Stability of Transmission-lines.

During the past year a technical investigation has been undertaken in connection with the electrical stability of transmission-lines. This trouble, which has made its appearance in older countries, has not yet been experienced in this country, but with the rapid growth of load which is now taking place it has become imperative for the Department to examine its own transmission-lines with a view to forestalling the trouble, and it is hoped that as a result of the investigations now being made it will be able to predict the maximum load over any portion of the lines with fair accuracy and take steps accordingly.

Line Surveys.

Line-survey methods have been given further attention, and instructions drawn up for the information of district officers, indicating a different basis of procedure in order to obtain the most economical location and layout of transmission-lines without definitely fixing the size of conductors and height of supports.

Investigations have been made in connection with longitudinal movement of suspension insulators when excessive spans vary in length, and consideration has also been given to the problems of line-vibration and spacing of conductors in very long spans.

BROKEN WIRES AND POLES.

During the year there were reported by electric supply authorities 1,547 cases of broken wires and 128 broken poles.

From incomplete returns the approximate number of miles of each size and material of conductor is scheduled below, together with a summary of the number of breaks reported in the respective sizes of wires in use. The scheduled mileage of conductors erected totals 85,613, and the average number of miles of line per broken conductor reported is 55. Taken on a route-mile basis of 17,759 miles, the number of breaks per route-mile of line erected is very low—viz., 0·087. Falling trees are the principal destructive agent in the case of broken wires, 531 cases, or 34·32 per cent., being due to this cause.

There is an increase in the number of broken poles—viz., 128, as against 65 last year—and this is attributed principally to the number of locally-grown bluegum poles erected six or seven years ago and which are now failing due to decay.

Actual Mileages and Sizes of Overhead Conductors in Use at 31st March, 1929.

Size of Conductors (S.W.G.).	Copper.	Failures.	Aluminium.	Failures.	Galvanized Steel.	Failures.	Galvanized Iron.	Failures.	Copper-weld.	Failures.	Steel-cored Aluminium.	Failures.	Bronze.	Failures.	Total Failures.
	Miles.		Miles.		Miles.		Miles.		Miles.		Miles.		Miles.		
7/20	5,486	310	..	..	..	..	..	..	..	..	..	..	..	..	310
7/18	8,592	301	..	..	1	..	..	..	..	..	..	..	..	..	301
7/17	1,956	23	..	..	..	..	..	..	..	..	..	..	..	..	23
7/16	12,964	129	96	3	16	..	..	..	..	..	..	..	..	..	132
7/15	2,108	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7/14	9,032	..	114	3	240	..	..	..	..	..	..	..	..	..	3
7/13	1,061	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7/12	309	..	260	3	..	..	..	..	8	..	..	..	..	..	3
7/10	12	6	24	4	..	..	..	..	..	..	..	..	..	..	10
7/9	63	..	4	..	..	..	..	..	..	..	..	..	..	..	..
19/18	271	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/17	404	1	..	..	..	..	..	..	..	..	..	..	..	..	1
19/16	1,284	1	..	..	..	..	..	..	..	..	..	..	..	..	1
19/15	101	..	1	..	..	..	..	..	..	..	..	..	..	..	..
19/14	504	2	..	..	..	..	..	..	..	..	..	..	..	..	2
19/13	1,467	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19/12	5	1	..	..	1	..	..	..	..	..	..	..	..	..	1
37/16	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/15	399	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/14	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/13	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37/12	3	1	..	..	..	..	..	..	..	..	..	..	..	..	1
12	2,981	139	..	..	..	..	96	..	..	..	..	..	30	..	139
10	10,445	311	..	..	137	..	269	..	502	..	..	..	..	..	311
8	12,211	172	..	..	2,699	34	5,375	59	903	12	..	..	..	..	277
7	778	..	..	..	5	..	..	..	91	..	..	..	..	..	..
6	255	..	..	..	..	..	16	..	169	14	..	..	..	..	14
4	609	..	..	..	..	..	..	..	58	..	..	..	..	..	..
2	84	..	..	..	..	..	..	..	..	..	59	..	..	..	..
0	116	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7/·062	..	..	..	..	..	..	..	..	..	..	107	..	..	..	..
7/·0743	..	..	..	..	..	..	..	..	..	..	25	..	..	..	..
7/·0834	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..
6/·144	..	..	..	..	..	..	..	..	..	..	19	..	..	..	..
2/0	..	..	11	..	..	..	..	..	..	..	59	..	..	..	..
3/0	..	..	..	..	..	..	..	..	..	..	138	..	..	..	..
Miscellaneous Sizes.															
7/8	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
7/11	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..
7/·122	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
6/·144	..	..	..	..	..	..	..	..	..	..	19	..	..	..	..
6/·186	..	..	44	..	..	..	..	..	..	..	..	..	..	..	..
5/15	..	..	..	..	115	..	..	..	..	..	..	..	..	..	..
4/14	..	..	..	..	..	..	287	..	..	..	..	..	..	..	..
19/10	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..
14/12	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Odd failures	..	18	..	..	..	..	..	..	..	..	..	..	..	..	18
Totals	73,586	1,415	561	13	3,214	34	6,043	59	1,731	26	448	..	30	..	1,547

Grand total miles, 85,613.