

Recording Devices Working Group Update

52nd Meeting of the Railroad Safety Advisory Committee

December 4th, 2014
Washington, DC



FRA – Office of Railroad Safety
12/5/2014



Recording Devices Working Group (RDWG) Update

- Review task statement
- RDWG meetings to date
- FRA position on recording devices
- Questions to be resolved
 - Control and use of data
 - Technical requirements
- Scheduled meetings and report to full RSAC



Task No. 14-01

Purpose:

To develop regulatory recommendations addressing the installation and use of inward- and outward-facing image recorders in controlling locomotive cabs.

The recommendations should address installation requirements and timelines, technical controls, recording retention periods, retrieval of recordings, controlled custody of recordings, crashworthiness standards at least equivalent to those for locomotive event recorders, use of recordings for accident investigation and railroad safety study purposes, and use of recordings in conducting operational tests.



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Background:

In light of NTSB Recommendations R-10-1, R-10-2, and recent accidents, FRA believes it is appropriate to evaluate the adoption of regulations addressing inward- and outward-facing locomotive image and audio recorders to advance railroad safety.

Recordings would be used:

- to assist in post-accident/incident investigations (railroad, highway-rail grade crossing, and trespasser).
- to assist in evaluating railroad employee fatigue, distraction, and crew interactions.
- for use as a training tool for railroad employees, and for use in conducting operational tests of railroad employees.



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Description:

- NTSB Recommendations R-10-1 and R-10-2
- 49 CFR Part 229, Railroad Locomotive Safety Standards
- 49 CFR Part 218, Subpart D, Prohibition Against Tampering With Safety Devices
- 49 CFR Part 217, Railroad Operating Rules
- Railroad accidents (e.g., Chatsworth, CA; Goodwell, OK; Bronx, NY)



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Issues requiring specific report:

- All matters related to the development of regulatory standards governing the installation and use of inward- and outward-facing images and audio recorders in controlling locomotive cabs, including economic data required for regulatory analysis.



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NTSB Recommendations R-10-1 and R-10-2

- Require the installation, in all controlling locomotive cabs and cab car operating compartments, of crash- and fire-protected inward- and outward-facing audio and image recorders capable of providing recordings to verify that train crew actions are in accordance with rules and procedures that are essential to safety, as well as train operating conditions.



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- The devices should have a minimum 12-hour continuous recording capability with recordings that are easily accessible for review, with appropriate limitations on public release, for the investigation of accidents or for use by management in carrying out efficiency testing and systemwide performance monitoring programs. (R-10-1).
- Require that railroads regularly review and use in-cab audio and image recordings (with appropriate limitations on public release), in conjunction with other performance data, to verify that train crew actions are in accordance with rules and procedures that are essential to safety. (R-10-2).

RDWG Update

RDWG meetings to date:

- June 5, 2014
- September 2-3, 2014
- October 28-29, 2014



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Presentations (June 5, 2014)

- FAA presentation on cockpit audio recording devices.
- APTA/SCRAA/Metrolink/NCTD presentations on use of recording devices in transit and commuter rail operations.
- AAR presentation on recording devices.
- Labor presentation on recording devices.

Presentation (September 3, 2014)

- KCS presentation on use of inward- and outward-facing image recording devices.



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Presentations (October 28-29, 2014)

- AAR presentation, use of image recording devices in trucking industry.
- FRA C³RS presentation.
- Security Industry Association presentation on use of image recording devices.



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RDWG Update

FRA positions on recording devices

- Mandate outward- and inward-facing image recording devices.
- Allow operational testing using image recording devices with established random selection requirements for inward-facing recording devices.

Recording Protection and Handling

Railroad Handling and Release

- Development of rule text requiring railroads to adopt and comply with chain-of-custody and release protocols for locomotive recordings.



Recording Protection and Handling

Limitations on the release of locomotive recordings:

- FOIA – related issues
- Handling of locomotive recordings and chain-of-custody after an accident/incident
- 49 CFR 229.135(e)-(f), event recorder requirements



Recording Protection and Handling

FRA's preliminary position regarding controls on two types of locomotive recordings:

- Outward-facing recordings
- Inward-facing recordings



Recording Protection and Handling

Outward-facing recordings

- Least restrictive controls due to lack of privacy interest, merely recording view of the environment outside of the locomotive cab that the public can also see.
- FRA preliminary position- (49 CFR 229.135(e)), in the event of an accident/incident required to be reported under part 225, railroads shall preserve such recordings for one year for potential analysis by FRA and/or NTSB.



Recording Protection and Handling

Inward-facing image recordings

- Stricter controls due to elevated privacy interests, as recordings are of actions of employees inside the locomotive cab.
- FRA preliminary position, recordings shall only be retained and accessed by the railroad, or by FRA/NTSB, in the event of:
 - an accident/incident required to be reported under part 225.



Recording Protection and Handling

- Other specific triggering events to be contemplated by the Working Group (e.g., stop signal violations):
 - Violation of a Federal railroad safety law, regulation or order.
 - Performance of operational tests in accordance with part 217, with mandatory “randomness” protocols for such testing.
 - Investigation of violations of criminal or civil laws.
 - Original recording to FRA/NTSB if requested, railroad may retain copy.



Recording Protection and Handling

Inward-facing image recordings

- Recordings must be retained for one year from the date of a triggering event, and applicable chain-of-custody protocols must be followed.
- Use of recordings in part 240/242 certification actions or as evidence in other administrative proceedings to be considered.

Technical Requirements

Primary questions to be resolved:

- Which locomotives must be equipped, by when?
- What components are required?
- What software is required?
- What are the inspection, testing, and maintenance requirements?
- Are there any additional requirements, such as tampering prohibitions?



Technical Requirements

Which locomotives must be equipped?

- Defined by speed, similar to event recorders (required when locomotives operate at more than 30 mph).
- Defined by Class of railroad, such as Class I and Class II railroads, and defined passenger operations.
- Defined by employee work hours, railroads with more than 400,000 total employee work hours per year.



Technical Requirements

Required components:

- Outward-facing image recorders,
- Inward-facing image recorders,
- Memory Module,
- Review and Download Interface, and
- Software.



Technical Requirements

Outward-facing image recorders

- Number of image recorders
- Resolution (HDTV) and focal length
- Frames per second (15, 23, more)
- Night time sensitivity: Current headlight illumination adequate
- Capable of distinguishing signal aspect

Technical Requirements

Inward-facing image recorders

- Cab camera system design:
 - Field of view sufficient to show every person in the cab, allowing facial recognition in at least some of the views.
 - Prohibition on cameras in the sanitation compartment.
 - Light sensitivity, able to record using daytime ambient light levels in the cab, and switching to infra-red illumination when light levels fall too low.



Technical Requirements

Inward-facing image recorders

- Functional requirements
 - Record electronic device use in the cab
 - Record signs of fatigue
 - Show departure from the seat and/or cab
- Record at least 5 frames per second or more

Technical Requirements

Memory Module

- Establish recording capacity requirements for both inward- and outward-facing image recording devices.
 - NTSB recommendation, 12-hour capacity
- Determine minimum capacity to meet accident investigation *and* operational testing requirements.



Technical Requirements

Memory Module

- Crashworthy standards for recording devices
 - Use of established standards for Event Recorder Memory Module (ERMM) defined in Part 229, Appendix D.
- Determine if data used for non-accident events, such as operational testing, needs to be preserved in a crashworthy ERMM.

Technical Requirements

Review and Download Interface

- Inspection, testing, and maintenance purposes, limited to 30-second recordings, and made specifically for that purpose.
- Wired or wireless downloads, must be secured against unauthorized access, by encryption, password use, and/or other measures.



Technical Requirements

Software

- If intermittent recording required, software must monitor defined parameters to turn system on/off.
- Security features will need to be embedded in software to prevent unauthorized downloading.
- Software should perform basic equipment health monitoring and display a warning.

Technical Requirements

Inspection, Testing, and Maintenance

- Recording device system to be inspected or tested
 - Every 92 days
 - Every 184 days



Technical Requirements

Inspection, Testing, and Maintenance

- Failure or partial failure of the system, the locomotive shall not be used in the lead position.
 - Past next forward point where repairs can be made
 - Past next daily inspection
- May move locomotive to trailing position.



Technical Requirements

Tampering

- Tampering provision similar to the event recorder provision at § 229.135(g), which includes:
 - Tampering with the hardware, and
 - Tampering with (destroying or altering) recorded data.

Technical Requirements

Tampering

- Tampering sanctions include civil penalties and disqualification from performing safety-sensitive functions on a railroad.
 - Civil Penalties, as provided for in Part 218, Appendix B
 - Disqualification could occur under the procedures specified in Part 209



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Scheduled RDWG Meetings:

- December 9-10, 2014
- January 21-22, 2015
- March 3-4, 2015

Recommendations to full RSAC

- April 1, 2015

