

13. Recommended Practice for Passenger Information System Inspection, Testing and Maintenance

Approved June 25, 2002
APTA Rail Transit Standards Fixed Structures Inspection and Maintenance Committee

Approved January 10, 2003
APTA Rail Transit Standards Task Force

Authorized June 8, 2003
APTA Rail Transit Standards Policy Committee

Abstract: This recommended practice provides guidelines for inspecting, testing, and maintaining rail transit communication system passenger information systems.

Keywords: communication, inspection, maintenance, passenger information system, public address system

Introduction

(This introduction is not a part of APTA RT-SC-RP-013-03, *Recommended Practice for Passenger Information System Inspection, Testing and Maintenance*.)

APTA rail transit safety standards and recommended practices represent an industry consensus on practices for rail transit systems to help achieve a high level of safety for passengers, employees, and the general public. This document was created by and for those parties concerned with its provisions; namely, rail transit systems (operating agencies), manufacturers, consultants, engineers, and general interest groups. This recommended practice provides guidelines for inspecting, testing, and maintaining rail transit passenger information systems.

APTA recommends this practice for:

- Individuals or organizations that inspect, maintain, and/or operate rail transit systems
- Individuals or organizations that contract with others for the inspection, maintenance, and/or operation of rail transit systems
- Individuals or organizations that influence how rail transit systems are inspected, maintained, and/or operated (including but not limited to consultants, designers, and contractors)

The application of any practices or guidelines contained herein is voluntary. In some cases, federal and/or state regulations govern portions of how a rail transit system operates. In such cases, the government regulations override any conflicting practices this document recommends.

Participants

APTA greatly appreciates the contributions of the following members of the Signals and Communications Subcommittee who provided the primary effort in drafting the *Recommended Practice for Passenger Information System Inspection, Testing and Maintenance*:

Carlton “Don” Allen, P.E.
Sal Arceo
Gabrielle Bayme
Paul Camera

Lenny De Meyer
Michael Esford
Patrick Lavin
Ruben Madrigal

Thomas Peacock
Stephen Roberts
Carey Vaughn

The following members of the Rail Transit Standards Fixed Structures Inspection and Maintenance Committee contributed to the review and approval process of the *Recommended Practice for Passenger Information System Inspection, Testing, and Maintenance*:

James Dwyer, Chair
Frank Cihak, Vice Chair

Anthony Adams
Carlton “Don” Allen, P.E.
Sal Arceo
Roger Avery
Peter Bertozzi
Steven Bezner, P.E.
Raymond Borge
Michael Brown
John Bumanis
Clay Bunting
R. Sean Burgess
Paul Camera
David Cappa, P.E.
Gricelda Cespedes
Robert Chappell
Frank Cihak
Catherine Cronin
Lenny De Meyer
Tom Devenny

David Dunderdale
James Dunn
James Dwyer
William Early, P.E.
Percy Erves
Michael Esford
Richard Falcon
Ray Favetti
Peter Fedun, P.E.
Steve Feil
Robert Fiore
John Gaito
Ricky Green
Mohammad Irshad
Patrick Lavin
Harry Lupia
Frank Machara
Ruben Madrigal
Michael Monastero

Bill Petit
David Rankin
Pingali Rao, P.E.
Richard Raschke
James Redding
Stephen Roberts
Charles Slavis, P.E.
Frederick Smith, P.E.
Richard Spatz
Charles Stanford
F. Brian Steets
Paul Swanson, P.E.
Steven Thompson
Fred Tijan
Gary Touryan
Carey Vaughn
James Wang, P.E.

APTA Rail Transit Standards Fixed Structures Inspection and Maintenance Committee project consultants:

Peter Gentle, P.E., *STV Incorporated*
Carol Rose, *STV Incorporated*

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*

Contents

1. Overview	13.1
1.1 Scope.....	13.1
1.2 Purpose.....	13.1
2. Definitions and acronyms	13.1
2.1 Definitions	13.1
2.2 Acronyms.....	13.2
3. Inspection, testing, and maintenance provisions.....	13.2
3.1 Inspection, testing, and maintenance frequency	13.2
3.2 Training.....	13.3
3.3 Materials	13.3
3.4 Tools	13.3
3.5 Personal protective equipment.....	13.4
3.6 Safety	13.4
3.7 Inspection, testing, and maintenance procedures	13.4
3.8 Correction of deficiencies.....	13.6
3.9 Documentation.....	13.6
Annex A (informative) Bibliography.....	13.7

Recommended Practice for Passenger Information System Inspection, Testing and Maintenance

1. Overview

1.1 Scope

This document establishes recommended guidelines for inspecting, testing, and maintaining rail transit passenger information systems.

1.2 Purpose

The purpose of this recommended practice is to verify that passenger information systems and equipment are operating safely and as designed through periodic inspection, testing, and maintenance, thereby increasing reliability and reducing the risk of hazards and failures.

2. Definitions and acronyms

For the purposes of this recommended practice, the following definitions and acronyms apply:

2.1 Definitions

2.1.1 cartridge fuse: A device used to protect an electric circuit from the effect of excessive current draw enclosed in an insulating cartridge. *See also:* **fuse**.

2.1.2 delivered audio quality (DAQ): The quality of an audio message as heard by the human ear when delivered to a speaker or other audio device. *See also:* **delivered visual quality**.

2.1.3 delivered visual quality (DVQ): The quality of a video message, text or image seen by the human eye when delivered and displayed on a monitor. *See also:* **delivered audio quality**.

2.1.4 fuse: A device used to protect an electric circuit from the effect of excessive current draw. *See also:* **cartridge fuse**.

2.1.5 hazard: Any real or potential condition that can cause injury, death, or damage or loss of equipment or property.

2.1.6 operations control center (OCC): A location or locations designed, equipped, and staffed for the purposes of monitoring and controlling RTS activities from a central location or locations. *Syn:* **rail control center, rail operations center, rail service control center**.

2.1.7 original equipment manufacturer (OEM): The enterprise that initially designs and builds a piece of equipment.

2.1.8 passenger information system: A system for communicating audio and/or visual information to employees and passengers.

2.1.9 personal protective equipment (PPE): All clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons, and work boots.

2.1.10 public address system (PA): A system for communicating audio information to employees and passengers.

2.1.11 rail transit system (RTS): The organization or portion of an organization that operates rail transit service and related activities. *Syn:* **operating agency, operating authority, transit agency, transit authority, transit system.**

2.1.12 ribbon fuse: A cylindrical fuse consisting of a ribbon shaped fusible metal enclosed in a glass or transparent plastic cylinder with end caps.

2.2 Acronyms

DAQ	delivered audio quality
DVQ	delivered visual quality
OCC	operations control center
OEM	original equipment manufacturer
PA	public address system
PPE	personal protective equipment
RTS	rail transit system

3. Inspection, testing, and maintenance provisions

3.1 Inspection, testing, and maintenance frequency

The inspection, testing, and maintenance procedures in this recommended practice should be performed when passenger information systems are placed in service, when they are modified, repaired, or disarranged, or as otherwise deemed necessary by the RTS.

The RTS should determine the need for additional inspection, testing, and maintenance frequencies for passenger information systems. A review of the following factors may be useful in making this assessment:

- OEM-recommended intervals
- Industry experience
- Operating environment/conditions
- Historical data
- Reliability-centered maintenance program development

- Failure analysis
- RTS testing and experience
- Regulatory requirements

The frequency of tasks should comply with applicable federal, state, and local regulations.

3.2 Training

The RTS and/or their maintenance contractors should develop and execute training programs that provide employees with the knowledge and skills necessary to safely and effectively perform the tasks outlined in this recommended practice.

3.3 Materials

The following materials are recommended for inspecting, testing, and maintaining passenger information systems:

- RTS-approved cleaning materials
- Additional materials as required by the OEM and/or RTS

3.4 Tools

The following tools are recommended for inspecting, testing, and maintaining passenger information systems:

- Multi-meter*
- Tone generator*
- Portable test unit
- Laptop with applicable software and hardware interface
- Telephone test set
- Sound level meter*
- RTS-approved portable radio
- Standard tools carried by maintenance personnel
- Additional tools as required by the OEM and/or RTS

* Calibrate in accordance with OEM and/or RTS requirements.

3.5 Personal protective equipment

Personal protective equipment, as required by the RTS, should be worn at all times during inspection, testing, and maintenance.

3.6 Safety

RTS safety rules, procedures, and practices shall be followed at all times during inspection, testing, and maintenance.

3.7 Inspection, testing, and maintenance procedures

The inspection, testing, and maintenance procedures in this recommended practice may be modified for each rail transit system's requirements but should contain the steps listed in Sections 3.7.1-3.7.2 as a minimum.

3.7.1 Inspection and testing

3.7.1.1 General

- 3.7.1.1.1** Notify the operations control center (OCC) and/or other authorities of the inspection activities to be performed.
- 3.7.1.1.2** Inspect passenger information system equipment for proper condition and operation both local and remote.
- 3.7.1.1.3** From each passenger station, evaluate the audio and/or visual quality at passenger areas.
- 3.7.1.1.4** Check the quality of the audio and visual messages at each passenger area (stations), using Table 1 below. Test the PA system to evaluate real-time messaging, pre-recorded messages and all-station, branch messaging.
- 3.7.1.1.5** Compare the ambient noise level to the PA audio level, using a sound level meter, to ensure that the ratio prescribed by the RTS and/or OEM is still being met. Ambient noise levels may increase due to a number of factors including new construction or increased traffic levels in the area.
- 3.7.1.1.6** Notify the OCC and/or other authorities when inspection is complete.

Table 1 – DAQ/DVQ quality ratings

Delivered Audio/Visual Quality Rating	
Rating	Criteria
1	No audio and/or visual.
2	Audio and/or visual present but unusable.
3	Speech understandable with repetition rarely required. Some noise/distortion may exist.
4	Speech and/or text easily understood.

3.7.1.2 Mechanical

3.7.1.2.1 Notify the OCC and/or other authorities of the inspection activities to be performed.

3.7.1.2.2 Ensure that connections are tight and that there are no missing or damaged support brackets, fasteners and mounting hardware.

3.7.1.2.3 Inspect passenger information system equipment for damage, loose cabling, loose brackets, unprotected electrical connections or other defects.

3.7.1.2.4 Notify the OCC and/or other authorities when inspection is complete.

3.7.1.3 Electrical

3.7.1.3.1 Notify the OCC and/or other authorities of the inspection activities to be performed.

3.7.1.3.2 Inspect cabling and wiring to ensure that it is not frayed, burned, broken, cut, or otherwise defective.

3.7.1.3.3 Inspect cables to ensure they do not exceed their normal bending radius and are positioned to prevent chafing or cutting.

3.7.1.3.4 Inspect electrical connections for signs of corrosion, broken wires, broken connections, missing hardware, loose connections, frayed or burned wires, defective insulation and moisture.

3.7.1.3.5 Inspect ribbon or cartridge type fuses and other electrical protection equipment for burned, separated or otherwise damaged elements and replace as required.

3.7.1.3.6 Notify the OCC and/or other authorities when inspection is complete.

3.7.2 Maintenance

3.7.2.1.1 Perform cleaning procedures as required by the OEM and/or RTS.

3.7.2.1.2 Perform filter cleaning and/or replacement as required by the OEM and/or RTS.

3.7.2.1.3 Re-coat mounting hardware as required by the OEM and/or RTS.

3.7.2.1.4 Lubricate moving parts as required by the OEM and/or RTS.

3.7.2.1.5 If no further work is to be performed, notify the OCC and/or other authorities that inspection and maintenance activities are complete.

3.8 Correction of deficiencies

Deficiencies identified during passenger information system inspection, testing, and maintenance should be corrected and documented in accordance with OEM and/or RTS requirements.

3.9 Documentation

Inspection, testing, and maintenance activities should be documented, reviewed, and filed in accordance with RTS procedures.

Annex A

(informative)

Bibliography

- [B1] Original equipment manufacturer (OEM) specifications for passenger information system inspection, testing, and maintenance.
- [B2] Rail transit system (RTS) procedures for passenger information system inspection, testing, and maintenance.