

Wanganui-Hawera line caused an interruption, but no signs of damage could be found. One of the co-ordination gaps at Wanganui flashed over. Three other storms caused flashovers on the Stratford-New Plymouth Waipawa-Dannevirke, and Mangahao-Bunnythorpe lines respectively.

(2) *Special Maintenance*.—During the year the “live-line” gang completed the overhaul of the Bunnythorpe-Wanganui line. Latterly this gang has been working on the Mangahao-Bunnythorpe lines and the section of the Bunnythorpe-Woodville line from Bunnythorpe to Pohangina River crossing. The “live-line” gang has been encamped at Bunnythorpe, while the other special-maintenance gang, which has been located at Mangaore, has co-operated on the Mangahao-Bunnythorpe line overhaul. A third maintenance gang was engaged on the overhaul of the lines radiating from Tuai Power-station.

In addition to special maintenance, changing poles and insulators, and refitting poles, &c., under live-line conditions, assistance was given by these gangs with the usual maintenance on various lines and substation structures.

An overhaul of the Porirua Mental Hospital L.T. overhead lines was also carried out.

The 11 kV. feeder lines for the Railway Department traction supply were completed and tested, and have now been made available to that Department.

Experimental work was carried out with the oxy-acetylene pole burning outfit, it being found that after winter rains the rot in the poles had too much moisture for successful burning. Tests on an automatic line-splicing device were also made, but further work was delayed on account of the manufacturer's failure to reply to a query regarding the ability of the device to withstand conductor vibration.

(3) *Khandallah High-tension Testing-set*.—The usual retests were made of insulators found defective by live-line testing. In addition to this work, several tests (including porosity tests) were made for the Post and Telegraph Department. Porosity, puncture, and flashover tests were made on some sample foreign insulator units.

(4) *Insulator Deterioration*.—Live-line testing of all insulators in service was carried out with the following results.—

					Strain.	Suspension.
Total number tested—						
110 kV.	..	..	..	..	24,041	99,977
50 kV.	..	..	..	..	1,812	1,194
Number defective—						
110 kV.	..	..	..	..	19	153
50 kV.	..	..	..	..	2	Nil
Total number tested						127,024
Total defective						174
Per cent. defective						0.137

The above table does not include 50 kV. pin type insulators.

(5) *Guy Insulators*.—A series of careful measurements was made throughout the year to determine the slippage of the end connections of the new (wedge) type of wooden guy insulators. Slippage was found to be entirely negligible.

(d) TELEPHONE LINES.

An investigation was carried out into the “blistering” of copper-weld telephone wire which is commencing to give trouble owing to resulting breaks.

Initial indications of the trouble, as well as being shown by breaks in the wire, were shown by rust patches or “blisters,” where the inner steel had become exposed and commenced to rust.

In view of the importance of this problem (there are approximately 2,240 miles of various sizes of this wire in use by the Department and Supply Authorities throughout the Dominion), a thorough investigation was made. Wire in use and in stock was examined for blisters, and various cross-sections were mounted, polished, and photomicrographs prepared.

The outcome of this was that the basic cause appeared to be due to the dissymetry of the steel core, rendering the outer copper unduly thin in places. It also appears that this trouble has been overcome in material of recent manufacture.

Sections of wire showing evidence of “blistering” are at present being replaced.

(e) COMMUNICATION SYSTEM.

The terminal equipment was maintained in good order throughout the year, and tests, which included investigations on acoustic shock absorbers and portable telephones, were made on various types of new instruments.

Several systems of communication between the generating-rooms and the control rooms of the power-houses were tried, and a design was made for a system which it is considered will be a satisfactory solution of this problem.

Crystal control was installed on the transmitters of the experimental radio-telephone between Mangahao and Tuai, and a large amount of data was collected on the operation of this equipment. This is at present being analysed, but the indications are that with the present power of 100 watts at the transmitters the service is entirely satisfactory, except for approximately two hours either side of midday, when results are erratic.