15. Recommended Practice for On-Board Recording Equipment Periodic Inspection and Maintenance

Approved July 15, 2002
APTA Rail Transit Standards Vehicle Inspection and Maintenance Committee

Approved January 10, 2003
APTA Rail Transit Standards Task Force

Authorized June 8, 2003
APTA Rail Transit Standards Executive Committee

Abstract: This recommended practice covers basic procedures for periodic inspection and maintenance of data, audio and video recording equipment on rail transit vehicles.

Keywords: recording equipment, periodic inspection and maintenance
Introduction

(This introduction is not a part of APTA RT-VIM-RP-015-03, Recommended Practice for On-Board Recording Equipment Periodic Inspection and Maintenance.

This Recommended Practice for On-Board Recording Equipment Periodic Inspection and Maintenance for rail transit vehicles 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, practices or guidelines contained herein is voluntary. In some cases, federal and/or state regulations govern portions of a rail transit system’s operations. In those cases, the government regulations take precedence over these recommended practices. APTA recognizes that for certain applications, the standards or practices, as implemented by individual rail transit systems, may be either more or less restrictive than those given in this document.

This document describes the basic inspection and maintenance requirements for on-board recording equipment on rail transit vehicles. APTA recommends the use of these practices by:

- Individuals or organizations that maintain on-board recording equipment on rail transit vehicles;
- Individuals or organizations that contract with others for the maintenance of on-board recording equipment on rail transit vehicles; and
- Individuals or organizations that influence how on-board recording equipment is maintained on rail transit vehicles.
Participants

The American Public Transportation Association greatly appreciates the contributions of the following individual(s), who provided the primary effort in the drafting of the *Recommended Practice for On-Board Recording Equipment Periodic Inspection and Maintenance*:

David Case

At the time that this recommended practice was completed, the VIM Committee included the following members:

**Jayendra Shah, Chair**

**Ben Antonio, Vice Chair**

Dave Barber
Richard Berk
Stephen Bonina
Joseph Brattelli
Gordon Campbell
David Case
Dhiren Chakraborty
Lisa Cobb
John Condrasky
Richard Curtis

Phil Eberl
Timothy Harewood
Kevin Johnson
David Kowalski
Paul Kovacs
Brian Ley
Joseph Marie
Bill McCoy
Thomas Peacock
David Phelps

James Plomin
Lemuel Proctor
John Sadorra
Mario Sequeira
John Shea
Clive Thornes
Brian Whately
Hannie Woodson

APTA Rail Transit Standards Vehicle Inspection and Maintenance Committee project consultant:

Gordon S. Campbell, *LDK Engineering*

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 ..............................................................................................................................................15.1

1.1 Scope ................................................................................................................................................15.1
1.2 Purpose .............................................................................................................................................15.1

2. References ............................................................................................................................................15.1

3. Definitions, abbreviations, and acronyms ..........................................................................................15.1

3.1 Definitions ..........................................................................................................................................15.1
3.2 Abbreviations and acronyms ..............................................................................................................15.2

4. Frequency of conduct ...........................................................................................................................15.2

5. Requirements and specific tasks ..........................................................................................................15.3

5.1 Materials ...........................................................................................................................................15.3
5.2 Tools ..................................................................................................................................................15.3
5.3 Safety/personal protective equipment ...............................................................................................15.3
5.4 Training requirements ........................................................................................................................15.3
5.5 Inspection and maintenance ...............................................................................................................15.4
5.6 Correction of deficiencies ..................................................................................................................15.5

Annex A (informative) Bibliography ......................................................................................................15.6
Recommended Practice for On-Board Recording Equipment Periodic Inspection and Maintenance

1. Overview

This document establishes a recommended practice for data, audio and video recording equipment inspection and maintenance. Individual rail transit systems should tailor these recommended practices to accommodate their specific equipment and mode of operation.

1.1 Scope

This recommended practice includes all essential periodic inspection and maintenance requirements for data, audio and video recording equipment used on rail transit vehicles.

1.2 Purpose

This recommended practice is intended for use by rail equipment maintenance organizations. It establishes procedures for periodic inspection and maintenance of data, audio and video recording equipment for rail transit vehicles, with emphasis on maintenance of safety critical components.

2. References

Original Equipment Manufacturer’s specifications for data, audio and video equipment inspection and maintenance.

Rail transit system procedures for data, audio and video equipment inspection and maintenance.

3. Definitions, abbreviations, and acronyms

3.1 Definitions

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

3.1.1 vehicle data recording system: An installed system, or a capability integrated into another functional system, consisting of a data recording mechanism, recording medium, processing software and hardware, and any sensors and wires that feed vehicle performance data to the recording mechanism.
3.1.2 **vehicle video recording system:** An installed system, consisting of a video recording mechanism, recording medium, and any sensors and wires that feed video to the recording mechanism.

3.1.3 **vehicle cab voice recording system:** An installed system, consisting of an audio recording mechanism, recording medium, and any sensors and wires that feed audio to the recording mechanism.

### 3.2 Abbreviations and acronyms

- **ANSI**  American National Standards Institute
- **OEM**  Original Equipment Manufacturer
- **VDRS**  Vehicle Data Recording System
- **VVRS**  Vehicle Video Recording System
- **VCVRS**  Vehicle Cab Voice Recording System

### 4. Frequency of conduct

Maintenance tasks on the data, audio and video recording equipment should be performed on a regular schedule to ensure proper operation of the equipment. The sections listed in Table 1 provide a guide of detailed procedures for each identified maintenance task.

#### Table 1

<table>
<thead>
<tr>
<th>INSPECTIONS AND MAINTENANCE</th>
<th>RECOMMENDED INSPECTION INTERVALS (Not to Exceed)</th>
<th>SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDRS</td>
<td>180 Days</td>
<td>5.5.1</td>
</tr>
<tr>
<td>VVRS (Tape)</td>
<td>60 Days</td>
<td>5.5.2</td>
</tr>
<tr>
<td>VVRS (Solid State)</td>
<td>180 days</td>
<td>5.5.3</td>
</tr>
<tr>
<td>VCVRS (Tape)</td>
<td>60 days</td>
<td>5.5.4</td>
</tr>
<tr>
<td>VCVRS (Solid State)</td>
<td>180 days</td>
<td>5.5.5</td>
</tr>
<tr>
<td>All Recording Systems</td>
<td>60 days</td>
<td>5.5.6</td>
</tr>
</tbody>
</table>

**NOTE:** Accurate historical data should be used to fine-tune the maintenance scheduling. Efficient resource allocation can result from careful tracking of vehicle recorder performance. This is a highly recommended practice particularly with tape-based recorders, which require more frequent and involved maintenance activity.

The frequency of inspection and maintenance tasks shall comply with all applicable federal, state and local regulations. Further, in the conduct of a rail transit system’s periodic inspection and maintenance program, frequencies for individual tasks may be established based on a number of additional factors, including but not limited to:

- OEM – recommended intervals
- Industry Experience
- Operating Environment/Conditions
- Historical Data
- Performance Requirements
- Failure Analysis
- Rail Transit System’s Testing and Experience
- Reliability Centered Maintenance Programs

5. Requirements and specific tasks

5.1 Materials

The following materials are normally required for on-board recording equipment inspection and maintenance:

- VDRS download and readout equipment and software.
- VVRS download and readout equipment and software.
- VCVRS download and readout equipment and software.
- Referenced OEM maintenance manuals for additional materials.

5.2 Tools

The following tools are normally required for on-board recording equipment inspection and maintenance:

- Standard tools carried by the maintenance personnel.
- Download and readout equipment specified by the recorder OEM.

5.3 Safety/personal protective equipment

Appropriate personal protective equipment, meeting minimum ANSI Standards and as required by the rail transit system, shall be worn at all times in the performance of these inspection and maintenance tasks.

5.4 Training requirements

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

5.5.1 VDRS periodic maintenance

Where applicable, verify that the current wheel size setting input to the recording system is accurate.

Verify recorder time/date information is correct. Calibrate as required in accordance with rail transit systems procedures.

Download all recorded data from the VDRS using equipment and/or software provided by the recorder OEM, and following the prescribed steps dictated by the recorder OEM.

Review downloaded data and verify that all recorded parameters are being recorded within prescribed tolerances. If some parameters would not normally be recorded due to the rarity of occurrence, then a reasonable attempt should be made to trigger the parameter on the vehicle before the data is downloaded.

If any parameters are not recording properly, repair or replace as required in accordance with the rail transit systems procedures.

NOTE: Many stand-alone data recorders currently in production are equipped with a self-test feature that verifies that the data being recorded by the unit is exactly as presented to the recorder. This feature can help determine if any irregularities in data recording are being caused by the recorder itself (the self-test feature will indicate a failure) or by the sensor and wiring system feeding information to the recorder (no failure will be indicated by the self-test feature).

5.5.2 Tape-basedVVRS periodic maintenance

Review current recorder time and date and recalibrate recorder to reflect the correct time and date. Remove and review the tape to verify that the recorder is currently working correctly. Clean the recording heads according to the OEM suggested method. Install a new tape into the vehicle’s recording system.

If there is a problem with the recording system, the malfunctioning part of the system should be replaced with functioning parts before the vehicle is put back into service.

5.5.3 Solid stateVVRS periodic maintenance

Review current recorder time and date and recalibrate recorder to reflect the correct time and date. Download all recorded data from the VVRS using equipment and/or software provided by the recorder OEM, and following the prescribed steps dictated by the recorder OEM. Review the most recent downloaded video and verify that the video is being recorded as designed. Repair as necessary or replace malfunctioning component.

5.5.4 Tape-based VCVRS periodic maintenance

Review current recorder time and date and recalibrate recorder to reflect the correct time and date. Remove the tape and review to verify that the recorder is currently working correctly. Clean
recording heads according to the OEM’s suggested method. Install a new tape into the vehicle’s recording system. Repair as necessary or replace malfunctioning component.

5.5.5 Solid state VCVRS periodic maintenance

Review current recorder time and date and recalibrate recorder to reflect the correct time and date. Download all recorded data from the VCVRS using equipment and/or software provided by the recorder OEM, and following the prescribed steps dictated by the recorder OEM. Review the most recent downloaded audio and verify that the audio is being recorded as designed. Repair as necessary or replace malfunctioning component.

5.5.6 General on-board recording systems inspection

Inspect all cameras, camera housings and recording stations for any condition that would prevent intended operation of the recorder. Clean the camera lens. Replace missing or damaged equipment/hardware and tighten any loose hardware.

5.6 Correction of deficiencies

Any deficiencies uncovered during the inspections required in Section 5.5.1 through 5.5.6 should be corrected and documented in accordance with rail transit system procedures and OEM recommendations.
Annex A (informative)

Bibliography
