US Federal Regulatory Oversight of Rail Transportation of Toxic by Inhalation (TIH) Material

Mark Hartong, Rajni Goel and Duminda Wijesekera
Federal Railroad Administration, Howard University and George Mason University
Outline

• Current regulatory requirements
• Rail industry and its role in the movement of security sensitivity materials
• New US Federal regulatory requirements associated with TIH shipments
• Conclusions
Background of Current Regulatory Requirements

• Rail system - critical component economy
  – 563 freight railroads operate on over 171,000 miles of track
  – 1.85 trillion ton-miles of freight (40% of all intercity freight volume)
  – 1.7 to 1.8 million carloads are hazardous material

• US PL 110-53 – protects Toxic by Inhalation (TIH) or Poison by Inhalation (PIH) material
Background of Current Regulatory Requirements (cont.)

• DOT hazardous material regulations
  – issued by: Pipeline and Hazardous Materials Safety Administration (PHMSA)
  – govern transportation of hazardous materials by all modes (highway, rail, ship, and air)

• Carriage by rail regulations:
  – 172 defines the hazardous material classes

• Shipments of explosive (Class 1), gasses (Class 2), Flammables (Class 3), toxic by inhalation (Class 6.1) & radioactive materials (Class 7) are Special concern
  – propensity for use as a weapon of mass destruction
  – extreme impact on the human body
Impact of TIH Accidents

- Railways are critical and sensitive component of US infrastructure
  - Norfolk Southern freight trains in Graniteville, South Carolina - January 6th 2005 - Direct and indirect damages exceeded $40 million
  - Canadian Pacific derails in Minot, ND - January 18th, 2002 - release of anhydrous ammonia
    - 1 killed, 333 injured, 11,600 evacuated for 1 week
  - Worst Case Scenario Study of 90-ton car chlorine accident in center of DC - would leave 100,000 killed or injured
## TIH Shipments (Source US Census Bureau)

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons (Thousands)</th>
<th>Ton Miles (Millions)</th>
<th>Average Length of haul (Miles)</th>
</tr>
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<tr>
<td>2007</td>
<td>4005</td>
<td>2551</td>
<td>580</td>
</tr>
<tr>
<td>2002</td>
<td>6090</td>
<td>3226</td>
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<td>1997</td>
<td>8868</td>
<td>6736</td>
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Statutory Obligations & Regulatory Requirements

- Carrier Obligation (49 U.S.C. 11101) creates interrelated requirements:
  - Railroads must provide common carrier rates to any requester
  - Railroads must provide rail service pursuant to those rates
- Railroads at risk of catastrophic liability when transporting TIH
- Cannot decline transportation of hazardous materials due to inconvenience or non-profitability
- Association of American Railways (AAR) has developed protocols to minimize risks - in the “United States Hazardous Materials Instructions for Rail, in OT-55, and CPC-1187
Rail - Voluntary Requirements

• Developed handling and routing requirements
  – List of hazardous and TIH materials
  – Technical and handling requirements of trains moving TIH
  – Main rail routes over which TIH is moved
  – Railroad operating practices and facilities

• OT 55
  – Tracking locations /Request security sensitive information
  – TRANSCAER - outreach program to assist emergency response and planning groups
  – Successful in mitigating unplanned release of TIH material
  – SHORTCOMING: OT-55 requirements are recommended practices

• Self Policing
Federal Safety and Security Regulations

• Recent federal regulatory efforts
  – Developed by FRA, PHMSA, and TSA
  – For example, includes the
    • 49 CFR 172 and 174 - satisfy the requirements of section 1551 of Implementing Recommendations of the 9/11 Commission Act of 2007

• Regulations establish risk-based protocols for evaluating the safety and security of TIH shipments
Requirements of Regulations

All rail carriers are now required to:

• Compile annual data on shipments of explosive, TIH, and radioactive materials

• Use the data to analyze safety and security risks along rail routes where those materials are transported

• Assess alternative routing options

• Make routing decisions based on those assessments.

• Address in their security plans en-route storage and in transit delays

• Inspect placarded hazardous materials rail cars for signs of tampering or the presence of suspicious items.
RAIL SAFETY IMPROVEMENTS ACT

- Known as RISA - established 2008
- Class 1 railroads must install Positive Train Control (PTC) Systems on any route segment transporting 5 million gross tons annual and carry any TIH materials
- PTC - a SCADA system
  - Ensures positive train separation
  - Prevents derailments
  - Protection for TIH
  - new implementing regulations of 49 CFR Subpart I for PTC SCADA systems
    - require cryptographically based message integrity and non-repudiation mechanisms to prevent misuse of the PTC system
PTC system
TSA Rail Transportation Security Regulations

• Requires bulk shipments of TIH materials be handled through a continuous chain of custody

• Improves security in 3 ways
  – freight rail carriers and certain facilities handling specified hazardous materials be able to report location and shipping information to TSA
  – railroads and shippers must ensure a chain of custody when exchanging extremely high-risk hazardous materials
    • shipment must be under “positive control” at all times
  – Improved safety regulations:
    • FRA may randomly conduct inspections for compliance
    • TSA has the same latitude with respect to security inspections
Conclusions

• Several shortcomings to current regulations
  – Leave out addressing some hazmat materials
  – Regulations limited to loaded cars
  – Only covers a limited number of high threat urban cities

• Railroads object to new unfunded mandates

• Shippers and others concerned railroads may use regulations to condense TIH traffic

• Regulations are too broad provide wide possible solution space - not sure what will be acceptable or unacceptable

• Formulation of these new regulations will improve overall safety and security of Critical Infrastructure