Safe Transport of Energy Products (STEP)

Presented by
Rob Benedict, Senior Regulations Officer
Office of Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration

December 9, 2014 – Slide 1
Objectives

Who is PHMSA?

- Agency Mission
- Role in the Safe Transportation of Energy Products

How the Landscape is Changing?

- Energy Boom
- Effects on Transportation

What’s Next / Where do we go from here?

- HM-251 Proposed Rulemaking
- HM-251B Advanced Notice of Proposed Rulemaking
PHMSA’s mission is to protect people and the environment from the risks of hazardous materials transportation.

PHMSA works to achieve its safety mission through:

- Robust Regulations
- Transparency
- Rigorous enforcement
- Strong partnerships
- Continuing education
PHMSA is a small agency with a big mission. PHMSA is responsible for overseeing a hazardous materials safety program that minimizes the risks to life and property inherent in commercial transportation. PHMSA’s hazardous materials regulations provide safety and security requirements for more than $1.4 trillion shipments annually. This amounts to 2.2 billion tons of material moved by air, rail, highway, and water.
To ensure hazardous materials are identified, packaged and handled safely and securely during transportation, hazardous materials are categorized into hazard classes and packing groups based upon the transportation risks.

To minimize the consequences of an incident should one occur, the HMR require shippers to properly package the materials commensurate with the risks they pose in transportation.

To provide effective communication to transportation workers and emergency responders regarding the hazards of the materials being transported (e.g. shipping papers, package marking and labeling, and vehicle placarding). The HMR require shippers to provide emergency response information applicable to the material being transported.

To improve awareness of and adherence to relevant laws and regulations, PHMSA evaluates risk, enforces safety standards, educates stakeholders, investigates incidents and failures, conducts research, and supports the emergency response community.
<table>
<thead>
<tr>
<th>Topic</th>
<th>CFR Part(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification of Materials</td>
<td>49 CFR Part 173</td>
</tr>
<tr>
<td>Package Selection</td>
<td>49 CFR Part 173</td>
</tr>
<tr>
<td>Tank Car Standards</td>
<td>49 CFR Part 179</td>
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<tr>
<td>Operational Controls</td>
<td>49 CFR Part 174</td>
</tr>
<tr>
<td>Security Plans</td>
<td>49 CFR Part 172.800-822</td>
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<tr>
<td>Routing of Trains</td>
<td>49 CFR Part 172.800-822</td>
</tr>
<tr>
<td>Coordination with FRA</td>
<td>49 CFR Part 200-269</td>
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</table>
Growing domestic production of crude oil continues to reshape the U.S. energy economy, with crude oil production approaching the historical high achieved in 1970 of 9.6 million barrels per day.
As energy production in the U.S. increases, so does the need to transport that energy in all its forms.

Due to increased production the volume of crude oil moving by rail has quadrupled in less than a decade.
Despite a recent decline in the number of rail accidents, the frequency of derailments involving crude oil are increasing.

These derailments can have lasting consequences to the public, communities, and environment.

This has been demonstrated most dramatically in Lac-Mégantic, Quebec.
December 9, 2014 – Slide 10

Major Flammable Liquid Recent Derailments

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/06</td>
<td>New Brighton, PA</td>
</tr>
<tr>
<td>10/07</td>
<td>Plainesville, OH</td>
</tr>
<tr>
<td>8/08</td>
<td>Luther, OK</td>
</tr>
<tr>
<td>2/11</td>
<td>Arcadia, OH</td>
</tr>
<tr>
<td>6/09</td>
<td>Cherry Valley, IL</td>
</tr>
<tr>
<td>11/11</td>
<td>Tiskilwa, IL</td>
</tr>
</tbody>
</table>

Accident Data from NTSB
Major Flammable Liquid Recent Derailments

Accident Data from NTSB

2012
- 8/12 Plevna, MT

2013
- 3/13 Parkers Prairie, MN
- 4/13 Bremner, OH

2014
- 7/12 Columbus, OH
- 3/13 Lac-Megantic, QC
- 7/13
- 11/13-4/14
  - Aliceville, AL
  - Casselton, ND
  - Plaster Rock, ND
  - New Augusta, MS
  - Vandergrift, PA
  - Lynchburg, VA

December 9, 2014 – Slide 11
PHMSA’s Role

Systematic Approach to Rail Safety

Proper Classification  Operational Controls  Tank Car & Rail Integrity  Emergency Response

December 9, 2014 – Slide 12
### Emergency Orders issued related to Rail Transport of Flammable Liquids

<table>
<thead>
<tr>
<th>Emergency Order</th>
<th>Date Issued</th>
<th>Action taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>EO 28 (78 FR 48218)</td>
<td>August 7, 2013</td>
<td>Addressed safety issues related to securement of certain hazardous materials trains including those containing large volumes of hazardous materials.</td>
</tr>
<tr>
<td>Docket No. DOT-OST-2014-0025</td>
<td>February 25, 2014 revised and amended Order on March 6, 2014</td>
<td>Required those who offer crude oil for transportation by rail to ensure that the product is properly tested and classified in accordance with Federal safety regulations.</td>
</tr>
<tr>
<td>Docket No. DOT-OST-2014-0067</td>
<td>May 7, 2014</td>
<td>Requires all railroads that operate trains containing one million gallons of Bakken crude oil to notify SERCs about the operation of these trains through their States. Specifically, this notification should identify each county, or a particular state or commonwealth’s equivalent jurisdiction, in the state through which the trains will operate.</td>
</tr>
</tbody>
</table>
• Notice of Proposed Rulemaking - Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains: Proposes, for trains transporting a large volume of flammable liquids:
  o New operational requirements
  o Improved tank car standards
  o Revised requirements to ensure proper classification of mined gases and liquids.
  o Notification requirements

• Defines a High Hazard Flammable Train: as a train comprised of 20 or more carloads of a Class 3 flammable liquid
Anatomy of a Tank Car

- Tank Head
- Pressure Relief Device
- Top fittings
- Tank Shell
- Head Shield
- Bottom fittings
- Coupler
## Proposed Tank Car Standard

### New Construction

<table>
<thead>
<tr>
<th>Option 1 –</th>
<th>Incorporates several enhancements designed to increase puncture resistance; provide thermal protection to survive a 100-minute pool fire; protect top fitting and bottom outlets during a derailment; and improve braking performance.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 2 –</strong></td>
<td>The Option 2 car has most of the same safety features as the Option 1 car, including the same increase in shell thickness, jacket requirement, thermal protection requirement, and head shield requirement, but it lacks rollover protection and the ECP brake equipment.</td>
</tr>
<tr>
<td><strong>Option 3 –</strong></td>
<td>A jacketed CPC-1232 tank car standard, with improvements made to the bottom outlet handle and pressure relieve valve. This car is a substantial safety improvement over the current DOT Specification 111 but does not achieve the same level of safety as the Options 1 or 2. This tank car has a 7/16 inch shell, which is thinner than Options 1 or 2 tank cars.</td>
</tr>
</tbody>
</table>

### Existing Fleet

Existing DOT Specification 111 tank cars that are used as part of a HHFT, may be retrofitted to meet the three Options for the DOT Specification 117 requirements or be retired, repurposed, or operated under speed restrictions for up to five years, based on packing group assignment.

<table>
<thead>
<tr>
<th>Packing Group</th>
<th>DOT 111 Not Authorized After</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>October 1, 2017</td>
</tr>
<tr>
<td>II</td>
<td>October 1, 2018</td>
</tr>
<tr>
<td>III</td>
<td>October 1, 2020</td>
</tr>
</tbody>
</table>
Rail Routing

- PHMSA is proposing to require the additional safety and security planning requirements prescribed in § 172.820, for HHFTs.
- This includes consideration of 27 Safety and Security Factors.

Braking

- Require alternative brake signal propagation systems, distributed power (DP), and two-way end of train (EOT) device immediately.
- Require electronic controlled pneumatic brakes (ECP) at a future date.

Speed

- Establish a 50-mph maximum speed restriction for HHFTs;
- Provide three Options for a 40-mph speed restriction for any HHFT unless all flammable liquid tank cars meet the enhanced tank car standards and
- In the event a rail carrier cannot comply with the enhanced braking requirements, to establish a 30-mph speed restriction for those HHFTs.
Classification of Mined Gas and Liquid

- Require a sampling and testing program for mined gases and liquids.
- Plan must include: (1) frequency of sampling and testing; (2) sampling at various points along the supply chain; (3) sampling methods; (4) testing methods; (5) statistical justification for sample frequencies; and, (6) duplicate samples for quality assurance.

Notification

- Require railroads that operate trains containing one million gallons of Bakken crude oil to notify SERCs about the operation of these trains through their States.
• Advanced Notice of Proposed Rulemaking - Oil Spill Response Plans for High-Hazard Flammable Trains: Sought comment on OSRPs:
  o Current thresholds
  o Costs of developing and implementing and submitting them for approval
  o Clarity of current requirements
HM-251B Overview

**Scope / Threshold**
- 1,000,000 gallons or more of crude oil per train consist
- An HHFT of 20 or more carloads of crude oil per train consist
- 42,000 gallons of crude oil per train consist
- Another threshold

**Plan Content**
- Clarity of the Current Requirements for Comprehensive OSRPs
- Elements needed to be added or removed
- Implementing a plan across a rail line

**Cost / Benefit**
- What is the cost imposed
- What Safety Benefit is Derived

**Voluntary Compliance**
- To what extent do railroads already comply
- Call to Action
- Emergency Order

December 9, 2014 – Slide 20
• **Operation Safe Delivery:** A website describes the Department's efforts to enhance the safe transport of flammable materials by rail and acts as a valuable resource for enhancing the safe transport of flammable liquids.
  - The site will be continuously updated to provide:
    - Progress reports on industry commitments as part of the “Call to Action”
    - Additional Departmental activities related to rail safety initiative.
    - Questions and Answers
    - Chronology of our actions in this arena

• **Hazardous Materials Safety Assistance Team**

Stakeholders: Safety is Everyone’s Goal

- Crude oil producers
- Communities & Municipalities
- Rail Carriers
- International Community
- Shippers
- DOE
- FMCSA
- NSTB / TSB
- EPA
- FAA
- PHMSA
- Industry Associations
- Emergency Responders
- FRA
- Congress
- DOE
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