

7. Recommended Practice for Presence Detector Inspection and Testing

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Abstract: This recommended practice provides guidelines for the inspection and testing of rail transit signal system presence detectors.

Keywords: inspection, presence detector, signal, test, testing

Introduction

(This introduction is not a part of APTA RT-SC-RP-007-03, *Recommended Practice for Presence Detector Inspection and Testing*.)

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 and testing rail transit presence detectors.

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 Presence Detector Inspection and Testing*:

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 Presence Detector Inspection and Testing*:

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*

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Recommended Practice for Presence Detector Inspection and Testing

1. Overview

1.1 Scope

This document establishes recommended guidelines for inspecting and testing rail transit presence detectors.

1.2 Purpose

The purpose of this recommended practice is to verify that presence detectors are operating safely and as designed through periodic inspection and testing, 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 electro-static discharge: The release of stored electrical energy.

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

2.1.3 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.

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

2.1.5 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.

2.1.6 presence detector: A device used to detect the presence of a train in a pre-determined section of rail.

2.1.7 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.**

2.2 Acronyms

DMM	digital multi-meter
OCC	operations control center
OEM	original equipment manufacturer
PPE	personal protective equipment
PVC	polyvinyl chloride
RTS	rail transit system

3. Inspection and testing provisions

3.1 Inspection and testing frequency

The inspection and testing procedures in this recommended practice should be performed when presence detectors 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 and testing frequencies for presence detectors. 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 and testing wayside signal ac power systems:

- RTS-approved solvent
- RTS-approved lint free wipes
- Additional materials as required by the OEM and/or RTS

3.4 Tools

The following tools are recommended for inspecting and testing wayside signal ac power systems:

- Electro-static discharge protection equipment
- Multi-meter*
- RTS-approved portable radio
- Standard tools carried by maintenance personnel
- Additional tools as recommended 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 and testing.

3.6 Safety

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

3.7 Inspection and testing procedures

Presence detector inspection and testing procedures 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

3.7.1.1 Notify the operations control center (OCC) and/or other authorities of the inspection activities to be performed.

3.7.1.2 Inspect the area for an accumulation of debris. Remove and bag debris.

- 3.7.1.3** Inspect wayside drains for blockage or ineffective drainage.
- 3.7.1.4** Inspect the area for damage caused by standing water, water leaks, or retention.
- 3.7.1.5** Inspect the area for any condition that may interfere with the operation of the equipment.
- 3.7.1.6** Follow RTS electro-static discharge protection procedures to prevent damage to the equipment.
- 3.7.1.7** Inspect presence detector equipment for physical damage, frayed or loose wiring, properly secured plugs and connectors, loose or missing hardware, and proper insertion of printed circuit cards and components. Clean equipment as required.
- 3.7.1.8** Inspect track mounted wire loops for physical damage, frayed or loose wiring, properly secured plugs and connectors, loose or missing hardware, and broken or missing mounting clips.
- 3.7.1.9** Inspect equipment and observe system status lights and other indications for proper system operation.
- 3.7.1.10** Inspect the presence detector room and/or enclosure equipment, for damage, cracks, breaks, defective latches, locks, hinges, covers, and loose, deteriorated, or damaged conduit connections, and hardware. Holes and unused entrances not used for ventilation shall be sealed.
- 3.7.1.11** Inspect polyvinyl chloride (PVC), fiberglass, rubber and other cable conduit material for damage, cracks, breaks, loose conduit connections, missing or loose components, and hardware.
- 3.7.1.12** Ensure covers, doors, and locks are in place and secured.
- 3.7.1.13** Notify the OCC and/or other authorities when inspection is complete.

3.7.2 Testing

- 3.7.2.1** Notify the OCC and/or other authorities of the testing activities to be performed.
- 3.7.2.2** Perform tests using RTS and/or OEM -approved procedure to ensure proper operation of all system functions.
- 3.7.2.3** Measure power sources for proper values and tolerances.
- 3.7.2.4** Depress test pushbutton on presence detector module and verify relay operation.
- 3.7.2.5** Check presence detector tuning and adjust per RTS and/or OEM recommendations if necessary.

- 3.7.2.6 If possible, verify operation of presence detector equipment under normal operation that includes the presence of a rail vehicle.
- 3.7.2.7 Ensure covers and locks are in place and secured.
- 3.7.2.8 Notify the OCC and/or other authorities when testing is complete.

3.8 Correction of deficiencies

Deficiencies identified during presence detector inspection and testing should be corrected and documented in accordance with OEM and/or RTS requirements.

3.9 Documentation

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

Annex A

(informative)

Bibliography

- [B1] Original equipment manufacturer (OEM) specifications for presence detector inspection and testing.
- [B2] Rail transit system (RTS) procedures for presence detector inspection and testing.