



APTA RT-OP-S-021-15

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APTA Operating Practices Working Group

Standard for On-Track Equipment Safety Requirements

Abstract: This standard provides minimum safety requirements for On-Track Equipment (OTE) programs. Such programs must address the protection of all roadway workers conducting work on or near the Rail Transit Systems (RTS) rights-of-way. These programs require: adherence to rules and procedures; training; qualification; regular OTE maintenance; and monitoring of OTE safety compliance. This standard incorporates all of these elements and introduces a consistent approach throughout the rail transit industry.

Keywords: on-track equipment, roadway worker protection, railroad maintenance machine, maintenance vehicle, track safety, work area, work zone safety

Summary: This standard addresses and strengthens On-Track Equipment (OTE) safety requirements and related roadway worker protection (RWP), which were key elements raised by the National Transportation Safety Board (NTSB). According to *Safety Advisory 14-1 Right-of-Way Worker Protection* issued December 2013 by the FTA, Roadway Worker fatalities “continue to occur on the order of two to six per year.” To address this issue, the NTSB requested that the FTA require every RTS to evaluate their roadway worker protection programs and procedures and to issue direction to ensure that they adequately and effectively address appropriate training, communication, maintenance vehicle movement authorities, flagging procedures, rules compliance, and the sharing of a work area by multiple work crews. Unannounced compliance checks, periodic hazard analysis when required, review and revision of RTS RWP programs and the implementation of appropriate technology are the directives of this standard.

Every RTS requires periodic, scheduled and unscheduled maintenance of the tracks, switches, structures, signals, traction power system and other wayside equipment. The execution of this work

requires trained and qualified personnel to be on or about the right-of way (ROW) and their protection is of paramount importance. This protection is accomplished through enhanced design of

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safety systems on OTE; development of clear rules and procedures which govern the safe actions of roadway workers, the safe use and movement of OTE; and compliance with those rules and procedures.

Scope & Purpose: This standard applies to use of OTE by the RTS and its contractors. It addresses the basic required design elements; vehicle inspection requirements and maintenance; use of equipment in work areas and on track, and operating procedures that govern all actions on or near the OTE.

This standard augments existing APTA standards that address the protection of roadway workers by focusing specifically on the use and movement of OTE. Other issues related to RWP, work zone safety, and contractor safety are addressed in other APTA Operating Practices Standards.

Please review the following concurrently:

This standard references and incorporates provisions contained in the following APTA standards:

- APTA-RT-OP-S-011-10 ‘*Standard for Rule Compliance*’
- APTA-RT-OP-S-016-11 ‘*Standard for Standard for Roadway Worker Protection Program Requirements*’;
- APTA Standard APTA-RT-OP-S-004-03 ‘*Standard for Work Zone Safety*’ ; and
- APTA-RT-OP-S-010-03 ‘*Standard for Contractor’s Responsibility for Right of Way Safety*’

Roadway workers will be the common term used throughout the document to represent individuals working on the roadway or ROW. Other terms for workers may also be used, as appropriate.



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Introduction

This introduction is not part of APTA RT-OP-S-021-15, *Standard for On-Track Equipment Safety Requirements*.

This standard will augment existing APTA standards that address roadway worker protection, by focusing specifically on the use and movement of on-track equipment, which includes hi-rail vehicles and equipment. It is intended for rail transit, and has been developed in coordination with federal regulations 49 CFR Part 214 Subpart C and Subpart D, established in 1997.

While there are several standards and industry practices that refer to protection of right-of-way roadway workers, there are no standards that specifically address in a uniform way the movements of OTE which have been contributory factors in several fatalities of the workers.

This standard requires that the rail transit industry equip all existing and new OTE with certain minimum design features such as automatic change-of-direction alarms; back up alarms which provide audible signals; and alarms that are distinguishable from surrounding ambient noise, all of which will serve as secondary warning systems. This standard also requires that the RTS develop operating procedures and guidance for the use of OTE in work zone areas and along the right-of-way.

The work for developing this standard was initially started in response to NTSB recommendation R 12-36 to the APTA. The recommendation was as a result of an investigation into a fatal collision between a hi-rail vehicle and roadway workers. The NTSB's recommendation related specifically to OTE audible alerts, but the incident had multiple contributing factors.

Potential contributing factors also included the job complexity, workers and equipment in close proximity, and limited audible/visual warning due to loud work environment or size of equipment. This standard also incorporates, as applicable, elements of '*Safety Advisory 14-1 Right-of-Way Worker Protection*' issued December 2013 by the FTA.

Currently, there is no FTA regulation pertaining to RWP safety. The best source of data on RWP comes from the FRA through the FAMES Group (Fatality Analysis of Maintenance-of-way Employees and Signalmen). Their recent report on "Fatal Striking Accidents when Roadway Maintenance Machines Were Present", showed that 22 of the 41 roadway worker fatalities analyzed occurred with one or more OTE in proximity. Some of these workers were struck by the OTE while others were struck by trains or equipment moving on the adjacent track.

In developing this standard, APTA is appreciative of key expert stake holders which included the FTA (Office of Safety); personnel for rail transit properties including operations, safety, and maintenance-of-way; consultants; American Railroad Engineering & Maintenance of Way (AREMA); and the National Rail Contractors & Maintenance Association (NRCA).

Note on alternate practices

Individual RTSs may modify the practices in this standard to accommodate their specific equipment and mode of operation. APTA recognizes that some RTSs may have unique operating environments that make strict compliance with every provision of this standard impractical. As a result, certain transit systems may need to implement the standards and practices herein in ways that are more

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restrictive than this document prescribes. Transit systems may develop alternate practices to the APTA standards so long as the alternates are based on a safe operating history and are described and documented in the System Safety Program Plan (SSPP), or another document that is referenced in the SSPP.

Documentation of alternate practices shall:

- a) Identify the specific APTA transit safety standard requirements that cannot be met;
- b) State why each of these requirements cannot be met;
- c) Describe the alternate methods used; and
- 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).

It must be noted that rail transit is not directly comparable to railroads (e.g. Amtrak, commuter, freight rail etc.). RTSs differ greatly in the types of service, vehicles, and technology employed, with some systems operating fully automated trains on exclusive rights-of-way and others operating on streets mixed with traffic. Rail transit demands a unique approach to solving its problems, and the APTA Rail Transit Standards Program was enacted to accomplish this complex task.

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1. RTS on-track equipment operating safety requirements

The RTS shall develop rules and/or procedures for the safe use of on track equipment (OTE) to include, at a minimum all requirements established in the following sections of this Standard.

The RTS shall develop a process for performing periodic review of the OTE rules and/or procedures. The RTS shall periodically review its RWP program rules and procedures for compliance with its OTE rules and procedures.

The RTS shall ensure that individuals assigned to operate or direct OTE are properly trained and qualified, unless under the direct supervision of a qualified operator, as defined by the RTS.

The RTS shall require contractor owned and/or operated OTE to meet the requirements set forth in this Standard.

The elements contained in this standard apply to and govern any and all persons operating OTE, including RTS employees and contractors.

1.1 Physical characteristics plan

In developing its OTE rules and/or procedures, the RTS shall consider, as a minimum, the following elements and address any hazards. In some cases, this information may also be required to be addressed in a site specific work plan, if determined by the RTS:

- Physical characteristics of the RTS (e.g. stations, interlockings, signal locations, traction power substations, wayside traction power equipment that may be energized, bridges, tunnels, viaducts, limited clearance zones, line of sight);
- Physical clearance of adjacent areas, including but not limited to structures, rail vehicles, and electrical infrastructure;
- Expected work/tasks for OTE operators and roadway workers;
- Operating OTE;
- Types of OTE;
- Red zones;
- Low clearances;
- No clearance zones;
- Automobile traffic; and
- Buried utilities or other hazards, if work involves any portion of equipment to extend below the surface of the right-of-way.

2. General OTE inspection documentation requirements

The RTS shall develop procedures regarding the requirements for OTE inspection prior to it being

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operated. These procedures shall also indicate the frequency for inspection of the OTE for operational safety. The RTS shall identify and document the inspection requirements which apply to RTS and contractors' OTE.

2.1 Pre-work OTE inspections

The RTS shall develop a procedure that clearly identifies the inspection process to be followed by the OTE operator prior to OTE operation.

The RTS shall establish and require the completion of an OTE pre-work inspection checklist prior to the initial operation of the OTE and require retention of that checklist on the OTE throughout the work period. This shall include provisions indicating that:

- The operator of OTE shall check the OTE components for compliance per the requirements of the RTS, prior to using the OTE at the start of the operator's work shift, in a manner prescribed by the RTS.
- Any non-complying safety-related condition that cannot be repaired immediately shall be tagged and dated in a manner prescribed by the RTS and reported to the designated official.

The RTS shall identify the types of roadway workers who are authorized to complete the checklist.

The pre-work checklist shall include a list safety items that shall be operational, at a minimum, including:

- Light system, including: headlight, tail and brake lights, warning lights.
- Alert systems, including audible movement alert and change of direction alarm horn.
- Brake system.

The RTS shall determine which defects could inhibit the safe operation of the OTE and whether or not the unit can be operated with alternate safeguards as formally identified and required by the RTS.

The RTS shall develop procedures governing the use of failed OTE, including the movement of the OTE to a safe place of repair.

The RTS shall require the documentation of pre-work and any OTE inspection activities.

The RTS shall determine if certain environmental conditions will allow for work to be continued if headlights and/or horns are found to be non-compliant. The RTS shall identify mitigating procedures which will serve as an acceptable temporary substitution under these circumstances. The RTS shall identify who is authorized to make the decision to continue work and the procedures to be followed and documentation to be retained if such conditions are permitted.

2.2 OTE lockout/tagout procedures

The RTS shall develop lockout/tagout procedures for each type of OTE operated on the RTS, regardless of whether equipment is defective or under maintenance. The RTS shall require that contractors meet or exceed RTS requirements. The use of the term lockout/tagout shall not be intended to mean instructions related specifically to electrical systems/traction power lockout or tagout.

Rail Transit Standard for On-Track Equipment Safety Requirements**2.3 OTE inspections**

The RTS shall develop procedures for the initial and periodic inspection and maintenance of OTE owned or leased by the RTS.

The RTS shall establish requirements that contractors conduct periodic inspection and/or maintenance of OTE, which can be verified by the RTS.

In addition to the OTE inspection requirements, the RTS shall establish inspection requirements specific to hi-rail vehicles and equipment used by the RTS.

3. OTE operations alert system requirements

OTE operations alert system refers to equipment installed on the OTE, wayside, or track that provides audible alarms and visual warnings for the purpose of alerting OTE presence and/or movement to roadway workers.

The RTS shall determine the appropriate types of alert systems necessary for the RTS's specific environmental and equipment considerations.

The RTS shall equip all OTE with the alert systems described in Section 3.1 of the Standard.

In the period before existing OTE is equipped with permanent alert systems described in Section 3.1 of this Standard, the RTS shall equip existing OTE with a portable horn or other audible warning device that produces a sound loud enough to be heard by roadway workers and other OTE operators within the immediate work area.

Within 24 months of the adoption date of this Standard, the RTS shall retrofit existing OTE with the minimum requirements listed in Section 3.1.

The OTE alert provisions contained in Section 3 of this Standard shall apply only when OTE is operating on track.

The RTS shall provide for an alert system mode that can be activated when rubber tire OTE is operating in a working mode on pavement containing embedded track.

3.1 Minimum requirements for an OTE operations alert system

The minimum requirements for an OTE operations alert system are:

- Audible OTE movement alarm.
- Audible OTE change of direction alarm, minimum of three seconds in length.
- OTE lighting.

The RTS shall require that any audible alarm activates automatically when the vehicle begins movement or changes direction of movement.

The RTS shall require that any audible alarm produces a sound loud enough to be heard by roadway workers and other OTE operators within the immediate work area.

All audible alarms installed on OTE shall be distinguishable from the surrounding noise.

The RTS shall establish a procedure for the temporary use of alternate alerts in the event that the automatic system stops functioning while at the work site or during track travel.

The RTS shall establish a procedure for the temporary use of alternate alerts when noise ordinances prohibit the use of the audible alarms.

The RTS shall require that audible alarms are discussed in the pre-work safety briefing, including a discussion of any different alarm sounds that may be used on specific equipment.

3.1.1 Audible OTE movement alarms

OTE shall be designed so that the movement alarm may be interrupted by the OTE operator when operating the OTE in work mode if the function of the OTE would result in a constant, or almost constant, sounding of the device. The equipment shall include a function so that it cannot be permanently overridden and will default to the automatic mode after an established time period. Work mode shall not include the movement of OTE during track travel. The use of OTE audible alarms shall be determined by the RTS or any prevailing regulatory requirements.

Any triggering mechanism (on/off or override switch) for the device shall be clearly identifiable and within easy reach of the OTE operator.

The RTS shall establish minimum requirements for the use of existing OTE that is not yet equipped with OTE movement alarm equipment, including, but not limited to sounding the horn prior to movement from a stationary location or when changing direction.

3.1.2 Audible OTE change of direction alarm

The OTE change of direction alarm shall be distinguishable from the movement alarm and shall be a minimum of three seconds in length.

3.1.3 OTE lighting requirements

At a minimum, the RTS shall equip each existing OTE with a permanent illumination device or portable light that is securely mounted on the OTE. New OTE shall be equipped with permanent illumination devices. The illumination device or portable light shall be capable of illuminating obstructions on the track ahead for a distance of 300 feet under normal weather and atmospheric conditions when the OTE is operated during the period between one-half hour after sunset and one-half hour before sunrise or in dark areas such as tunnels.

3.1.3.1 Alternating flashing warning lights for direction of OTE movement

The RTS shall equip all OTE with alternating flashing white lights¹ that remain on when the vehicle is moving. Such lighting shall not be part of the headlight of the OTE. When the vehicle starts moving, these lights shall activate automatically and be visible on the end of the vehicle facing the direction of movement. These lights shall automatically turn off when the vehicle is not in a drive mode.

¹Alternating flashing lights can be accomplished using strobe, LED, or other white lights with a single or double flash pattern between 60-120 fpm.

Rail Transit Standard for On-Track Equipment Safety Requirements**3.1.3.2 Flashing warning lights for OTE**

The RTS shall equip all OTE with a flashing warning light or system of warning lights mounted in a way that provide 360-degrees of warnings on the outside of the vehicle.

3.1.4 OTE-related technology**3.1.4.1 Use of new OTE-related technologies**

In order to promote multiple layers of protection, the RTS shall consider the use of available technologies as an overlay to the existing OTE safety protocols. However, this recommendation is made with three very strong caveats:

- Use the technology in addition to—not in place of—the established on-track safety rules and procedures.
- Do not use the technology in a way that would put workers at risk in the event of a failure of the technology.
- Conduct a hazard analysis and thoroughly test and evaluate the performance of the technology in the specific physical and operating environments of the RTS.

3.1.4.2 Consideration for detection of OTE on the right of way technologies

The RTS shall consider the feasibility and reliability of OTE detection systems (such as automatic vehicle locator systems) that provide for the identification of the presence and/or movement of OTE on the track. If the RTS determines that such systems are technologically feasible and provide reliability, as established by the RTS, it may require the installation of such systems.

3.1.5 Visual reflective device

The RTS shall equip the front, rear, and sides of all on-track equipment with visual reflective tape and/or other high-visibility reflective materials.

The RTS shall establish specific requirements for the design and placement of reflective tape and/or other high-visibility reflective materials on OTE.

3.2 Safety considerations in OTE design

The RTS shall consider current and future safe operating practices and safety-related technologies in the design and development of specifications for new OTE. The RTS shall consider evaluating new operating environments or system modifications that may have an impact on how OTE is used or types of OTE being introduced to the RTS.

3.3 OTE acceptance testing requirements

The RTS shall incorporate the design provisions of this standard into acceptance testing requirements for OTE, as appropriate.

4. OTE operating rules and procedures

The RTS shall develop operating rules and procedures for normal and abnormal conditions that address the following areas:

- OTE operator responsibilities.
- OTE movement rules.
- Roadway workers when working on, or around OTE.

Procedures shall include, but not be limited to:

- Preventing a person from being struck by OTE in motion or operation.
- Preventing injury or property damage related to placement and/or movement of OTE payload.
- Preventing any part of the OTE from being struck by a train or other OTE on another track.
- Preventing any part of the OTE from contacting a train, other OTE, or wayside fixed infrastructure.
- Stopping the OTE short of other machines or obstructions on the track.

4.1 OTE operator responsibilities

The RTS shall identify the minimum responsibilities for OTE operators, consistent with APTA Standards APTA-RT-OP-S-016-11 '*Standard for Standard for Roadway Worker Protection Program Requirements*'; APTA Standard APTA-RT-OP-S-004-03 '*Standard for Work Zone Safety*'; and APTA-RT-OP-S-011-10 '*Standard for Rule Compliance*'.

4.2 OTE movement rules

The RTS shall develop and implement rules governing the movement of OTE on the mainline and in the yard. At a minimum, the movement rules shall address:

- OTE and train separation during track travel.
- OTE and roadway worker separation.
- Limits of movement being clearly communicated and acknowledged by the EIC and/or the OTE operator.
- Allowances for moving multiple pieces of work equipment in a block, as defined by RTS, including, at a minimum: communication, spacing between units, and speed.
- Allowances for moving multiple pieces of OTE past wayside signals.
- Maximum Authorized Speeds on mainline and through stations as determined by RTS, accounting for:
 - Type of OTE
 - OTE weight
 - Payload
 - Line of sight
 - Reverse or normal running.
- A defined transfer point and communication channel when control of OTE transferred from OCC to EIC/QPE/work area.
- Movement of OTE when entering and leaving mainline territory.
- Movement of OTE past signals, switches, and grade crossings.
- Movement of OTE within the work zone controlled by QPE.
- Movement of OTE through adjoining working limits.

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- Movement of OTE where the operator in a cab has an obstructed view, and use of a pilot, video system, or safe operating protocol, as determined by the RTS, may be required.
- Movement of OTE with the audible alert manually overridden via use of the triggering mechanism referenced in Section 3.1.1 of this Standard.
- Idling restrictions related to noise and exhaust.
- Proper securement of unattended OTE.
- Emergency procedures.

The RTS shall develop rules on movement alarms and OTE lighting involving track travel; while working in a work zone; and when changing direction.

4.3 Roadway workers when working on or around OTE

The RTS shall define the process for how roadway workers will communicate with the OTE operator.

The RTS shall develop a procedure establishing those specific types of signaling to be used by roadway workers or other wayside personnel “on the ground” to communicate with OTE operators during equipment operations to ensure mutual understanding, safe movement of OTE, and worker protection.

4.3.1 Red zones

For each piece of OTE, the RTS shall establish the areas where OTE mechanical actions (swing arms, moving parts, etc.) would pose a hazard to roadway workers. Roadway workers shall not enter the red zone until/unless the operator of the OTE makes eye contact with the roadway workers, ceases operation, and removes his/her hands from the controls.

4.3.2 Proper clearances

The RTS shall designate a lookout (or lookouts) to observe OTE clearance and give timely warning for all operations when it is difficult for the operator to observe clearance.

5. OTE requirement for pre-work safety briefings

Specific requirements for the Pre-Work Safety Briefing are contained in APTA Standard APTA-RT-OP-S-016-11 *Standard for Roadway Worker Protection Program Requirements*.

The RTS shall require that when OTE is in use, the Pre-Work Safety Briefing shall also include hazard identification and mitigation, as well as information unique to the use of OTE, including but not limited to:

- OTE audible and visual alerts and alarms.
- Special instructions relating to the work zone around OTE and minimum distances between machines while working and traveling.
- Mounting and dismounting OTE on the field side, not on a live track side, when possible.
- Identifying and reviewing environmental conditions (e.g., wet, icy, oily/greasy rails) affecting the stopping distance of OTEs.
- How OTE operators shall clearly communicate signals for slowing, stopping, and changing direction, as well as movement of payload(s).

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- Procedures for establishing clear communication and maintain proper clearance between OTE operators and workers on the ground under adverse weather conditions (if applicable). Communicating change in direction is imperative.
- Transfer of non-shunting equipment onto the mainline.
- Movement authority with respect to signals, switches, and grade crossings.
- Procedures for establishing clear communications when OTE operations are transferred from one operator to another.

6. Track allocation program requirements

The RTS shall establish a track allocation program that defines the process to schedule and authorize access to the ROW, for OTE and roadway workers. For details on track allocation program requirements, see APTA Standards APTA-RT-OP-S-020-14 *Standard for Rail Transit Track Allocation Program Requirements* and APTA RT OP-S-016-11 *Standard for Roadway Worker Protection Program Requirements*.

Each RTS shall establish procedures for notifications to revenue equipment operations for areas of the railroad which have been allocated for maintenance or non-revenue operations.

7. Contractor's responsibility for right-of-way safety

The RTS shall provide appropriate rules, regulations and procedures for the conduct of contractors who will perform work on the ROW and operating/interfacing with on-track equipment. For details on the contractor's responsibility while on the ROW, see APTA Standard APTA-RT-OP-S-010-03 *Standard for Contractor's Responsibility for Right of Way Safety*. The RTS shall also incorporate the requirements of this APTA Standard into the contractor's requirements.

RTS shall establish contractual requirements that contractors will provide records, when requested, to show that workers are qualified to operate OTE. Each RTS shall establish contractual requirements that contractors are to provide maintenance documentation, inspection records and weight documentation to ensure equipment is within its intended operating parameters and in a state of good repair.

The RTS shall establish requirements for contractors to maintain OTE in accordance with manufacturer's requirements, or other requirements as indicated by the RTS.

The RTS shall establish requirements for contractors to provide OTE and OTE operators that are compliant with the provisions of this standard, unless provisions or a written and signed waiver is granted by the RTS.

8. Personal protective equipment

The RTS shall identify and establish the proper level of PPE requirements related to the operation of and working around OTE.

9. Rule compliance program

The RTS shall establish a procedure to ensure OTE operators and roadway workers are in compliance with the RTS's operating and safety rules during the performance of their duties.

See APTA-RT-OP-S-011-10 '*Standard for Rule Compliance*' for additional information on structuring a comprehensive Rule Compliance Program.

10. Training program structure

The RTS shall ensure each OTE operator is trained and qualified for each piece of OTE he or she operates. The RTS shall ensure that individuals assigned to operate or direct OTE are trained and qualified on all requirements of this standard, unless the OTE is operated under the direct supervision of a qualified operator during training, as defined by the RTS.

The RTS shall incorporate OTE awareness, based on the provisions of this Standard, into the RWP training program.

The RTS shall establish a process to ensure that contractor OTE operators are appropriately trained and/or qualified to operate the OTE.

The RTS shall ensure that all OTE-related training complies with the requirements of APTA Standard RT-OP-S-0143-03 *Standard for Training of Rail Operations and Station Operations Personnel*. This shall include, at a minimum, provisions for: initial, refresher, return-to-work, and post-incident training.

11. Recordkeeping

The RTS shall establish a program for keeping appropriate OTE equipment and operator records. Information may be recorded on forms provided by the RTS or by electronic means.

The RTS shall determine and document the record retention timeline. At a minimum, records shall be composed of the following:

- OTE operator training and/or qualification.
- OTE inspection records.
- OTE maintenance records.

The RTS shall consider, as a minimum, retaining the following training information:

- Date and Type of Training.
- Date of employee qualification and associated records.
- Name and qualification of the Instructor(s).
- Name of the trainee.
- Specific equipment and safety –related work practice topics.
- Contractor training.

Other related APTA Standards

- Standard on Work Zone Safety – APTA-RT-S-OP-004-03
- Standard for Contractor’s Responsibility for Right-of-Way Safety – APTA-RT-OP-S-010-03 (*Previously numbered as APTA-RT-S-OP-010-03*)
- Standard for Rule Compliance – APTA-RT-OP-S-11-10 (*Previously numbered as APTA-RT-S-OP-11-10*)
- Standard for Training of Rail Operations & Station Operations Personnel – APTA-RT-OP-S-013-03 (*Previously numbered as APTA-RT-S-OP-013-03*)
- Standard for Roadway Worker Protection Program Requirements – APTA-RT-OP-S-016-11 (*Previously numbered as APTA-RT-S-OP-016-11*)
- Standard for Rail Transit Track Allocation Program Requirements – APTA-RT-OP-S-020-13 (*Previously numbered as APTA-RT-S-OP-020-13*)

References

- FTA Safety Advisory 14-1: *Right-of-Way Worker Protection* issued December 2013
- 49 CFR 214.511 (a) Audible warning device requirements
- 49 CFR 214.511 (b) Automatic change of direction alarms
- 49 CFR 214.523 (c) New hi-rail vehicles (requirements for equipment)
- 49 CFR 517 Retrofitting of existing on-track roadway maintenance machines manufactured on or after January 1, 1991
- 49 CFR 521 Flagging equipment for on-track roadway maintenance machines and hi-rail vehicles
- 49 CFR 523 Periodic inspection of hi-rail vehicles
- 49 CFR 527 (a) On-track roadway maintenance machines; check for compliance prior to using machine at the start of operator’s work shift.

Definitions

alarm: Audible sound designed to provide warnings in a working environment.

alert system (alert): The audio and visual equipment installed to provide warnings in a working environment.

controlled track: Track upon which the RTS’s operating rules require that all movement of trains must be authorized by a train dispatcher or a control operator.

contract operator: A contractor who operates and/or maintains a rail transit system.

employee: An individual who is engaged or compensated by an RTS or by a contractor to an RTS to perform any of the duties defined in this standard.

employee-in-charge (EIC): (define)

employer: An RTS, or contractor to an RTS, which directly engages or compensates individuals to perform any of the duties defined in this standard.

exclusive track occupancy: A method of establishing working limits on controlled track in which movement authority of trains and other equipment is withheld by the train dispatcher or control operator, or is restricted by flag persons.

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flag person: When used in relation to roadway worker safety, flag person means an employee designated by the RTS to direct or restrict the movement of trains past a point on a track to provide on-track safety for roadway workers.

foul time: One method of establishing working limits on controlled track in which a roadway worker is notified by the train dispatcher or control operator that no trains will operate within a specific segment of controlled track until the roadway worker reports clear of the track.

fouling a track: The placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or other on-track equipment, or in any case is within a distance determined by the RTS.

inaccessible track: A method of establishing working limits on non-controlled track by physically preventing entry and movement of trains and equipment.

individual train detection (ITD): A procedure by which a lone worker acquires on-track safety by seeing approaching trains or on-track equipment and moves to a place of safety before its arrival.

lone worker: An individual roadway worker who is not being afforded on-track safety by another roadway worker, who is not a member of a roadway work group, and who is not engaged in a common task with another roadway worker.

non-controlled track: Track upon which trains are permitted by RTS rule or special instruction to move without being under an automatic train control system or receiving authorization from a train dispatcher or control operator.

on-track equipment (OTE): A rail mounted vehicle or equipment, including hi-rail vehicles and equipment, that is not used in revenue service but is used to inspect, maintain, and repair the rail system.

on-track safety: The practice of working in a manner that will minimize the danger of being struck by a moving RTS train or other on-track equipment, provided by operating and safety rules that govern track occupancy by personnel, trains and on-track equipment.

operations control center/control center/central control: The facility where rail operations such as train control, train dispatching, train supervision and related field activities are accomplished for the entire rail transit system or for specific segments of a system if there is more than one such facility.

place of safety: A location or condition that protects a worker from a train or other on-track equipment.

qualified: A status attained by an employee who has successfully completed any required training for, has demonstrated proficiency in, and has been authorized by the employer to perform the duties of a particular position or function.

qualified protection employee (QPE): An individual trained and qualified on on-track safety and operating rules and assigned the responsibility of providing on-track protection. An RTS may use another term for the person in this position. The QPE can also be referred to as the employee in charge (EIC).

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rail transit system (RTS): The organization that operates rail transit service and related activities. Also known as the transit system, transit agency, operating agency, operating authority, transit authority and other similar terms.

rail vehicle: A self-propelled vehicle equipped with flanged wheels.

red zone: An area surrounding working equipment, employees using tools, and lifting operations which, if entered by an individual(s), creates the potential for injury as a result of being struck by equipment, tools, or material. A red zone may be specifically defined by rule.

roadway: Owned property of the RTS within the controlled area, as defined by the RTS, often referred to as “right-of-way.”

roadway work group: Two or more roadway workers organized to work together on a common task.

roadway worker: Any employee of an RTS, or of a contractor to an RTS, whose duties include inspection, construction, maintenance or repair of RTS track, bridges, roadway, signal and communication systems, electric traction systems, roadway facilities or roadway maintenance machinery on or near track or with the potential of fouling a track, and other personnel directly involved with their protection.

system safety program plan: A document developed and adopted by the rail transit agency, describing its safety policies, objectives, responsibilities and procedures.

track travel: The movement of OTE on track outside of working limits.

train: A rail mounted vehicle that is used or intended to be used in revenue service.

train approach warning: A method of establishing on-track safety by warning roadway workers of approaching trains or on-track equipment.

watchperson/lookout: An employee who has been trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment.

working limits: A segment of track with definite boundaries upon which trains and/or on-track equipment may move only as authorized by the roadway worker having control over that defined segment of track.

Abbreviations and acronyms

FRA	Federal Railroad Administration
FTA	Federal Transit Administration
EIC	employee in charge
ITD	individual train detection
NATSA	North American Transit Services Association
OTE	on-track equipment
PPE	personal protective equipment
QPE	qualified protection employee
RWP	roadway worker protection
RTS	rail transit system
SSPP	System Safety Program Plan

Summary of changes

This is a new document therefore there are no changes.

Document history

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