an outage on the Tuai-Napier line, and one was responsible for the failure of a trifurcating-box on No. 1 Hutt feeder at Khandallah.

Earth-resistance tests were taken over the whole transmission system and, where necessary, extra precautions taken to bring the resistance values down to standard.

III. EARTHQUAKE ON THE 3RD FEBRUARY, 1931.

The first sign of this earthquake was at 10.48 a.m., when the Bunnythorpe East line opened at Mangahao and both Tuai-Napier lines opened at Tuai.

Telephonic communication was cut off from Mangahao north of Waipukurau, and Tuai was entirely isolated.

Supply was restored within half an hour to all stations south of Waipukurau, to which station power was resumed at 12.27 p.m. from Mangahao after minor repairs were effected. To carry all load Wellington City steam plant was called on to render assistance.

Tuai resumed power to Gisborne at 8.30 p.m. on the 3rd February, and to Wairoa about noon on the 4th February.

Telephone communication from Mangahao to Napier was established on the night of the 3rd, and to Tuai on Thursday, the 5th. This, however, was intermittent owing to the frequent after-shakes tangling the wires together, but on the 6th good service was obtained.

On the 4th February power at 11 kv. was delivered to Napier from Waipukurau Substation.

After temporary repairs had been effected to the Tuai-Napier lines, supply from Tuai was given to Napier at 11 kv. on the east line, and to the general system at 110 kv. via the west line on the 12th February, Tuai paralleling with Mangahao at 4.10 p.m.

On the 13th February, about 1.40 p.m., a heavy earthquake put the Tuai-Napier line out again, owing to the isolating-switches at Waikoau shaking open. The shake also interrupted telephone communication between Napier and Tuai. Communication between Mangahao and Tuai was eventually established by means of the Palmerston North and Gisborne Radio stations and Tuai paralleled once more with Mangahao at 9.10 p.m.