4. Standard for Work Zone Safety

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Abstract: This standard provides guidance for the development of Rail Transit System RTS work zone safety rules and procedures and provides suggested approaches for developing said rules and procedures

Keywords: right of way, wayside worker, work zone safety,
Introduction

(This introduction is not a part of APTA RT-OP-S-004-03, Standard for Work Zone Safety)

This Standard for Work Zone Safety represents a common viewpoint of those parties concerned with its provisions, namely, transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. The application of any standards, recommended practices or guidelines contained herein is voluntary. In some cases, Federal and/or State regulations govern portions of a Rail Transit System’s (RTS) operations. In those cases, the government regulations take precedence over this standard. APTA recognizes that for certain applications, the standards or practices, as implemented by individual rail transit agencies, may be either more or less restrictive than those given in this document.
Participants

The American Public Transportation Association greatly appreciates the contributions of the following individuals, who provided the primary effort in the drafting of the Standard for Work Zone Safety:

John Blum
Rudy Crespo
Al Fazio
Austin Jenkins

Maurice Lewis
Gary Rosenthal
Paul Stangas

At the time that this standard was completed, the Operating Practices Committee included the following members:

**Peter Tereschuck, Chair**

**Austin Jenkins, Vice Chair**

Nigel Astell
Franklin Beauford
Harvey Becker
John Blum
Charles Briscoe
Aubrey Burton
Robert Campbell
Rudy Crespo
Jess Diaz
James Dunn
Brian Dwyer
Charles Dziduch
Al Fazio
Gerald Francis
James Gallagher

David Gibson
Kent Haggas
Richard Hanratty
Leonard Hardy
John P. Hogan
Paul Jamieson
Austin Jenkins
Al Johnson
Charles Joseph
Daryl Lampkins
Antonio Lares
Maurice Lewis
Paul Liston
Stephanie Markos
W. Mark Miller

Laura Mizner
Terry Mulcahy
Dan Murphy
Lori Oakley
Paul Oversier
Jeffrey Parker
Chester Patton
Gary Rosenthal
Harry Saporta
Fredrick Shein
Paul Stangas
Wayne Terry
George Turner
C.J. Welter

APTA Rail Transit Standards Operating Practices Committee project consultants:

Christopher Wallgren, Transportation Resource Associates, Inc.

APTA Rail Transit Standards project team:

Gabrielle Bayme, Standards Development Program Specialist and Project Editor
Saahir Brewington, Administrative Assistant and Project Editor
Antoinette Hankins, Program Assistant

Thomas Peacock, Director-Operations & Technical Services
David Phelps, Senior Project Manager - Rail Programs

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Standard for Work Zone Safety

1. Overview

The standard provides ways for Rail Transit Systems to address situations that are present when workers perform routine and emergency work on an operating rail line. The Standard recommends that Rail Transit Systems perform periodic internal audits to ensure compliance with these rules and procedures.

1.1 Scope

This standard establishes the minimum required content for Work Zone Safety Rules and Procedures to be developed for Rail Transit Systems (RTS), and applies to both mainline and yard operations.

1.2 Purpose

APTA developed this standard to help Rail Transit Systems identify and mitigate wayside worker safety concerns. The Standard addresses the duties of wayside workers and train operators. While referenced in this Standard, the corresponding work zone safety duties, responsibilities and authority of yardmasters and train controllers are addressed in a separate standard. Development of such rules and procedures should enhance the safety of all concerned without unnecessarily restricting operation of trains through work zones.

1.3 Alternate practices

Individual rail transit systems may modify the practices in this standard to accommodate their specific equipment and mode of operation. APTA recognizes that some rail transit systems may have unique operating environments that make strict compliance with every provision of this standard impossible. As a result, certain rail transit systems may need to implement the standards and practices herein in ways that are more or less restrictive than this document prescribes. A rail transit system (RTS) may develop alternates to the APTA standards so long as the alternates are based on a safe operating history and are described and documented in the system’s safety program plan (or another document that is referenced in the system safety program plan).

Documentation of alternate practices shall:

a) Identify the specific APTA rail transit safety standard requirements that cannot be met

b) State why each of these requirements cannot be met
c) Describe the alternate methods used
d) Describe and substantiate how the alternate methods do not compromise safety and provide a level of safety equivalent to the practices in the APTA safety standard (operating histories or hazard analysis findings may be used to substantiate this claim).

2. References

The Operating Practices Committee did not use references to develop this standard.

3. Definitions, abbreviations, and acronyms

3.1 Definitions

For the purposes of this standard, the following terms and definitions apply. The job titles listed below are used in this standard for informational purposes only. It is up to the individual RTS to determine and utilize titles as it finds appropriate. Each person, or his/her designee shall perform the tasks described below.

3.1.1 audible signals: A signal, the indication of which is conveyed by a horn, bell or whistle.

3.1.2 control center/central control/operations control center: That facility where train control, train dispatching, and/or train supervision is accomplished for the entire rail transit system or for specific segments of a system if there is more than one Control Center; the train command center.

3.1.3 flagperson/watchperson: Personnel assigned to control movement of trains by the display of hand signals, flags, or lights. Personnel may also be assigned to protect workers who are engaged in work activities on the right of way.

3.1.4 hand signal: A signal - the indication of which is conveyed by the motion or position of a person’s hand or arm. A flag may be used to enhance visibility of a hand signal. A lantern or other suitable hand held light shall be used to convey hand signals in tunnels or during hours of darkness.

3.1.5 mainline: Those tracks upon which scheduled service is operated and which are designated as such.

3.1.6 on sight/operation on sight: A requirement that train operators shall look ahead and be constantly alert for any condition which may cause injury or damage and be ready to bring their train to a safe and smooth stop. Movement must be made so as to control the movement to permit stopping within one half of the range of vision of: (a) Other trains or rail equipment occupying or fouling the track, (b) Obstructions, (c) Switches not properly lined for movement, (d) Derails set in the derailing position, (e) Any signal requiring a stop, and (f) Broken rail and misaligned track.
3.1.7 **rail transit system (RTS):** Term used to describe the organization that operates rail transit service and related activities. It is also known as the transit system, transit agency, operating agency, operating authority, transit authority, or other similar term.

3.1.8 **right-of-way:** The area at track level or above track level at a distance from the centerline of the track, as specified by the RTS.

3.1.9 **temporary warning device:** Signs, flags, lights, discs or targets installed when wayside workers are present to alert and direct the actions of train operators of approaching trains and removed when no longer needed.

3.1.10 **train:** Any motorcar, locomotive or other self-propelled on-rail vehicle, with or without other cars coupled. A regular train is a train authorized by a schedule. An extra train is any train that is not in the schedule.

3.1.11 **train controller/dispatcher/supervisor:** An employee, usually stationed in a control center, authorized and responsible to direct the operation of trains on the mainline. Some RTSs may employ other employees, subordinate to the Controller, to facilitate train movements at critical locations.

3.1.12 **train operator:** The onboard employee who controls the movement of a train.

3.1.13 **wayside worker:** Any employee or outside contractor who performs work upon the right of way within a specified distance of the tracks. At some properties, these personnel may be referred to as roadway workers. Flagpersons and watchpersons are considered wayside workers.

3.1.14 **work zone:** A section of track where train operations are temporarily restricted due to the presence of one or more wayside workers that may be designated by use of a temporary warning device.

3.1.15 **yard:** A facility within defined limits that has a system of tracks used for making up trains, storing trains, and other purposes. A maintenance facility may be included.

3.1.16 **yardmaster:** The employee who supervises the movement of trains within a Yard.

4. **Background**

Every operating RTS requires periodic, scheduled maintenance of the tracks, switches, structures, signals, traction power system and other wayside equipment. Unscheduled emergency repair of system elements is an integral part of RTS operation. Non-rail transit work activity may also necessarily impinge on the rail transit right of way. The protection of trains and their passengers and the employees who perform work in a work zone is assured through the adherence to clear rules and procedures governing both wayside worker and train operator actions.
5. Requirements

Each RTS shall develop and implement rules and procedures that specifically identify the behaviors and appropriate actions of wayside workers and train operators. These rules and procedures shall be appropriate for the operating rail transit system, taking into consideration the operating environment, train operating speed, equipment, geographical location, climate conditions, and specific duties of wayside workers.

As part of this plan, the RTS shall, at a minimum, address the following:
- Responsibilities
- Employee Training
- Audible and Hand Signals
- Radio/Communication Procedures
- Speed Past Wayside Workers
- Types of Worker Protection
  - Personal Protection
  - Reduced Speed Zones
  - Work Zones
  - Temporary Warning Devices
  - Removing a Track(s) from Service
  - Flagging
- Removing Tracks from Service in a Work Zone
- Returning Tracks to Service in a Work Zone
- Placing Track Back in Service
- Personal Protective Equipment
- Worker Attire
- Walking on Right of Way

6. Responsibilities – train operators and wayside workers

6.1 Train operators

Within the work zone, train operators shall operate their trains on sight and have their train under control at all times. Upon observance of warning devices or personnel on the right of way, the train operator shall reduce speed to the prescribed limit, sound the designated audible warning, and be prepared to stop. Train operators shall not be required or allowed to operate their train into the work zone until they have received and acknowledged a proceed indication from wayside workers.

Train operators shall be required to be observant for unusual conditions, which may pose a hazard to the wayside workers or to the train and its passengers, while passing through the work zone. They shall be required to obey all rules, regulations, procedures and special operating instructions.

Train operators shall be required to read all written notices that may be posted or issued to them, for monitoring radio transmissions and obeying verbal instructions regarding work taking place on the right of way. Train operators shall report any improper or
missing flagging protection. Properties with automatic train operation (ATO) may require manual operation where wayside workers are present.

6.2 Wayside workers

Wayside workers shall be required to be alert for trains approaching the work zone on any track from either direction at any time. They shall be trained and required to understand track layouts in order to establish proper installation of temporary work zone limits and warning devices.

When working in gangs of two or more people, at least one wayside worker shall be designated responsibility as flagperson/watchperson to watch for approaching trains and to give appropriate hand signals to the train operators of trains approaching the work zone. This worker shall be prepared to signal the train to stop and always ensure that all other workers are clear before permitting a train to proceed.

Upon observance of an approaching train, or hearing a train’s audible signal, or hearing a watchperson/flagperson’s warning, all wayside workers shall stop work, remove equipment that may be in the way of a train, and move to a place of safety. The watchperson/flagperson shall face the train and signal the train operator to proceed if it is safe to do so. The flagperson shall signal the train operator to stop if the track is not clear of personnel and/or equipment.

Before entering the right of way, wayside workers shall have an evacuation plan in the event of an unexpected incursion.

Wayside workers are responsible for obeying all rules, regulations, procedures and special operating instructions and are responsible for monitoring radio transmissions and obeying verbal instructions regarding the work taking place on the right of way.

7. Employee training – train operator and wayside worker

7.1 Train operators

As a part of their training program and at a minimum, train operators shall be taught the rules and procedures developed by the RTS to address the requirements and responsibilities in sections 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, and 16 of this standard.

7.2 Wayside workers

As a part of their training and at a minimum, personnel who work on the right of way shall be taught the rules and procedures developed by the RTS to address the requirements and responsibilities in sections 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, and 16 of this standard.
8. Audible and hand signals

Rules/procedures for audible and hand signals shall be developed. These signals shall apply consistently to train operators and wayside workers. At a minimum, signals utilized shall include audible and hand signals.

8.1 Types of audible signals:

- Answer to any signal not otherwise provided.
- Call for signals
- Alarm for persons on the track

8.2 Types of hand signals:

- Stop or remain standing
- Reduce speed
- Proceed

9. Radio/communication procedures

9.1 Train operators

Train operators shall monitor their radios and acknowledge any messages that apply to their operation.

9.2 Wayside workers

Before entering the track area, wayside workers shall notify the control center and/or yardmaster and receive authorization. All wayside workers shall be advised of the provisions of the authorization. They shall tell the control center and/or yardmaster exactly where they will be working, what they will be doing and the expected duration of the work. Upon completion of the work and clearing of the right of way, the control center and/or yardmaster shall be notified.

9.3 Control center/yardmaster

When appropriate, the control center and/or yardmaster shall notify train operators of the presence of the wayside workers, their exact location, the nature of the work and the expected duration. They shall again notify train operators when the wayside workers are clear of the right of way.

10. Speed past wayside workers

The RTS shall establish a maximum authorized speed, in conjunction with the operate on sight rule, to be observed by train operators when passing workers on the right of way.
The determination of this speed is dependent upon but not limited to the following: Automatic or manual operation, signaling, visibility, weather, braking capability of equipment, clearances for persons on the right of way, condition of track or nature of the work being done on the right of way. This speed shall be posted at appropriate locations or governed by rule.

11. Types of wayside worker protection

The RTS shall, at a minimum, establish safety criteria, rules and procedures to utilize the methods outlined below, or other forms of protection more compatible with full ATO systems.

11.1 Personal protection

Some work of typically short duration along the right of way may not require the use of temporary warning devices and the establishment of a formal work zone. Rules governing those activities shall be developed by the RTS. Workers assume responsibility for their own safety when working under these conditions, and the work must not involve machinery or tools that would prevent the worker from hearing the approach of a train or a radio call. Under this type of work activity, visibility of oncoming trains shall not be impaired. Workers shall adhere to all other wayside safety rules. When appropriate, the control center will notify trains that may operate in the area of employee(s) under these conditions, and the employees shall notify the control center when they are clear of the right of way.

11.2 Reduced speed zones

Whenever conditions warrant, a reduced speed zone shall be established. Where appropriate, as in ATO or cab signal territory, signal indications for the maximum allowable speed shall be reduced accordingly. Otherwise, warning devices shall be posted indicating the maximum allowable speed and indicating where normal speed may resume.

11.3 Work zones

A work zone is the area in which wayside workers will be present. Wayside workers shall be protected, as appropriate.

11.4 Temporary warning devices

A procedure shall be developed that establishes the type and location of warning devices in advance of a work zone. These devices may be a series of signs, flags, lights, discs or targets, or other such devices, as appropriate. The number and distance between each and their relationship to the work zone will be dependent upon but not limited to the following: Automatic or manual operation, maximum train speed, visibility, clearances, braking capability of equipment, the nature of the work being done on the right of way.
11.5 Flagging

Each RTS shall establish procedures to determine and establish when flagging protection shall be provided for a work group. Determinants may include, but are not limited to the size of the work group, access to safe refuge areas, sight distances, types of equipment being used, duration of the work or nature of the work. Flagging shall involve the use of an appropriately trained and properly equipped flagpersons or an automatic audible/visual device at an appropriate distance far enough in advance of the work site to warn the work crew of the approach of a train in a timely manner.

12. Removing tracks from service in a work zone

A procedure shall be established to temporarily remove tracks from service when necessary to ensure the safety of wayside workers and/or train operations. This procedure shall require authorization, by the control center and/or yardmaster responsible for the track(s) involved, of the person in charge of the Work Zone activity to temporarily remove tracks from service. The authorization shall establish the time that the track may be out of service and physical limits of the authority. The procedure shall include a requirement for written notification to all affected RTS departments. Appropriate temporary warning devices, established and adopted by the RTS, shall be provided at each entrance to the out of service track. The warning devices shall be placed in such a way as to leave no doubt that the track is out of service. The person in charge of the Work Zone activity shall immediately notify the control center and/or yardmaster if the track(s) involved cannot be returned to service within the time authorized.

13. Returning tracks to service in a work zone

A procedure shall be established for returning tracks to service after having been temporarily removed from service for wayside worker activity. Upon completion of work, tracks should be returned to service as soon as possible. Before returning tracks to service, the person in charge of the Work Zone shall ensure that all equipment, material and wayside workers are clear of the track and that track and structures are safe to return to service. All temporary wayside worker warning devices shall then be removed from the right of way. Any necessary flags or signs restricting train movement shall be placed as appropriate. The person in charge of Work Zone activity shall then immediately notify the control center and/or yardmaster responsible for the track(s) involved that the track can be returned to service.

14. Personal protective equipment

The RTS shall establish what safety equipment a person working on the right of way is required to use. At a minimum the RTS shall require high visibility clothing (safety vests or jumpsuits) to be worn by all wayside workers. The RTS shall determine what is appropriate for high visibility clothing. Additionally, other equipment may also be required, which may include but is not limited to the following: head protection, eye protection, foot protection, and two way radios. In addition, in the hours of darkness or in tunnels, a person working on the right of way shall have a working flashlight or lantern.
15. Worker attire

The RTS shall establish appropriate worker attire guidelines for persons when working on the right of way. Those clothing items, which are inappropriate for use, shall be identified.

16. Walking on right of way

Persons on the right of way shall walk against normal direction of traffic and stay clear of tracks whenever possible. They shall expect the movement of trains in either direction on any track at any time. They shall never step on any rail, equipment or metal debris. They shall use walkways when available and practical. They shall observe and comply with clearance restrictions. They shall observe and comply with all instructions and restrictions imposed by rule, procedure, bulletin or the Control Center.