

# Operational Controls for High-Hazard Flammable Trains

New Regulatory Requirements Addressed  
in HM-251 Final Rule  
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# Key Provisions of HM-151

1. New TC & DOT 117, 117 P and 117R tank car specifications
2. Special Trains – HHFT and HHFUT
3. Train Speed
4. Proof of Classification
5. Train & Locomotive Safety
6. Emergency Response
7. Enhanced Braking
8. Routing, Notification and Risk Assessments
9. Taking Higher Risk Tank Cars Out of Service
10. Scheduling of New Tank Car Implementation



# Special Trains – HHFT / HHFUT

- High Hazard Flammable Liquid Trains

*≥ 20 loaded tank cars containing a Class 3 flammable liquids in a continuous block or,*

*≥ 35 loaded tank cars containing a Class 3 flammable liquid within train*

- High Hazard Flammable Liquid Unit Trains –

*≥ 70 loaded tank cars containing a Class 3 flammable liquid within train traveling more than 30 mph*

# Reduced Operating Speeds

$$\text{Kinetic Energy} = \frac{1}{2} (\text{Mass}) \times (\text{Velocity})^2$$

- Reduce speed from 50 mph to 40 mph
  - Severity of accident reduced by 36%
  - A 10-mph reduction in speed equates to a 20% increase in turnaround time (assuming 50 mph average train speed), requiring a 20% increase in fleet size

High Hazard Flammable Liquid Trains –  
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≥ 35 loaded cars within train

High Hazard Flammable Liquid Unit Trains –  
≥ 70 loaded cars within train traveling more  
than 30 mph

# Reduced Operating Speeds

- Restrict all HHFTs to 50-mph in all areas
- Restrict HHFTs in High-Threat Urban Areas (HTUA) to 40 mph unless all tank cars meet the new DOT 117, 117R, or 117P standard

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# High Threat Urban Areas (HTUA)\*

State	Candidate Urban Area	Geographic Area Captured in the Data Count	Previously Designated Urban Areas Included
Oregon	Portland Area	Portland, Vancouver, and a 10-mile buffer extending from the border of the combined area	Portland, OR
Washington	Seattle Area	Seattle, Bellevue, and a 10-mile buffer extending from the border of the combined area	Seattle, WA

\* Defined in 49 CFR 1580.3

# More Accurate Classification of Unrefined Petroleum-Based Products

- Document sampling and testing program for all unrefined petroleum-based products, such as crude oil
- Certify that programs are in place, document the testing and sampling program outcomes, and make information available to DOT personnel upon request

# Rail Routing – Risk Assessment

- Railroads operating HHFTs would be required to perform a routing analysis that considers, at a minimum, 27 safety and security factors\* and select a route based on its findings.

\* 49 CFR §172.820

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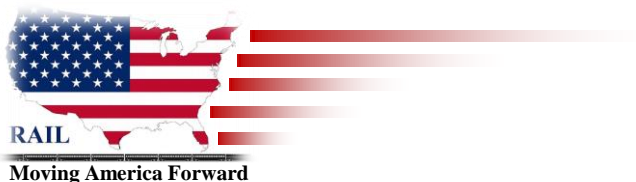
# THE SAFETY AND SECURITY RISK ANALYSIS

1. Volume of hazardous material transported;
2. Rail traffic density;
3. Trip length for route;
4. Presence and characteristics of railroad facilities;
5. Track type, class, and maintenance schedule;
6. Track grade and curvature;
7. Presence or absence of signals and train control systems along the route ("dark" versus signaled territory);
8. Presence or absence of wayside hazard detectors;
9. Number and types of grade crossings;
10. Single versus double track territory;
11. Frequency and location of track turnouts;
12. Proximity to iconic targets;
13. Environmentally sensitive or significant areas;
14. Population density along the route;
15. Venues along the route (stations, events, places of congregation);
16. Emergency response capability along the route;
17. Areas of high consequence along the route, including high consequence targets as defined in §172.820(c);
18. Presence of passenger traffic along route (shared track);
19. Speed of train operations;
20. Proximity to en-route storage or repair facilities;
21. Known threats, including any non-public threat scenarios provided by the Department of Homeland Security or the Department of Transportation for carrier use in the development of the route assessment;
22. Measures in place to address apparent safety and security risks;
23. Availability of practicable alternative routes;
24. Past incidents;
25. Overall times in transit;
26. Training and skill level of crews; and
27. Impact on rail network traffic and congestion.



# Rail Routing - Notification

- Ensures that railroads notify State and/or regional fusion centers, and that State, local and tribal officials who contact a railroad to discuss routing decisions are provided appropriate contact information for the railroad in order to request information related to the routing of hazardous materials through their jurisdictions.



# Enhanced Braking

- Two way End of Train device
- Distributed Power (DP)
- Electronically Controlled Pneumatic Brakes



# Electronically Controlled Pneumatic (ECP) Braking Schedule

All HHFTs	Must have either EOT or DP braking functionality, speed restricted to 50 mph, 40 mph in HMTUA	Current
HFFUT with 1 or more loaded tank car containing a Class 3 PG I material	Must have ECP braking, or be restricted to 30 mph	Prior to Jan. 1, 2021
All HHFUTs (any Class 3 materials)	Must have ECP braking, or be restricted to 30 mph	Prior to May 1, 2023

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# FRA Safety Advisory 2015-01\*

- Recommends railroads continue to install Wheel Impact Load Detectors (WILDs) along routes used by HHFTs and lower the thresholds for actions to be taken when impacts are detected by WILDs in accordance with guidelines recommended by FRA
- Recommends that HHFTs that travel long distances should have mechanical and brake inspections conducted by “qualified mechanical inspectors”.



\* Published in FR on April 27, 2015

Thank You !!!