

# Tank Car Safety & Security

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ASSOCIATION OF  
AMERICAN RAILROADS



# Outline

- TIH Tank Cars
- Advanced Tank Car Collaborative Research Program
- Tank Car Committee Activities
- Remote Monitoring Equipment / Asset Condition Visibility Task Force
- Freight Rail Security Rule
- Rail Routing Rule (HM-232-E)



# Toxic Inhalation Hazard (TIH) Tank Cars

- On April 1, 2008, the Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a notice of proposed rulemaking (NPRM) on tank cars carrying TIH materials
- There were four days of public meetings and two technical workshops before comments were due
- Performance standard
  - Heads: capable of withstanding a 30 MPH impact
  - Shells: Capable of withstanding a 25 MPH impact
- 8 year phase out schedule
- 30 MPH speed restriction in dark territory



## TIH Tank Cars (cont.)

- AAR filed comments on June 2, 2008 raising 5 issues:
  - Whether DOT has utilized the proper criterion for ascertaining the safety of tank car designs;
  - Whether, in formulating the proposed standard, DOT has sufficiently considered potential accident scenarios;
  - Whether DOT has properly characterized the improvement in safety afforded by the industry's interchange standard, as embodied in CPC- 1187;
  - Whether there is a need for DOT to grandfather tank cars that will not meet its final standard; and
  - Whether the proposed speed limits (30 & 50 MPH) are warranted.



## TIH Tank Cars (cont.)

- It became apparent that PHMSA would not be able to finalize a rulemaking soon, and shippers needed to replace cars reaching their age limit
- AAR, ASLRRRA, ACC, CI and RSI petitioned PHMSA on July 3, 2008
- The petition requested cars built from now until PHMSA finalizes a rulemaking be constructed to a standard equivalent to the standard passed by AAR's Tank Car Committee with a 25 year life
- In an agreement with ACC, CI and RSI, AAR agreed to suspend CPC-1187 until six months after a final PHMSA rule, or until January 1, 2013 with an 8 year implementation schedule when an interim rule was issued equivalent to our petition



# TIH Tank Cars (cont.)

- PHMSA issued a final rule for interim cars on January 13, 2009
- The final rule
  - Did not include the minimum thickness requirements in the AAR standard (CPC-1187)
  - Allows these cars to operate for 20 years
  - Included a 50 MPH speed restriction on all trains carrying one car of TIH
  - No increased lading is allowed
- AAR chose to not file a petition for reconsideration (due 2/12)
- On February 20<sup>th</sup> the TCC unanimously voted to suspend CPC-1187 until January 1, 2013
- The TCC is considering how to prevent moving non-TIH cars into TIH service so new cars are not required

# • Advanced Tank Car Collaborative Research Program

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# Advanced Tank Car Collaborative Research Program (ATCCRP)

- Collaborative effort between DOT/FRA, DHS/TSA and S&T, Transport Canada, AAR, ACC, CI, TFI, & RSI
- Purpose
  - The ATCCRP is a cooperative arrangement between the participants for collaboration on research which will inform the development of new, risk-based, designs, standards and regulations for tank cars carrying toxic inhalation hazard (TIH) materials
- Key Contingencies:
  - Mutually agreed upon Project Director
  - Open exchange of information
- Funding: \$3 - \$5 million per year – 5 years (\$100K 1<sup>st</sup> year)



Homeland Security



Transport Canada

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# ATCCRP (cont.)

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- Phil Daum of Engineering Systems Inc. has been hired as Program Director
- Met two days in July to explore research needs
- Phase 1 is to better define the research necessary
- Technical papers are being drafted to define research to be conducted
- The phase 1 deliverable is a research plan scheduled for first quarter 2010

# ATCCRP - Research Needs Being Explored

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- The Relationship among Conditional Probability of Release (CPR), Modeling and Test Results
- Alternate Material Configurations
- Foams
- Effect of Lading Temperature/Pressure
- Modify Temperature and Pressure to Reduce Dispersion Effects
- Sandwich Car Design
- Optimize Steels
- Coupler Modification



# Tank Car Committee Activities

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## T87.1 - Environmentally Sensitive Chemicals

- Another Tank Car Committee initiative to reduce risk associated with these commodities
- A model has been created to evaluate the risk of transporting these commodities taking into account environmental conditions along the railroad right of way and the probability of release involving these cars
- The model is being used to estimate the cleanup, evacuation and service disruption costs of these commodities – i.e. benefits
- Benefits will be compared to the cost improvements to the cars carrying these commodities
- Improved standards will be sought for cars which have a positive net present value
- So far the benefits have not outweighed the additional costs for the products evaluated
- Mixtures are in the process of being addressed



## T87.5 - Consider Head and Shell Requirements for Non-Pressure Cars Transporting Packing Group 1 and 2 Materials

- A Task Force was formed at the July 2009 Tank Car Committee to investigate this issue
- This is a result of many accidents involving these commodities including:
  - CN accident in Rockford, IL on June 19, 2009 involving one fatality and 11 injuries
  - NS accident in New Brighton, PA October 20, 2006
  - CSX accident in Brooks, KY on January 16, 2007
  - Many other accidents in the last five years totaling over \$59 million



## T87.5 (cont.)

- First TF meeting July 25, 2009
- Exploring all options
- UIUC will be running an optimization model prior to teleconference scheduled for October 2
- Over 615,000 shipments and 76,000 tank cars could be potentially impacted
- Plan to start with new cars after some future date first



# Remote Monitoring Equipment (RME) / Asset Condition Visibility Task Force (ACV-TF)





## Remote Monitoring Equipment (cont.)

- C- 10286 Issued March 27, 2006 (effective April 1, 2006)  
AAR Standard S-2045
  - Cabling should be enough to reach the device without excess
  - Cabling inside jacket or inside conduit
  - Approval required by Tank Car Committee
  - Requires registration in UMLER (fitting code RD)
  - Stencil or decal with contact information must be provided (2" x 3")
  - Installed in a manner not to create a safety hazard





## Remote Monitoring Equipment (cont.)

- Dow is equipping all their TIH cars with RME
- Examples of the sensors being installed include the following:
  - Dome (open/closed)
  - Temperature excursion
  - Chlorine vapor detection in dome above 10 ppm
  - Accelerometer / impact detection
  - Loaded / empty status
  - Location with geofencing capabilities for HTUA's, and shipper consignee locations
  - Lack of movement



## Remote Monitoring Equipment (Cont.)

- Issues the railroads need to decide:
  - Do we want to receive the signals?
  - If so, which ones, to whom and how?
  - Do we want to establish a standard?
  - Do we want to require encryption of the signal?
  - Do we want to require all signals be sent to railroads?



## Asset Condition Visibility Task Force (ACV-TF)

- The ACV-TF has been formed to create a standard for the format for reporting exceptions from RME on hazmat cars to the railroads
- Work rules and response protocols have been drafted into a white paper for all known sensors
- Three initial alert types:
  - Maintenance required
  - Shipper to investigate
  - Custodian to investigate
- Three initial levels of urgency for the above alert types:
  - Before change in custody
  - Next reasonable opportunity
  - Immediate attention required



# Draft Railroad Actions

<b>Alert</b>	<b>Actions</b>
Generic alert	If active, dispatcher needs to communicate to crew to move train to specific safe location. Once in a safe location, RR emergency response center identifies someone to do sensor specific inspection.
Dome Sensor	Do a visual inspection of the seal. If seal is present, continue normal operations and report to shipper. If seal is broken, call appropriate authorities.
Temperature	Take external car temp reading (need to determine best place to take the temp consider ambient temp) to determine if car is temperature is higher than expected. If temp is normal, report normal temp to shipper. If temp is higher than expected take appropriate action.
Impact	Inspect coupler and sill for cracks/defects (need more data to determine this procedure) If no defect found continue operations and notify shipper If defect found, follow defect procedures and notify shipper
Chemical Detector/Sniffer	Move car to the closest safe location Mobilize railroad/contract hazmat person to investigate Follow emergency notification procedures Feedback to Shipper
Hand Brake	If handbrake is set, release hand brake and report to shipper If handbrake is not set, continue operations and report to shipper



# Challenges

1. Who is going to climb on the car when RRs have to investigate an alert? How long will it take to bring someone into location if external person is needed?
2. What happens if an alert happens in a HTUA? Does the train get moved out of HTUA before investigation or investigate while in HTUA?
3. Still need to involve Shortlines and better understand their concerns and capabilities to react to alerts.
4. Need a feedback system in place to evaluate reliability and accuracy of system.



# Pilot Project

- BNSF, CSX, BASF, Dow, GE Technology, and Savi Technologies conducted a pilot project to test the draft protocols
- Project was completed in the spring of 2009
- Once the system has been tested, a standard to incorporate the standard message protocols outlined in the white paper will be considered



# Circular Letter C-10698

- C-10698 “Early Solicitation of Stakeholder Inputs – Remote Monitoring Equipment Data Sharing
- Comments received from 8 parties including:

AAR’s ACV-TF	American Railcar
Amstead Rail	BASF
GE Railcar	Greenbrier
Olin	Progressive Rail
- Most agree that safety & security critical information should be shared with those parties needing it (carriers & those in control)
- Some misunderstanding about who should pay



# ACV-TF Path Forward

- The Asset Condition Visibility Task Force has completed a pilot project to test a central system for reporting alerts created by remote monitoring equipment
- An interchange standard is being developed for the message protocol, and an interchange standard is being considered to require reporting
- A system is being developed to accept the messages and to create a feedback mechanism





# Freight Rail Security Rule

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# Major Provisions

## 49 CFR Part 1520

1520 Protection of Sensitive Security Information

Adds definitions for rail centric terminology to the SSI rules

## Part 1580 – Rail Transportation Security

### **Subpart A- Scope, Definitions, Authority**

1580.5: Inspection Authority

### **Subpart B- Freight Rail Provisions**

1580.100: Applicability

1580.101: Requires Rail Security Coordinator

1580.103: Location and Shipping Information

1580.105: Reporting Significant Security Concerns

1580.107: Chain of Custody and Control

1580.109: Preemptive Effect

### **Subpart C-Passenger Rail Provisions**

1580.201: Rail Security Coordinator

1580.203: Reporting Significant Security Concerns

**Applies to rail carriers,  
hazmat shippers,  
and hazmat receivers\***

**Applies to passenger  
and mass transit operators**



# DETAILS

## 1580.5: Inspection Authority

- Applies to freight and passenger railroad carriers; shippers; receivers (in HTUA only); tourist, scenic, historic, and excursion rail operators; operators of private cars; and operators of rail transit systems not operating on tracks that are part of the general railroad system of transportation
- Without advance notice, TSA and authorized DHS officials must be allowed to:
  - Enter, inspect, and test property, facilities, equipments, and operations
  - View, inspect, and copy records as necessary to carry out TSA's security-related statutory or regulatory authorities
- In order to fulfill TSA directed duties, TSA and DHS officials working with TSA may be present within any area or conveyance without access or identification media issued or approved by the inspected entity
- **If requested, TSA inspectors and DHS officials working with TSA will present their credentials for examinations, but they may not be photocopied, or otherwise reproduced**



# Who and What is Covered

## Part 1580 – **Rail Transportation Security**

- 1580.100: Applicability
  - Freight railroad carriers
  - Rail hazardous materials shippers
  - Rail hazardous materials receivers (in HTUA only)
  - Freight rail carriers hosting a passenger operation
  - Operators of private cars, including business cars and circus trains
- **Rail security-sensitive materials (RSSM)**
  - A rail car containing more than 5,000 lbs. of a Division 1.1, 1.2, or 1.3 Explosive material
  - A tank car containing a material poisonous by inhalation including anhydrous ammonia
  - A rail car containing a highway route-controlled quantity of Class 7 (radioactive) material



# 1580.101: Rail Security Coordinator

- **Applies to all listed in 1580.100** (carriers, shippers, HTUA receivers)
  - Must designate a primary and at least one alternate RSC
  - Must provide to TSA: names, titles, phone numbers and email address of RSC designees
  - For hazmat carriers, shippers, and receivers must ensure at least one RSC:
    - Serves as primary contact for intelligence and security related activities
    - Available to TSA 24/7
    - Coordinates security practices with appropriate law enforcement and emergency response agencies
  - Email: [freightrailsecurity@dhs.gov](mailto:freightrailsecurity@dhs.gov)
  - Regular mail: Transportation Security Administration  
Freight Rail Security Division,  
TSA-28 601 South 12th Street  
Arlington, VA 20598-6028



## 1580.103: Location and Shipping Information

- Applies to:
  - Carriers transporting one or more RSSM
  - Rail hazardous materials shippers
  - Rail hazardous materials receivers in an HTUA
- Must have procedures in place to determine the location for each car under its *physical custody* that contains RSSM

*TSA will make the request. Covered parties do not necessarily have to generate reports unless requested to do so.*



## 1580.103: Location and Shipping Information (cont.)

- Must provide the following information:
  - **Rail car current location** by city, county, and state; include railroad milepost, track designation, and the time that location was determined
  - **Rail car routing**
  - **List of all cars containing RSSM**
    - Proper shipping name
    - Hazard class and 4 digit ID number
    - Car initial and number
    - Status of car (in yard, on main, etc.)
    - Class 1 carriers must report the location for a single car within 5 minutes and within 30 minutes for two or more cars
    - Other carriers must report the location and shipping information within 30 minutes
- Must provide a telephone number to TSA to use for requesting location information
- Cannot be an answering service or answering machine



## 1580.105: Reporting Significant Security Concerns

- Applies to carriers, shippers & receivers
- Must immediately notify TSA by calling the Freedom Center (TSOC)
- Potential threats or significant security concerns, examples include:
  - Interference with train crew
  - Bomb threats
  - Reports or discovery of suspicious items that result in disruption of operations
  - Suspicious activity occurring onboard a train or inside a facility
  - Suspicious activity observed at or around rail cars, facilities, or infrastructure
  - Discharge, discovery, or seizure of a firearm or other deadly weapon
  - Indications of tampering with rail cars
  - Information relating to the possible surveillance of rail cars or facilities
  - Correspondence received that indicates a potential threat
- Must supply name, contact numbers, and descriptions of events

***.TSOC: 1-866-615-5150***





# 1580.107: Chain of Custody and Control

Seven conditions that apply to chain of custody:

**1. Shipper to carrier** (both inside and outside HTUA)

- Must physically inspect car before loading
- Keep rail car in a *rail secure area* after being inspected until carrier takes physical custody of car
- Document transfer of custody

**2. Carrier receiving from Shipper** (both inside and outside HTUA)

- Carrier must perform security focused inspection per 49 CFR 174.9
- Document transfer of custody



## 1580.107: Chain of Custody and Control (cont.)

### 3. *Carrier to Carrier* (inside HTUA)

- Must insure that car is not left unattended “at any time during physical transfer of custody”
- Receiving carrier must perform required security inspection
- Per 49 CFR 174.9
- Document transfer of custody

### 4. *Carrier to Carrier* (outside HTUA)

- If car is going to go through an HTUA...
  - Must insure that car is not left unattended “at any time during physical transfer of custody”
  - Receiving carrier must perform required security inspection
  - Document transfer of custody



## 1580.107: Chain of Custody and Control (cont.)

### 5. **Carrier to receiver** (inside HTUA)

- Must not leave the RSSM rail car unattended in a non-secure area until the receiver accepts custody of the car
- Document the transfer of custody

### 6. **Receiver** (inside HTUA)

- Ensure that receiver or carrier maintains positive control of the car during physical transfer
- Keep the car in a rail secure area until the car is unloaded
- Document the transfer of custody



## 1580.107: Chain of Custody and Control (cont.)

### 7. **Receiver rejecting car** (inside and outside of HTUA)

- Provisions of chain of custody and control do not apply to those receivers that do not regularly receive RSSM and who “reject” a car
- The chain of custody provisions do apply to the rail carrier who gets the rejected car from the receiver

- **Exemptions for receivers**

- A receiver located in an HTUA may request an exemption from TSA if the receiver believes that there is insufficient risk to warrant “chain of custody”
- 1580.107(j) lists the information that must be presented in the exemption appeal



# Important Terms in 1580.107

- **Attended**

- A car is attended if an employee or authorized representative is:
  - Physically located on site in reasonable proximity to the rail car
  - Capable of responding to unauthorized access or activity at or near the rail car, including immediately contacting law enforcement or other authorities
  - *And...*the employee immediately responds to any unauthorized access or activity at or near the rail car either personally or by contacting law enforcement or other authorities

This definition is different from the one used in the TIH Risk Reduction surveys.



## Important Terms in 1580.107 (cont.)

- **Positive Control (maintains)**
  - A hazardous materials receiver and rail carrier communicate and cooperate with each other to provide for the security of the rail car during the physical transfer of custody.
  - Attending the rail car is part of positive control
- **Rail Secure Area**
  - The shipper and the receiver must use physical security measures to ensure no unauthorized person gains access to the rail secure area
  - *This is also defined in the definitions section of the rule* as a secure location(s) identified by a rail hazardous materials shipper or rail hazardous materials receiver where security-related pre-transportation or transportation functions are performed on rail cars containing the categories and quantities of rail security-sensitive materials (as defined) are prepared, loaded, stored, and/or unloaded.



# Other Provisions

- **1580.109: Preemptive Effect**
  - This section preempts state, local, and tribal laws or regulations covering the same subject matter
- **Subpart C (1580.200)**
  - Contains provisions for passenger rail operators requiring a rail security coordinator and reports of significant security concerns



# Freight Rail Security Rule Citation

**The Final Rule was published in the Federal Register  
on November 26, 2008**

**Copies of the Federal Register can be obtained at:  
<http://www.gpoaccess.gov/fr/index.html>**

**The citation is FR Volume 73, No. 229, 72130**





# Questions for Freight Rail Rule?

## Procedural and general questions:

Scott Gorton

TSNM-Freight Rail Policy

Phone: 571-227-1251,

Email: [scott.gorton@dhs.gov](mailto:scott.gorton@dhs.gov)

## Legal questions:

David Kasminoff,

Office of Chief Counsel-Regulations,

Phone: 571-227-3583,

Email: [david.kasminoff@dhs.gov](mailto:david.kasminoff@dhs.gov)

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Written questions about the regulation can be sent to:  
[\*\*freightrailsecurity@dhs.gov\*\*](mailto:freightrailsecurity@dhs.gov)



# Rail Routing Rule - HM-232E

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# HM-232E Introduction

- Notice of Proposed Rulemaking
  - Issued December 21, 2006
- Interim Final Rule
  - Issued April 16, 2008
  - Effective June 1, 2008
  - Voluntary compliance May 16, 2008
  - Comments closed May 16, 2008
- Final Rule published November 26, 2008



# Rule Requirements

- Collect data (Certain high hazard materials)
- Use data to analyze route safety and security
- Analyze practicable alternate routes
- Choose safest/most secure route
- Let DOT see your data
- Reduce storage/delays in transit
- Perform security inspections



# Applicability

- Applies to Carriers transporting:
  - Security Sensitive Materials
  - Designated by DHS
- Includes
  - >5,000 lbs Division 1.1, 1.2, or 1.3 (single carload)
  - A bulk quantity of PIH (includes anhydrous ammonia)
  - A Class 7 material in HRCQ Quantity



# Collecting Data

- Commodity data must be kept and compiled by carriers for the previous *calendar* year
  - Complete by 90 days after end of CY
  - 2008 contains only 6 months (7/1 to 12/31)
- Collected by route, line segment or series of line segments
- Commodity data by UN number
  - Can include all Class 7 and 6.1
- Identified by geographic location



# Route Analysis

- In Writing
- Analysis include appendix D (27 factors)
- Includes:
  - Classification/Switching Yards
  - Sidings
  - Storage Facilities
- Excludes:
  - Offeror/Consignees Facilities
  - Private Sidings/Tracks



# Consultation

- Must seek relevant information from state, local, and tribal officials
- Information on risks from high consequence targets (HCTs) including:
  - Property
  - Natural resources
  - Location
  - Area
  - Other DHS designated targets
- HCTs designated by DHS





# Rail Carrier Point of Contact

- Each carrier must identify a point of contact (name, title, phone number, and email address) and provide it to:
  - State and/or local fusion centers along the routes
  - State, local and tribal officials that may be that may be affected by routing decisions



# Alternate Route Analysis

- Same time as initial route analysis
- If a practical alternate route exists including:
  - Authority to operate
  - Interchange agreements



# Alternate Considerations

- Criteria in Appendix D plus:
  - Comparison of Risks
  - Remediation/Mitigation Measures
  - Economic Impact
    - Commodity
    - Route
    - Customer relationship
  - Relevant information from state, local, and tribal officials
    - If not must explain in writing



# HM-232E Appendix D “Rail Risk Analysis Factors” for Route Analyses

1. Volume of hazmat
2. Rail traffic density
3. Trip length
4. Railroad facilities
5. Track type and class
6. Track grade and curvature
7. Signals and train control systems
8. Wayside detectors
9. Number and types of grade crossings
10. Single vs. double track
11. Frequency and locations of track turnouts
12. Proximity to iconic targets
13. Env sensitive areas
14. Population density
15. Venues along route
16. Emergency response capability along route
17. Areas of high consequence
18. Passenger traffic
19. Speed of train operations
20. Proximity to enroute storage or repair facilities
21. Known threats (from TSA)
22. Measures in place to address safety and security risks
23. Availability of alternative routes
24. Past incidents
25. Overall time in transit
26. Training and skill level of crews
27. Impact on rail network traffic and operations



# Selecting the Route

- Select safest/most secure route
- Annual review required
- Restrict disclosure (SSI)
  - Comparative analysis
  - Charts and Graphs
  - System Maps



# Completing the Analysis

- **Completed by:**
  - September 1, 2009 for 2008 (if only 1/2 2008 data used)
  - March 31, 2010 (if all 2008 data is used)
  - December 31<sup>st</sup> after that
- **System-wide approach**
- **Subsequent years include:**
  - Operational changes
  - Traffic adjustments
  - Other changes as appropriate
  - Infrastructure modifications
  - Changes to HCTs



## Routing Risk Assessment Tool

- Government and railroads have developed a tool under a grant to the Railroad Research Foundation (RRF) from FEMA to incorporate the 27 factors
- The tool is being used by railroads to comply with the rule
- The Railroad Research Foundation is in the process of seeking funding for service, hosting, training, maintenance and enhancements to keep the tool functional going forward



# Records

- Hard copy or electronic image accessible at principal place of business
- Available on request (DOT/DHS reps)
- Retained for a minimum of two years
- Restrict distribution, disclosure, availability to persons with a need-to-know





# Preemption

- §172.822
  - Specifically preempts any law, order, directive of a state, political subdivision of a state, or an Indian tribe
    - Designation
    - Limitation
    - Prohibition



# Compliance

- **If analysis is deficient**
  - FRA can mandate analysis revisions
- **If not safest/most secure route**
  - FRA can mandate different route
  - FRA must consult with TSA and STB in this case
- **Compliance reviews by HQ staff**
  - Includes other disciplines



# Storage/Delays in Transit

- Revisions/Additions to Security Plan
  - Formal consultation with offerors/consignees
    - Measures to minimize
  - Notification after 48 Hour delay identified
    - Include revised schedule
  - Unauthorized access for storage
  - Mitigating risks for storage near population centers
  - Measures for escalating threat conditions



# Safety/Security Inspections

- 49 CFR 174.9 Requirements

- Now includes security Inspections (ground level)

- IED (Defined)
- Seals
- Tampering

Includes:

- Ammonium Nitrate
- §172.820 Commodities (explosives, TIH, and HRCQ of RAD)
- Cargoes of Interest (based on threat)

- Follow Security Plan for Problems

- Don't accept/forward

Move under §174.50



# Thank You

## Questions:



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