ORIGINAL

Decision No. 1927

BEFORE THE RAILROAD COMMISSION OF THE STATE OF CALIFORNIA

W. S. JUNKIN,
Complainant,

vs.

PACIFIC GAS & ELECTRIC COMPANY,
Defendant.

Case No. 466

C. P. Cutten for the Pacific Gas & Electric Company,
Henry B. Lister for W. S. Junkin.

GORDON, COMMISSIONER,-

O P I N I O N

This complaint was filed for the purpose of compelling the defendant to install circuit breakers of the over load release type on all transmission lines operated by the defendant company in the State of California.

The complainant alleges, in effect, that the defendant operates all its sixty-thousand (60,000) volt lines without fuses, circuit breakers or other automatic devices for breaking the circuit in case of ground or short circuit thereon. That said lines are liable to fall due to electric causes and in falling come in contact with other wires or objects thereby becoming a manace to life and property. That the principal danger arises from the fact that defendant has heretofore neglected to install the proper station protective devices and that such protective devices would minimize if not entirely eliminate the danger; further that the practice of defendant's operators is to test into faulty lines in order to burn trouble clear and that said practice is harzardous to the public.

The defendant thereafter filed its answer denying most of the material allegations of the complainant. The defendant denies that it maintains all its sixty-thousand (60,000) volt lines without any devices which would protect life and property in case of breakage or short-circuit and states that it uses circuit breakers and fuses where feasible; that its lines are not liable to fall due to shorts and are not liable by falling to become a menace or create danger to life or property. That it employs the most competent engineers to construct, operate and maintain its high tension lines; that said lines are maintained in a safe, proper and efficient manner and that very few accidents causing injury to persons or property have resulted from the operation, construction and maintenance of its lines.

The answer further states that the installation of circuit breakers on its transmission lines would not reduce the danger to a minimum; that it would be impossible to operate its system or give adequate service if it should be compelled to so install automatic circuit breakers; that the danger is not increased by hand operated switches; that operators test lines to determine if trouble remains and denies that this or any other of its practices are negligent or extremely or at all dangerous to the public.

The first hearing in this case was held in San Francisco on December 22, 1913. At this time the complainant did not appear but was represented by counsel. Little evidence was presented by either complainant or defendant relative to the complaint or the allegations therein and the case was therefore adjourned until such time as the Commission should make an investigation of the matter. On April 7, 1914, the second hearing was held at which time the report of the Commission's engineers was presented and several of defendant's station operators appeared at the request of the Commission and testified regarding the methods of operation of defendant's lines. Neither the complainant nor his attorney were present at this hearing

However, the points at issue, affecting as they do the protection of the public, are considered sufficiently important to justify careful consideration by the Commission notwithstanding the apparent indifference on the part of complainant.

From the evidence presented, it appears that the defendant company operates its sixty-thousand (60,000) volt transmission systems without automatic circuit breakers on its transmission lines at its hydro-electric generating plants and at the majority of its switching stations, except on certain station transformers and certain branch circuits; that it is the practice of the company's station operators to test lines to determine the location of faults; and that lines are sometimes energized after it is evident to the operator that such lines are short circuited or grounded.

It further appears that the defendant company's transmission lines are subject to damage and failure due to various causes and in case of failure to become a menace to persons and property; that the extent of the hazard is increased where such lines fall on other electric conductors, such as telephone, telegraph and signal circuits, secondary wires and metallic fences; that injuries and death to persons and damage to property have resulted either from contact with transmission lines or with other conductors in contact therewith; that the hazard is greater on primary distribution circuits than on transmission lines and that a greater number of deaths were caused by contact with lines and apparatus in normal operation than by those in abnormal conditions.

The defendant reported that thirty-nine (39) deaths have occurred on its electric system during the years of 1910-1913 inclusive; eleven (11) on transmission lines; seventeen(17) on distribution lines and eleven (11) in stations. Thirty-two (32) persons were killed due to electric contact with the normal apparatus on lines and seven (7) by contact with lines in abnormal condition. In three (3) cases death might have been prevented by station pro-

tective devices though conclusive evidence was not obtainable. One of these cases occurred on a transmission line.

The number of deaths occurring on eleven (11) other electric companies' systems shows that the hazard is approximately the same on all systems and that the installation of circuit breakers has no marked effect on the number of deaths or extent of the hazard.

Approximately 80% of all fatalities reported were due to accidental contact with normal circuits. Of the persons so electrocuted 60% were employes working on or near live apparatus. After consideration of above statistics it seems advisable that the Commission issue a general order prescribing safety rules for the handling of electrical lines and equipment.

More or less interference with telephone and telegraph circuits occurs due to induction from power lines but as this matter is covered by the Commission's General Order No.39 it will not be considered herein.

The greater number of cases of line failure resulting in hazard to life and property could not apparently be prevented by station protective devices but could in many instances be prevented by more careful construction and maintenance of such lines. It is, therefore, considered advisable to this Commission to investigate further the construction and maintenance of all power, telephone, telegraph and signal lines as well as the operation of such lines. For the reason that further investigation appears necessary several phases of the matter in question will not be covered by this decision.

It appears that the public safety is subjected to considerable additional hazard if line trouble is not immediately evident to operators of stations which are not equipped with automatic devices to break the circuit in cases of short circuit or ground on such lines and it is obvious that in the absence of proper indicating devices, lines may be maintained alive in a condition which menaces life and property.

From the evidence it appears that under defendant's methods

of operation, operators of hydro-electric plants are instructed to

feed at least as far as the nearest switching station and to energize such lines up to the capacity of his plant for a sufficient time after trouble is apparent to permit of trouble being located and separated at switching station. When it becomes evident to operators of hydro-electric plants that ground or short circuit exists on lines between his plant and the nearest switching station he immediately separates such circuits.

Considerable danger arises when high tension lines come in contact with other wire lines on metallic fences. In the case of the latter the danger may be minimized by properly sectionalizing and grounding fences where subject to possible contact with lines of dangerous potential.

In view of the great importance of the matter under consideration I would strongly recommend that the Commission's Electrical Engineer be directed to investigate fully the entire subject of physical hazard due to the construction, operation and maintenance of electric lines and apparatus of dangerous potential with a view to recommending such protective measures as may appear necessary to minimize the existing hazard to life and property.

I am of the opinion, however, that, while defendant company is entitled to just recognition for its efforts to reduce the hazard referred to, certain additional protective measures may reasonably be adopted pending the result of further investigation by the Commission and I therefore submit the following form of order:

O R D E R

A public hearing having been held in the above entitled proceeding and the matter being submitted for the consideration of the Commission,

IT IS HEREBY ORDERED that the defendant shall submit to the Commission within thirty (30) days from the date of this order,

(1) A plan for equipping its generating plants and transmission switching stations where an operator is in regular attendance in such a manner and with such instruments or apparatus as will indicate to the operator at all times the voltage between each wire and ground of all high tension circuits connected to the station buses or feeding through the station.

(2) A plan for equipping all distribution circuits of a potential in excess of 750 volts between conductors or between one conductor and ground at the source of power supply with fuses or oil switches which shall be rendered automatic for short circuits and grounds.

(3) A plan for sectionalizing and grounding all metallic fences subject to possible contact with its power lines of dangerous potential with a view to minimizing the danger to persons or property resulting from such contact, and

IT IS HEREBY FURTHER ORDERED that the Commission's Electrical Engineer be and he is hereby directed to fully investigate the matter of physical hazard due to the construction, operation and maintenance of electric lines and apparatus of dangerous potential and to report to the Commission the result of such investigation as set forth in the opinion which precedes this order.

The foregoing opinion and order are hereby approved and ordered filed as the opinion and order of the Railroad Commission of the State of California.

Dated at San Francisco, California, this 7th day of November, 1914.

H. D. Loveland

Alex Gordon

Edwin O. Edgerton

Commissioners.