



Enhanced Tank Car Standards and Operational Controls for High Hazard Flammable Trains (HM-251)





History



P-1577 – March 9, 2011

CPC-1230 – July 26, 2011

T87.6 – August 17, 2011 (first meeting)

CPC-1232 – August 31, 2011

ANPRM – September 6, 2013 (78 FR 54849)

NPRM – August 1, 2014 (79 FR 45016)

Final Rule – May 8, 2015 (89 FR 26644)



Scope of Rule

- **High Hazard Flammable Train (HHFT)**
 - ⚠ 20 or more loaded cars in a continuous block
 - ⚠ 35 loaded cars throughout the train
- **High Hazard Flammable Unit Train (HHFUT)**
 - ⚠ 70 or more loaded tank cars in a single train





Elements of Rule



Classification



Routing/Notification



Speed Restrictions



Braking



Tank Car Specifications



Classification

- **Sampling and testing program for unrefined petroleum products**
 - ⚠ Frequency of sampling/testing
 - ⚠ Sample prior to offering/changes
 - ⚠ Sampling method
 - ⚠ Test methods
 - ⚠ Quality control measures
 - ⚠ Duplicate samples
 - ⚠ Criteria for modification of program
 - ⚠ Other methods
- **Certify, document, and make available to DOT**
- **49 CFR Section 173.41**



Routing

- **Risk assessment**

- ⚠ Routing analysis (27 safety and security factors)

- ⚠ Select a route based on its findings

- **Notification**

- ⚠ Contact information for State and/or regional fusion centers and State, local, and tribal officials

- ⚠ Request information related to the routing of hazardous materials through their jurisdictions

- ⚠ Does not replace the requirement for Railroads to notify States of Bakken Crude routes.

- **49 CFR § 174.310 (a)(1)**



Speed Restriction

- **HHFT**

- ⚠️ 40 mph in High Threat Urban Area (§ 1580.3)

- Unless all tank cars meet new standards

- ⚠️ 50 mph otherwise

- ⚠️ 49 CFR § 174.310 (a)(2)





Braking

- **Effective date (HHFT)**

- ⚠ Two-way end-of-train device (§ 232.5) or
- ⚠ Distributed Power (§ 229.5)
- ⚠ Speed > 30 mph

- **January 1, 2021 (HHFUT)**

- ⚠ Class 3 PGI material (Bakken Crude oil)
- ⚠ Speed > 30 mph
- ⚠ Electronically controlled Pneumatic Brakes (49 CFR Part 232, Subpart G)
- ⚠ Not buffer cars

Braking

- **January 1, 2023**
 -  All HHFUTs (includes denatured alcohol)
- **Buffer cars counted in determine effective and operative brakes (§ 232.609)**
- **Alternate brakes systems may be approved (49 CFR Part 232, Subpart F)**
- **§ 174.310(a)(3)**

Tank Car Specification

- **New cars constructed after October 1, 2015**
 - ⚠ Spec standard
 - ⚠ Performance standard
 - ⚠ DOT 117
- **Existing car to be retrofitted**
 - ⚠ Spec standard
 - ⚠ Performance standard
 - ⚠ DOT117R
- **Prescribed retrofit schedule**
- **Retrofit reporting**

New Tank Cars

- **Specification Standard (DOT117)**

- ⚠ TC-128 Minimum shell/head thickness – 9/16”
- ⚠ Tank head puncture resistance system – § 179.16(c)
- ⚠ Thermal protection system – § 179.18
- ⚠ Bottom outlet valve – prevent unintended actuation during a derailment
- ⚠ Top fittings protection – AAR’s Tank Car Manual, E 10.2.1)
- ⚠ **49 CFR Part 179, Subpart D**

New Tank Cars

- **Performance Standard (DOT117P)**
 - ⚠ Shell - 12" x 12" indenter: 12 mph
 - ⚠ Tank head – 18 mph
 - ⚠ Thermal protection system – § 179.18
 - ⚠ Bottom outlet valve – prevent in intended actuation during a derailment
 - ⚠ Top fittings protection – AAR's Tank Car Manual, E 10.2.1)
 - ⚠ § 179.202-12

Retrofit Tank Cars

- **Specification Standard (DOT117R)**

- ⚠ Minimum shell/head thickness – 7/16”
- ⚠ Tank head puncture resistance system – § 179.16(c)
- ⚠ Thermal protection system – § 179.18
 - Jacket is required (basis of all modeling)
- ⚠ Bottom outlet valve – prevent unintended actuation during a derailment
- ⚠ § 179.202-13

Retrofit Schedule

Car specification /Service	U.S. Retrofit Timeline	Car specification /Service	Canadian Retrofit Timeline
DOT111 (NJ)/PGI	January 1, 2017 January 1, 2018	DOT111 (NJ)/Crude Oil	May 1, 2017
DOT111 (J)/PGI	March 1, 2018	DOT111 (J)/Crude Oil	March 1, 2018
CPC-1232 (NJ)/PGI	April 1, 2020	CPC-1232 (NJ)/Crude Oil	April 1, 2020
DOT111 (NJ)/PGII	May 1, 2023	DOT111 (NJ)/Ethanol	May 1, 2023
DOT111 (J)/PGII	May 1, 2023	DOT111 (J)/Ethanol	May 1, 2023
CPC-1232 (NJ)/PGII	July 1, 2023	CPC-1232 (NJ)/Ethanol	July 1, 2023
CPC-1232 (J)/PGI and II and all remaining cars in PGIII	May 1, 2025	CPC-1232 (J)/PGI and II all remaining cars in other flammable liquid service	May 1, 2025

Retrofit Reporting

- Owners of non-jacketed DOT111 cars
- PGI service in HHFT
- Unable to meet January 2017 deadline
- Report by March 1, 2017

⚠ DOT117R

⚠ DOT117P

⚠ DOT111 (not retrofitted)

⚠ DOT117

⚠ ECP (ready/equipped)

- **§ 174.310(5)**



Alignment with Transport Canada

- **Retrofit schedule**

- ⚠ U.S. based on packing group

- ⚠ TC based on commodity

- **Applicability**

- ⚠ U.S.-HHFT

- ⚠ TC single tank car

- **ECP**

- ⚠ U.S. required for HHFT after January 1, 2021 (PGI), and May 1, 2023 (PGII/III)

- ⚠ Not yet required. TC orally committed to ECP brakes.



Appeal Delays

August 10, 2015: PHMSA notice of anticipated delay in processing administrative appeals to the HM-251 final rule.

Appeals from	Docket No.	Focus of appeal
Association of American Railroads (AAR)	PHMSA-2012-0082-3480	<ul style="list-style-type: none"> • Advanced Brake Signal Propagation Systems. • Scope of the Rulemaking.
American Chemistry Council (ACC)	PHMSA-2012-0082-3473	<ul style="list-style-type: none"> • Thermal Protection for Tank Cars. • Advanced Brake Signal Propagation Systems. • Retrofit Timeline and Tank Car Reporting Requirements.
American Fuel & Petrochemical Manufacturers (AFPM).	PHMSA-2012-0082-3470	<ul style="list-style-type: none"> • Scope of the Rulemaking. • Retrofit Timeline and Tank Car Reporting Requirements.
Columbia River and Northwest Treaty Tribes	PHMSA-2012-0082-3478	<ul style="list-style-type: none"> • Information Sharing/Notification. • Tribal Impacts and Consultation.
Dangerous Goods Advisory Council (DGAC)	PHMSA-2012-0082-3471	<ul style="list-style-type: none"> • Advanced Brake Signal Propagation Systems. • Scope of the Rulemaking. • Testing and Sampling Program.



Questions?



FRA – Office of Railroad Safety

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