

GENERAL ORDER No. 33B
(Superseding General Order No. 33A)

Railroad Commission of the State of California

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

Approved February 24, 1936. Effective March 16, 1936
(Decision No. 28586, Case No. 4095, 39 C.R.C. 593)

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 interlocking plants and/or installations operated by remote control or centralized traffic control.

(b) The limits of an interlocking plant shall be defined as that portion of the track between opposing home signals over which movements are controlled by interlocking signals. Such appliances as distant signals, track circuits, indicators, 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; provided, however, that minor changes in circuit wiring which do not affect the locking may be made by the carrier without formal approval by the Commission, if revised plans of such changes are submitted to the Commission within 30 days after changes have been made.

(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 general ground plan 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 each copy of the application of carrier for approval of construction, reconstruction or other change in interlocking plants. Additional copies of such plans must be filed equivalent to one greater than the number of interested carriers:

(a) A general ground plan, drawn to convenient scale but preferably 100 feet per inch, which shall show length of all track circuits and the location of the tower, derails, signals (including train order signals), locks, switch points and all tracks in the vicinity of the crossings, junction or yard. If this plan is furnished on other than a white background, there shall appear on the print, in any location most convenient with respect to the subject matter of the print, a white space which will have a vertical dimension of at least two inches and a horizontal dimension of at least three inches.

(b) For new installations 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 two (2) miles 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.—All plans must be furnished with the minimum number of folds to bring them within filing size, 8½" x 13", and so folded that title and drawing number appear on the outside.

3. In Preparing Exhibits

The Association of American Railroad Signal Section symbols shall be used.

4. Commission Shall Approve Plans

(a) When plans are approved by the Commission, a copy so marked will be 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. Request for Inspection

(a) When the plans for an interlocking plant have been approved by the Commission and its construction or reconstruction has been completed, request by letter or telegram shall be made to the Commission for inspection. The request 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) Request for inspection by letter or telegram shall be made by the carrier having charge of construction not less than five days prior to date of initial operation. After receipt of this application the Commission shall notify applicant of the date of inspection. There shall be furnished to the Commission's representative, at the location of the plant on the date set for inspection, complete circuit plans and if mechanical locking is used a locking sheet and a dog chart must be supplied.

(c) 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 request 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

The representative of the Commission inspecting the interlocking plant may, at his discretion, for what appears to him to be good cause, recommend changes necessary for the safe operation of the interlocking plant and direct that the interlocking plant be not operated until such changes are made.

If the final inspection discloses the interlocking plant to be in compliance with the general order, and changes shown to be necessary at the time of inspection have been made, the carrier concerned will receive the written approval of the Commission for the operation of the interlocking plant.

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

The light indications displayed by signals shall conform to the following:

- (1) A green light to indicate "PROCEED;"
- (2) A yellow light to indicate "CAUTION" or "RESTRICTED SPEED;"
- (3) A red light to indicate "STOP."

NOTE: It is to be understood that a "CAUTION" or "RESTRICTED SPEED" indication makes it mandatory that action be taken at, or before passing, the signal, to comply with the rule prescribed by the carrier for observance of such indications.

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) Mechanically-operated home signals shall be pipe-connected.

(b) When home signals are semiautomatic 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 semiautomatic and form a part of the block signal system.

(d) Where a train order signal is located within interlocking limits, such signal must be so interlocked that it can not be cleared until the interlocking signals have first been cleared. At specific locations, with the approval of the Commission, suitable means may be provided so that the interlocking signal may be operated without regard to the position of the train order signal during the hours when there is no operator on duty.

(e) The home semaphore arm shall have a square end.

(f) When two or more home signals are on the same mast, the top signal shall in all cases govern the normal route.

11. Distant Signals

(a) A power-operated distant signal, automatically controlled, shall be provided at a sufficient distance in approach to the home signal to insure ample safe stopping distance for all classes of trains or cars. Its control shall be such that it will display a restrictive indication when home signal is at "STOP" and a "PROCEED" indication when the home signal indicates "PROCEED" and intervening track is unoccupied.

(b) Where conditions warrant the distant signal may be omitted by permission.

12. Derails

(a) Except at automatic interlocking plants, split point derails shall be located on high speed tracks, with a minimum distance from the drawbridge, crossing or fouling point of the main tracks involved, 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) Backup derails, when used on steam railroads shall be located 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.

(c) Derails shall be located on all other than high speed tracks 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 from the main track.

(d) 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.

(e) 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 running rail. Guard rail shall be fastened to the track with at least equal security to that of the running rail and shall be not less than seventy (70) pounds per yard, except that when the running rail is less than seventy (70) pounds, guard rail may be the same weight.

13. Facing Point Protection

Facing point switches, derails and movable point frogs shall be equipped with facing point locks or equivalent electrical protection.

14. 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.

15. Time Locks and Electric Locking

(a) Approach, stick or time locking shall be provided in connection with all home signals. When a distant signal is used, approach locking shall be provided to be effective at least during the last 1,500 feet in approach thereto and continuing to the home signal.

(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 time releases may be provided in such cases.

(c) All lever locks must be of the forced drop type.

Section 15 is retroactive.

16. 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.

17. Locks and Seals

(a) Provision shall be made in interlocking machines for locking or sealing the mechanical locking in such 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 or sealed.

18. Cross and Ground Protection

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

19. Indicators

(a) Provision must be made at manually-controlled interlocking plants for visual indication of the occupancy of the track circuits.

20. Automatic Interlocking

(a) Home signals shall be located not less than five hundred (500) feet nor more than seven hundred and fifty (750) feet from crossing and shall normally indicate "STOP."

(b) Distant signals must be installed as provided in Section 11. In low speed territory a lighted distant warning sign may be used in lieu thereof where desirable, provided the matter is handled in accordance with Section 26, when plans are filed in compliance with subsection 2(a) of this Order.

(c) Manually-operated time releases must be provided to function as follows:

1. A red indicator light in release box shall appear after release has completed operation, provided home signals on intersecting and conflicting tracks display "STOP" indication and tracks between home signals are unoccupied by engines, cars or trains.

2. After release has been operated, the signal should display a "PROCEED" indication only under conditions described in Items 1, 2 and 3 of Subsection 20(f).

3. A red repeater light may be installed on signal mast, which will be displayed in the event that signal fails to display a "PROCEED" indication after operation of release as described above. Red repeater light is to be displayed only when all home signals display "STOP" indications, both releases normal and tracks between home signals are unoccupied.

4. At locations where approach circuits may be occupied for considerable periods of time, automatic time releases may be provided to give preference to trains on the intersecting track after approach circuit has been occupied for a predetermined time interval.

(d) A reliable graphic time recorder must be provided to accurately record the movement of engines, cars or trains through automatic interlocking plants, as follows:

1. Record separately for each approach circuit date and time of day any train enters and leaves approach circuit.
2. Record date and time of day any train enters and leaves interlocking limits.
3. Record separately for each home signal the date, time of day and duration of time that each home signal indicates "PROCEED."
4. Chart speed to be not less than six inches per hour.

NOTE: Records produced in accordance with the above requirements must not be destroyed within a period of two years from time recorded.

Identification of pens should be standardized as follows:

- | | | |
|-----------------------|---|--------------------|
| 10. Eastbound Signal | } | Other Railroads |
| 9. Eastbound Approach | | |
| 8. Detector Circuit | | |
| 7. Westbound Approach | | |
| 6. Westbound Signal | | |
| 5. Eastbound Signal | } | Reporting Railroad |
| 4. Eastbound Approach | | |
| 3. Detector Circuit | | |
| 2. Westbound Approach | | |
| 1. Westbound Signal | | |

Subsection 20(d) is retroactive.

(e) Circuits

1. Clearing circuits should be of sufficient length to permit distant signals to reach the "PROCEED" position before trains, cars or engines traveling at maximum speed permitted in that territory reach the distant signal.

2. Circuits should be arranged to permit alternate moves over the crossing unless otherwise agreed upon by interested carriers and approved by the Railroad Commission.

3. Home and distant signals must be equipped with contacts operated by the signal mechanism or with other means to provide a correct check of the indication displayed by the signal.

4. When approach lighting is used, each approach circuit shall light signal sufficiently in advance of an approaching train to permit proper observance of its indication.

5. Home signal proceed control circuits must be checked through signal mechanism contacts of opposing and conflicting home signals or their repeater relays and through normal contacts in time releases for intersecting tracks.

6. The circuits should be so designed that the momentary shunting of any one of the track circuits within home signal limits shall not change the sequence of train operation already set up.

7. The circuits shall be so arranged that when two trains enter approach circuits simultaneously only one home signal shall indicate "PROCEED," including provision to prevent the conflicting home signal from momentarily flashing green. Item 7 of subsection 20(e) is retroactive.

8. A predetermined time interval must be provided between the display of the "STOP" indication at a home signal and that of a "PROCEED" indication at home signal on intersecting track.

(f) Operation. When a train enters an approach circuit, the signal governing its further movement should display a "PROCEED" indication only under the following conditions:

1. Opposing and conflicting home signals must display "STOP" indication and distant signals "RESTRICTED SPEED" or more restrictive indication.

2. Conditions in the block ahead must be such as to permit the display of a proceed or restricted speed indication.

3. Tracks on intersecting line between home signals must be unoccupied.

4. Where an automatic release is provided for giving preference to movements on intersecting or conflicting tracks, the approach clearing circuits affecting the automatic release must be occupied for not less than a predetermined time interval.

5. If operative distant signal is used and home signal indicates "PROCEED" the speed of the train must not exceed thirty (30) miles per hour during the time the first unit of equipment is passing between the home signal and the crossing. If operative distant signals are not used the train speed, under conditions similar to the above, must not exceed twenty (20) miles per hour.

(g) With the exception of manually-operated time releases, controlling and recording apparatus must be located at a sufficient distance from the tracks to ordinarily avoid damage in the event of collision or derailment. Manually-operated time releases must be located adjacent to the crossing at a point where trainmen who have occasion to operate same will, as far as possible, have an unobstructed view of each route.

21. 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.

22. Maintenance and Operation

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.

23. No Interlocking Plant Shall Be Abandoned Nor Its Operation Discontinued Without the Permission of This Commission

24. Reports to the Commission

(a) Quarterly reports of interlocking plant performance shall be prepared by the carrier for the quarter ending March 31st, June 30th, September 30th and December 31st of each year, for each interlocking plant maintained and operated by it. Such reports shall be filed with the Commission within thirty (30) days after the end of the quarter for which they are made and shall be prepared in a manner prescribed and upon the forms provided by the Commission.

(b) Within a period of fifteen (15) days after the occurrence, a complete copy of the testimony given at all investigations conducted in connection with derailments or collisions within the limits of interlocking plants must be forwarded to the Commission. In the event of serious personal injury, or property damage exceeding \$150, occurring as a result of such accidents, the Commission must be immediately notified by telephone or telegraph.

GENERAL

25. Order Not Retroactive—Time Limit for Changes

Except as herein otherwise provided, this order is not retroactive. The retroactive provisions of this order shall become effective on and after January 1, 1937.

26. 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.

Exemptions granted under General Orders Nos. 33 and 33-A, and now in effect, will continue in full force and effect under this order, unless otherwise ordered by this Commission.

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 16th day of March, 1936.

Approved and dated at San Francisco, California, this twenty-fourth day of February, 1936.

RAILROAD COMMISSION OF THE STATE
OF CALIFORNIA,

By H. G. MATHEWSON, *Secretary*