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APTA PRESS Passenger Systems
Working Group

Passenger Railroad Emergency Communications

Abstract: This standard establishes the minimum criteria for the provision and use of onboard communications systems for railroad operating personnel, with particular focus on communications in the event of an emergency.

Keywords: emergency communications, radios

Summary: The establishment and execution of communications between train crews, operations control personnel and train passengers are of the utmost importance under normal circumstances. During emergency situations, such communications take on added importance in the task of ensuring the safety of all involved. This standard has been designed to assist and guide individuals and organizations in incorporating safety considerations into communications systems.

Scope and purpose: This standard establishes minimum criteria for onboard communications systems for railroad operating personnel. It is divided into five categories: train crew-to-train crew emergency communications; train crew-to-operations control/dispatch center emergency communications; train crew-to-passenger emergency communications; train crew-to-emergency responder emergency communications; and operations control/dispatch-to-passenger emergency communications.

This document represents a common viewpoint of those parties concerned with its provisions, namely transit operating/planning agencies, manufacturers, consultants, engineers, and general interest groups. APTA standards are mandatory to the extent incorporated by an applicable statute or regulation. In some cases, federal and/or state regulations govern portions of a transit system's operations. In cases where this is a conflict or contradiction between an applicable law or regulation and this document, consult with a legal advisor to determine which document takes precedence.

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Participants

The American Public Transportation Association greatly appreciates the contributions of the **PRESS Passenger Systems Working Group**, which provided the primary effort in the drafting of this document.

At the time this standard was completed, the working group included the following members:

Rony Philip, Denton County Transportation Authority (DCTA), *Chair*
Nicholas Harris, Hatch LTK, *Vice Chair*

Mark Anderson, *Huber + Suhner, Inc.*
Carl Atencio, *American Rocky Mountaineer*
Andrew Aubert, *TDG Transit Design Group*
Charles Barlow, *EverGlow NA*
Jeffrey Bennett, *DC DOT*
Bill Bruhn, *Jessup Manufacturing*
Paul Callaghan, *Transport Canada*
Ed Carruthers, *SEPTA*
Melvin Clark, *Hatch LTK*
Sean Cronin, *Metra*
Miles Crumley, *TriMet*
Sebastian Durzynski, *TDG Transit Design Group*
Phillippe Etchessahar, *ALSTOM Transport*
Steve Finegan, *Atkins Global NA*
Tom Freeman, *International Name Plate Supplies*
Muriel Friday, *Capital Metro. Trans. Authority*
Andre Gagne, *ALSTOM Transport*
Marc Gagne, *TDG Transit Design Group*
Jeffrey Gordon, *Federal Railroad Administration*
Lowell Goudge, *ALSTOM Transportation*
Yosi Grunberg, *Atkins Global NA*
Robert Jones, *Stadler Rail Group*
Joseph Kenas, *ALSTOM Transport*
Christian Knapp, *Denver Transit Operators*
Tammy Krause, *Atkins Global NA*

Peter Lapré, *Federal Railroad Administration*
Francesco Maldari, *MTA Long Island Rail Road*
Liam Martin, *ABB, Inc.*
Eloy Martinez, *Hatch LTK*
James Michel, *Marsh USA, Inc.*
Johnathan Michel, *Fourche Design*
Joshua Munoz, *Hatch LTK*
Thomas Peacock, *Atkins Global NA*
Scott Rodda, *Virginkar & Associates, Inc.*
Thomas Rowbottom, *Port Authority Trans Hudson*
Mehrddad Samani, *Hatch LTK*
Duane Sayers, *Regional Transportation District*
Brian Schmidt, *San Joaquin Regional Rail Commission*
Martin Schroeder, *Jacobs*
Richard Seaton, *TDG Transit Design Group*
Kiyotaka Seki, *Railway Technical Research Institute*
Melissa Shurland, *Federal Railroad Administration*
David Skillman, *Amtrak*
Blair Slaughter, *Amtrak*
Nick Sorenson, *Utah Transit Authority*
Walt Stringer, *Walt Stringer & Associates*
Lukasz Smysiak, *VIA Rail Canada*
David Wade, *International Name Plate Supplies*
Gary Wagner, *Amsted Rail*
Andrew Wood, *Washington State DOT*

Project team

Nathan Leventon, *American Public Transportation Association*
Narayana Sundaram, *American Public Transportation Association*

Introduction

This introduction is not part of APTA-PR-PS-001-98, Rev. 2, “Passenger Railroad Emergency Communications.”

This standard applies to all:

- railroads that operate intercity or commuter passenger train service on the general railroad system of transportation; and
- railroads that provide commuter or other short-haul rail passenger train service in a metropolitan or suburban area, including public authorities operating passenger train service.

This standard does not apply to:

- rapid transit operations in an urban area that are not connected to the general railroad system of transportation;
- tourist, scenic, historic or excursion operations, whether on or off the general railroad system of transportation;
- operation of private cars, including business/office cars and circus trains; or
- railroads that operate only on track inside an installation that is not part of the general railroad system of transportation.

This standard is designed to help individuals and organizations incorporate and apply safety considerations in the emergency communications process. It describes the emergency communications functions and responsibilities of the following groups:

- train crew members with other train crew members
- train crew members with operations control or dispatch centers
- train crew members with passengers on their trains
- train crew members with emergency responders
- operations control/dispatch personnel with passengers

This standard is intended for the following:

- train crew members
- operations control or dispatch personnel
- railroad operations managers
- individuals or organizations that have a responsibility for maintaining railroad communications equipment
- individuals or organizations that are involved in the design and manufacturing of railroad communications systems

This standard uses a systems approach to help provide useful means for evaluating and selecting methods of railroad communications in the event of an emergency. Railroads and car builders should carefully identify the skills and training requirements necessary for all railroad personnel who are required to use communications systems to meet emergency evacuation requirements presented in this standard.

Passenger Railroad Emergency Communications

1. Emergency communications

1.1 General procedures

1.1.1 Required types of communications equipment

- The controlling locomotive, leading multiple unit or cab cars shall be equipped with communications systems consistent with the requirements for trains in the 49 Code of Federal Regulations (CFR), Part 220.9, Requirements for trains. In the case of joint operations, the communications systems must also be able to communicate with the Operations Control Center (OCC) of the host railroad.
- A redundant communications system capable of contacting the OCC shall be operable prior to departure from the initial terminal in case of primary radio failure en route. In the case of joint operations, the communications systems must also be able to communicate with the OCC of the host railroad.
- The public address (PA)/intercom system shall be tested for operability prior to departure from the initial terminal in accordance with 49 CFR Part 238.121, Emergency Communication. If a failure of the public address/intercom system occurs while the train is en route, then an alternate means of establishing and maintaining contact with passengers and among crew members shall be utilized in accordance with the railroad's operating rules and instructions.
- A train crew member, generally the locomotive engineer, located in the controlling locomotive, leading multiple units or cab car shall have a means of communicating orally with a designated train crew member. In case of failure of this means of communication, the train crew shall establish alternative means.
- If the train is so equipped, the crew communicating signal system (e.g., buzzer or bell) shall be tested to determine operability prior to departure from the initial terminal. In case of failure of this means of communication, the operating crew shall establish alternative means.
- If the train is so equipped, communication systems designed for use by passengers, such as those required by 49 CFR Part 238.121(b), shall have clear, concise instructions for their use posted at or near the location of the communications equipment in each rail vehicle. The operating instructions must be legible and clearly marked with photoluminescent material in accordance with APTA PR-PS-S-002-98, Rev. 3, "Emergency Signage for Egress Access of Passenger Railroad Equipment."
- If the train and OCC are so equipped, direct communications between the OCC and passengers shall be considered.
- If so equipped, backup power shall be compliant with 49 CFR Part 238.121(c)(1)-(3). If equipped with a train radio, backup power shall be sufficient to supply additional power for radio communication for 30 seconds at 10-minute intervals for a period of 90 minutes or with the last 15 minutes of the 90-minute period being continuous communication.

1.2 Train crew-to-train crew communications

In the event of an emergency, train crew members shall communicate with one another through the quickest means available (e.g., train radios, PA system or simple voice contact) to assess the severity of the situation.

1.3 Train crew-to-operations control/dispatch center communications

After establishing contact with one another and assessing the situation, a member of the train crew shall contact the railroad's OCC to inform them of the emergency by whatever means necessary. If the hardwired radio system is not operational, then an alternate mode may be used, including a handheld portable radio, cellular telephone or other available means selected by the passenger rail operator. The use of station, wayside, landline or block line telephones may be used if accessible and expedient.

If using a radio to establish emergency communication, communication shall be established in accordance with the Federal Railroad Administration (FRA) regulations for emergency radio transmission as prescribed in 49 CFR, Part 220.47, Emergency radio transmissions. The emergency situation must be described in accordance with the requirements of 49 CFR, Part 220, Railroad Communications. However, if due to the nature of the emergency or the condition of the communications equipment as a result of the emergency, the communication by the crew to the OCC is incomplete, then the OCC must endeavor to obtain as much information as possible in order to determine the safest, most expeditious response to the emergency.

If using a combination of communication modes in the transmission/receipt of emergency communications (e.g., initiating transmission from a radio equipped with a keypad, which directs the call to the OCC telephone), then the most restrictive communication protocols shall prevail as defined by the host railroad.

1.4 Train crew-to-passenger communications

After informing the OCC, a train crew member shall communicate with the passengers on the train by whatever mode possible. If the PA system is not operational or is determined to be only partially operational, train crew members shall walk through the train consist and establish direct communications with passengers. This process shall be repeated at reasonable intervals throughout the duration of the emergency situation.

1.5 Train crew-to-emergency responder communications

It shall be a property-specific determination as to whether or not train crews will directly contact emergency responders after first notifying the OCC. However, after the arrival of emergency responders, and upon their establishing command and control, train crew members will offer full cooperation (see Appendix C, "Train crew-to-emergency responder communications").

1.6 Use prohibition of communication modes

If it becomes known that a suspicious package or bomb is suspected or discovered on the train, a designated member of the train crew will immediately notify the OCC by the quickest means available. Upon completion of this transmission, a member of the train crew will announce over the PA system to the passengers that the use of all cellular telephones and portable electronic devices must cease.

No portable radio transmission shall be activated within at least 300 ft of the train. The ranking emergency responder (police, fire department, bomb squad, etc., consistent with applicable state and local regulations) will determine all further communications and establish command and control at the scene.

1.7 Training of railroad operations personnel

Train crew members shall be instructed at intervals specified in the specific agency's program of instruction on operating rules, or in accordance with the requirements of 49 CFR Part 243.

Instruction shall include the physical use of the different modes of communication systems used within the rail service. It shall also cover proper communications protocols required while operating each of the different

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modes of communications and communications systems used on the rail property and/or within the rail service.

In addition to initial and periodic instruction, employees whose duties require them to use communications systems and equipment in connection with railroad operations will be periodically tested for compliance with communication standards and protocols under the FRA requirements in 49 CFR Part 217.9, Program of operational tests and inspections; recordkeeping.

Related APTA standards

APTA PR-PS-S-002-98, Rev. 3, “Emergency Signage for Egress Access of Passenger Railroad Equipment”

References

This standard shall be used in conjunction with the following publications:

Code of Federal Regulations:

Title 49 CFR, Part 217, Railroad Operating Rules

Subpart A, General

Section 9, Program of operational tests and inspections; recordkeeping.

Title 49 CFR, Part 220, Railroad Communications

Subpart A, General

Section 9, Requirements for trains.

Subpart B, Radio and Wireless Communication Procedures

Section 47, Emergency radio transmissions.

Title 49 CFR Part 223, Safety Glazing Standards - Locomotives, Passenger Cars and Cabooses

Title 49 CFR Part 238, Passenger Equipment Safety Standards

Subpart B, Safety Planning and General Requirements

Section 121, Emergency communication.

Paragraph (b), Intercom system.

Paragraph (c), Back-up power.

Subpart E, Specific Requirements for Tier II Passenger Equipment

Section 439, Doors.

Title 49 CFR, Part 243, Training, Qualification, and Oversight for Safety-Related Railroad Employees

Definitions

dispatch: See *Operations Control Center*.

emergency (emergency situation): An unexpected event related to the operation of passenger train service involving significant threat to the health or safety of one or more people and requiring immediate action. Examples include derailment, highway/rail grade crossing accident, passenger or employee fatality or serious illness/injury, evacuation of train, or security situation.

hardwired radio: A radio communications device permanently mounted in a railroad vehicle and permanently connected to an antenna mounted on the vehicle.

intercom: A communications system within a train consist that is keyed into by a train crew member for transmission/broadcast to/from specific locations within the train and used to provide train crew-to-passenger communication and intra-crew communication.

Operations Control Center (OCC): A central or designated regional location of a railroad with responsibilities for directing the safe movement of trains.

public address (PA) system: A communications system within a train consist used to provide train crew-to-passenger communication and intra-crew communication with speakers located throughout the interior of the rail vehicles, including the vestibules, and optionally on the exteriors of the vehicles. Removable hand microphones are considered part of the system.

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redundant communications system: A backup system of communications to be used in the event of failure of the primary communications system. Such redundant systems may consist of a portable radio carried by a train crew member, a cellular telephone available to a crew member, or multiple hardwired radios in the consist of a train.

train crew member: A railroad employee involved with the movement of railroad rolling equipment and working together with other train crew members as an operating crew. This operating crew unit is under the charge and control of one crew member, generally the conductor of the train, and is subject to the railroad operating rules and program of operational test and inspections, as well as governed by the Hours of Service Act.

working radio: A radio that can communicate two ways (transmit and receive), with the OCC (through repeater stations, if necessary) from any location within the rail system, with the exception of limited segments of territory where topography or transient weather conditions temporarily prevent effective communication.

working wireless communications: A hard-wired radio, portable radio, cellular telephone, or other means of two-way communication, with the capability to communicate with either the OCC or an emergency responder of the railroad from any location within the rail system (with the exception of limited segments of territory where topography or transient weather conditions temporarily prevent effective communications).

Abbreviations and acronyms

CFR	Code of Federal Regulations
FCC	Federal Communication Commission
FRA	Federal Railroad Administration
HPPL	high-performance photoluminescent
NATSA	North American Transportation Services Association
OCC	Operations Control Center
PA	public address

Summary of document changes

- Document formatted to the new APTA standard format.
- Sections have been moved and renumbered.
- Scope and summary moved to the front page.
- Definitions, abbreviations and acronyms moved to the rear of the document.
- Two new sections added: “Summary of document changes” and “Document history.”
- Some global changes to section headings and numberings resulted when sections dealing with references and acronyms were moved to the end of the document, along with other cosmetic changes, such as capitalization, punctuation, spelling, grammar and general flow of text.
- Names of participants updated.
- Introduction updated.
- Section 1.1.1: CFR requirements for failure of communication equipment en route added.
- Section 1.1.1: Consideration of direct communications between the OCC and passengers added.
- Section 1.1.1: Performance requirements for back-up power for train radio update to correspond with Federal Railroad Administration interpretation of 49 CFR § 238.121(c).
- Removed definition of tone generator.
- Appendix B: Peer review of emergency communications in the passenger railroad industry updated with most recent survey results.

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Document history

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The original version of this standard took effect Jan. 1, 2000.

Appendix A: Bibliography

- [B1] DOT-FRA-ORD 93-24, Federal Railroad Administration/Volpe Center, U.S. Department of Transportation, Recommended Emergency Preparedness Guidelines for Passenger Trains, December 1993.
- [B2] 49 CFR, Part 223, Safety Glazing Standards.
- [B3] 49 CFR, Part 239, Passenger Train Emergency Preparedness
- [B4] 49 CFR, Part 270, System Safety Program
- [B5] FRA Emergency Order Number 20—Notices 1 and 2.

Appendix B: Peer review of emergency communications in the passenger railroad industry

The following is a summary of findings, gathered in August 2017, from a peer review of North American passenger railroad operators regarding crew-to-crew and crew-to-OCC communications.

Survey questions

Instructions/Contact info

The survey below is intended to gather information on industry practices regarding emergency communication systems, in-car signs/maps, primary exit path operation and demarcation, in-car stairway emergency markings, and high-performance photoluminescent (HPPL) material testing.

1. Contact Info
 - a) Name of Primary Filer
 - b) Title
 - c) Transit Agency/Organization
 - d) Email Address
2. Are you employed by a (select one):
 - ☐ Railroad/Transit Agency
 - ☐ Manufacturer

Crew to Passenger Communications Systems

1. Indicate each of the following that are part of your railroad's crew to passenger emergency communication system.
 - ☐ Intercom
 - ☐ Public address systems
 - ☐ Brochures describing emergency egress procedures
 - ☐ Signage denoting a locked exit path
 - ☐ Automatic messaging
 - ☐ Other - Write In
2. Does your system use station, wayside, landline, or block line phones in an emergency?
3. Does your system have a policy allowing for direct contact from train crew to emergency responders?
4. Does your railroad have any communication protocols between your OCC and passengers?

Emergency Egress Signs/Maps

1. Do you post emergency egress signs/maps in your railcars?
2. Please identify your most common type of passenger rail vehicle (Manufacturer, model name, and year).
3. Indicate whether any of the following locations are where emergency egress signs/maps are posted in your most common type of passenger rail vehicle (check all that apply):
 - ☐ Vestibules
 - ☐ Doors
 - ☐ Stairways
 - ☐ Bulkheads
 - ☐ Other Locations - Please Specify
4. Please provide photos of example exit orientation signs or graphics and their placement within your most common railcar, if possible.

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5. Please provide example pictures of various locator signs in one of your passenger vehicles. If possible, please provide dimensions for the locator signs pictured.
6. Please indicate the vehicle(s) that the pictures of your locator signs came from (Manufacturer, model, year):
7. Please indicate the how long, in minutes after activation, your backup power source is required to function to power emergency in car systems such as low-level exit path markings, signs, and communication systems.
8. Please indicate which, if any, languages other than English are your emergency egress signs posted in any of your railcars.

High performance photoluminescent materials

1. What methods has your organization used for measuring performance of high performance photoluminescent (HPPL) material?
2. Would your organization be willing to measure performance of high performance photoluminescent material rather than measuring charging light intensity?
3. What is your organization's current practice regarding determining representative rail car areas?

Doors

1. Please provide photos of the Emergency exit systems, including any signs/markings regarding operation, most commonly employed by your commuter railroad in your most common railcar indicated previously.
2. Do you indicate that a door is locked and is not a useable exit path (example: front- and rear-most doors in a multiple unit consist)? If alternative exit paths are indicated at the locked door location, please provide photos of the indication.

Stairways

1. If you have stairways in your cars, please indicate the vehicle model and provide photos of your most common and most unusual low level exit path marking configuration around a car stairway. This includes: Any accompanying signage, Stairway step and tread markings or lighting, Stairway side markings or lighting, and Upper and lower landing areas.

Kick Out Panels

1. How do you interpret the current CFR requirement 49 CFR §238.439(c) regarding kick-out panels and markings?

Survey respondents

- ACE
- Alaska Railroad
- Amtrak
- Bombardier
- DCTA
- LIRR
- MARC
- Metra
- Nippon Sharyo
- RTD
- SCRRA
- SEPTA
- Siemens

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- Sound Transit
- Talgo
- TriMet
- UTA

FIGURE 1
Survey Results Summary

Question		Percent Affirmative
Indicate each of the following that are part of your railroad's crew to passenger emergency communication system.	Intercom	77%
	PA	100%
	Brochure	85%
	Locked Exit Signage	85%
	Automatic messaging	38%
Does your system use station, wayside, landline, or block line phones in an emergency?		54%
Does your system have a policy allowing for direct contact from train crew to emergency responders?		77%
Does your railroad have any communication protocols between your OCC and passengers?		62%
Do you post emergency egress signs/maps in your railcars?		92%

Appendix C: Train crew-to-emergency responder communications

APTA does not propose to issue standard language prescribing train crew-to-emergency responder communications at this time, as it was regarded as a property-specific decision subject to property-specific guidelines.

In general, however, it is not recommended that train crews have direct radio contact with emergency responders. The reasons for this recommendation are as follows:

- To do so would cause the crew members to have to contact multiple personnel in the event of an emergency, preventing them from performing their primary duties of informing the railroad's OCC and ensuring the safety of the train's passengers.
- To do so would require the train radios to be equipped with a wide variety of radio channels in order to communicate with the emergency responders in each of the municipalities, counties, states, provinces or other jurisdictions through which a passenger train may operate.