



US DOT

Pipeline and Hazardous

Materials Safety

PHMSA

Anthony Murray

Eastern Region - Field Operations

Trenton, NJ

April 19, 2016

Maine Prepares Conference



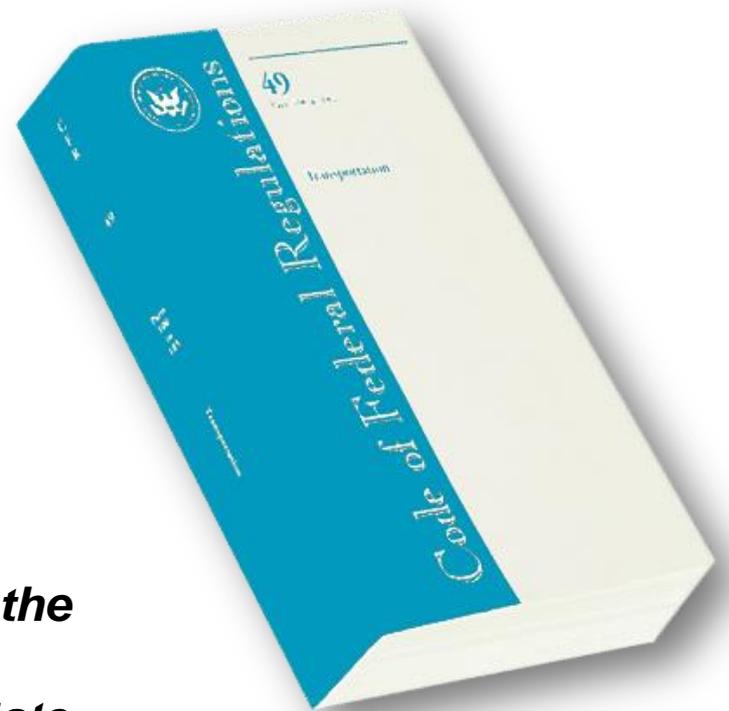


Hazardous Materials Regulations (HMR)

Primary Goal

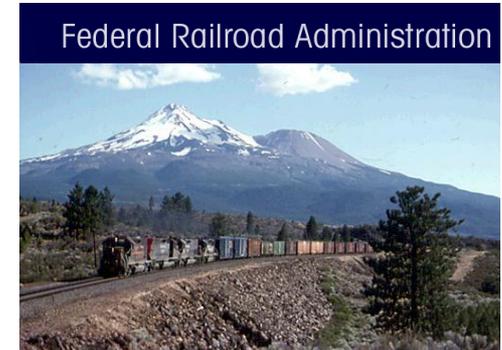
SAFETY
SECURITY

“protect against the risks to life, property, and the environment which are inherent in the transportation of hazardous materials in intrastate, interstate, and foreign commerce.”





Hazardous Materials Regulations Responsibilities



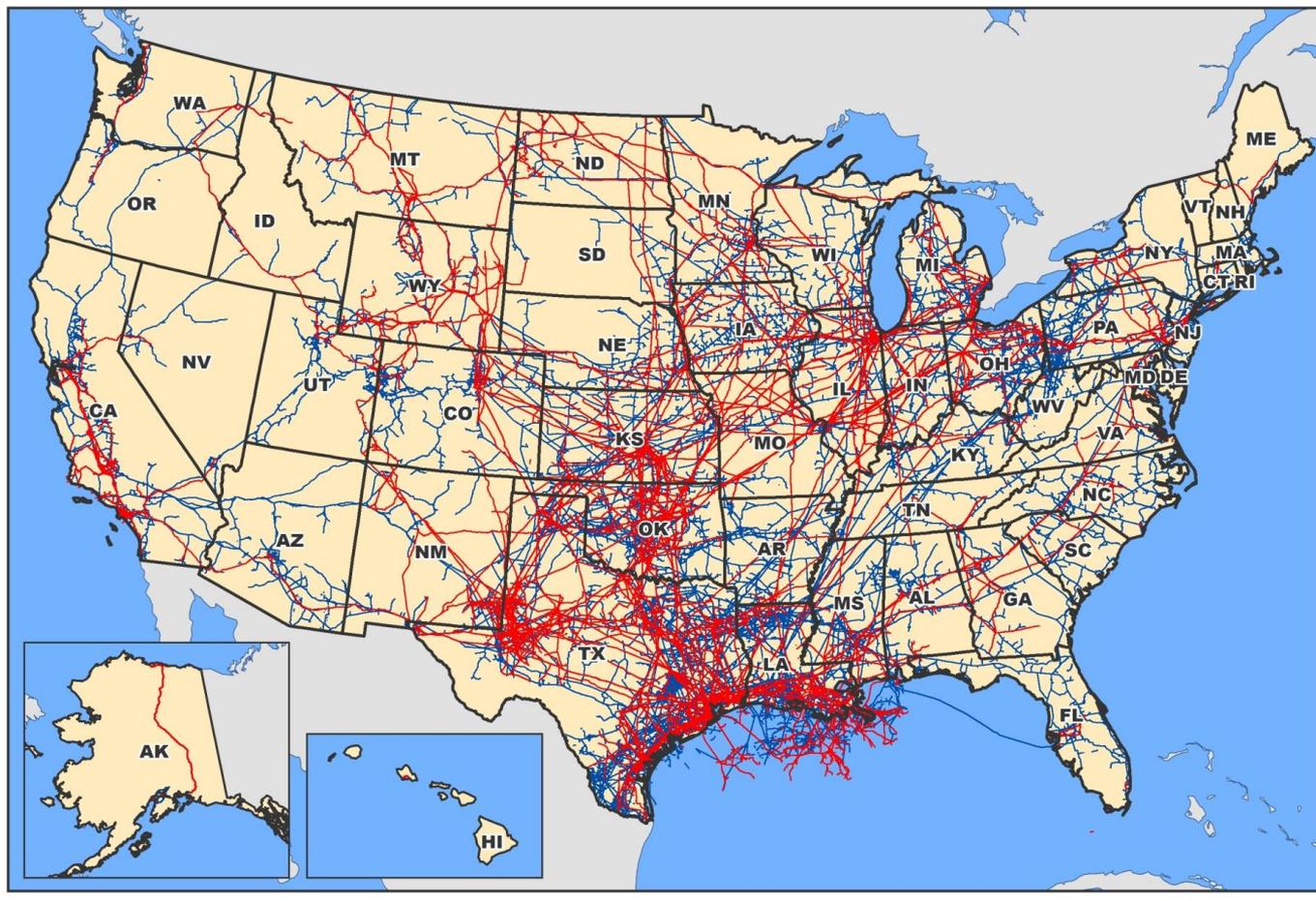
- Modal administrations (FAA, FMCSA, and FRA) enforce the HMR respective to their mode
- U.S. Coast Guard (Department of Homeland Security) enforces the HMR respective to maritime operations





Office of Pipeline Safety

Pipelines in the United States



RED = Petroleum Liquids

BLUE = Petroleum Gases





Sissonville, WV

December 11, 2012

20-Inch Natural Gas Transmission Pipeline

One Nation...
One Number...



Know what's below.
Call before you dig.



15 Miles North on I-77
from Charleston, WV





CATS meeting topics include: accessing pipeline maps

<http://www.npms.phmsa.dot.gov/>

PIMMA
Pipeline Integrity Management
Mapping Application

Click Here to Apply
for PIMMA Access

Already have a Username?
Log on here:

- PIPELINE OPERATOR
- FEDERAL GOVERNMENT
- STATE & LOCAL GOVERNMENT

The banner features a background image of a pipeline system with numerous vertical risers in a mountainous, forested area. The text is overlaid on this image.





Facility Response Plan Team

Team Contact Information

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and Security Division

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(202)366-4774

For emergency after hours requests please call Nathan Schoenkin
at 202-740-1978





Tenents of the HMR



Classify

Contain

Communicate

Comply





Hazard Classes Classify The Risk



Explosives



Gases



**Flammable
Liquids**



**Flammable
Solids**



**Oxidizers and
Organic Peroxides**



**Poison and
Infectious Substances**



Radioactive



Corrosive



Miscellaneous





Contain the Risk - Packaging





Communicate the Risk – HazCom



Section 1 - Identification of Chemical Product and C

Rockwood Pigments & Trading Pty Ltd
 21 David St
 Sandhurst, Vic 3175
 Substance: Blends of black, yellow and red iron oxides in varying
 Trade Name: Iron Oxide Pigments
 Other Names: This MSCB is intended for a range of pigments based
 Product Use: pigments used in a wide variety of applications
 Creation Date: January, 2009
 Revision Date: January, 2009

Section 2 - Hazards Identification

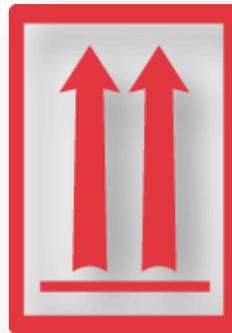
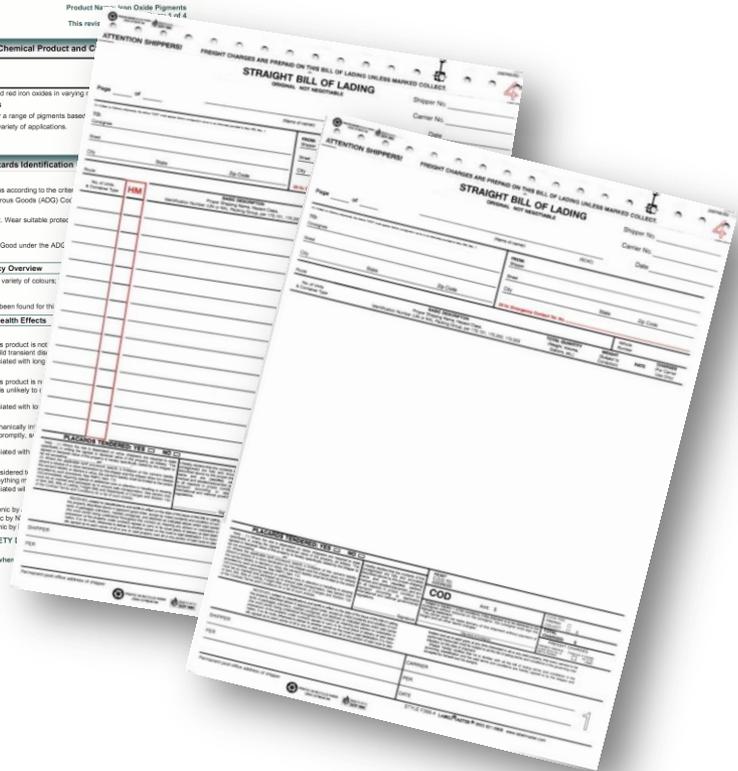
Statement of Hazardous Nature
 The product is classified as hazardous according to the order
 Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code
Risk Phrases: Not Hazardous - No criteria found.
Safety Phrases: S22, S26, S36/37/39. Do not breathe dust. Wear suitable protect
 and eye.
SUBSP Classification: None allocated.
ADG Classification: None allocated. Not a Dangerous Good under the ADG.
UN Number: None allocated.

Emergency Overview

Physical Description & Colour: Powdered solids in a variety of colours;
 (see colours)
Odour: No odour.
Major Health Hazards: no significant risk factors have been found for this

Potential Health Effects

Inhalation:
Short Term Exposure: Available data indicates that this product is not
 irritating, although unlikely to cause anything more than mild transient effects.
Long Term Exposure: No data for health effects associated with long
Skin Contact:
Short Term Exposure: Available data indicates that this product is n
 normal use. However product may be mildly irritating, but is unlikely to c
 which should disappear once contact ceases.
Long Term Exposure: No data for health effects associated with lo
Eye Contact:
Short Term Exposure: This product is likely to be mechanically irri
 effects should result. However, if material is not removed promptly, or
 long term consequences.
Long Term Exposure: No data for health effects associated with
Ingestion:
Short Term Exposure: Significant oral exposure is considered b
 irritating to mucous membranes but is unlikely to cause anything of
Long Term Exposure: No data for health effects associated with
Carcinogen Status:
ASPC: No significant ingredients is classified as carcinogenic by
NTP: No significant ingredients is classified as carcinogenic by N
IARC: No significant ingredients is classified as carcinogenic by I
MATERIAL SAFETY I
 Issued by: Rockwood Pigments & Trading Pty Ltd
 Poisons Information Centre: 13 1126 from anywhere

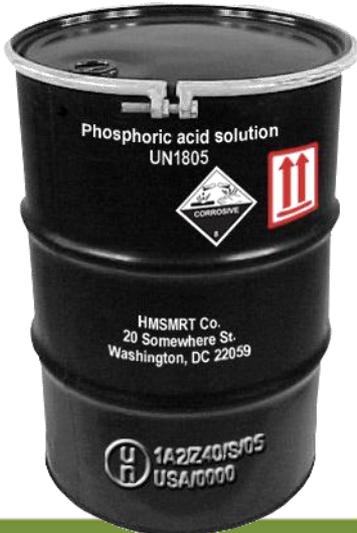
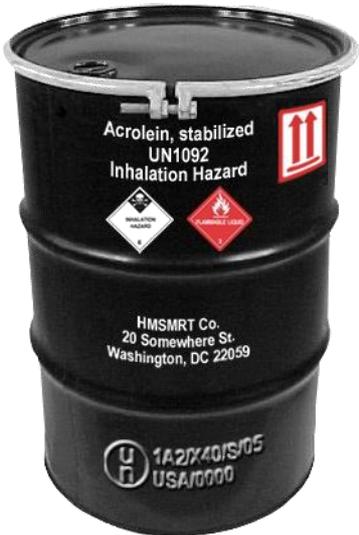


1090





Properly Marked and Labeled





General Placarding Requirements

Placard a container or vehicle:

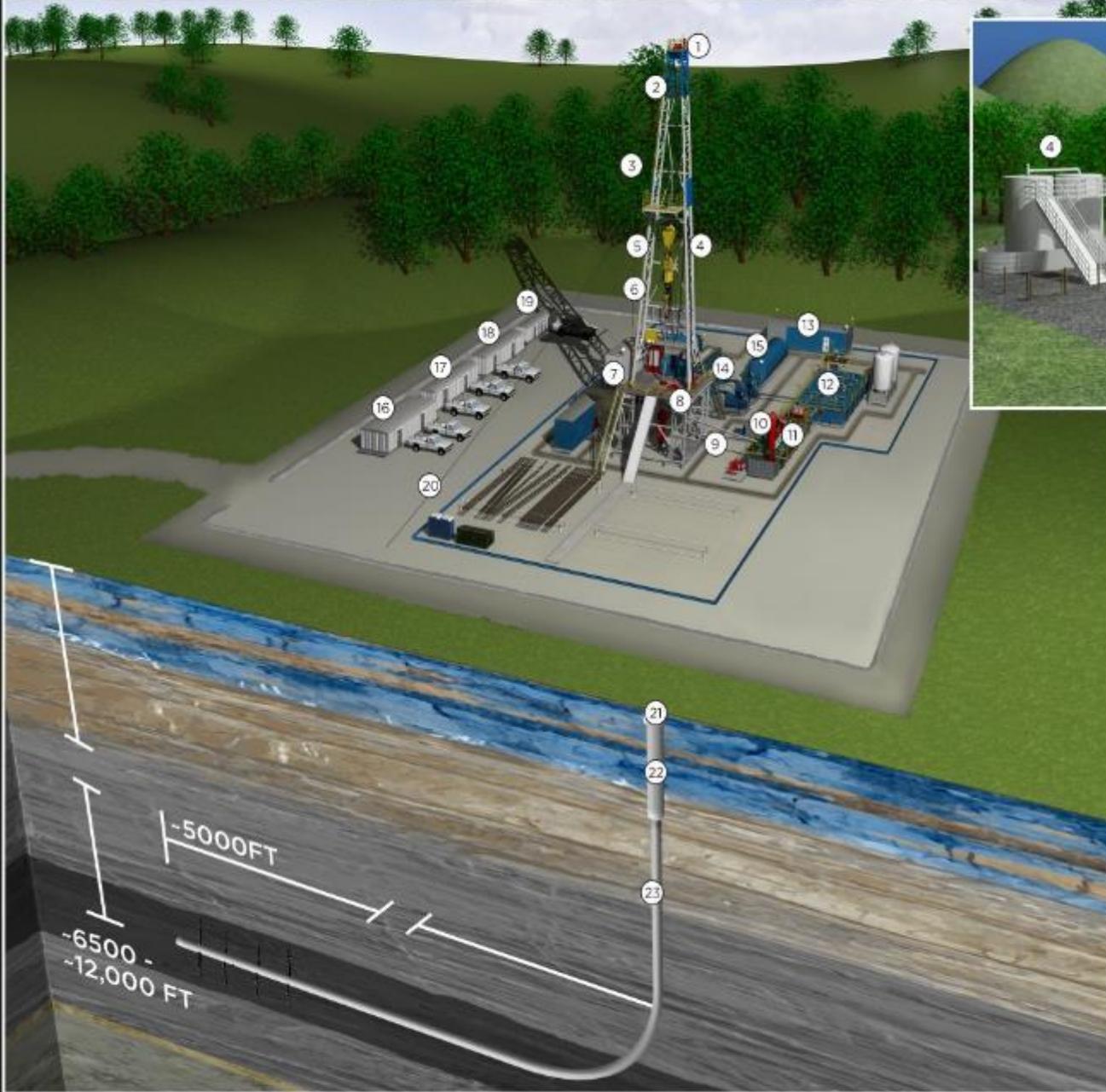
- on each side and each end
- for any quantity of hazardous material

Some exceptions exist based on:

- the hazard and quantity present



ROTARY RIG AND PRODUCTION SITE



Rotary Rig Legend

- | | |
|------------------------------|----------------------------------|
| 1 Crown Block Assembly | 13 Mud House |
| 2 Crown Platform/Watertable | 14 Mud Pumps |
| 3 Derrick Board/Monkey Board | 15 Diesel Tank |
| 4 Mast | 16 Company Man - Quarters |
| 5 Travelling Block | 17 Toolpusher - Quarters |
| 6 Top Drive/Power Swivel | 18 Direction Drillers - Quarters |
| 7 Mouse Hole | 19 Mud Workers - Quarters |
| 8 Hydraulic/Air Hoists | 20 Geronimo Line |
| 9 Mud Return Line | 21 Conductor Casing |
| 10 Mud-Gas Separator | 22 Surface Casing |
| 11 Shale Shakers | 23 Production Casing |
| 12 Mud Pits | |

Production Site Legend

- | | |
|--|--|
| 1 Production wellhead | 3 Departing Pipeline with chemical treatment tank |
| 2 Gas Processing units, with line heater | 4 Brine water Production tanks, in secondary containment |

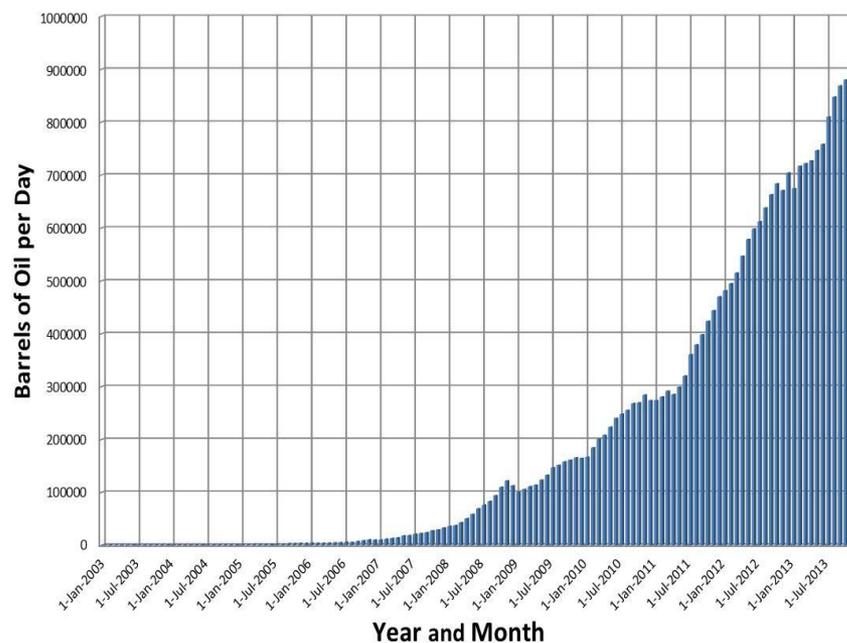
Typically housed on a 300' x 400' padsite, rotary rigs are common to the oil and natural gas industry and can be used to drill multiple wells from a single site. Standing up to 186 feet high, these rigs can drill to a variety of depths and are manned 24 hours a day by rotating five-man crews. Crews live off-site, but report to the rig manager or toolpusher who lives on-site. Chesapeake employs an on-site drilling supervisor, often referred to as a company man, to oversee the complete operation.



US Energy Production

- Growth of domestic natural gas and crude oil production is revolutionizing the US energy economy.
- During December 2013, over 11 million barrels daily were produced.
- In 2013 the Bakken play produced over 10% of all US oil.
- In November 2013, over 10,022 Bakken wells produced 29 million barrels of oil, over 900,000 barrels of oil daily.

Table 1: Bakken Oil Production in North Dakota 2003-2013

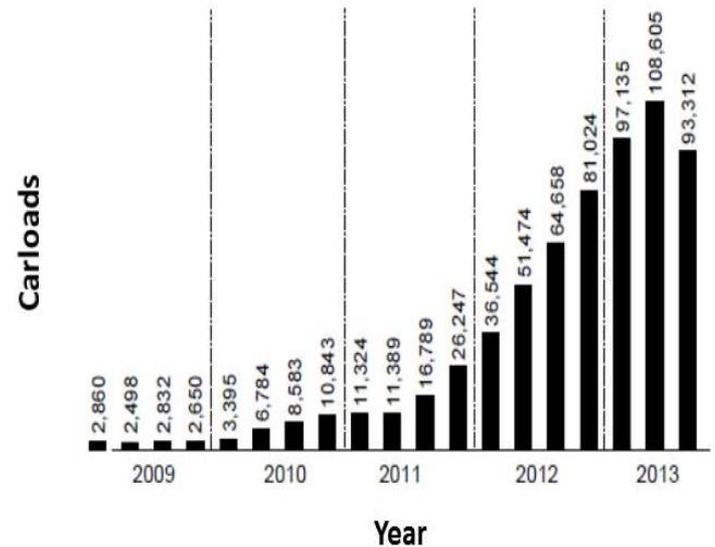




Crude Oil Transport

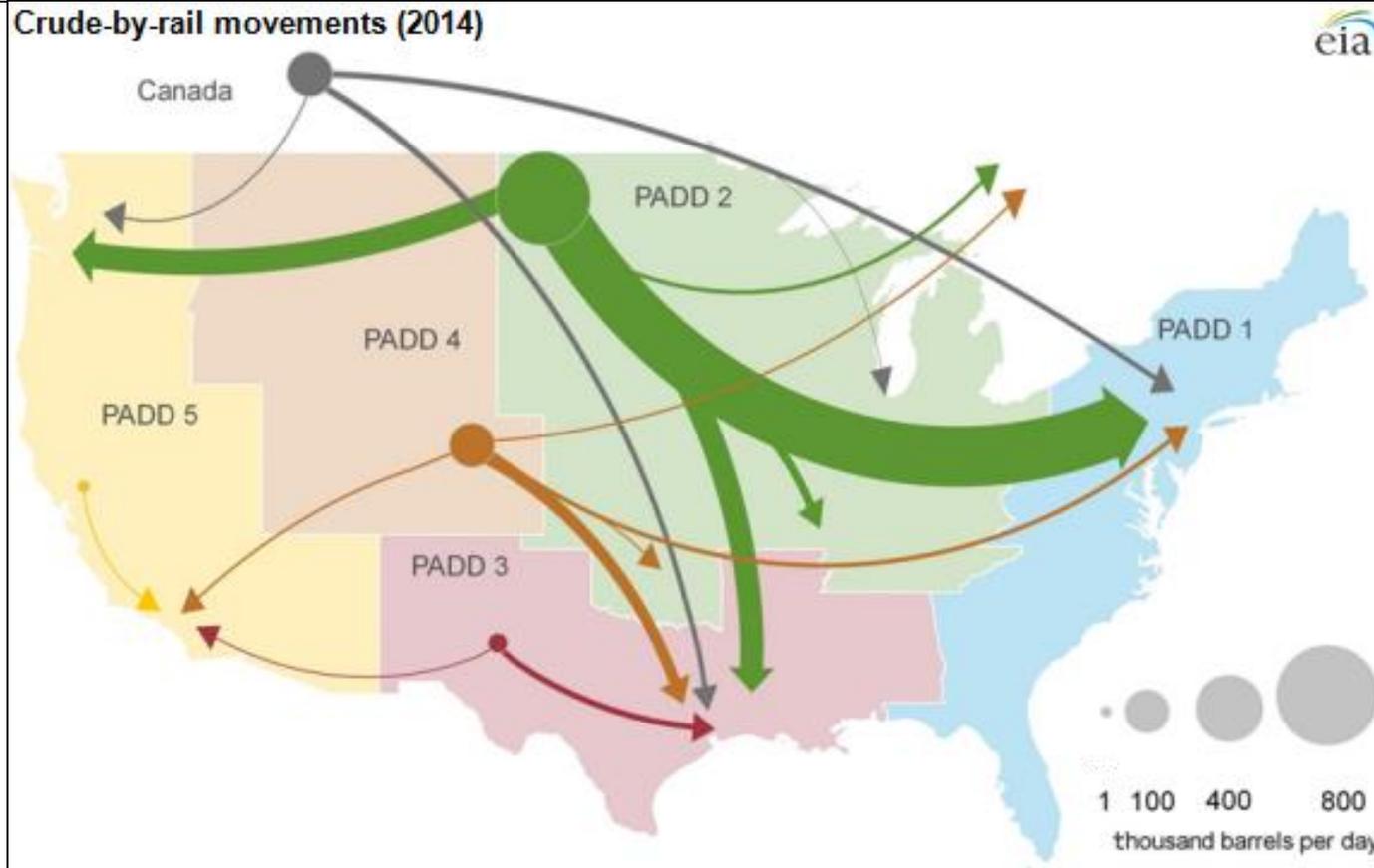
- Increased energy production results in increased transport by all modes.
- The volume of crude oil moving by rail has quadrupled in less than a decade due to increased production.
- Rail volume has increased, but accidents have declined by 43 %.
- Accidents involving hazmats are down 16 %.
- Increased use of unit trains of 100+ cars of a single commodity.

Table 2: Originated Carloads of Crude Oil on Class 1 Railroads





Crude Oil Movements 2014

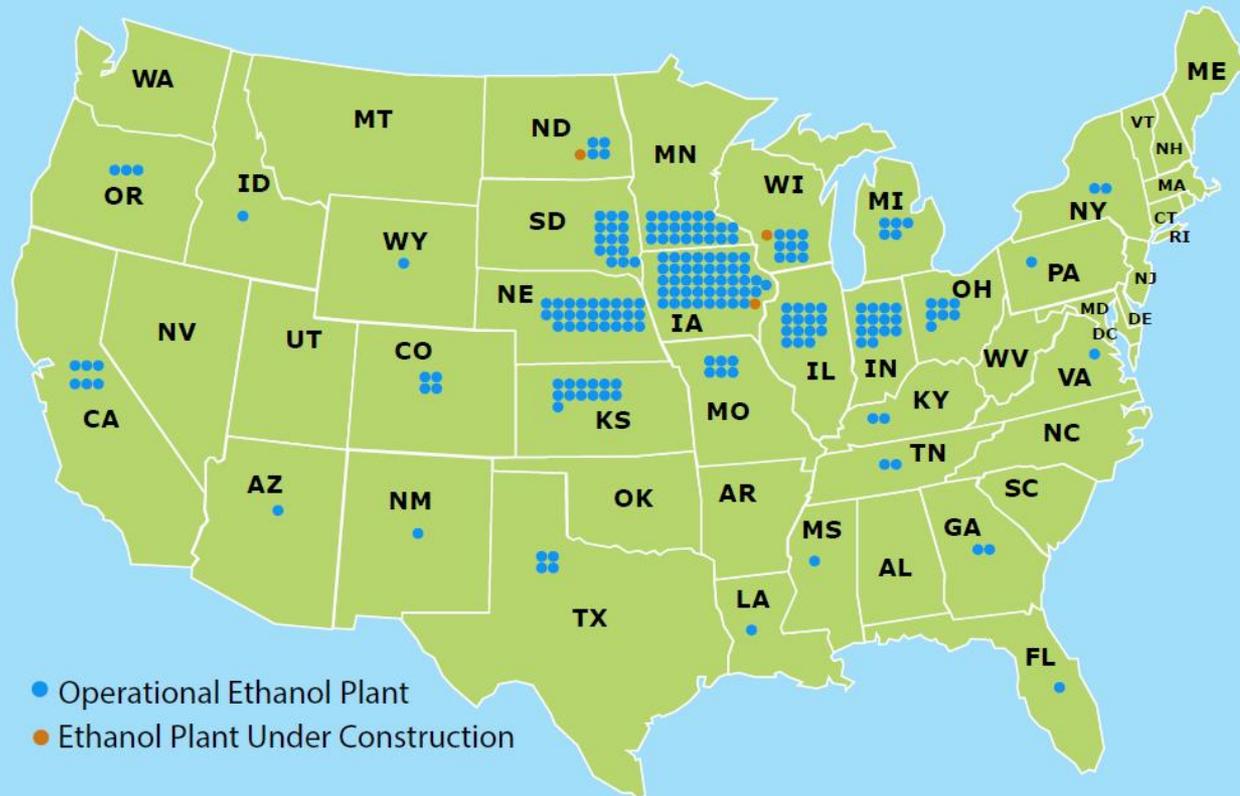


Crude-by-rail movements greater than 1,000 barrels per day are represented on the map; short-distance movements between rail yards within a region are excluded.



ETHANOL PRODUCTION FACILITIES

U.S. ETHANOL BIOREFINERIES BY STATE





Safe Transportation of Energy Products – The Next Step

Crude Oil-Growing domestic production of crude oil continues to reshape the U.S. energy economy, with crude oil production approaching the historical high .

Natural Gas- Hydraulic Fracturing and horizontal drilling have led to an increase in production in the United States. The U.S. is forecast to become a net exporter by 2017. Globally, more than 40% of natural gas is consumed in the generation of power and heat (US approximately 50%).

Liquefied Natural Gas-Liquefying natural gas reduces volume **600x** for easier transport & store. However transportation of LNG provides challenges.



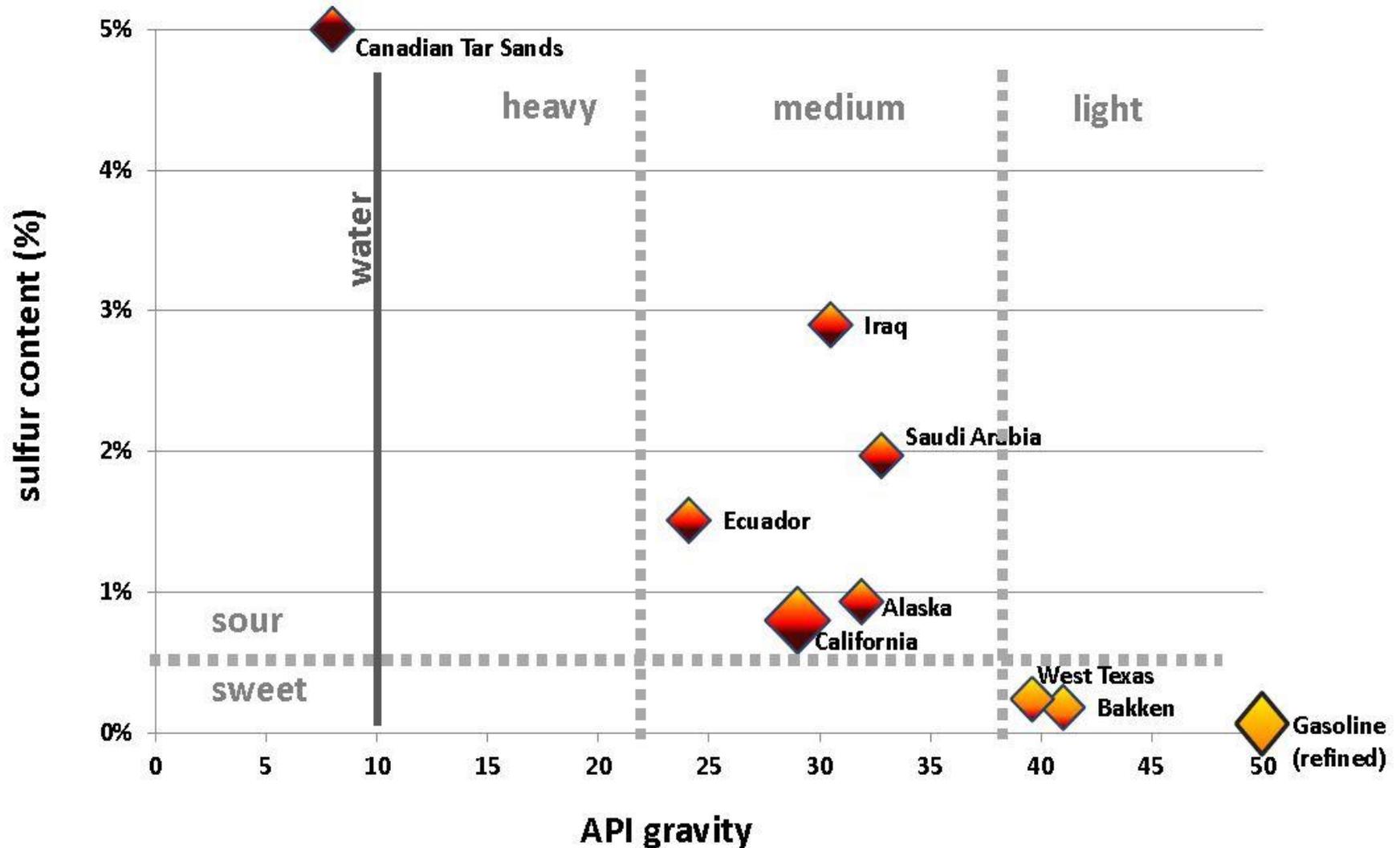


Recent Bakken Crude Oil Derailments

- **Mount Carbon, WV**
February 16, 2015, 28 cars derailed
- **Lynchburg, VA**
April 30, 2014, 15 tank cars derailed
- **Plaster Rock, NB**
January 7, 2014, 16 cars derailed, 8 hazmat
- **Casselton, ND**
December 20, 2013, 20 of 106 tankers derailed
- **Aliceville, AL**
November 8, 2013, 25 of 90 cars derailed
- **Lac-Megantic, QE**
July 6, 2013, 74 cars derailed, 47 fatalities



crude oil characteristics





Petroleum Crude Oil Hazards

- Petroleum crude oil poses a unique risk to transportation. Viscosity, specific gravity, Hydrogen Sulfide (H₂S), flammable dissolved gases, corrosive materials and flammable liquids are just a few examples of variations that may be experienced from one well to another or even day to day.





Testing & Sampling Crude Oil





Class 3 – Flammable Liquids

FLAMMABLE liquids

- Flashpoint $\leq 60^{\circ}\text{C}$ (140°F)
- Incorporated flashpoint test procedures: §171.7
“Reference Material”



| Packing Group | Flash Point (closed cup) | Initial Boiling Point |
|---------------|---|--|
| I | | $\leq 35^{\circ}\text{C}$ (95°F) |
| II | $< 23^{\circ}\text{C}$ (73°F) | $> 35^{\circ}\text{C}$ (95°F) |
| III | $\geq 23^{\circ}\text{C}$ (73°F), $\leq 60^{\circ}\text{C}$ (140°F) | $> 35^{\circ}\text{C}$ (95°F) |

§173.120; §173.121





Petroleum Crude Oil Hazards

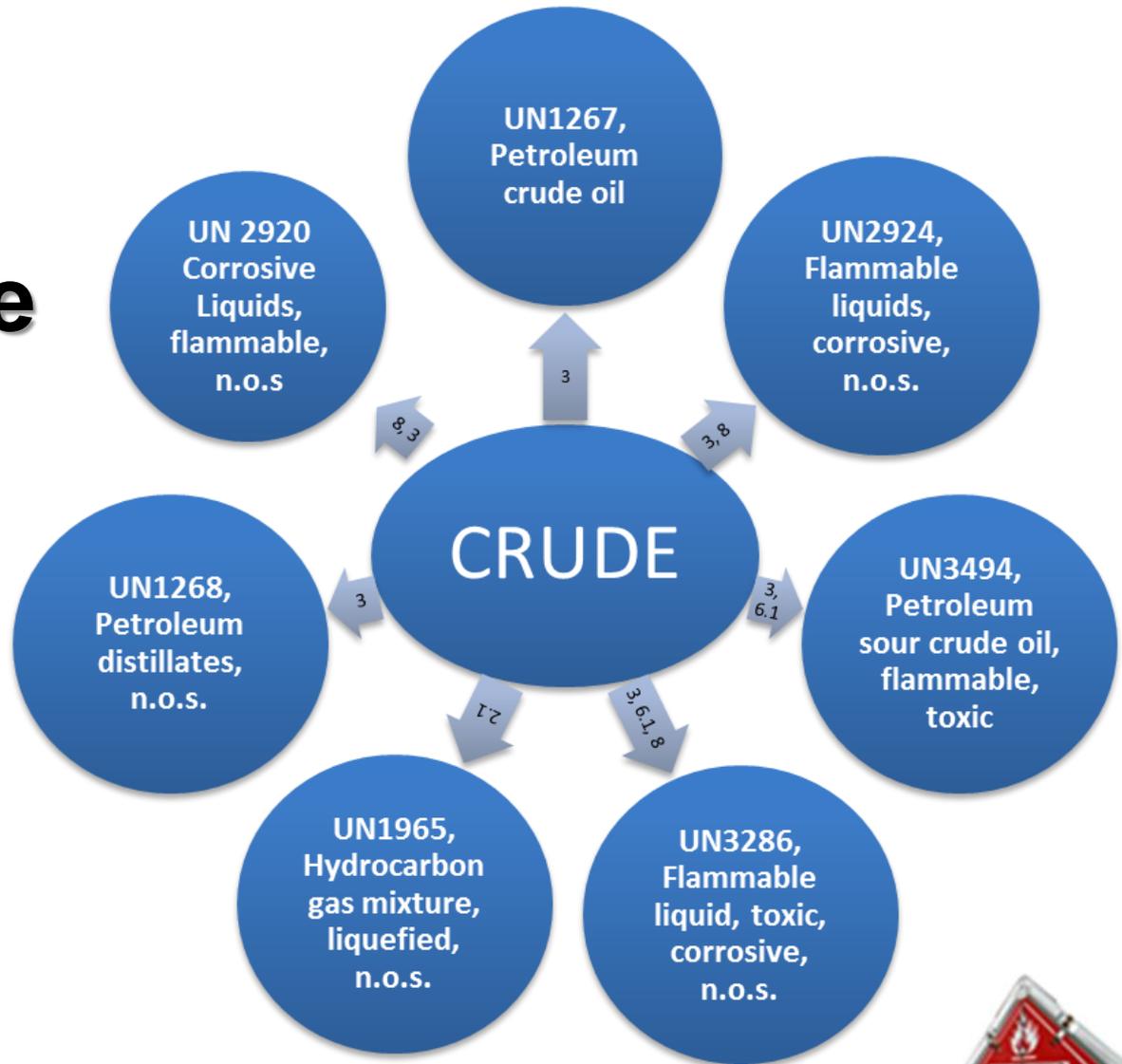
| Class | Division | Name |
|-------|----------|-----------------------------------|
| 2 | 2.1 | Flammable gas |
| 2 | 2.2 | Non-Flammable Gas |
| 2 | 2.3 | Toxic Gas |
| 3 | | Flammable and combustible liquids |
| 6 | 6.1 | Poisonous materials |
| 8 | | Corrosive materials |

An offeror must determine whether the particular shipment of crude oil contains additional hazards that require additional descriptions or changes in packing groups.





Possible Examples include but are not limited to:





Enhanced Tank Car Standards &

Operational Controls for High-Hazard Flammable Trains – Final Rule

- Secretary Anthony Foxx and Canadian Transport Minister Lisa Raitt jointly announced publication of final rule HM-251 on May 1, 2015
- This rulemaking was published May 08, 2015 and is effective July 7, 2015
- Together they stressed the importance of a harmonized approach to rail safety





Final Rule Applicability

- Unless stated otherwise, the rule applies to “**High-hazard flammable trains**” (HHFT).
- HHFT means a continuous block of 20 or more tank cars loaded with a flammable liquid or 35 or more tank cars loaded with a flammable liquid dispersed through a train.
- With regard to Electronically Controlled Pneumatic Braking (ECP), **High-hazard flammable unit train (HHFUT)** means a train comprised of 70 or more loaded tank cars containing Class 3 flammable liquids traveling over 30 mph.



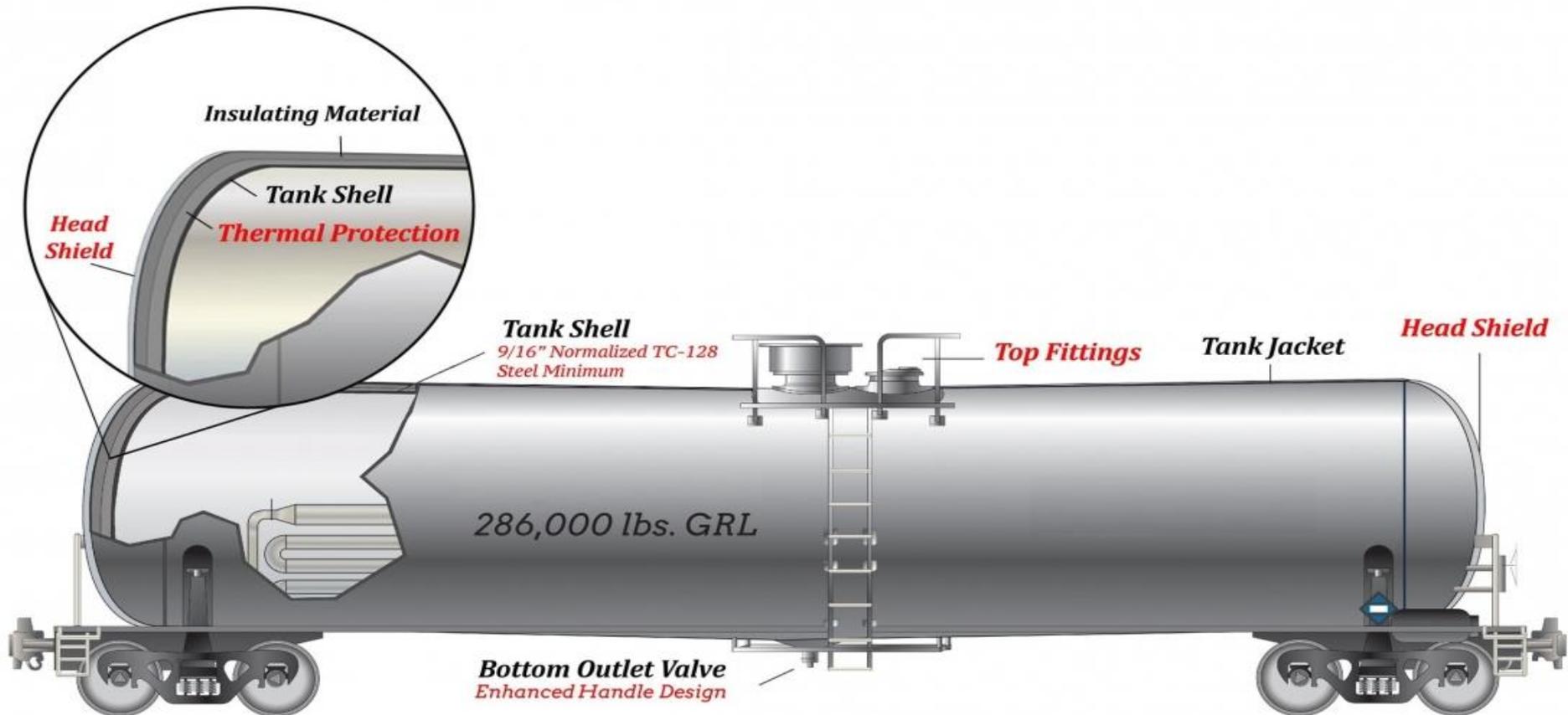


Enhanced Standards for New Tank Cars Used in HHFTs

- New tank cars constructed after October 1, 2015 are required to meet enhanced DOT Specification 117 design or performance criteria for use in an HHFT
- This standard includes enhancements designed to:
 - **Improve puncture resistance** (thicker shells and full-height head shielding)
 - **Improve thermal protection and survivability** (Thermal jacketing and Pressure relief devices)
 - **Protect equipment** (top fittings protection and bottom outlet protection / securement)



DOT 117 Specification Car



Safety enhancements of DOT Specification 117 Tank Car:

Full-height ½ inch thick head shield

Tank shell thickness increased to 9/16 inch minimum TC-128 Grade B, normalized steel

Thermal protection

Minimum 11-gauge jacket

Top fittings protection

Enhanced bottom outlet handle design to prevent unintended actuation during a train accident



Retrofit Standard for Existing Tank Cars HHFTs

- Existing tank cars must be retrofitted in accordance with the DOT-prescribed retrofit design or performance standard for use in an HHFT.
- Revision of retrofit schedule was based on considerable public comment and in-depth economic and safety analysis.
- Final rule adopts a **risk based approach** based on two variables:
 - (1) the packaging of the material and
 - (2) the characteristics of the material.





Retrofit Timeline

| Timeline for Continued Use of DOT Specification 111 Tanks for Use in United States | |
|---|--|
| Tank Car Type / Service | US Retrofit Deadline |
| Non Jacketed DOT-111 tank cars in PG I service | <i>(January 1, 2017)* January 1, 2018</i> |
| Jacketed DOT-111 tank cars in PG I | <i>March 1, 2018</i> |
| Non Jacketed CPC-1232 tank cars in PG I service | <i>April 1, 2020</i> |
| Non Jacketed DOT-111 tank cars in PG II service | <i>May 1, 2023</i> |
| Jacketed DOT-111 tank cars in PG II service | <i>May 1, 2023</i> |
| Non Jacketed CPC-1232 tank cars in PG II service | <i>July 1, 2023</i> |
| Jacketed CPC-1232 tank cars in PG I and PG II service and all remaining tank cars carrying PG III materials in an HHFT (pressure relief valve and valve handles). | <i>May 1, 2025</i> |

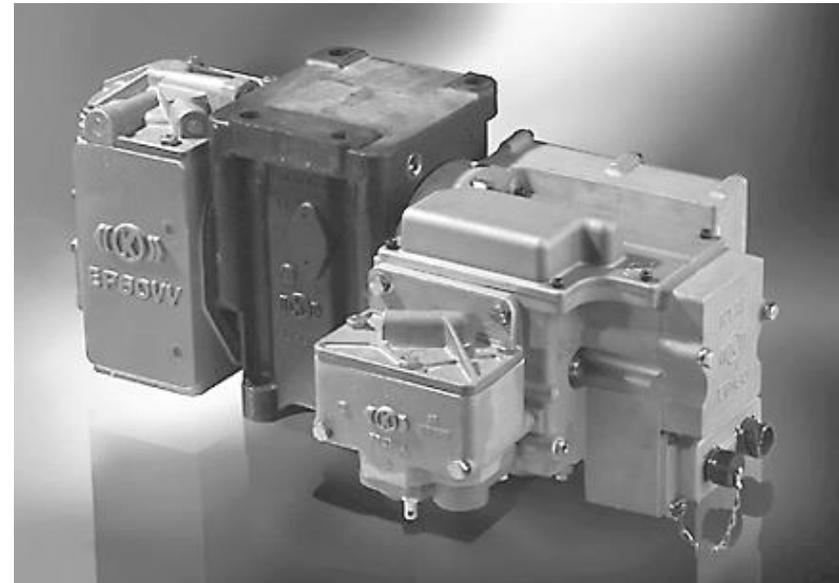
[\[1\]](#) *The January 1, 2017 date would trigger a reporting requirement, and owners of Non Jacketed DOT-111 tank cars in PG I service would have to report to the DOT the number of tank cars that they own that have been retrofitted, and the number that have not yet been retrofitted.*





Enhanced Braking Systems

- Requires HHFTs to have in place a functioning two-way **End of Train** device or a **Distributive Power** braking system.
- Requires any High Hazard Flammable Unit Train (HHFUT) transporting at least one PG I flammable liquid be operated with an **Electronically Controlled Pneumatic (ECP)** braking system by **January 1, 2021**.
- Requires all other HHFUTs be operated with an **ECP** braking system by **May 1, 2023**.





Speed Restrictions

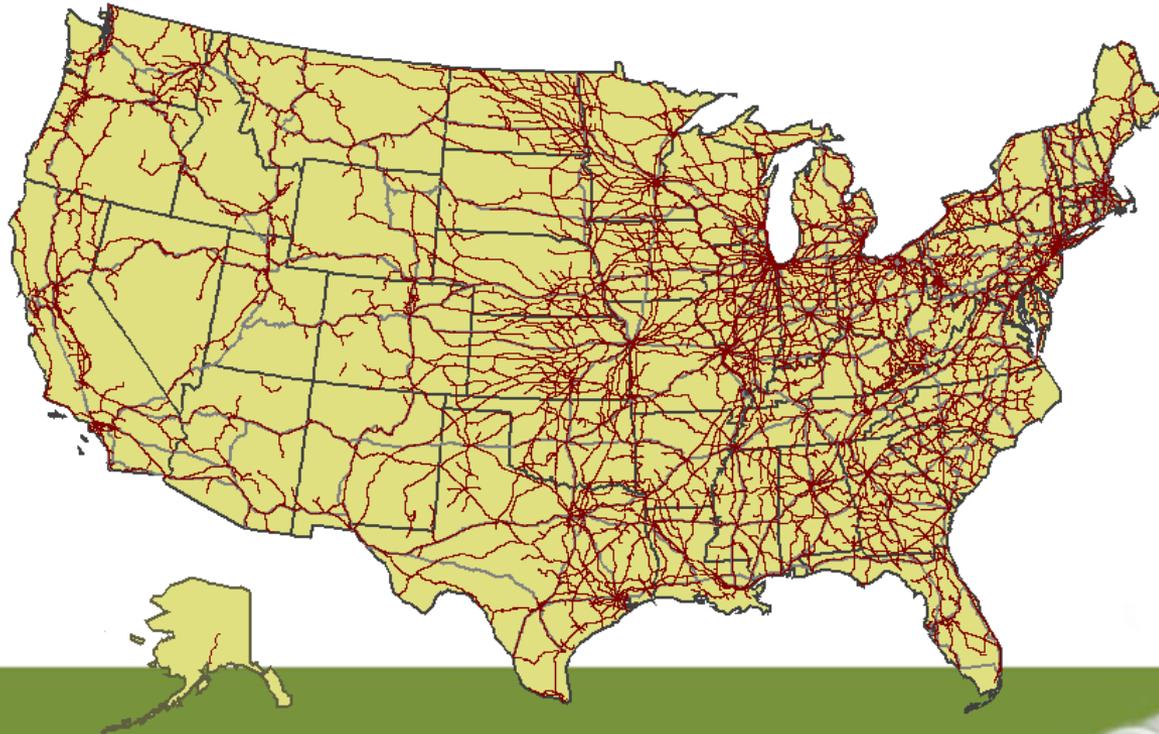
- Adopts a 50-mph restriction across the board for HHFTs.
- Adopts a 40-mph restriction in High Threat Urban Areas (HTUAs) for HHFTs containing one or more DOT 111 tank cars (including CPC-1232s).
- The 40-mph restriction for HHFTs operating in HTUAs without new or retrofitted tank cars is also currently required under FRA's April 24, 2015 Emergency Order No. 30.





Rail Routing and Notification

- RRs operating HHFTs must perform routing analysis considering, at least, 27 factors and make routing decisions based on that analysis.
- Railroads operating HHFTs must provide contact information to state/regional fusion centers regarding routing information.
- Leverages current routing notification requirements to inform emergency responders of HHFT movement while addressing security issues.





Sampling and Testing Program

- Under new § 173.41 shippers in all modes must develop and carry out a sampling and testing program for all unrefined petroleum-based products.
- In addition, shippers must certify that program is in place and make information available to DOT personnel upon request.
- Voluntary use of API RP 3000 may satisfy certain requirements of the new program.





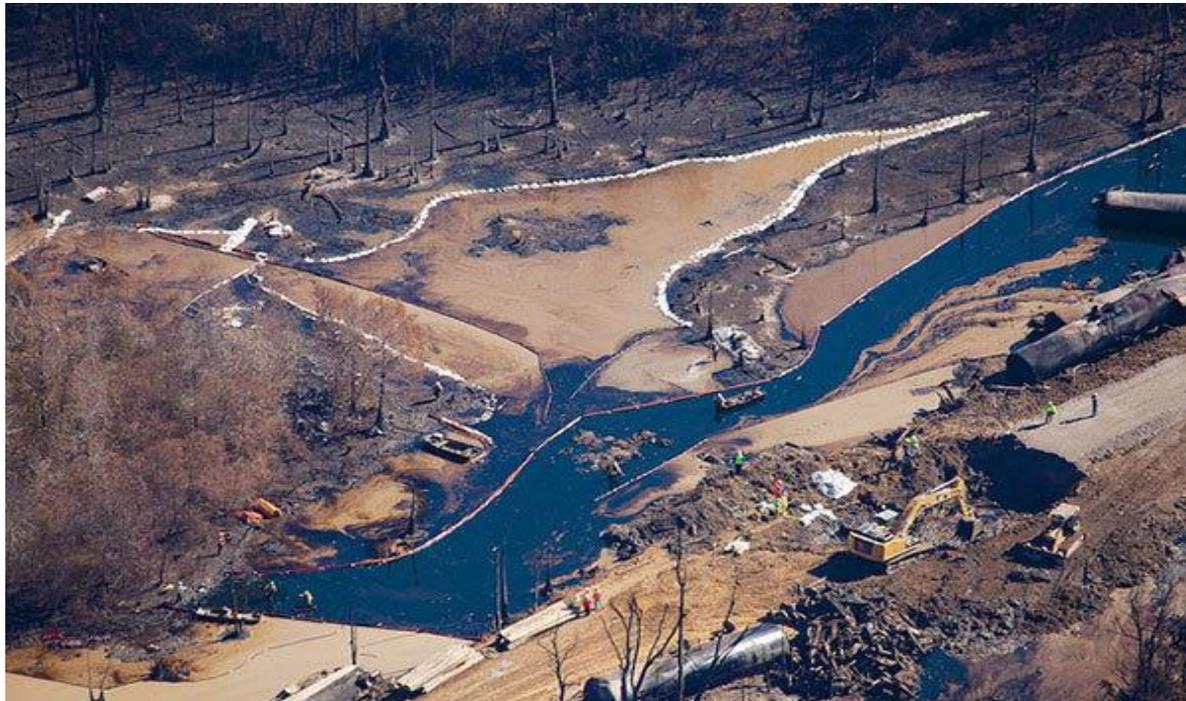
Sampling and Testing Program

- More specifically, the plan must address:
 - **Frequency of sampling and testing**, including sampling prior to the initial offering and when changes that may affect the properties occur;
 - **Sampling methods** that ensures a representative sample of the entire mixture;
 - **Testing methods** that enable classification;
 - **Quality control measures** for sample frequencies;
 - **Duplicate samples** (or equivalent) for quality assurance;
 - **Criteria for modifying the program**; and
 - Testing (or other methods) to identify **properties relevant to packaging requirements**



Additional Regulatory Efforts

- **Advanced Notice of Proposed Rulemaking - Oil Spill Response Plans for High-Hazard Flammable Trains:** Sought comment on OSRPs:
 - Current thresholds
 - Costs of developing and implementing and submitting them for approval
 - Clarity of current requirements





U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

Transportation Rail Incident Preparedness & Response

<http://phmsa.dot.gov/hazmat/osd/emergencyresponse/TRIPR>



<http://dothazmat.vividlms.com/tools.asp>





PHMSA's Outreach

Crude Oil Transportation and Emergency Response

- Assistance for Local
Emergency Response
Training (**ALERT**) Grant

SECURITY AND EMERGENCY RESPONSE TRAINING CENTER

<http://sertc.org/course-type/mobile/>





Association of American Railroads

ASKRAIL™

First Responder APP Video

<https://www.aar.org/AskRail>

<http://bcove.me/xlu3f437>





Why its important to have an operative vacuum relief valve





Where to Find More Information...

PHMSA
Pipeline and Hazardous Materials
Safety Administration

U.S. Department of Transportation

Contact Us | FAQs | Site Map

PHMSA Home | Pipeline Safety | **Hazardous Materials Safety**

Go Advanced Search

2012 EMERGENCY RESPONSE GUIDEBOOK
A Guidebook for First Responders During the Initial Phase of a Pipeline Gas, Liquid, or Hazardous Material Transportation Incident

DOT Distributes Over 2 Million New Hazardous Materials Emergency Guidebooks to Nation's First Responders

1 2 3 4 5

Hazmat News | **Most Viewed Info**

Safety Advisories

- > [PHMSA Continues Push to Clarify & Update Hazmat Rules](#)
- > [2011 Hazmat Penalty Action Report](#)
- > [Hazmat Harmonization Rule on Air Packaging Issued](#)
- > [PHMSA seeks comment on transportation of lithium batteries](#)
- > [PHMSA Proposes Updating Hazmat Rules to Better Balance Safety Standards and Regulatory Requirements](#)

Find PHMSA Offices

[Key Officials](#)
Regional Offices

PHMSA/Hazmat Resources

- Regulations & Rulemakings**
PHMSA regulates and ensures the safe movement of hazardous materials.
- Data & Reports**
PHMSA tracks data on the frequency of failures, incidents and accidents.
- Permits & Approvals**





A guidebook intended for use by first responders
during the initial phase of a **transportation incident**
involving **dangerous goods/hazardous materials**

2016

EMERGENCY RESPONSE GUIDEBOOK



SCT

SECRETARÍA DE
COMUNICACIONES
Y TRANSPORTES





ERG Print Production





ERG Distribution – Print Version

- More than 13 Million Free Copies distributed to Date in the US
- Over Two Million Copies of 2012 Edition Through State Emergency Management Coordinators





Distribution of ERGs

Maine

Robert S. Gardner

Maine Emergency Management Agency

State House Station 72

Augusta, ME 04333-0072

P: 207.624.4400

F: 207.287.3178

robert.s.gardner@maine.gov

<http://hazmat.dot.gov/guidebook.htm>





Hazardous Material Info-Center

1-800-HMR-4922

(1-800-467-4922)

E-mail: infocntr@dot.gov

Hours of Operation: 9 am – 5 pm ET



- Obtain answers to HMR questions
- Request copies of Federal Register, special permits or training materials
- Report HMR violations
- Fax on Demand





Thank You!

**GOT A
HAZMAT
QUESTION?**

<http://hazmat.dot.gov>

**INFO-LINE
1-800-467-4922**





Hazardous Material Safety Assistance Team

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