

*Waikino*.—Two 11 kv. current transformers broke down during the year. A flashover which damaged three 11 kv. insulators and potential transformer fuses was caused by a rat.

*Hamilton*.—An additional feeder was installed by Hamilton Borough to be connected to the 11 kv. switch-gear. The borough's two existing cables are to be paralleled, and the panel thus made available is to be used for the new and larger feeder. An automatic telephone exchange was installed by the Post and Telegraph Department.

*Huntly*.—To enable supply to be given to the new fertilizer-factory, a 1,000 kv.a. three-phase 50/11 kv. transformer from Takapuna substation was installed temporarily, and, with a new 11 kv. switch cubicle, was put in service on 1st February, 1936.

*Te Awamutu*.—A 50 kv. O.C.B. bushing with cracked porcelain shed was replaced.

*Hangatiki*.—The 50 kv. fuses were removed after installation of a line O.C.B. at Te Awamutu. The 50/11 kv. transformers were overhauled.

(c) *Transmission-lines.*

Seven 50 kv. pin insulators failed in service during the year, five of them being damaged by lightning, and one by flashover caused by a bird, and one being found badly cracked.

Also two 110 kv. suspension insulator units were damaged by lightning, and 25 units were damaged by leakage due to salt spray.

Three hundred and seventy-four pin insulators (50 kv.) were found defective by live-line testing during the year, and in addition twenty-eight were found defective by inspection. (A further 111 of two kinds which had been found to be liable to failure were replaced.) Of the 50 kv. insulators, 133 were replaced with live-line tools.

Thirty-four 52 ft., forty-eight 42 ft., three 38 ft., one 35 ft., one 30 ft., and thirteen 25 ft. poles were found defective and replaced during the year. On a number of poles on different lines holes due to decayed knots or other causes were cleaned out and filled with a bitumen mixture to prevent further decay.

On all 110 kv. and 50 kv. lines during the year there were a total of thirty-one outages due to faults on lines, involving outages of the lines on which they occurred of a total time of 170 hours 56 minutes, and, in addition, there were further outages, with a total time of about 300 hours, on the different sections of the Arapuni-Penrose lines due to salt in the severe storm of 2nd to 7th February, 1936.

This year's figures are for twenty-eight sections of lines, so that the interruptions average a little more than one per section, with an average time of about six hours to get the section of line ready again for service, and, in almost all cases, there was an alternative means of supply available to consumers.

The usual maintenance of lines and access tracks, and examination of insulators and poles, was carried out during the year. Special work on individual lines was as follows:—

*Arapuni-Penrose 110 kv. Wood-pole Line*.—Following the discovery of a pole with decayed heart-wood, all poles on this line were examined for decay by boring small holes right through them. Twenty-seven poles on this line were replaced on account of this defect, and seven for other defects, and several others were strengthened.

*Penrose-Takapuna 50 kv. Line*.—The overhaul and resagging of this line were completed. A number of tower bases were painted where showing signs of rust.

*Hamilton-Frankton 11 kv. Line*.—This line was altered by removing circuits from it which are no longer necessary, and is now a four-circuit line to pole 34 (three circuits for Central Waikato Power Board and one for Public Works Department consumers) and two-circuit from pole 34 to pole 124.

On a large number of Post and Telegraph crossings on different lines, double insulators and 7/16 copper wire instead of the existing solid wire were installed to comply with regulations.

*Salt-storm in February*.—After very heavy easterly wind with torrential rain on Saturday night and Sunday morning (1st and 2nd February, 1936), the rain ceased about noon on Sunday, and the wind changed through north to west and blew heavily all Sunday afternoon from the west without rain. It died down about 8 p.m. From then on the weather was normal, with heavy dews at night, until it rained heavily on Thursday night.

The westerly gale on Sunday must have carried inland an enormous quantity of salt, up to a distance of more than twenty miles, as, when dry, the salt was plainly visible on insulators, in the form of flakes not unlike frost, and traces of it could be seen on the foot of the towers.

At 3.46 p.m. on Sunday, all three Arapuni-Penrose circuits tripped out on fault, but the wood-pole line was closed in again normally, and hay found on the tower-line by patrol was considered to be the cause of the trouble, but at 11.50 p.m. all three circuits again tripped out in quick succession, and, shortly after, the structure at Bombay was found to be covered with a slimy coating of salt spray, and all insulators and bushings were sparking violently, owing to the combined effect of dew and salt.

About 2 a.m. patrols started from Penrose and Bombay on cleaning insulators, and shortly afterwards linemen from Hamilton started working north from Rangiriri Hills.

A summary of the work is as follows:—

By Monday at 6 p.m. eighteen men working eighteen hours cleaned insulators on both circuits of the steel-tower line on 167 towers, and at 6.48 p.m. both circuits were livened up from Arapuni to Bombay, and they remained in service until about 4 a.m., when they tripped out automatically due to a flashover.

On Tuesday thirty-five men worked twelve hours wiping most of these towers again (it having been found impossible, with the limited gear that can be carried, to clean off wet salt in one wiping), as well as wiping twenty-six additional towers. At 6.30 p.m. both circuits were made alive to Penrose, and remained alive until they tripped out automatically at 5.27 a.m. on Wednesday.