



Railway Signal and Traffic Control Systems Standards

June 4, 2007



Railway Association
of Canada

Railway Signal and Traffic Control Systems Standards

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1. Scope

- 1.1 These standards are intended to ensure that railway signal and traffic control systems are installed, modified and maintained in a safe manner. These standards apply to railway companies subject to the jurisdiction of the Minister of Transport pursuant to the *Railway Safety Act (RSA)*.

2. Definitions

In these Standards:

- 2.1 “**AREMA**” means American Railway Engineering and Maintenance of Way Association.
- 2.2 “**approach locking**” means electric locking effective while a train is approaching, within a specified distance, a signal displaying an aspect to proceed. Approach locking will:
- a) prevent the electrically controlled movement of any interlocked or electrically locked switch, movable point frog, or derail in the route governed by the signal until after the expiration of a predetermined time interval after such signal has been caused to display its most restrictive aspect, and;
 - b) prevent an aspect to proceed from being displayed for any conflicting route.
- 2.3 “**closed circuit principle**” means the principle of circuit design where a normally energized electric circuit which, on being interrupted or de-energized, will cause the controlled function to assume its most restrictive condition.
- 2.4 “**fail safe**” a term used to designate a railway signaling design principle, the objective of which is to eliminate the hazardous effects of a failure of a component or system.
- 2.5 “**qualified person**” means, in respect of a specified duty, a person who, because of the individual's knowledge, training and experience, is qualified to perform that duty safely and properly.
- 2.6 “**railway signal and traffic control systems**” means mechanical, electric or electronic signal systems which include Interlockings, Automatic Block Signal Systems, Traffic Control Systems, Cab Signal Systems, including other similar appliances, methods and systems used in non-signaled territory.
- 2.7 “**route locking**” means electrical locking, effective when a train passes a signal displaying an aspect for it to proceed. Route locking:
- a) will prevent the movement of any switch, movable point frog, or derail in advance of the train within the route entered.
 - b) may be so arranged that as a train clears a track section of the route, the locking affecting that section is released.
- 2.8 “**test**” means to inspect the apparatus and also to subject it to specified electrical and/or mechanical tests to verify its condition.

2.9 **“time locking”** means a method of electrical locking, effective when a signal has been caused to display an aspect to proceed.

Time locking:

- a) will prevent the movement of any switch, movable point frog, or derail in the route governed by that signal, until after the expiration of a predetermined time interval after such signal has been caused to display its most restrictive aspect.
- b) will prevent an aspect to proceed from being displayed for any conflicting route.

3. Railway Signaling Design Principles

3.1 Railway signal and traffic control systems shall be designed using fail safe principles.

3.2 Railway signal and traffic control systems shall, so far as possible, be arranged so that failure of any part of the system shall cause affected signals to give the most restrictive indications that the condition requires.

3.3 All control circuits, the functioning of which affects safety of train operation, shall be designed on the closed circuit principle.

3.4 Railway signal and traffic control systems shall be so interconnected that aspects to proceed cannot be displayed simultaneously for conflicting movements, except that opposing signals may indicate "proceed at restricted speed" at the same time for switching movements only.

3.5 In signaled territory, track circuits and route locking shall be provided to prevent operation of power switches, derails or movable-point frogs, underneath or directly in front of a train.

3.6 At Interlockings, approach or time locking shall be provided in connection with signals displaying aspects more favorable than "proceed at restricted speed." In Centralized Traffic Control systems, approach or time locking shall be provided for all controlled signals.

3.7 Each signal shall be located with respect to the next signal or signals in advance which govern train movements in the same direction so that a restrictive aspect can be complied with by means of a brake application, other than an emergency application, initiated at such signal.

4. General Requirements

4.1 Railway signal and traffic control systems which affect the safety of railway operations shall be installed and modified in accordance with the American Railway Engineering and Maintenance of Way Association – Communications and Signals Manual of Recommended Practice (AREMA C&S Manual) as amended from time to time.

4.2 If a railway company wishes to depart from an AREMA recommended practice, it shall file with Transport Canada an alternative practice, which shall provide an equivalent level of safety.

4.3 If a railway company wishes to implement new systems or technologies not dealt with in the AREMA C&S Manual, it shall file with Transport Canada a supplementary practice which outlines the proposal and makes clear how it will provide an acceptable level of safety.

4.4 A railway company shall file with the Minister any alternative practice, supplementary practice or amendments thereto, which it intends to follow, 60 days prior to its implementation. At all rail level crossings and moveable bridges, not protected by interlocking appliances, a stop sign shall be erected at a point 300 feet each way from the nearest frog of crossing, or each way from the nearest end of a moveable bridge and all trains must be brought to a full stop at the stop sign and shall not thereafter proceed until a proper signal has been given for that purpose.

5. TESTING AND INSPECTION OF RAILWAY SIGNAL AND TRAFFIC CONTROL SYSTEMS

5.1 Every railway company shall ensure that signal circuits and signal devices, that affect the safety of train operations, are tested and inspected at the minimum frequencies specified in the company's signal inspection and test instructions which are to be filed with Transport Canada periodically. Tests and inspections shall be performed by a qualified person.

5.2 Railway companies shall ensure that only qualified persons are engaged in the testing and inspection of railway signal and traffic control systems.

5.3 Railway companies shall ensure that qualified persons are:

- a) properly trained and fully conversant with the requirements of these standards, and;
- b) comply with the requirements of these standards when engaged in their duties.



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