

# USDOT/PHMSA Multimodal Seminar

Transporting Hazardous  
Materials by Highway

A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, extending from the right edge towards the center.

# FMCSA Responsibilities

- ◆ Motor Carrier Safety/HM Regulations and Enforcement
- ◆ Improving Commercial Motor Vehicle Safety
- ◆ Vehicle Inspections, Carrier Reviews, and Collection of Data on Violations
- ◆ HM Shipper/Cargo Tank Facility Inspections, Incident Investigations, and Data Collection
- ◆ Registration and Regulation of Household Goods Transportation
- ◆ R&D on Operational Safety of Commercial Vehicles and Carriers

# FMCSA Jurisdiction

- ◆ The offering of hazardous materials for transportation and the transportation of hazardous materials in interstate, intrastate and foreign commerce by highway....



# FMCSA Compliance & Enforcement Program

- ◆ HM Carriers
- ◆ HM Shippers
- ◆ Cargo tank inspection, test, repair and manufacturing facilities
- ◆ Registration of cargo tank facilities
- ◆ FMCSA HM Safety Permit Program
- ◆ PHMSA Special Permit Program

# Shipper Vs. Carrier Responsibilities

## Shipper

- ◆ Classify hazmat
- ◆ Packaging
- ◆ Shipping papers, emergency info & phone #
- ◆ Communication: marking, labeling, Placarding
- ◆ Compatibility
- ◆ Blocking & bracing
- ◆ Shipper's certification

## Carrier

- ◆ Shipping papers, emergency info & phone #
- ◆ Communication: marking and Placarding
- ◆ Loading and unloading
- ◆ Compatibility
- ◆ Blocking and bracing
- ◆ Shipper requirements when acting as an HM shipper & motor carrier

# Shipper Vs. Carrier Responsibilities

- ◆ If a carrier picks up a sealed trailer, do they have to verify the contents to ensure the shipping papers and placards are correct?
- ◆ YES. See 171.2(f)
- ◆ The Shipper and Carrier are EQUALLY responsible for compliance!

# Overview

- ◆ Incident Reporting
- ◆ Part 177: Carriage by Public Highway
- ◆ Part 180: Cargo Tank Tests/Inspections
- ◆ FMCSR/Part 385: HM Safety Permits
- ◆ FMCSR/Part 397: HM Driving and Parking
- ◆ Common Roadside Violations

# Canada Explosives Incident



# Incident Reporting

- ◆ 171.15 – requires immediate notice by telephone of certain incidents.
  - Any fatality; Any injury requiring hospitalization; public evacuations of over 1 hour; freeway shutdown for over 1 hour; operational flight pattern of an aircraft is altered.
- ◆ 171.16 – requires written report within 30 days of any unintentional release.

# Incident Reporting

- ◆ Form F5800.1 (01/2004)
- ◆ Electronic filing option
- ◆ Applies to whoever is in possession of the HM at the time of the incident

# Incident Reporting

## Unintentional Release

- ◆ The escape of a HM from a package on an occasion not anticipated or planned.
- ◆ This includes releases resulting from collision, package failures, human error, criminal activity, negligence, improper packing, or unusual conditions (ex: over pressurization of package )

# Incident Reporting

- ◆ Must report non-release incidents involving cargo tanks where:
  - There is structural damage to the lading retention system; or
  - Damage that requires repair to a system intended to protect the lading retention system.

# Incident Reporting

## Undeclared Shipment

- ◆ A material subject to any of the hazard communication requirements (shipping papers, marking, labeling, placarding); and
- ◆ Offered for transportation in commerce without any visible indication to the person accepting the HM for transportation that a HM is present.

# Incident Reporting Exceptions

- ◆ a minimal amount from a vent, routine operation of seal or loading/unloading lines.
- ◆ PGIII material in Class or Division 3,4,5,6.1,8 or 9;
- ◆ Packaging having a capacity of less than 20 liters for liquids, 30kg for solids; AND
- ◆ Total aggregate release is less than 20 liters (5.2 gallons) for liquids , less than 30 kg (66 lbs.) for solids.
- ◆ This exception not valid for Haz Waste.

# 2007 Detroit Tanker Fire



# Part 177 – Carriage by Public Highway

- ◆ Requirements applicable to the acceptance and transportation of hazardous materials by private, common, or contract carriers by motor vehicle.
- ◆ "...each carrier, including a connecting carrier, shall perform the duties specified and comply with all applicable requirements in this part..." (177.800(b))

# Unacceptable Shipments

## 177.801

- ◆ No person may accept or transport by motor vehicle a forbidden material or hazardous material that is not prepared in accordance with the requirements of this subchapter.

# Compliance with FMCSR 177.804

- ◆ Motor carriers subject to this part shall comply with 49 CFR parts 390 through 397 (FMCSR) to the extent those regulations apply.
- ◆ FMCSR: Federal Motor Carrier Safety Regulations

# Cell Phones and HM

## ◆ Texting:

- 392.80 prohibits all drivers from texting while operating a CMV in interstate commerce; includes CDL disqualification
- 177.804(b) applies Section 392.80 to all vehicles transporting placardable quantities.

## ◆ Cell Phone Restrictions:

- PHMSA NPRM HM-256A

# Training – 177.800 & 177.816

- ◆ A carrier may not transport a hazardous material by motor vehicle unless each of its hazmat employees involved in that transportation is trained as required by this part and subpart H of part 172.

# Hazmat Training – Part 172

## Subpart H

- ◆ A systematic program to ensure familiarity with this subchapter
- ◆ Able to recognize and identify hazardous materials
- ◆ Knowledge of specific requirements applicable to functions performed by employee
- ◆ Emergency response/self-protection measures

# Hazmat Training – Part 172

## Subpart H

- ◆ Definition of hazmat employer
- ◆ Definition of hazmat employee
- ◆ Training may be provided by the hazmat employer or other public or private source

# Hazmat Training – Part 172

## Subpart H

- ◆ General awareness/familiarization training
- ◆ Function-specific training
- ◆ Safety training
- ◆ Security awareness training
- ◆ In-depth security training

# Hazmat Training – Part 172

## Subpart H - Recordkeeping

- ◆ Hazmat employees name
- ◆ Most recent training completion date
- ◆ Description, copy or location of training materials
- ◆ Name and address of person providing the training
- ◆ Certification that employee has been trained and tested

# Driver Training – 177.816

- ◆ Must train drivers in FMCSRs (Parts 390-397)
  - Pre-trip inspection
  - Use of vehicle controls and equipment
  - Operation of vehicle
  - Maneuvering tunnels, bridges, etc.
  - Loading and unloading, load securement
  - Attendance of vehicles, parking, smoking, routing, and INCIDENT REPORTING

# Driver Training – 177.816(b)

- ◆ Cargo Tanks of any size and Portable Tanks of 1,000 gallons or more capacity
  - Emergency control features
  - Special vehicle handling characteristics (high center of gravity, fluid surge, etc.)
  - Loading and unloading procedures
  - Properties of HM being transported
  - Part 180 tests for cargo tanks

# Driver Training – 177.816(c)

- ◆ The training required by this section may be satisfied by compliance with the requirements for a CDL with a tank or hazmat endorsement
- ◆ Carrier must determine additional training requirements
- ◆ NOTE: 177.816 training must be done every 3 years – most CDLs are valid for more than 3 years, so the carrier must provide the training in the interim!

# Shipping Papers – 177.817(a)

- ◆ A person may not accept HM for transportation unless it complies with Part 172, unless excepted from shipping paper requirement.
- ◆ Subsequent carriers are not subject to Section 172.204 (shipper certification).

# Shipping Papers – 177.817(b)

- ◆ Initial carriers are required to have shipping papers that include the shipper certification.
- ◆ Shipper certification is not required for:
  - Shipments entirely by private carrier
  - Shipments by cargo tank supplied by carrier
  - These exceptions don't apply to hazardous waste

# Shipping Papers – 177.817(c)

- ◆ Shipments interlined with rail have additional shipping paper provisions:
  - Description of the freight container
  - Kind of placard affixed

# Shipping Papers – 177.817(d)

## Accessibility

- ◆ Must be tabbed or appear first if with other shipping documents.
- ◆ Driver at vehicle controls:
  - Within reach with seat belt on **AND** readily visible to anyone entering vehicle; OR
  - In a holder mounted to the inside of the driver's door.

# Shipping Papers – 177.817(d) Accessibility

- ◆ Driver NOT at vehicle controls:
  - In a holder mounted to the inside of the driver's door; OR
  - On the driver's seat in the vehicle.

# Shipping Papers – 177.817(f) Retention

- ◆ Must retain paper or electronic copy at Principal Place of Business
- ◆ Hazardous Waste – 3 years
- ◆ All other HM, Shipper – 2 years
- ◆ All other HM, Carrier – 1 year
- ◆ If shipper and carrier – 2 years

# Shipping Papers – 177.817(f) Retention

- ◆ Documentation must include date of acceptance of shipment by carrier.
- ◆ May retain a single shipping paper, IF carrier also retains a record of each shipment made including shipping name, identification number, quantity transported, and date of shipment.

# Movement of Vehicles – 177.823

- ◆ Can move unmarked/placarded vehicle in emergency, escorted, or with permission from USDOT.
- ◆ Leaking cargo tanks may be moved only the minimum distance necessary.

# Transportation by Highway

177.834



# Loading and Unloading

## 177.834(a)

- ◆ Any package containing any hazardous material, not permanently attached to the motor vehicle, must be secured against shifting, including relative motion between packages, within the vehicle on which it is being transported, under conditions normally incident to transportation

# Loading and Unloading

## 177.834(b)

- ◆ Each package containing a hazardous material bearing a package orientation marking must be loaded on a transport vehicle or within a freight container in accordance with such markings and must remain in the correct position indicated by the markings during transportation

# Loading and Unloading

## 177.834

- ◆ (c) No Smoking loading/unloading
- ◆ (d) Keep Fire Away
- ◆ (e) Handbrake Set
- ◆ (f) Use of Tools
- ◆ (h) Fueling Road Units
- ◆ (i) Cargo Tank Attendance
- ◆ (l) Use of Cargo Heaters
- ◆ (m) Rail Tanks on Highway
- ◆ (n) Can't stack DOT portable tanks
- ◆ (o) Unloading Portable Tanks

# Loading and Unloading

## 177.834(j)

- ◆ A person may not drive a cargo tank motor vehicle containing a hazardous material regardless of quantity unless:
  - All manhole closures are closed and secured
  - All valves and other closures in liquid discharge system are closed and free of leaks

Section 173.29(b)(2) allows cargo tanks that have been cleaned and purged to be transported with open manhole closures.















What it should look like...



# Thou Shall Not Leak... 173.24(b)(1)



# Class-Specific Provisions

- ◆ 177.835 – Class 1
- ◆ 177.837 – Class 3
- ◆ 177.838 – Class 4, 4.2 and Class 5
- ◆ 177.839 – Class 8
- ◆ 177.840 – Class 2
- ◆ 177.841 – Divisions 6.1 and 2.3
- ◆ 177.842 and 843 – Class 7

# Segregation of Hazardous Materials – 177.848

- ◆ This section applies to Hazardous Materials that are in packages that require Labels. **MUST** include subsidiary labels!



# Segregation of Hazardous Materials – 177.848

- ◆ Identify the hazard class of material 1 in left column of table
- ◆ Identify the hazard class of material 2 in the top row of the table
- ◆ Find intersecting point
- ◆ Refer to key and determine applicable requirement

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

Class or division	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas Zone A	2.3 gas Zone B	3	4.1	4.2	4.3	5.1	5.2	6.1 liquids PG 1 Zone A	7	8 liquids only
Explosives ..... 1.1 and 1.2	A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives ..... 1.3		*	*	*	*	*	X		X	X	X		X	X	X	X	X		X
Explosives ..... 1.4		*	*	*	*	*	O		O	O	O		O	X	X	X	O		O
Very insensitive explosives. 1.5	A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Extremely insensitive ex- plosives. 1.6		*	*	*	*	*													
Flammable gases ..... 2.1		X	X	O	X				X	O							O	O	
Non-toxic, non-flammable gases. 2.2		X			X														
Poisonous gas Zone A ..... 2.3		X	X	O	X		X				X	X	X	X	X	X			X
Poisonous gas Zone B ..... 2.3		X	X	O	X		O				O	O	O	O	O	O			O
Flammable liquids ..... 3		X	X	O	X				X	O					O		X		O
Flammable solids ..... 4.1		X			X				X	O							X		O
Spontaneously combustible materials. 4.2		X	X	O	X				X	O							X		X
Dangerous when wet materials. 4.3		X	X		X				X	O							X		O
Oxidizers ..... 5.1	A	X	X		X				X	O	O						X		O
Organic peroxides ..... 5.2		X	X		X				X	O							X		O
Poisonous liquids PG I zone A. 6.1		X	X	O	X		O				X	X	X	X	X	X			X
Radioactive materials ..... 7		X			X		O												
Corrosive liquids ..... 8		X	X	O	X				X	O		O	X	O	O	O	X		

# Segregation of Hazardous Materials – 177.848

- ◆ Symbols are used to indicate requirements.

X = Materials may not be stored together

O = Materials may be stored with restrictions

\* = Explosive

A = Ammonium Nitrate Fertilizer

Blank = No restrictions

# Additional Highway Provisions

- ◆ 177.854 Disabled vehicles and broken or leaking packages
- ◆ 177.870 HM in Passenger Carrying Vehicles

# Cargo Tank Testing



# Cargo Tank Test & Inspection Requirements

## 180.407

- ◆ *Periodic test and inspection.* Each specification cargo tank must be tested and inspected as specified in the following table by an inspector meeting the qualifications in §180.409.
- ◆ Types of Tests:
  - Annual: External Visual, Leakage Test (V&K)
  - 5 Years: Internal Visual, Pressure Test (I&P)
  - Specialty Tanks: Lining Inspection, Thickness Test
  - Exceptions apply to all of these tests!

# Part 180 Cargo Tanks

- ◆ The Cargo Tank Owner is responsible for:
- ◆ Ensuring the CT meets specifications
- ◆ Ensuring the CT is tested/inspected/repaired properly and by QUALIFIED personnel
- ◆ Maintaining all documentation related to the CT



# HM Safety Permits

- ◆ Separate from PHMSA's HM Registration Program
- ◆ FMCSA Program
- ◆ High risk materials

# HM Safety Permits

- ◆ More than 55 lbs of a 1.1, 1.2, or 1.3 or an amount of 1.5 material requiring placarding
- ◆ PIH Division 2.3 or 6.1 material
  - Zone A – package > 1 liter
  - Zone B – Bulk package
  - Zone C&D – Bulk pkg > 3500 gallons

# HM Safety Permits

- ◆ Compressed or refrigerated liquid methane or natural gas or other liquefied gas:
  - with a methane content of at least 85%
  - and in a bulk package greater than 3500 gallons
- ◆ Class 7 Highway Route Controlled Quantities (HRCQ)

# Who Needs a HMSP: 385.403

- ◆ Applies to:
  - ◆ Interstate carriers
  - ◆ Intrastate carriers
  - ◆ Foreign domiciled carriers
- 

# How do I get a HMSP: 385.407

- ◆ The motor carrier must file an application on form MCS-150B ([www.fmcsa.dot.gov](http://www.fmcsa.dot.gov))
- ◆ The motor carrier must:
  - Have a "Satisfactory" safety rating assigned by FMCSA.
  - Have a crash rate in the lower 70% of the national average as indicated by FMCSA data.
  - Have a driver, vehicle, hazardous material and total out-of-service rate in the lower 70% of the national average as indicated by FMCSA data.
  - Have a Security plan and train all HM employees in security awareness and in depth security.
  - Develop a Communications plan.
  - Be registered with USDOT/PHMSA.

# How do I get a HMSP: 385.407

- ◆ Permit is effective for two years, then renew (385.419).
- ◆ Carriers must provide HMSP # to shippers upon request (385.417).
- ◆ Shippers required to ask for HMSP # (173.22(b)).
- ◆ Denials, suspensions, revocations.

# Temporary Permits: 385.409

- ◆ Temporary Permits may be issued to motor carriers that do not have a safety rating until a compliance review can be completed.
- ◆ Temporary Permits will not be issued to carriers that do not have a security plan; have a crash rate in the top 30% of the national average; or have an Out-Of-Service rate above 30%.
- ◆ Temporary Permits are valid for 180 days, but may be extended.

# What Else: 385.413

- ◆ Carriers must carry a copy of permit in each vehicle.
- ◆ Carriers transporting Class 7 or Division 1.1 – 1.3 materials must have a written route plan and the telephone number of the motor carrier representative who is familiar with the route.
- ◆ Carriers transporting Class 7 materials must have a Level VI inspection prior to movement.

# What Else: 385.413

- ◆ Driver must comply with communications plan and maintain communications log for 6 months after shipment.
- ◆ Log must contain the name of the driver, ID of the vehicle, permitted material(s) and the date, location, and time of each contact.
- ◆ May be phone calls, radio calls, or electronic communications.
- ◆ The plan must require contact from the driver at the beginning and end of each duty tour, and at the pickup and delivery of each permitted load.

# Denials of HMSP: 385.421

- ◆ HMSP applications or renewals will be denied when:
  - The carrier does not submit a MCS-150B;
  - The carrier has a less than Satisfactory safety rating;
  - The carrier fails to maintain a satisfactory security plan;
  - The carrier fails to comply with the regulations in a manner that shows the carrier is unfit to have a permit;
  - The carrier fails to comply with an Out-Of-Service Order;
  - The carrier fails to maintain the minimum levels of financial responsibility;
  - The carrier fails to maintain PHMSA HM registration;
  - The carrier fails to maintain its operating authority, has its registration suspended or fails to pay a penalty.



# FMCSR – Part 397

- ◆ Class 1.1 – 1.3: See 397.5, 397.7 and 397.19
- ◆ 397.11 Fires
- ◆ 397.15 Fueling Vehicles
- ◆ 397.17 Tires
- ◆ 397.67 and 397.101 Highway Routing

# Smoking 397.13

- ◆ Applies to any person, driving or not
  - within 25 feet
- ◆ Class/Division 1, 2.1, 3, 4.1, 4.2, 5 materials; or
- ◆ An empty Cargo Tank (not purged) that contained a Class/Division 2.1 or 3 material.



**For Further Information and copies of rulemakings please see the following:**

◆ FMCSA website at  
<http://www.fmcsa.dot.gov>

PHMSA website at  
<http://www.phmsa.dot.gov>

# What'd he say??

Terrell H Cook  
HM Program Specialist  
Western Service Center  
USDOT/FMCSA

512-916-5448  
terrell.cook@dot.gov



# Placarding Requirements

## ◆ 172.502 Prohibited placarding



# Part 172 - Marking

## ◆ Green panels???



# Part 172 - Marking

## ◆ Explosive sulfur???



# Part 172 - Marking





9260

MOLTEN  
ALUMINIUM

**HOT**



# Placarding Requirements





# Placarding Requirements

- ◆ What hazard class is it???



# Placarding Requirements

- ◆ What hazard class is it???



# Placarding Requirements

- ◆ What hazard class is it???



# Placarding Requirements

- ◆ I have no idea what he is communicating?



# Placarding Requirements



# Placarding Requirements

