



FRA Passenger Rail Safety Initiatives and Regulatory Activities

2019 PRIIA NGEC ANNUAL CONFERENCE

DEVIN ROUSE, PE
DIRECTOR, PASSENGER RAIL DIVISION

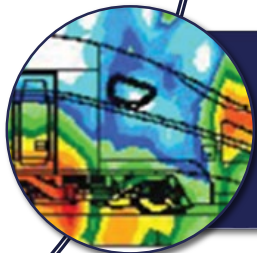
Outline



Recent Passenger Equipment Rulemaking



Proposed Rulemakings



Future Efforts

New Passenger Equipment Safety Standards (Tier III) Rule

WHAT IS IT?



2018 Passenger Equipment Safety Standards Rule

Published on November 21, 2018
(83 FR 59182, Nov. 21, 2018)

Primarily addresses two major issues:

1. Codifies requirements for trainsets using crash energy management (CEM) – based on 2011 Guidance
2. Establishes baseline design requirements for next generation of very high-speed trainsets (“Tier III”)

Developed from industry recommendations through Engineering Task Force (ETF) of the Railroad Safety Advisory Committee (RSAC)

59182 Federal Register / Vol. 83, No. 225 / Wednesday, November 21, 2018 / Rules and Regulations

DEPARTMENT OF TRANSPORTATION
Federal Railroad Administration
49 CFR Parts 229, 231, 236, and 238
[Docket No. FRA-2013-0060, Notice No. 3]
RIN 2130-AC46

Passenger Equipment Safety Standards; Standards for Alternative Compliance and High-Speed Trainsets

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Final rule.

Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Devin Rouse, Staff Director, U.S. Department of Transportation, Federal Railroad Administration, Office of Railroad Safety, Passenger Rail Division, 1200 New Jersey Avenue SE, Washington, DC 20590 (telephone: 202-493-6185); or Michael Hunter, Attorney Adviser, U.S. Department of Transportation, Federal Railroad Administration, Office of Chief Counsel, 1200 New Jersey Avenue SE, Washington, DC 20590 (telephone: 202-493-0368).

SUPPLEMENTARY INFORMATION:

Common Abbreviations

AAR Association of American Railroads
APTA American Public Transportation Association
AWO ready-to-run weight, empty
CEM crash energy management
CFR Code of Federal Regulations
CG center of gravity
EN EuroNorm
ETF Engineering Task Force
FE finite element
FEA finite element analysis
FRA Federal Railroad Administration
g gravitational acceleration (32.2 feet/second²)
HSR high-speed rail
in inch(es)
kip kilopound(s)
kN kilo-Newton(s)
kph kilometer(s) per hour
lbf pound(s)-force
mph mile(s) per hour
ms millisecond(s)
MU multiple-unit
OVI occupied volume integrity
PTC positive train control
RIA regulatory impact analysis
ROW right-of-way
RSAC Railroad Safety Advisory Committee
ITM inspection, testing, and maintenance
PTIP Passenger Train Emergency Preparedness
PESS Passenger Equipment Safety Standards
U.S.C. United States Code
UIC International Union of Railways

Table of Contents

I. Executive Summary
II. Statutory and Regulatory Background
A. Statutory Background
B. Implementation of the 1994 Passenger Safety Rulemaking Mandate
C. Development of the Final Rule
III. Discussion of Comments and Conclusions
A. General Comments
B. Proposed Subpart I and the Inspection, Testing, and Maintenance Requirements for Tier III Passenger Equipment
C. Proposed Subpart J and the Safe Operation Plan for Tier III Passenger Equipment
D. Comments From the NTSB
V. Section-by-Section Analysis
VI. Regulatory Impact and Notices

A. Executive Orders 12866, 13563, and 13771, and DOT Regulatory Policies and Procedures
B. Regulatory Flexibility Act and Executive Order 13272
C. Paperwork Reduction Act
D. Federalism Implications
E. International Trade Impact Assessment
F. Environmental Impact
G. Executive Order 12896 (Environmental Justice)
H. Executive Order 13175 (Tribal Consultation)
I. Unfunded Mandates Reform Act of 1995
J. Energy Impact
K. Analysis Under 1 CFR Part 51

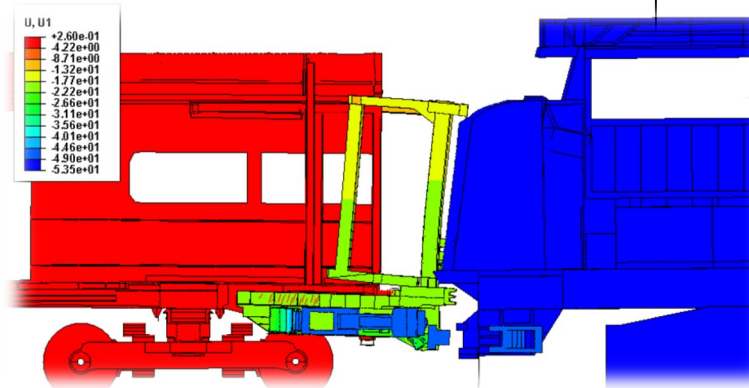
I. Executive Summary
Having considered the public comments in response to FRA's December 6, 2016, proposed rule on standards for alternative compliance and high-speed trainsets, see 81 FR 88006, FRA issues this final rule amending the Passenger Equipment Safety Standards, 49 CFR part 238. This final rule is the product of consensus reached by FRA's Railroad Safety Advisory Committee (RSAC), which accepted the task of reviewing passenger equipment safety needs and programs and recommending specific actions that could be useful to advance the safety of passenger service, including the development of regulatory requirements for the next generation of high-speed trainsets. The RSAC established the Passenger Safety Working Group ("PSWG" or "Working Group") to handle this task and develop recommendations for the full RSAC to consider. In September 2009, the Working Group in turn established the Engineering Task Force ("ETF" or "Task Force") for the purpose of producing a set of technical criteria and procedures to evaluate passenger rail equipment based on alternative designs. This work led to the development of the report entitled "Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service" ("Technical Criteria and Procedures Report" or "Report").¹ The guidance in the Technical Criteria and Procedures Report has assisted railroads and rolling stock manufacturers who have petitioned FRA for waivers from strict compliance with FRA's Tier I passenger equipment crashworthiness standards, and has been useful to FRA in

¹ U.S. Department of Transportation Report No. DOT-FRA-ORD-11/22. Washington, DC: Federal Railroad Administration, Office of Railroad Policy Research and Development, October 2011, available at http://www.fra.dot.gov/dlib/details/1012928p4_250_gD_IBT.



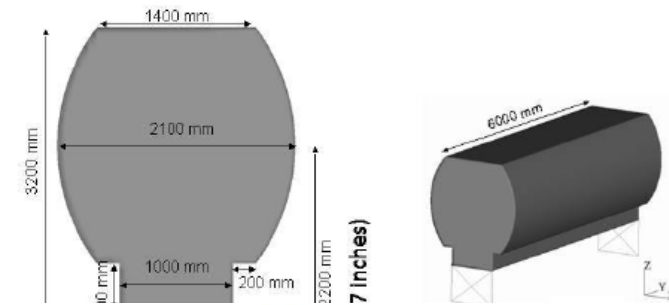
Crashworthiness & Crash Energy Management

- Developed by FRA's Engineering Task Force (ETF) with input from supply industry
- Based largely on EN 15227 and other governing international standards
- Provides more safety approaches and procurement options using proven international vehicle platforms



5.2. EN15227 Truck Collision Analysis

EN15227, the crashworthiness standard to which the EMUs under consideration by Caltrain were designed, includes a required collision scenario with a deformable object. This object is intended to represent a truck in a grade crossing. The object has a mass of 33,100 lb (15,000 kg) with a particular geometry and crush properties. Figure 34 shows the geometry of the object and the minimum force-displacement response for a particular impact scenario (impact with a rigid sphere.) The rail cars in question were designed to sustain an impact with this deformable object at a speed of 69 mph (110 km/hr) without excessive deformation of the occupied volume. Excessive deformation is defined as a reduction in length of passenger survival spaces more than 50 mm (2 inches) over any 5 m (16.4 ft) length or the plastic strain greater than 10 % in these areas. A specific space must also remain for the cab operator.



What is Tier III?

Tier III defines the requirements for next generation very high-speed trainsets

Key features are:

- ▶ Allows maximum authorized speeds of up to 220 mph
- ▶ Provides complete interoperability with conventional passenger & freight operations up to 125 mph
- ▶ Designed to harmonizes with “service proven” international standards and design methodologies
- ▶ Follows on the inspection and maintenance regime established for service proven trainsets.

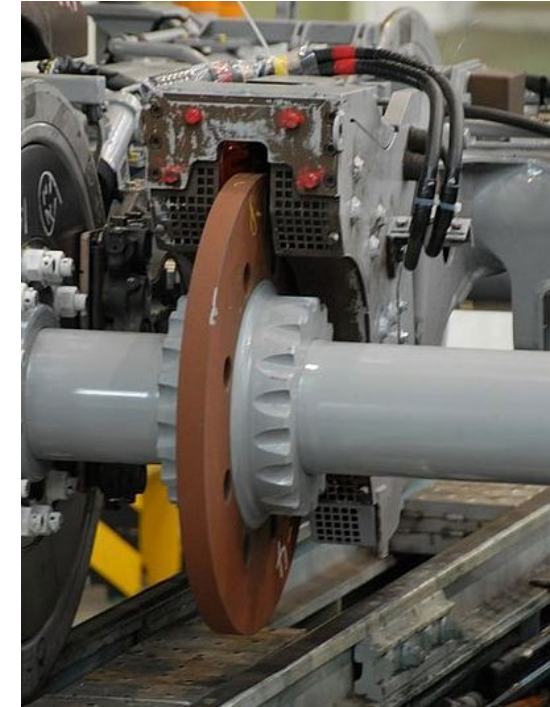


Tier III Regulatory Approach

Guiding principle: conceive performance-based regulations which accommodate existing service-proven designs **WITH MINIMUM MODIFICATIONS.**

Approach:

- ▶ **Systematic** – consider safety from a “system” perspective
- ▶ **Technology Neutral** – some metrics must be defined by the system and technology implemented, not prescribed



Rotary eddy current brake (courtesy of Wikipedia)

FRA Passenger Equipment Vision

Vision:

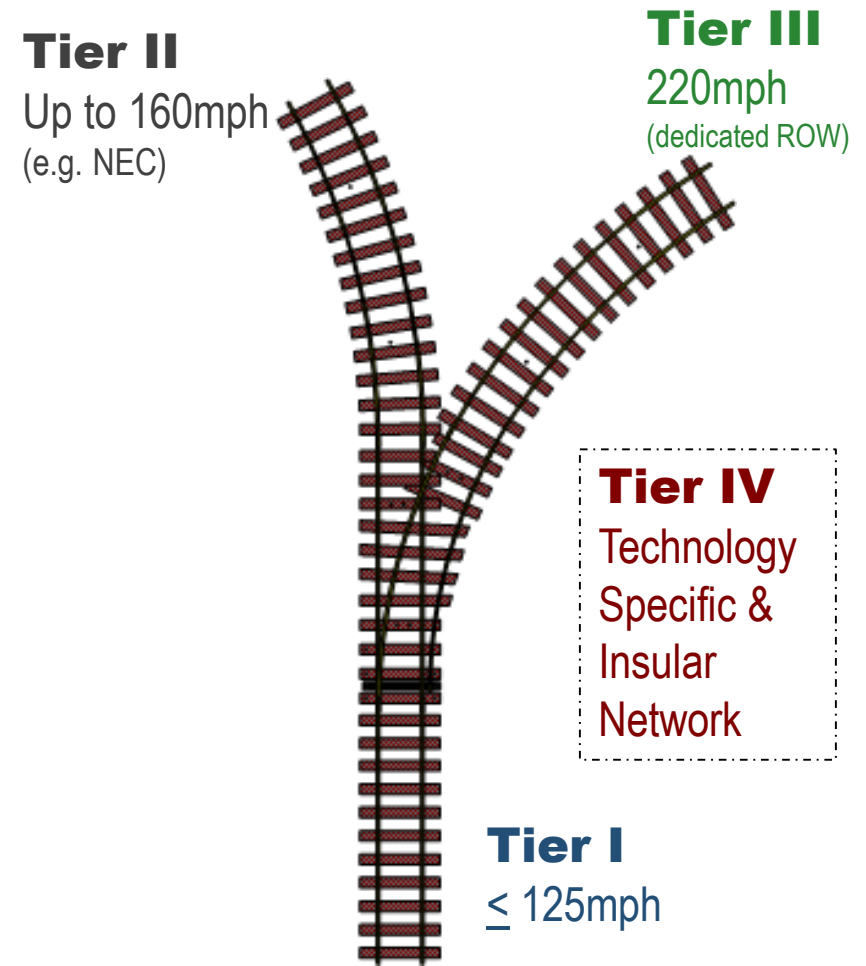
Create passenger equipment regulatory environment incorporating “service proven” designs, advanced technology, and a systematic approach to safety.

Tier I – conventional & alternative crashworthiness, speeds up to 125mph

Tier II – 160 mph maximum authorized speed on existing ROW (i.e. NEC)

Tier III – interoperable w/ all tiers up to 125 mph, dedicated ROW up to 220 mph

Tier IV – Technology specific HSR projects and “other” technologies for insular systems. [proposed]



Proposed Rulemakings

CURRENTLY UNDER DEVELOPMENT



Passenger Equipment Regulatory Plan

Significant planned rules effecting passenger equipment



Passenger Equipment Standards Rule 1:

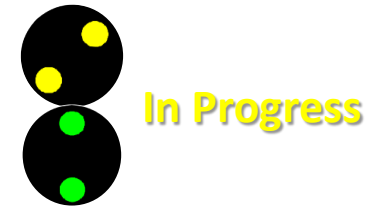
Tier I alternative crashworthiness

Tier III crashworthiness standards

Codify Tier III Glazing

Tier III Braking Systems

Align Tier II MAS with Class 8 limit



Passenger Equipment Standards Rule 2:

Tier III Safety Appliances & General Safety Requirements

Tier III Inspection Testing & Maint.

Single car/locomotive CEM

Tier IV Definition

Tier I safety appliances updates

Electronics (hardware/software Safety) & Passenger ECP

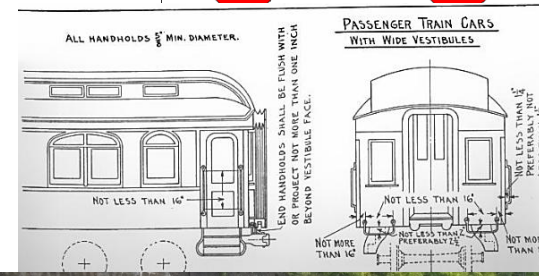
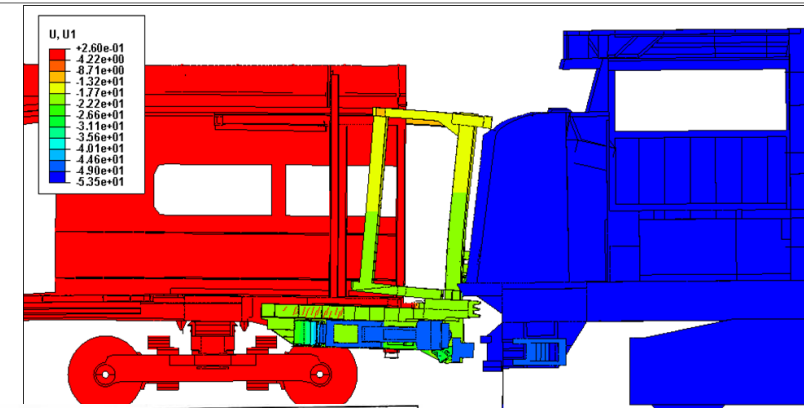
Compliance Testing/Documentation & Start-up Procedures

Passenger Equipment Rule 2 – under development

A second rulemaking governing passenger equipment safety standards has been under development since 2013

This rule is a complimentary expansion to the November 2018 rulemaking and will cover:

- Single car/locomotive CEM requirements;
- Tier III Inspection, Testing and Maintenance (ITM) requirements
- Updates to safety appliance requirements to address modern needs (including Tier III)
- Revisions to testing and commissioning process for new and rebuilt equipment designs

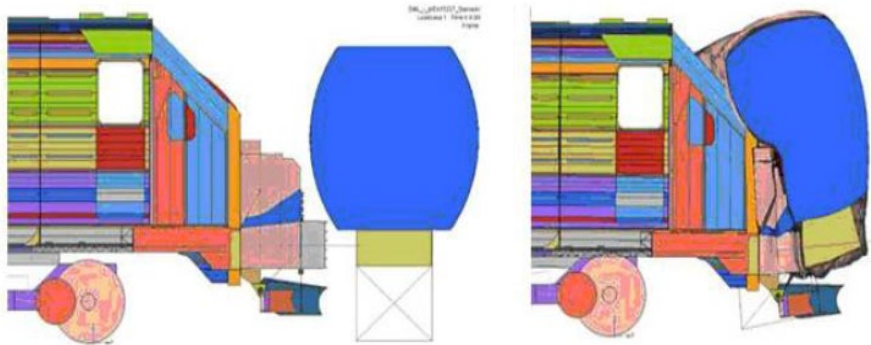
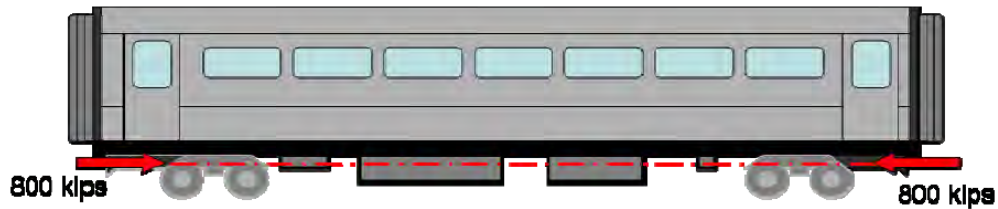


Single Car/Locomotive Crashworthiness

Updates current requirements for single car/locomotives to address CEM dynamics

Based on input from industry experts and suppliers through RSAC's Engineering Task Force

Similar (but not identical) to what was done for trainset crashworthiness in November 2018 Rule



Revisions to Pre-revenue Service Testing & Commissioning

FRA is currently working with industry to update and refresh the passenger equipment testing and commissioning requirements (238.111)

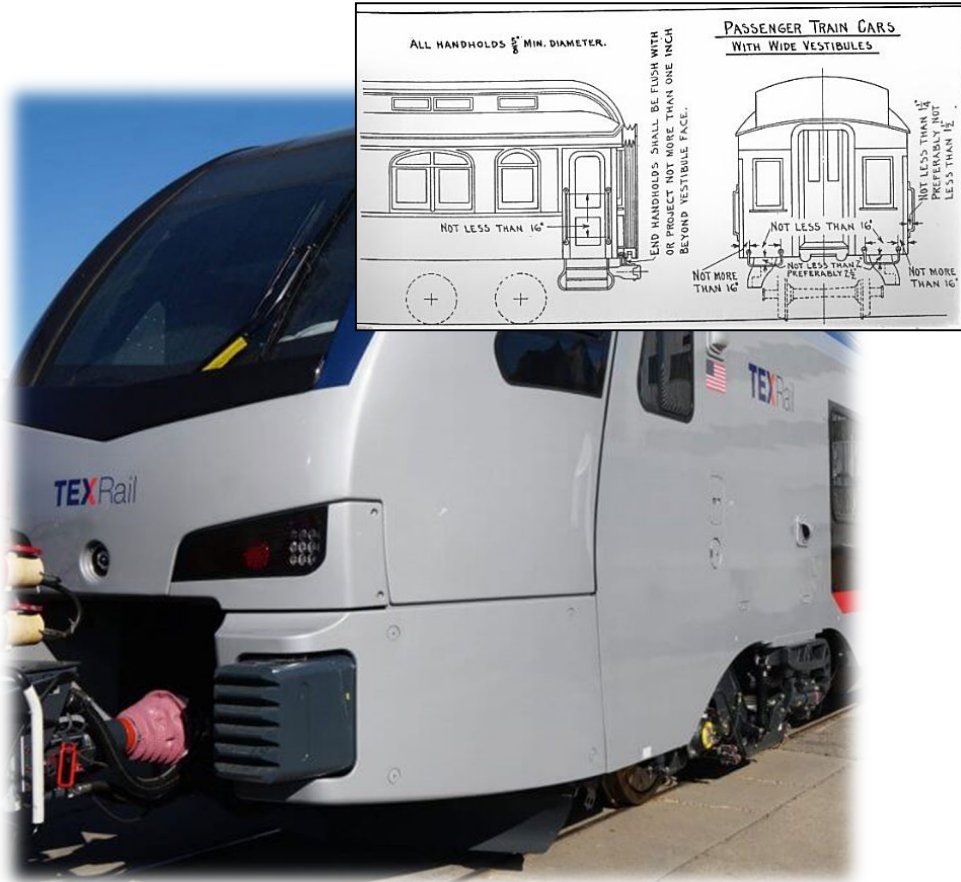
The current proposal would:

- Separate the substantive requirements into two sections:
 1. 238.110 - **Design criteria, testing, documentation, and approvals**
 2. 238.111 - **Pre-Revenue service acceptance testing (Dynamic)**

The intent is to clarify exactly what is required and when – based on experience since 1999



Updates to Passenger Equipment Safety Appliance Standards



Addresses the need for more modern language governing passenger safety appliances

Designed to be an 'option' - may still choose traditional Part 231 compliance

Designed to eliminate a number of existing waivers (Rock Island Rule)

Clarifies some welding requirements

Eliminates appliances that are unnecessary with modern technology

Future Efforts

AND RELEVANT UPDATES



Reorganization of RSAC

In September 2018 the Railroad Safety Advisory Committee was re-established under a new charter

Membership and administrative changes were made at the request of the Secretary

- *consistent with changes to other DOT Federal Advisory Committees*

First resolution of the new RSAC was to continue the passenger safety regulatory work of the Engineering Task Force

New working group activities will include:

- Finishing second ETF passenger equipment rulemaking; and
- Create a platform for addressing general passenger safety regulatory needs

<https://www.federalregister.gov/documents/2018/09/19/2018-20312/railroad-safety-advisory-committee-re-establishment>

 **FEDERAL REGISTER** 
The Daily Journal of the United States Government

 Notice

Railroad Safety Advisory Committee; Re-Establishment

A Notice by the [Federal Railroad Administration](#) on 09/19/2018

PUBLISHED DOCUMENT

AGENCY:
Federal Railroad Administration (FRA), U.S. Department of Transportation (DOT).

ACTION:
Notice of re-establishment of Railroad Safety Advisory Committee (RSAC).

SUMMARY:
The Federal Railroad Administration (FRA) announces the re-establishment of the Railroad Safety Advisory Committee (RSAC) via a new charter. RSAC is a Federal Advisory Committee established by the U.S. Secretary of Transportation in accordance with the Federal Advisory Committee Act to provide information, advice, and recommendations to the Administrator of FRA on matters relating to railroad safety. This charter will be effective for 2 years from the date it is filed with Congress.

FOR FURTHER INFORMATION CONTACT:
Kenton Kilgore, RSAC Designated Federal Officer/RSAC Coordinator, FRA Office of Railroad Safety, (202) 493-6286; or Larry Woolverton, Executive Officer, FRA Office of Railroad Safety, (202) 493-6212.

DOCUMENT DETAILS

Printed version:
[PDF](#)

Publication Date:
09/19/2018

Agencies:
[Federal Railroad Administration](#)

Document Type:
Notice

Document Citation:
83 FR 47407

Page:
47407 (1 page)

Agency/Docket Number:
Docket No. FRA-2000-7257,
Notice No. 87

Document Number:
2018-20312

DOCUMENT STATISTICS

Page views:
807

Thank you

QUESTIONS?