

ORIGINAL

Decision No. 19210

BEFORE THE RAILROAD COMMISSION OF THE STATE OF CALIFORNIA.

In the Matter of the Investigation
 on the Commission's own motion into
 the reasonableness of proposed rules
 and regulations governing the con-
 struction, reconstruction, mainte-
 nance and operation of interlocking
 plants, manually or automatically
 controlled or of remote control, at
 crossings, junctions, drawbridges,
 in yards and at sidings of railroads
 and street railroads.

Case No. 2451.

E. J. Foulds, W.E. Boland, and S. R. Florence,
 for Southern Pacific Company; Pacific Elec-
 tric Railway Company; Stockton Electric
 Railroad Company; Fresno Traction Company;
 Peninsular Railway Company, and San Jose
 Railroads.

Fred E. Pettit, Jr., for Los Angeles & Salt
 Lake Railroad Company.

E. Winans, for The Atchison, Topeka and Santa
 Fe Railway Company.

H. G. Weeks, for Los Angeles Railway Corpora-
 tion.

CARR. COMMISSIONER:

O P I N I O N

This is an investigation instituted on the Commis-
 sion's own motion into the propriety of a general order govern-
 ing the construction, reconstruction, maintenance and operation
 of interlocking plants, manually or automatically controlled or
 of remote control, at crossings, junctions, drawbridges, in yards
 and at sidings of railroads and street railroads, which it is
 proposed will supersede General Order No. 33, approved June 20,
 1913, and bring the latter into conformity with modern practices.

A public hearing was held at San Francisco, California, on December 30, 1927.

There seems to be no disagreement over the advisability of a new general order being made to supersede General Order No. 33, nor does there seem to be any disagreement as to the provisions it should contain. I recommend the following form of order.

O R D E R

An investigation having been instituted on the Commission's own motion into the reasonableness of certain proposed rules and regulations governing the construction, reconstruction, maintenance and operation of interlocking plants, manually or automatically controlled or of remote control, at crossings, junctions, drawbridges, in yards and at sidings of railroads and street railroads, and the matter being under submission and ready for decision;

The Railroad Commission of the State of California hereby finds as a fact that the rules and regulations governing the construction, reconstruction, maintenance and operation of interlocking plants manually or automatically controlled or of remote control, at crossings, junctions, drawbridges, in yards and at sidings of railroads and street railroads, attached hereto and to be known hereafter as this Commission's General Order No. 33A, are reasonable, just and in the interests of public health and safety, and basing our order on the above finding of fact,

IT IS HEREBY ORDERED that this Commission's General Order No. 33, approved June 20, 1913, and effective August 1, 1913, be and it is hereby superseded by General Order No. 33A.

IT IS HEREBY FURTHER ORDERED that all construction, reconstruction, maintenance and operation of interlocking plants, manually or automatically controlled or of remote control, at

crossings, junctions, drawbridges, in yards and at sidings of railroads and street railroads, coming within the jurisdiction of this Commission on and after March 1, 1928, shall conform to the rules and regulations attached hereto and to be known as this Commission's General Order No. 33-A.

The effective date of this order shall be March 1, 1928.

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 6th day of February, 1928.

Leon Whipple

Chas. J. ...

Frank ...

Thos. J. ...

M. J. ...
Commissioners.

General Order No. 33-A.

RAILROAD COMMISSION OF THE STATE OF CALIFORNIA.

REGULATIONS GOVERNING THE CONSTRUCTION,
RECONSTRUCTION, MAINTENANCE AND OPERA-
TION OF INTERLOCKING PLANTS AT CROSSINGS,
JUNCTIONS, DRAWBRIDGES, IN YARDS, AND AT
SIDINGS OF RAILROADS AND STREET RAILROADS.

Issued under authority of Public Utilities Act.

Approved *February 6, 1928* Effective March 1, 1928.

It is hereby ordered by the Railroad Commission of the State of California that the following regulations relating to the construction, reconstruction, maintenance and operation of interlocking plants at crossings, junctions, drawbridges, in yards and at sidings of railroads and street railroads, shall hereafter be observed in this State unless otherwise authorized or directed by the Commission.

DEFINITIONS.

- (a) The term "Interlocking Plant" as used in this order shall be defined as including manually or automatically controlled plants and/or installations operated by remote control.
- (b) The limits of an interlocking plant shall be defined by the home signals which are located farthest from the point intended to be protected on each track. Such appliances as distant signals, track circuits, annunciators, etc., which are located beyond the interlocking limits defined, shall be classed as auxiliary parts.

GENERAL REQUIREMENTS.

1. Plans and construction shall be approved.

- (a) No interlocking plant shall hereafter be constructed or reconstructed, nor shall any changes be made in the locking or in the location of any unit thereof until plans and specifications for such construction, reconstruction or other changes shall have been filed with and approved by the Commission.

- (b) When the plans are submitted to the Commission for its approval, the application for such approval must be signed by the general manager of the carrier which is to make the installation. The plans and profiles shall be signed by the general manager or by the responsible signal officer of each interested carrier. The application shall state which carrier will have charge of the construction, which of the maintenance and which of the operation of the interlocking plant.

2. Plans to be filed.

The following plans shall accompany the application of carrier for approval of construction, reconstruction or other change in interlocking plants.

- (a) A general ground plan, drawn to convenient scale, but preferably 100 feet per inch, which shall show the location of all tracks in the vicinity of the crossings, junction or yard; location of the tower; location of all derrails; signals, locks, switch points, and other special parts of the plant.
- (b) A profile of each main or branch line intersecting at the crossing, junction or yard, and/or connecting with the tracks controlled by the interlocking plant, which shall show such main or branch line through the interlocking plant and for a distance of not less than one (1) mile outside of home signal limits. Such profile shall show, in addition to the ground and grade lines; the elevations and rates of grade, the location, character, and dimensions of all bridges, culverts and way structures, and such other information as is usually contained upon standard profiles of railroads and street railroads.

(Note:- Number of copies of such exhibits filed with the application made informally shall be one greater than the number of interested carriers. If formal application is made additional prints must also be filed with each copy of formal application.)

3. In preparing exhibits. The American Railway Association, Signal Section symbols shall be used.

4. Commission will approve plans.

- (a) When plans submitted are found to be satisfactory, they will be approved by the Commission and a copy marked "Approved" sent to each interested carrier.

- (b) If the work is not commenced within one year after date of approval a new approval must be obtained.

5. Application for inspection.

- (a) When the plans for an interlocking plant have been approved by the Commission and its construction or reconstruction has been completed, application shall be made to the Commission for inspection. The application for inspection shall be accompanied or preceded by a corrected copy of the ground plan if any change has been made from the plan originally submitted.
- (b) There shall also be filed with or preceding the application for inspection a locking sheet, a dog chart, and a circuit plan. For automatic interlocking, only the circuit plans need be filed.
- (c) Application for inspection by letter or telegram shall be made by the carrier having charge of construction five days prior to date of initial operation. Plans, charts, etc., called for in Section 5 (b) shall be forwarded to the Commission on or before the same day. After receipt of the above application for inspection the Commission will notify applicant of the date of inspection.
- (d) When the carrier in charge of the construction or reconstruction of an interlocking plant applies to the Commission for inspection and approval of same as hereinbefore provided, it shall be the applicant's duty to notify all other interested carriers of such application, and of the date upon which the inspection will be made, that they may have representatives upon the ground if they so desire.

6. Approval of interlocking plant.

After an interlocking plant has been inspected as provided for in Section 5, and found to have been completed in accordance with the plans and specifications, it will be approved. The representative of the Commission inspecting the interlocking plant may, at his discretion, for what appears to him good cause, direct changes necessary for the safe operation of the interlocking plant and direct that the interlocking plant be not operated until such changes are made, subject, however, to the action of the Commission thereafter.

GENERAL SPECIFICATIONS

7. Type of Signals.

Signals shall be semaphore or light signals of approved type and so constructed that the failure of any part directly controlling the signal will cause it to display its most restrictive indication.

8. Signal Indications.

- (a) Semaphore signals shall display the following lights at night:
 - (1) A green light to indicate "proceed."
 - (2) A yellow light to indicate "caution."
 - (3) A red light to indicate "stop."
- (b) Light signal color indications for "proceed," "caution," and "stop," shall correspond to those outlined for semaphore signals.

9. Location of Signals.

All fixed signals shall be located above or adjacent to the track which they govern, and preferably on the right hand side of the track governed.

10. Home Signals.

- (a) Home signals operated mechanically shall be pipe connected.
- (b) When home signals are semi-automatic and conditions are such as to require it, means may be provided for moving a train into an occupied block by use of an approved type of fixed signal.
- (c) High speed signals located in automatic block signal territory shall be semi-automatic and form a part of the block signal system.

- (d) Where a train order signal is located within interlocking limits and controlled from the interlocking plant, such signal must be so interlocked that it cannot be cleared until the preceding home signals have first been cleared.
- (e) The home semaphore arm shall have a square end. When two (2) signal arms are used on the home signal mast, the top arm shall in all cases govern the main or high speed route and the lower arm the low speed or diverging route.

11. Distant Signals.

- (a) Power operated distant signals shall be used on all high speed lines and they shall be located a sufficient distance from home signals to insure safe operation, but in no case more than 6000 feet therefrom.
- (b) On low speed main lines, or where conditions warrant, the location of distant signals may be varied from the preceding requirements or by permission they may be eliminated where obviously unnecessary.
- (c) Distant signals shall be semi-automatic.
- (d) Where a two-position semaphore signal is used, it shall be distinguished by a notch cut in the end of semaphore arm. Its connection with the home signal through the interlocking shall be such that it will display its most restrictive indication when home signal is at "stop."

12. Signal Indication Locking.

Electric locks or other suitable devices shall be provided in connection with all signals for the purpose of insuring against the route being changed until the signal displays its most restrictive indication.

13. Derails.

- (a) Split point derails shall be located on high speed tracks, with a minimum distance from the drawbridge, crossing, or fouling point, which they are intended to protect, as follows: Where the grade is practically level on steam railroads six hundred (600) feet; on electric interurban or street railroads four hundred (400) feet. Not less than ten (10) feet for each one-tenth of one per cent grade shall be added to the above minimum distance for grades descending toward the drawbridge, crossing or fouling point, and not more than ten (10) feet for each one-tenth of one per cent grade shall be deducted in case of ascending grades; provided, however, that no derail shall be placed less than four hundred (400) feet for steam railroads nor less than two hundred (200) feet for electric railroads from the drawbridge, crossing or fouling point.
- (b) Pocket derails shall be located not less than seventy-five (75) feet from the crossing or fouling point.
- (c) Backup derails, when used, shall be located as follows: On steam railroads not less than two hundred (200) feet and on electric interurban or street railroads one hundred and fifty (150) feet from the crossing or fouling point.
- (d) Derails on all side tracks and spur tracks, and tracks other than main tracks, shall be located a sufficient distance from the fouling point to insure ample protection, and in no case less than fifty (50) feet. Such derails shall be so placed that a derailed train or car will be diverted away from the main track.
- (e) On tracks where the character of traffic and/or local conditions justify, as at junctions, in yards, or on passing tracks, the above specifications for location of derails may be varied from or derails may be omitted by special permission, granted at the time of submission of plans for approval.
- (f) Guard rails shall be provided in connection with all high speed derails. Guard rails shall extend at least one-half ($\frac{1}{2}$) the distance from the derail to the fouling point, and shall be located between the track rails parallel with and not less than eight (8) inches from ball of guard rail to ball

of continuous main rail. Guard rail shall be fastened to the track with at least equal security and be approximately the same weight as the running rails.

14. Facing Point Protection.

High speed main line facing point switches, derails, and movable point frogs shall be equipped with facing point locks or equivalent electrical protection.

15. Automatic Train Control.

Automatic train stopping devices, which are a part of a system of automatic train control approved by this Commission or the Interstate Commerce Commission, may be used in lieu of derails. In such devices, the means for automatically applying the train brakes shall be located a sufficient distance in advance of the fouling point as to insure a safe braking distance.

16. Time locks and Electric Locking.

- (a) Either time locks or approach locking shall be provided in connection with all home signals. When a distance signal is used approach locking shall be provided to be effective at least 1500 feet in advance thereof.
- (b) Track circuits and electric locking must be provided. Circuits shall be so arranged that routes can not be changed until trains or cars have passed through the locking limits or over certain predetermined sections. Suitable emergency releases may be provided in such cases.

17. Detector Bars.

Prior to January 1, 1930, all detector bars now in place shall be replaced or supplemented with electric track circuit locking.

18. Locks and Seals.

- (a) Provision shall be made in interlocking machines, for locking or sealing the mechanical locking in such a manner as to prevent interference by any one except authorized employees.

- (b) Power interlocking cabinets, time locks, time releases, emergency switches, and indicators, shall be sealed. Relay cases shall be locked.

19. Cross Protection.

All circuits shall be designed and arranged, as far as practicable, to prevent the operation of apparatus by cross or grounds.

20. Annunciators.

Annunciators shall be installed where operating conditions require them.

21. Automatic Interlocking.

- (a) Home signals shall normally indicate stop, clearing only on the approach of the train when conflicting routes are clear between home signal limits and no opposing or conflicting train has received clear signal. Home signals shall be located not less than 500 feet nor more than 750 feet from crossing.
- (b) Distant signals shall be installed and so arranged as to indicate caution when the home signal indicates stop, and controlled by track circuit between the distant and home signal. Distant signals shall be located a sufficient distance from the home signal to insure safe operation.
- (c) Preliminary track circuit shall be installed and shall extend back of the distant signal 3,000 feet where speed is 60 miles per hour, decreasing 50 feet for each mile per hour under and increasing 50 feet for each mile per hour over such maximum speed.
- (d) At all crossings protected by automatic interlocking a speed restriction of 20 miles per hour shall be enforced.

22. Materials and Workmanship.

Materials and workmanship shall be first class throughout, and the interlocking plant constructed in every way to warrant the safe and expeditious performance of the functions for which it is designed.

MAINTENANCE AND OPERATION

23. Shall be properly maintained and operated.

Interlocking plants shall be maintained and operated in accordance with rules which shall be submitted to and approved by the Commission. Such rules shall include the use of hand signals, when fixed signals become inoperative.

24. No interlocking plant shall be abandoned without the permission of this Commission.

25. Reports to the Commission.

Quarterly reports of interlocking plant performance shall be made to the Commission on the first day of January, April, July and October of each year, by the carrier on each interlocking plant maintained and operated by it. Such reports shall be filed within thirty days after the end of the quarter for which they are made and shall be prepared in the manner prescribed and upon the forms provided by the Commission.

GENERAL

26. Order Retroactive - Time Limit for Changes.

All interlocking plants, manually or automatically controlled, installed for the protection of either a grade crossing or a drawbridge shall conform with the terms of this order on and after January 1, 1930, except installations made during the effective time of General Order No. 33, and conforming therewith.

27. Exemptions.

If, in a particular case, exemption from any of the requirements herein is desired, the Commission will consider the application of a carrier for such exemptions when accompanied by a full statement of the conditions existing and the reasons why such exemption is asked. It is to be understood that any exemption so granted shall be limited to the particular case covered by the application.

The Commission reserves the right to modify any of the provisions of these rules in specific cases, when, in

the Commission's opinion, public interest would be served by so doing.

This order shall be effective on and after the first day of March, 1928.

R.M.
Approved and dated at San Francisco, California, this 6th day of February, 1928.

RAILROAD COMMISSION OF THE STATE OF CALIFORNIA,

By H. G. Mathewson, Secretary.