

**Valero Crude by Rail Project  
Public Comments received  
January 27 - February 3, 2014**

Commenter	Dated	Date Received
Marilyn Bardet	24-Jan-14	27-Jan-14
Mary Frances Kelly-Poh	24-Jan-14	27-Jan-14
Steve Young	25-Jan-14	27-Jan-14
Marilyn Bardet	26-Jan-14	27-Jan-14
Marilyn Bardet	27-Jan-14	27-Jan-14
Marilyn Bardet	27-Jan-14	27-Jan-14
Marilyn Bardet	29-Jan-14	29-Jan-14
Marilyn Bardet	29-Jan-14	29-Jan-14
Marilyn Bardet	29-Jan-14	30-Jan-14
Marilyn Bardet	29-Jan-14	30-Jan-14
Pat Toth Smith, Andy Smith & Alia Toth-Smith	2-Feb-14	3-Feb-14

## Amy Million - National Transportation Safety Board letters, with warning on CBR

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**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/24/2014 9:30 AM  
**Subject:** National Transportation Safety Board letters, with warning on CBR  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, George Oakes <oakes@earthlink.ne...>  
**Attachments:** R-14-001-003.pdf; R-14-004-006.pdf; image001.jpg; image002.png; R-14-001-003.pdf

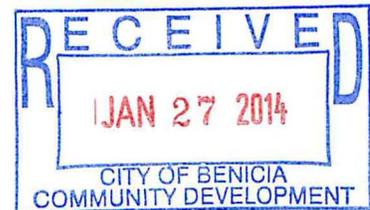
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Good morning Amy and Brad,

I'm sending the original, longer version of the story I'd submitted yesterday reporting on the National Transportation Safety Board's warning about the dangers of transporting crude by rail, "Oil Train Crash Risks 'Major Loss of Life.'"

I'm submitting in addition, two original letters sent by the NTSB to the Federal Railroad Administration (dated Jan 23, 2014) and also the Pipeline and Hazardous Materials Safety Administration (dated January 21, 2014) — both letters recommending new policies regarding increased safety precautions for the transport of fossil fuels by rail.

Please add these three submissions to the public legal record on Valero's proposed Crude-By-Rail Project for its upcoming CEQA review.





# National Transportation Safety Board

Washington, DC 20594

## Safety Recommendation

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**Date:** January 23, 2014

**In reply refer to:** R-14-1 through -3

The Honorable Joseph C. Szabo  
Administrator  
Federal Railroad Administration  
Washington, DC 20590

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The National Transportation Safety Board (NTSB) is providing the following information to urge the Federal Railroad Administration (FRA) to take action on the safety recommendations issued in this letter. These recommendations are derived from the NTSB's participation in the Transportation Safety Board of Canada's (TSB) investigation of the July 6, 2013, derailment of a Montreal, Maine & Atlantic (MMA) freight train in Lac-Mégantic, Quebec, Canada.

These recommendations address shipping classification for hazardous materials and safety and security plans for hazardous materials in railroad freight transportation. As a result of this investigation to date, and consistent with the evidence found and the observations made, the NTSB is issuing three safety recommendations to the FRA. Information supporting these recommendations is discussed below.

### **The Accident**

On July 5, 2013, at 10:45 p.m. eastern daylight time, MMA freight train MMA-002 was proceeding eastbound on the MMA Sherbrooke Subdivision, en route from Montréal, Quebec, to Saint John, New Brunswick, Canada. The train was 4,700 feet long and weighed more than 10,000 tons. The train was composed of 5 head-end locomotives, a special-purpose caboos equipped to remotely control the locomotives, 1 loaded boxcar used as a buffer car, and 72 US Department of Transportation (DOT) Specification 111 general service tank cars (DOT-111) loaded with petroleum crude oil. The waybills described the product in the tank cars as Petroleum Crude Oil, UN1267, Class 3, Packing Group III. The crude oil originated from a tank truck-to-rail car transloading facility in New Town, North Dakota, and was destined for an oil refinery in Saint John, New Brunswick. The Canadian Pacific Railway transported the tank cars from New Town to Montréal, where the train was conveyed to the MMA with the same waybill information.

About 11:00 p.m., the engineer stopped the train at the designated MMA crew change point at milepost 7.40 near Nantes, Quebec. He left the lead locomotive idling and then departed

the area, leaving the train unattended on the mainline track. The track had a descending grade of about 1.2 percent toward the town of Lac-Mégantic.

About 11:40 p.m., a nearby resident called the 911 emergency call center to report a fire on the idling locomotive. The local fire department responded, and the MMA dispatched an employee to assist the fire department personnel. About midnight, the responders initiated emergency shutdown procedures on the locomotive and extinguished the fire. The fire department and MMA personnel then departed the location, leaving the train unattended.

Shortly before 1:00 a.m. on July 6, 2013, the unattended train started to move, and it gathered speed, rolling uncontrolled for 7.4 miles down the descending grade into Lac-Mégantic. As the train entered the center of Lac-Mégantic, it was moving well over the authorized speed. The boxcar and 63 loaded crude oil tank cars derailed near the center of Lac-Mégantic. The locomotives separated from the train and came to rest about 1/2 mile east of the derailment.

At least 60 of the 63 derailed DOT-111 tank cars released about 1.6 million gallons of crude oil. Some of the spilled oil ignited immediately. The fire engulfed the derailed cars and the surrounding area. Forty-seven people died as a result of the fire, and nearby structures were destroyed or extensively damaged. The fire was extinguished by noon on July 7, 2013. About 2,000 people evacuated the surrounding area.

### **DOT Postaccident Actions**

On August 2, 2013, the FRA issued Emergency Order No. 28 to address safety issues related to securement of unattended trains containing the following:

- (1) five or more tank car loads of any one or any combination of materials poisonous by inhalation as defined in Title 49 *Code of Federal Regulations* (CFR) 171.8, and including anhydrous ammonia (UN1005) and ammonia solutions (UN3318); or (2) 20 rail car loads or intermodal portable tank loads of any one or any combination of materials listed in (1) above, or, any Division 2.1 flammable gas, Class 3 flammable liquid or combustible liquid, Class 1.1 or 1.3 explosive, or hazardous substance listed in 49 CFR 173.31(f)(2).<sup>1</sup>

These quantities of specific hazardous materials addressed in Emergency Order No. 28 are the same as those that define a key train<sup>2</sup> as outlined in the Association of American Railroads (AAR) Circular No. OT-55-N, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials*, effective August 5, 2013. Emergency Order No. 28 “was intended to address some of the human factors failures that may cause unattended equipment to be improperly secured and to protect against a derailment situation similar to that which occurred in Lac-Mégantic.”

<sup>1</sup> *Federal Register* 78, no. 152 (August 7, 2013): 48218.

<sup>2</sup> The Association of American Railroads revised the definition of *key train* on August 5, 2013, to mean “any train with one tank car load of Poison or Toxic Inhalation Hazard (Hazard Zone A, B, C, or D), anhydrous ammonia (UN1005), or ammonia solutions (UN3318); 20 car loads or intermodal portable tank loads of any combination of hazardous material; or one or more car loads of spent nuclear fuel or high level radioactive waste.”

Emergency Order No. 28 prohibits railroads from leaving trains or vehicles transporting the specified hazardous materials unattended on mainline track or siding outside of a yard or terminal unless the railroad adopts and complies with a plan that provides sufficient justification for leaving them unattended under specific circumstances and locations. The order also requires railroads to develop specific processes for securing, communicating, and documenting the securement of applicable unattended trains and vehicles, including locking the controlling locomotive cab door or removing the reverser<sup>3</sup> and setting a sufficient number of hand brakes before leaving the equipment unattended. In addition, the order requires railroads to review, verify, and adjust as necessary existing requirements and instructions related to the number of hand brakes to be set on unattended trains; conduct train securement job briefings among crewmembers and employees; and develop procedures to ensure qualified employees inspect equipment for proper securement after emergency response actions that involve the equipment.

On August 2, 2013, the FRA and the Pipeline and Hazardous Materials Safety Administration (PHMSA) issued joint Safety Advisory 2013-06.<sup>4</sup> The advisory recommends eight additional actions that railroads and shippers should take to ensure the safe transportation of hazardous materials:

- Review the details and lessons learned from the Lac-Mégantic accident;
- Review crew staffing levels;
- Require the train reverser to be removed and secured when unattended;
- Review all railroad operating procedures, testing, and operating rules concerning train securement;
- Review the Transport Canada<sup>5</sup> directives to secure and safely operate a train;
- Conduct a systemwide assessment of security risks when a train is unattended and identify mitigation efforts for those risks;
- Evaluate processes to ensure proper classification of hazardous materials for shipment; and
- Review shippers' and carriers' safety and security plans and amend the plans as necessary.

On January 2, 2014, PHMSA issued a safety alert addressing the flammability characteristics of the crude oil produced from the Bakken Shale formation region in the United States.<sup>6</sup> When it announced the safety alert, PHMSA noted that the alert reinforces “the requirement to properly test, characterize, classify, and where appropriate sufficiently degasify

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<sup>3</sup> The *reverser* is the directional control for the locomotive. Removing it would put the locomotive in neutral, preventing it from moving forward or backward under power of the engine.

<sup>4</sup> *Federal Register* 78, no. 152 (August 7, 2013): 48224.

<sup>5</sup> *Transport Canada* is the Canadian government department responsible for regulating transportation safety in Canada.

<sup>6</sup> Pipeline and Hazardous Materials Safety Administration, *Safety Alert, January 2, 2014: Preliminary Guidance from Operation Classification* (Washington, DC: US Department of Transportation, Pipeline and Hazardous Materials Safety Administration, 2014).

hazardous materials prior to and during transportation.” It also stresses that offerors<sup>7</sup> “must ensure that all potential hazards of the materials are properly characterized” and assign the appropriate classification and packing group of crude oil shipments.

The NTSB is concerned that major loss of life, property damage, and environmental consequences can occur when large volumes of crude oil or other flammable materials are on a single train involved in an accident, as seen in the Lac-Mégantic accident. The sharp increase in crude oil rail shipments in recent years as the United States experiences unprecedented growth in oil production has significantly increased safety risks to the public.<sup>8</sup> The NTSB agrees with the following safety concerns identified in Emergency Order No. 28:

- Crude oil is problematic when released because it is flammable, and the risk is compounded because it is commonly shipped in large units.
- Similar dangers exist with other hazardous materials such as ethanol, which was transported via rail more than any other hazardous material in 2012.
- Although the Lac-Mégantic accident occurred in Canada, the freight railroad operating environment in Canada is similar to that in the United States.
- The MMA train in the Lac-Mégantic accident was transporting 72 carloads of petroleum crude oil in a single consist. Rail lines in the United States commonly configure trains to transport crude oil by a unit train that consists virtually entirely of tank cars containing crude oil.

The Lac-Mégantic accident demonstrates the destructive effects of large numbers of derailed DOT-111 tank cars containing flammable materials as seen in several recent NTSB accident investigations:

- The December 30, 2013, BNSF Railway Company crude oil unit train that derailed near Casselton, North Dakota, after striking another derailed freight train. Several of the DOT-111 tank cars ruptured and released crude oil that ignited. The postaccident fire destroyed two locomotives and thermally damaged several additional tank cars causing violent, fiery eruptions. Dense, toxic smoke forced a temporary evacuation of the town.
- The July 11, 2012, Norfolk Southern Railway Company train derailment in a Columbus, Ohio, industrial area in which three derailed DOT-111 tank cars released about 53,000 gallons of ethanol, with energetic rupture of one tank car in a postaccident fire.

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<sup>7</sup> Title 49 CFR 171.8 defines *offeror* as any person who (1) performs, or is responsible for performing, any pre-transportation function required under this subchapter for transportation of the hazardous material in commerce and/or (2) tenders or makes the hazardous material available to a carrier for transportation in commerce.

<sup>8</sup> Bureau of Explosives, *Annual Report of Hazardous Materials Transported by Rail*, BOE 12-1 (Washington, DC: Association of American Railroads, Bureau of Explosives, 2013).

- The October 7, 2011, derailment in Tiskilwa, Illinois, of 10 DOT-111 tank cars resulting in fire, energetic rupture of several tank cars, and the release of 162,000 gallons of ethanol.<sup>9</sup>
- The June 19, 2009, Canadian National Railway derailment in Cherry Valley, Illinois, in which 13 of 19 derailed DOT-111 tank cars were breached, caught fire, and released about 324,000 gallons of ethanol. The postaccident fire resulted in one death, nine injuries, and the evacuation of 600 houses within 1/2 mile of the accident.<sup>10</sup>
- The October 20, 2006, derailment in New Brighton, Pennsylvania, in which 23 DOT-111 tank cars in a unit train derailed, fell from a bridge, caught fire, and released more than 485,000 gallons of ethanol.<sup>11</sup>

The NTSB is aware that the FRA investigated the February 6, 2011, derailment in Arcadia, Ohio, of a unit train of loaded DOT-111 tank cars that released about 786,000 gallons of ethanol from 32 derailed tank cars. The FRA also investigated the August 5, 2012, derailment of 18 DOT-111 tank cars of ethanol in Plevna, Montana, where 5 cars caught fire resulting in some explosions. Most recently, the FRA is investigating the November 7, 2013, derailment of 26 tank cars of a 90-car unit train of crude oil in Aliceville, Alabama, in which breached tank cars caught fire and released crude oil into a wetland.

### **Planning Requirements for Rail Transportation of Hazardous Materials**

Title 49 CFR Part 172, Subpart I, prescribes requirements for the development and implementation of plans to address security risks related to the commercial transportation of hazardous materials. On November 26, 2008, PHMSA, in coordination with the FRA and the Transportation Security Administration (TSA), issued a final rule requiring, among other things, that rail carriers compile annual data on certain shipments of explosive, toxic by inhalation, and radioactive materials; use the data to analyze safety and security risks along rail routes where those materials are transported; assess alternative routing options; and make routing decisions based on those assessments. The final rule also addresses section 1551(e) of the Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. 110-53, that requires rail carriers transporting “security sensitive materials” to select the safest and most secure route to be used in transporting those materials, based on the carrier’s analysis of the safety and security risks on primary and alternate transportation routes over which the carrier has authority to operate.

Route planning and route selection requirements have been incorporated into the Hazardous Materials Regulations at 49 CFR 172.820. The regulation requires that a rail carrier

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<sup>9</sup> National Transportation Safety Board, *Derailment and Hazardous Materials Release and Fire, Tiskilwa, Illinois, October 7, 2011*, RAB-13/02 (Washington, DC: National Transportation Safety Board, 2013).

<sup>10</sup> National Transportation Safety Board, *Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire, Cherry Valley, Illinois, June 19, 2009*, RAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

<sup>11</sup> National Transportation Safety Board, *Derailment of Norfolk Southern Railway Company Train 68QB119 with Release of Hazardous Materials and Fire, New Brighton, Pennsylvania, October 20, 2006*, RAR-08/02 (Washington, DC: National Transportation Safety Board, 2008).

that transports more than 5,000 pounds of a Division 1.1, 1.2, or 1.3 explosive in a single car load; a single bulk package of a material toxic by inhalation; or a highway route-controlled quantity of a Hazard Class 7, radioactive material, must annually compile commodity data to identify routes on which these materials are transported. The rail carrier also must annually analyze the safety and security risks for the transportation routes to include 27 risk factors, such as the volume of hazardous materials transported; track type, class, and maintenance schedule; track grade and curvature; environmentally sensitive or significant areas; population density along the route; emergency response capability along the route; and areas of high consequence along the route as defined in 49 CFR 172.820(c). The carrier also must identify alternative routes over which it has authority to operate and perform a safety and security risk assessment of those routes for comparison. The carrier must use the analysis to select the practicable route posing the least overall safety and security risk.

According to the regulations, if the FRA finds the carrier's route selection documentation and underlying analyses to be deficient, the carrier may be required to revise the analyses or make changes in the route selection. If the FRA finds that a selected route is not the safest and most secure practicable route available, in consultation with the TSA, the FRA may require the use of an alternative route.

A primary safety and security concern related to rail transportation of hazardous materials that was considered in the interim final rule published on April 16, 2008,<sup>12</sup> is the prevention of catastrophic release or explosion in proximity to densely populated areas, including urban areas and events or venues with large numbers of people in attendance, iconic buildings, landmarks, or environmentally sensitive areas. The goal of the PHMSA-required routing analysis is to ensure that each route used for the transportation of the specified hazardous materials presents the fewest overall safety and security risks. PHMSA also noted that even in the absence of alternative routes, assessing the safety and security risks along the route is critical to enhancing rail transportation safety and should prompt rail carriers to address identified vulnerabilities.

With the notable exception of the Lac-Mégantic accident, in which 47 people died and the town center was destroyed, none of the accidents cited above that involved fires and explosions on blocks of tank cars and unit trains carrying flammable materials occurred in densely populated areas. However, each of these accidents exhibited the potential for severe catastrophic outcomes had they occurred in such critical areas.

PHMSA has considered suggestions that other classes of hazardous materials, such as flammable gases, flammable liquids, hydrogen peroxide, oxidizers, poisons, and corrosives, should be included in the requirements for route selection. While evaluating the final rule, PHMSA, the FRA, and the TSA assessed the safety and security vulnerabilities associated with the transportation of different types and classes of hazardous materials based on accident scenarios and on scenarios that depict how hazardous materials could be used deliberately to cause significant casualties and property damage. In the interim final rule, the DOT and the TSA concluded the following:

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<sup>12</sup> *Federal Register* 73, no. 74 (April 16, 2008): 20752.

The risks are not as great as those posed by the explosive, poison inhalation hazards, and radioactive materials specified in the interim final rule, and we are not persuaded that they warrant the additional precautions required by the interim final rule.

Significant changes to the regulatory landscape have occurred since the issuance of the 2008 final rule. Major growth in crude oil and ethanol transportation volumes has occurred in recent years, yet this market did not exist when the rule was developed. According to the AAR *Annual Report of Hazardous Materials Transported by Rail* for 2012, crude oil shipments have increased 443 percent since 2005.<sup>13</sup> The first quarter of 2013 saw a 166 percent increase in crude oil shipment by rail over the first quarter of 2012, and growth is expected to continue for the foreseeable future.<sup>14</sup> Furthermore, in response to the US Environmental Protection Agency's 2005 Renewable Fuel Standard, ethanol traffic by railroad increased 441 percent between 2005 and 2011, and it was the most frequently transported hazardous material in 2012.

In the April 16, 2008, interim final rule, PHMSA stated that route planning and selection regulations were intended to protect against an event such as the one that occurred on January 6, 2005, in Graniteville, South Carolina, in which a release of chlorine, a material classified as a toxic inhalation hazard, caused 9 fatalities and 554 injuries.<sup>15</sup> The Lac-Mégantic accident and other recent accidents have demonstrated that the same potential for loss of life and damage to communities and the environment exists when accidents occur involving blocks of tank cars and unit trains transporting large volumes of flammable materials. Although the FRA actions under Emergency Order No. 28 acknowledge that better security is needed for unattended key trains, route planning and route selection protections currently required for explosive, toxic by inhalation, or radioactive materials are not required for trains transporting large bulk quantities of volatile flammable liquids through populated communities. The NTSB believes that at a minimum, the route assessments, alternative route analysis, and route selection requirements of 49 CFR 172.820 should be extended to key trains transporting large volumes of flammable liquid. Therefore, the NTSB recommends that the FRA work with PHMSA to expand hazardous materials route planning and selection requirements for railroads under 49 CFR 172.820 to include key trains transporting flammable liquids as defined by AAR Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas.

### **Oil Spill Response Plans**

Executive Order 12777<sup>16</sup> delegates to the DOT various responsibilities identified in section 311(j) of the Clean Water Act regarding discharges of oil and hazardous substances from transportation-related on-shore facilities. The PHMSA authority for on-shore transportation facilities (motor vehicles and rolling stock) is limited to promulgating regulations. Spill response

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<sup>13</sup> Bureau of Explosives, *Annual Report of Hazardous Materials Transported by Rail*, BOE 12-1 (Washington, DC: Association of American Railroads, Bureau of Explosives, 2013).

<sup>14</sup> J. Karl Alexy, "Crude Oil and Ethanol Transportation Trends" (presentation, 49th Railroad Safety Advisory Committee, Washington, DC, August 29, 2013).

<sup>15</sup> National Transportation Safety Board, *Collision of Norfolk Southern Freight Train 192 With Standing Norfolk Southern Local Train P22 With Subsequent Hazardous Materials Release at Graniteville, South Carolina, January 6, 2005*, RAR-05/04 (Washington, DC: National Transportation Safety Board, 2005).

<sup>16</sup> *Federal Register* 56 (October 22, 1991): 54757.

plans are submitted to the Federal Motor Carrier Safety Administration and the FRA for highway carriers and railroads, respectively. Since 1996, regulations have been in place at 49 CFR Part 130 to require comprehensive response plans for oil shipments in bulk packages (cargo tank motor vehicles and railroad tank cars) in a quantity that exceeds 42,000 gallons in a single package. For smaller petroleum oil shipments—in bulk packages of 3,500 to 42,000 gallons—the regulations require a less detailed basic response plan.

A spill response plan is intended to help the transporter develop a response organization and ensure the availability of resources needed to respond to an oil release. According to 49 CFR 130.31, the plan also should demonstrate that the response resources will be available in a timely manner to reduce the severity and impact of a discharge. Federal regulations require all railroads that transport liquid petroleum oil to develop basic written response plans that describe the manner of response to discharges that may occur during transportation, take into account the maximum potential discharge, identify the private personnel and equipment available to respond to a discharge, and retain that plan on file at its principal place of business and at the dispatcher's office. A comprehensive written plan is required for carriers transporting bulk shipments that exceed the 42,000-gallon package size. Each of these carriers also is required to have a comprehensive written plan that

- is consistent with the requirements of the National Contingency Plan (40 CFR Part 300) and Area Contingency Plans;
- identifies a qualified individual having full authority to implement removal actions;
- ensures by contract or other means the availability of private personnel and equipment necessary to remove a worst-case discharge;
- describes training, equipment testing, drills, and exercises; and
- is submitted to the FRA.

When a discharge occurs into navigable waters of the United States, the carrier is responsible for implementing the basic or comprehensive response plan.

Because trains typically travel many hundreds of miles, the response environments can present varied equipment needs, logistics, and containment strategies. Along a selected route, carriers would be better prepared to mitigate damage caused by releases of petroleum products if they identify and ensure by contract the personnel and equipment necessary to respond to petroleum product spills. Because there is no mandate for railroads to develop comprehensive plans or ensure the availability of necessary response resources, carriers have effectively placed the burden of remediating the environmental consequences of an accident on local communities along their routes.

Although railroad industry recommended practices for key trains contained in AAR Circular OT-55-N state that railroads will assist local emergency planning committees and emergency response organizations in developing plans and preparations for handling hazardous materials transportation accidents, these practices are not mandated, and the burden of responding to an accident and remediating the aftermath is still left with communities.

In the case of the Lac-Mégantic accident, the MMA did not have sufficient resources available to mitigate the release. About 1.6 million gallons of crude oil were released from the derailed tank cars in Lac-Mégantic with initial cleanup costs estimated at more than \$200 million, significantly exceeding the MMA's ability to respond to the accident and mitigate the release. According to a report released by the Quebec Ministry of Sustainable Development, Environment and Parks, the released crude oil covered about 77 acres of surface area in the center of Lac-Mégantic, and petroleum related contaminants that entered the Chaudière River were transported as far as 74 miles away.<sup>17</sup> The operational and financial responsibility for containing and remediating the release was placed on the provincial and federal governments.

The MMA is based in Maine, and it was similarly unprepared to respond to a worst-case discharge occurring within its US territory because it was not required to develop a comprehensive response plan. Had the regulatory threshold for comprehensive response planning included trains carrying large volumes of petroleum products, the FRA could have required the MMA to develop a plan to prepare for response to a release on the scale of the one that occurred in Lac-Mégantic.<sup>18</sup>

Although 49 CFR 130.31 requires comprehensive response plans to be submitted to the FRA, there is no provision for the FRA to review and approve plans, which calls into question why these plans are required to be submitted. The FRA would be better prepared to identify deficient response plans if it had a program to thoroughly review and approve each plan before carriers are permitted to transport petroleum oil products. In comparison to other DOT regulations for oil transportation in pipelines, an operator may not handle, store, or transport oil in a pipeline unless it has submitted a response plan for PHMSA approval.<sup>19</sup> The NTSB strongly believes there must be an equivalent level of preparedness across all modes of transportation to respond to major disasters involving releases of flammable liquid petroleum products. Therefore, the NTSB recommends that the FRA develop a program to audit response plans for rail carriers of petroleum products to ensure that adequate provisions are in place to respond to and remove a worst-case discharge to the maximum extent practicable and to mitigate or prevent a substantial threat of a worst-case discharge.

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<sup>17</sup> Quebec Ministry of Sustainable Development, Environment and Parks, *Déraillement ferroviaire raiilement de Lac-Mégantic (Environmental Characterization, Lac-Mégantic Derailment, Preliminary Report)*, (Quebec: Golder Associates, 2013).

<sup>18</sup> Concurrently, the NTSB has issued Safety Recommendation R-14-5 to PHMSA: "Revise the spill response planning thresholds contained in Title 49 *Code of Federal Regulations* Part 130 to require comprehensive response plans to effectively provide for the carriers' ability to respond to worst-case discharges resulting from accidents involving unit trains or blocks of tank cars transporting oil and petroleum products."

<sup>19</sup> As a result of its investigation of the rupture of a crude oil pipeline in Marshall, Michigan, on July 25, 2010, the NTSB issued Safety Recommendation P-12-9 to PHMSA: "Amend Title 49 *Code of Federal Regulations* Part 194 to harmonize onshore oil pipeline response planning requirements with those of the US Coast Guard and the US Environmental Protection Agency for facilities that handle and transport oil and petroleum products to ensure that pipeline operators have adequate resources available to respond to worst-case discharges." National Transportation Safety Board, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010*, PAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

## Hazardous Materials Packing Group Classification

The MMA train originated from a tank truck-to-rail car transloading facility in New Town, North Dakota, operated by Strobel Starostka Transfer (SST) on behalf of subsidiaries of World Fuel Services Corporation. The original bills of lading that SST provided to Canadian Pacific Railway described the hazardous material as a Hazard Class 3 flammable material, Packing Group III.

Packing groups indicate the degree of danger presented by the material as either high, medium, or low (Packing Group I, II, or III, respectively).<sup>20</sup> The table below shows the flash point and initial boiling point criteria for each packing group.

**Table.** Hazardous Liquids Class 3 Packing Group Criteria

Packing Group	Flash Point	Boiling Point
I	N/A	≤ 35°C
II	< 23°C	> 35°C
III	≥ 23°C ≤ 60°C	> 35°C

The intensity of the postaccident fire in Lac-Mégantic and the apparent low viscosity of the crude oil product prompted the TSB to collect and analyze samples of the product from nine undamaged tank cars in the train and from two tank cars in a second crude oil train stationed in Farnham, Quebec, to determine if the shipments had been properly described and the appropriate packing group assigned. Test results indicate the flash point was less than -35°C and the initial boiling point was between 43.9°C and 48.5°C, which placed this product in the lower end of the crude oil flash point range, well below the parameters for Packing Group III materials. Thus, the test results confirmed the crude oils on these trains had been incorrectly assigned to Packing Group III, and they should have been assigned to the more hazardous Packing Group II.

The crude oil on the accident train was derived from 11 different suppliers from producing wells in the Bakken Shale region of North Dakota, and the suppliers classified it as a Class 3 hazardous material with the packing group varying from Packing Group I to Packing Group III. Investigators determined that the hazardous materials shipping papers provided by trucking companies transporting crude oil from the wells to the transloading facility indicate the crude oil was Packing Group II, although these companies could not provide evidence that the oil had been tested to assign the appropriate packing group. Investigators learned that after these loads were placed into rail tank cars, the bills of lading SST provided to the Canadian Pacific Railway described the crude oil as Packing Group III. The accident train with the same incorrect Packing Group III waybill information was interchanged to the MMA in Montréal.

The provisions of 49 CFR 172.800(6) for Hazard Class 3 Packing Groups I and II materials shipped in large bulk quantities require that each person who offers for transportation

<sup>20</sup> Packing groups for Class 3 materials are defined in 49 CFR 173.121.

in commerce or transports in commerce such hazardous materials must develop and adhere to a transportation security plan for the hazardous materials. The security plan must include an assessment of possible security risks for shipments and appropriate measures to address the assessed risks. The plan elements must include provisions for personnel security, prevention of unauthorized access to the hazardous materials, and provisions for en route security from origin to destination, including shipments stored incidental to transportation. Packing Group III materials are excluded from this requirement.

The August 2, 2013, FRA and PHMSA joint safety advisory recommended that shippers review their safety and security plans and evaluate whether the existing plans adequately address personnel security, unauthorized access, and en route security, and as necessary, amend the plans to ensure the continued safe and secure transportation of railroad tank cars containing hazardous materials.

In addition, on November 20, 2013, the FRA and PHMSA jointly published Safety Advisory 2013-07 that announced the "Operation Classification" compliance initiative that involves unannounced inspections and testing to verify material classification and packing group assignments selected by shippers of petroleum crude oil.<sup>21</sup> The advisory also announced that FRA and PHMSA inspectors are auditing safety and security plans to determine whether the plans address the vulnerabilities highlighted in Emergency Order No. 28 and the August 2, 2013, safety advisory.

Pending publication of a report on the scope and findings of the FRA and PHMSA enforcement initiatives, the NTSB remains concerned that the practice of mischaracterizing the packing group of crude oil shipments may allow shippers to avoid the security requirements necessary for transporting large quantities of volatile crude oil. Further, although the safety advisory recommends that shippers evaluate and update their plans as necessary, it is essential that a system of compliance monitoring combined with FRA assistance is implemented to ensure these plans are adequate and the provisions fully operational. Therefore, the NTSB recommends that the FRA audit shippers and rail carriers of crude oil to ensure they are using appropriate hazardous materials shipping classifications, have developed transportation safety and security plans, and have made adequate provision for safety and security.

Investigators are still examining issues related to the Lac-Mégantic, Quebec, accident. At this time, the TSB has not made any final conclusions about this accident. Nonetheless, the NTSB has identified the safety issues described above, which should be addressed expeditiously. Therefore, the National Transportation Safety Board makes the following safety recommendations to the Federal Railroad Administration:

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<sup>21</sup> *Federal Register* 78, no. 224 (November 20, 2013): 69745.

Work with the Pipeline and Hazardous Materials Safety Administration to expand hazardous materials route planning and selection requirements for railroads under Title 49 *Code of Federal Regulations* 172.820 to include key trains transporting flammable liquids as defined by the Association of American Railroads Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas. (R-14-1)

Develop a program to audit response plans for rail carriers of petroleum products to ensure that adequate provisions are in place to respond to and remove a worst-case discharge to the maximum extent practicable and to mitigate or prevent a substantial threat of a worst-case discharge. (R-14-2)

Audit shippers and rail carriers of crude oil to ensure they are using appropriate hazardous materials shipping classifications, have developed transportation safety and security plans, and have made adequate provision for safety and security. (R-14-3)

The NTSB also issued three safety recommendations to the Pipeline and Hazardous Materials Safety Administration.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in these recommendations.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate receiving a response from you within 90 days detailing the actions you have taken or intend to take to implement them. When replying, please refer to the safety recommendations by number. We encourage you to submit your response electronically to [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov).

[Original Signed]

By: Deborah A.P. Hersman,  
Chairman



**National Transportation Safety Board**  
Washington, DC 20594

**Safety Recommendation**

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**Date:** January 21, 2014

**In reply refer to:** R-14-4 through -6

The Honorable Cynthia L. Quarterman  
Administrator  
Pipeline and Hazardous Materials  
Safety Administration  
Washington, DC 20590

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The National Transportation Safety Board (NTSB) is providing the following information to urge the Pipeline and Hazardous Materials Safety Administration (PHMSA) to take action on the safety recommendations issued in this letter. These recommendations are derived from the NTSB's participation in the Transportation Safety Board of Canada's (TSB) investigation of the July 6, 2013, derailment of a Montreal, Maine & Atlantic (MMA) freight train in Lac-Mégantic, Quebec, Canada.

These recommendations address hazardous materials route analysis and selection, oil spill prevention and response plans, and identification and classification of hazardous materials in railroad freight transportation. As a result of this investigation to date, and consistent with the evidence found and the observations made, the NTSB is issuing three safety recommendations to PHMSA. Information supporting these recommendations is discussed below.

**The Accident**

On July 5, 2013, at 10:45 p.m. eastern daylight time, MMA freight train MMA-002 was proceeding eastbound on the MMA Sherbrooke Subdivision, en route from Montréal, Quebec, to Saint John, New Brunswick, Canada. The train was 4,700 feet long and weighed more than 10,000 tons. The train was composed of 5 head-end locomotives, a special-purpose caboose equipped to remotely control the locomotives, 1 loaded boxcar used as a buffer car, and 72 US Department of Transportation (DOT) Specification 111 general service tank cars (DOT-111) loaded with petroleum crude oil. The waybills described the product in the tank cars as Petroleum Crude Oil, UN1267, Class 3, Packing Group III. The crude oil originated from a tank truck-to-rail car transloading facility in New Town, North Dakota, and was destined for an oil refinery in Saint John, New Brunswick. The Canadian Pacific Railway transported the tank cars from New Town to Montréal, where the train was conveyed to the MMA with the same waybill information.

About 11:00 p.m., the engineer stopped the train at the designated MMA crew change point at milepost 7.40 near Nantes, Quebec. He left the lead locomotive idling and then departed the area, leaving the train unattended on the mainline track. The track had a descending grade of about 1.2 percent toward the town of Lac-Mégantic.

About 11:40 p.m., a nearby resident called the 911 emergency call center to report a fire on the idling locomotive. The local fire department responded, and the MMA dispatched an employee to assist the fire department personnel. About midnight, the responders initiated emergency shutdown procedures on the locomotive and extinguished the fire. The fire department and MMA personnel then departed the location, leaving the train unattended.

Shortly before 1:00 a.m. on July 6, 2013, the unattended train started to move, and it gathered speed, rolling uncontrolled for 7.4 miles down the descending grade into Lac-Mégantic. As the train entered the center of Lac-Mégantic, it was moving well over the authorized speed. The boxcar and 63 loaded crude oil tank cars derailed near the center of Lac-Mégantic. The locomotives separated from the train and came to rest about 1/2 mile east of the derailment.

At least 60 of the 63 derailed DOT-111 tank cars released about 1.6 million gallons of crude oil. Some of the spilled oil ignited immediately. The fire engulfed the derailed cars and the surrounding area. Forty-seven people died as a result of the fire, and nearby structures were destroyed or extensively damaged. The fire was extinguished by noon on July 7, 2013. About 2,000 people evacuated the surrounding area.

### **DOT Postaccident Actions**

On August 2, 2013, the Federal Railroad Administration (FRA) issued Emergency Order No. 28 to address safety issues related to securement of unattended trains containing the following:

- (1) five or more tank car loads of any one or any combination of materials poisonous by inhalation as defined in Title 49 *Code of Federal Regulations* (CFR) 171.8, and including anhydrous ammonia (UN1005) and ammonia solutions (UN3318); or (2) 20 rail car loads or intermodal portable tank loads of any one or any combination of materials listed in (1) above, or, any Division 2.1 flammable gas, Class 3 flammable liquid or combustible liquid, Class 1.1 or 1.2 explosive, or hazardous substance listed in 49 CFR 173.31(f)(2).<sup>1</sup>

These quantities of specific hazardous materials addressed in Emergency Order No. 28 are the same as those that define a key train<sup>2</sup> as outlined in the Association of American Railroads (AAR) Circular No. OT-55-N, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials*, effective August 5, 2013. Emergency Order No. 28 “was intended to address some of the human factors failures that may cause unattended equipment to be

<sup>1</sup> *Federal Register* 78, no. 152 (August 7, 2013): 48218.

<sup>2</sup> The Association of American Railroads revised the definition of *key train* on August 5, 2013, to mean “any train with one tank car load of Poison or Toxic Inhalation Hazard (Hazard Zone A, B, C, or D), anhydrous ammonia (UN1005), or ammonia solutions (UN3318); 20 car loads or intermodal portable tank loads of any combination of hazardous material; or one or more car loads of spent nuclear fuel or high level radioactive waste.”

improperly secured and to protect against a derailment situation similar to that which occurred in Lac-Mégantic.”

Emergency Order No. 28 prohibits railroads from leaving trains or vehicles transporting the specified hazardous materials unattended on mainline track or siding outside of a yard or terminal unless the railroad adopts and complies with a plan that provides sufficient justification for leaving them unattended under specific circumstances and locations. The order also requires railroads to develop specific processes for securing, communicating, and documenting the securement of applicable unattended trains and vehicles, including locking the controlling locomotive cab door or removing the reverser<sup>3</sup> and setting a sufficient number of hand brakes before leaving the equipment unattended. In addition, the order requires railroads to review, verify, and adjust as necessary existing requirements and instructions related to the number of hand brakes to be set on unattended trains; conduct train securement job briefings among crewmembers and employees; and develop procedures to ensure qualified employees inspect equipment for proper securement after emergency response actions that involve the equipment.

The NTSB agrees with the following safety concerns arising from the Lac-Mégantic accident the FRA identified in Emergency Order No. 28:

- Crude oil is problematic when released because it is flammable, and the risk is compounded because it is commonly shipped in large units.
- Similar dangers exist with other hazardous materials such as ethanol, which was transported via rail more than any other hazardous material in 2012.
- Although the Lac-Mégantic accident occurred in Canada, the freight railroad operating environment in Canada is similar to that in the United States.
- The MMA train in the Lac-Mégantic accident was transporting 72 carloads of petroleum crude oil in a single consist. Rail lines in the United States commonly configure trains to transport crude oil by a unit train that consists virtually entirely of tank cars containing crude oil.

On August 2, 2013, PHMSA and the FRA issued joint Safety Advisory 2013-06.<sup>4</sup> The advisory recommends eight additional actions that railroads and shippers should take to ensure the safe transportation of hazardous materials:

- Review the details and lessons learned from the Lac-Mégantic accident;
- Review crew staffing levels;
- Require the train reverser to be removed and secured when unattended;
- Review all railroad operating procedures, testing, and operating rules concerning train securement;

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<sup>3</sup> The *reverser* is the directional control for the locomotive. Removing it would put the locomotive in neutral, preventing it from moving forward or backward under power of the engine.

<sup>4</sup> *Federal Register* 78, no. 152 (August 7, 2013): 48224.

- Review the Transport Canada<sup>5</sup> directives to secure and safely operate a train;
- Conduct a systemwide assessment of security risks when a train is unattended and identify mitigation efforts for those risks;
- Evaluate processes to ensure proper classification of hazardous materials for shipment; and
- Review shippers' and carriers' safety and security plans and amend the plans as necessary.

### **DOT-111 Tank Cars**

The NTSB recognizes that rail shipments of crude oil have sharply increased in recent years as the United States experiences unprecedented growth in oil production,<sup>6</sup> and the Lac-Mégantic accident demonstrates that major loss of life, property damage, and environmental consequences can occur when large volumes of crude oil or other flammable materials are on a train involved in an accident. The potential destructive effects of large numbers of derailed DOT-111 tank cars containing flammable materials are further demonstrated by several recent NTSB accident investigations:

- The December 30, 2013, BNSF Railway Company crude oil unit train that derailed near Casselton, North Dakota, after striking another derailed freight train. Several of the DOT-111 tank cars ruptured and released product that ignited. The postaccident fire destroyed two locomotives and thermally damaged several additional tank cars causing violent, fiery eruptions. Dense, toxic smoke forced a temporary evacuation of the town.
- The July 11, 2012, Norfolk Southern Railway Company train derailment in a Columbus, Ohio, industrial area in which three derailed DOT-111 tank cars released about 53,000 gallons of ethanol, with energetic rupture of one tank car in a postaccident fire.
- The October 7, 2011, derailment in Tiskilwa, Illinois, of 10 DOT-111 tank cars resulting in fire, energetic rupture of several tank cars, and the release of 162,000 gallons of ethanol.<sup>7</sup>

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<sup>5</sup> *Transport Canada* is the Canadian government department responsible for regulating transportation safety in Canada.

<sup>6</sup> Bureau of Explosives, *Annual Report of Hazardous Materials Transported by Rail*, BOE 12-1 (Washington, DC: Association of American Railroads, Bureau of Explosives, 2013).

<sup>7</sup> National Transportation Safety Board, *Derailed and Hazardous Materials Release and Fire, Tiskilwa, Illinois, October 7, 2011*, RAB-13/02 (Washington DC: National Transportation Safety Board, 2013).

- The June 19, 2009, Canadian National Railway derailment in Cherry Valley, Illinois, in which 13 of 19 derailed DOT-111 tank cars were breached, caught fire, and released about 324,000 gallons of ethanol. The postaccident fire resulted in one death, nine injuries, and the evacuation of 600 houses within 1/2 mile of the accident.<sup>8</sup>
- The October 20, 2006, derailment in New Brighton, Pennsylvania, in which 23 DOT-111 tank cars in a unit train derailed, fell from a bridge, caught fire, and released more than 485,000 gallons of ethanol.<sup>9</sup>

The NTSB is aware that the FRA investigated the February 6, 2011, derailment in Arcadia, Ohio, of a unit train of DOT-111 tank cars that released about 786,000 gallons of ethanol from 32 derailed tank cars. The FRA also investigated the August 5, 2012, derailment of 18 DOT-111 tank cars of ethanol in Plevna, Montana, where 5 cars caught fire, resulting in some explosions. Most recently, the FRA is investigating the November 7, 2013, derailment of 26 tank cars of a 90-car unit train of crude oil in Aliceville, Alabama, in which breached tank cars caught fire and released crude oil into a wetland.

### **Planning Requirements for Rail Transportation of Hazardous Materials**

Title 49 CFR, Part 172, Subpart I, prescribes the requirements for the development and implementation of plans to address security risks related to the commercial transportation of hazardous materials. On November 26, 2008, PHMSA, in coordination with the FRA and the Transportation Security Administration (TSA), issued a final rule requiring, among other things, that rail carriers compile annual data on certain shipments of explosive, toxic by inhalation, and radioactive materials; use the data to analyze safety and security risks along rail routes where those materials are transported; assess alternative routing options; and make routing decisions based on those assessments. The final rule also addresses section 1551(e) of the Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. 110-53, that requires rail carriers transporting “security sensitive materials” to select the safest and most secure route to be used in transporting those materials, based on the carrier’s analysis of the safety and security risks on primary and alternative transportation routes over which the carrier has authority to operate.

Route planning and route selection requirements have been incorporated into the Hazardous Materials Regulations at 49 CFR 172.820. The regulation requires that a rail carrier that transports more than 5,000 pounds of a Division 1.1, 1.2, or 1.3 explosive in a single car load; a single bulk package of a material toxic by inhalation; or a highway route-controlled quantity of a Hazard Class 7, radioactive material, must annually compile commodity data to identify routes on which these materials are transported. The rail carrier also must annually analyze the safety and security risks for the transportation routes to include 27 risk factors, such

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<sup>8</sup> National Transportation Safety Board, *Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire, Cherry Valley, Illinois, June 19, 2009*, RAR-12/01 (Washington DC: National Transportation Safety Board, 2012).

<sup>9</sup> National Transportation Safety Board, *Derailment of Norfolk Southern Railway Company Train 68QB119 with Release of Hazardous Materials and Fire, New Brighton, Pennsylvania, October 20, 2006*, RAR-08/02 (Washington DC: National Transportation Safety Board, 2008).

as the volume of hazardous materials transported; track type, class, and maintenance schedule; track grade and curvature; environmentally sensitive or significant areas; population density along the route; emergency response capability along the route; and areas of high consequence along the route as defined in 49 CFR 172.820(c). The carrier also must identify alternative routes over which it has authority to operate and perform a safety and security risk assessment of those routes for comparison. The carrier must use the analysis to select the practicable route posing the least overall safety and security risk.

According to the regulations, if the FRA finds the carrier's route selection documentation and underlying analyses to be deficient, the carrier may be required to revise the analyses or make changes in the route selection. If the FRA finds that a selected route is not the safest and most secure practicable route available, in consultation with the TSA, the FRA may require the use of an alternative route.

A primary safety and security concern related to rail transportation of hazardous materials that was considered in the interim final rule issued on April 16, 2008,<sup>10</sup> is the prevention of catastrophic release or explosion in proximity to densely populated areas, including urban areas and events or venues with large numbers of people in attendance, iconic buildings, landmarks, or environmentally sensitive areas. The goal of the PHMSA-required routing analysis is to ensure that each route used for the transportation of the specified hazardous materials presents the fewest overall safety and security risks. PHMSA also noted that even in the absence of alternative routes, assessing the safety and security risks along the route is critical to enhancing rail transportation safety and should prompt rail carriers to address identified vulnerabilities.

With the notable exception of the Lac-Mégantic accident, in which 47 people died and the town center was destroyed, none of the accidents cited above that involved fires and explosions on blocks of tank cars and unit trains carrying flammable materials occurred in densely populated areas. However, each of these accidents exhibited the potential for severe catastrophic outcomes had they occurred in such critical areas.

PHMSA has considered suggestions that other classes of hazardous materials, such as flammable gases, flammable liquids, hydrogen peroxide, oxidizers, poisons, and corrosives, should be included in the requirements for route selection. While evaluating the final rule, PHMSA, the FRA, and the TSA assessed the safety and security vulnerabilities associated with the transportation of different types and classes of hazardous materials based on accident scenarios and on scenarios that depict how hazardous materials could be used deliberately to cause significant casualties and property damage. In the interim final rule, the DOT and the TSA concluded the following:

The risks are not as great as those posed by the explosive, poison inhalation hazards, and radioactive materials specified in the interim final rule, and we are not persuaded that they warrant the additional precautions required by the interim final rule.

Significant changes to the regulatory landscape have occurred since the issuance of the 2008 final rule. Major growth in crude oil and ethanol transportation volumes has occurred in

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<sup>10</sup> *Federal Register* 73, no. 74 (April 16, 2008): 20752.

recent years, yet this market did not exist when the rule was developed. According to the AAR *Annual Report of Hazardous Materials Transported by Rail* for 2012, crude oil shipments have increased 443 percent since 2005.<sup>11</sup> The first quarter of 2013 saw a 166 percent increase in crude oil shipment by rail over the first quarter of 2012, and growth is expected to continue for the foreseeable future.<sup>12</sup> Furthermore, in response to the US Environmental Protection Agency's 2005 Renewable Fuel Standard, ethanol traffic by railroad increased 441 percent between 2005 and 2011, and it was the most frequently transported hazardous material in 2012.

In the April 16, 2008, interim final rule, PHMSA stated that route planning and selection regulations were intended to protect against an event such as the one that occurred on January 6, 2005, in Graniteville, South Carolina, in which a release of chlorine, a material classified as a toxic inhalation hazard, caused 9 fatalities and 554 injuries.<sup>13</sup> The Lac-Mégantic accident and other recent accidents have demonstrated that the same potential for loss of life and damage to communities and the environment exists when accidents occur involving blocks of tank cars and unit trains transporting large volumes of flammable materials. Although the FRA actions under Emergency Order No. 28 acknowledge that better security is needed for unattended key trains, route planning and route selection protections currently required for explosive, toxic by inhalation, or radioactive materials are not required for trains transporting large bulk quantities of volatile flammable liquids through populated communities. The NTSB believes that at a minimum, the route assessments, alternative route analysis, and route selection requirements of 49 CFR 172.820 should be extended to key trains transporting large volumes of flammable liquid. Therefore, the NTSB recommends that PHMSA work with the FRA to expand hazardous materials route planning and selection requirements for railroads under 49 CFR 172.820 to include key trains transporting flammable liquids as defined by AAR Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas.

### **Oil Spill Response Plans**

About 1.6 million gallons of crude oil were released from the derailed tank cars in Lac-Mégantic with initial cleanup costs estimated at more than \$200 million. According to a report released by the Quebec Ministry of Sustainable Development, Environment and Parks, the released crude oil covered about 77 acres of surface area in the center of Lac-Mégantic, and petroleum related contaminants that entered the Chaudière River were transported as far as 74 miles away.<sup>14</sup> As devastating as the Lac-Mégantic accident was, it did not fully represent a worst-case (maximum potential) discharge, because 9 of the 72 tank cars at the rear of the train did not derail or release crude oil.

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<sup>11</sup> Bureau of Explosives, *Annual Report of Hazardous Materials Transported by Rail*, BOE 12-1 (Washington, DC: Association of American Railroads, Bureau of Explosives, 2013).

<sup>12</sup> J. Karl Alexy, "Crude Oil and Ethanol Transportation Trends" (presentation, 49th Railroad Safety Advisory Committee, Washington, DC, August 29, 2013).

<sup>13</sup> National Transportation Safety Board, *Collision of Norfolk Southern Freight Train 192 With Standing Norfolk Southern Local Train P22 With Subsequent Hazardous Materials Release at Graniteville, South Carolina, January 6, 2005*, RAR-05/04 (Washington, DC: National Transportation Safety Board, 2005).

<sup>14</sup> Quebec Ministry of Sustainable Development, Environment and Parks, *Déraillement ferroviaire raiilement de Lac-Mégantic (Environmental Characterization, Lac-Mégantic Derailment, Preliminary Report)*, (Quebec: Golder Associates, 2013).

The Lac-Mégantic accident shows that railroad accidents involving crude oil have a potential for disastrous consequences and environmental contamination equal to that of the worst on-shore pipeline accidents. The July 25, 2010, crude oil pipeline accident in Marshall, Michigan, released about 843,000 gallons of crude oil from a 30-inch-diameter ruptured transmission pipeline and was the most costly inland pipeline crude oil spill in the United States to date, with environmental remediation costs approaching \$1 billion.<sup>15</sup> Although railroad accidents involving large numbers of crude oil tank cars can have similar outcomes, oil spill response planning requirements for rail transportation of oil/petroleum products are practically nonexistent compared with other modes of transportation. Current regulations do not require railroads transporting crude oil in multiple tank cars to develop comprehensive spill response plans and have resources on standby for response to worst-case discharges. Although simple plans must be developed, the plans are not reviewed to evaluate the capability of rail carriers to respond to and mitigate discharges.

Executive Order 12777<sup>16</sup> delegates to the DOT various responsibilities identified in section 311(j) of the Clean Water Act regarding discharges of oil and hazardous substances from transportation-related on-shore facilities. The PHMSA authority for on-shore transportation facilities (motor vehicles and rolling stock) is limited to promulgating regulations. Spill response plans are submitted to the Federal Motor Carrier Safety Administration and the FRA for highway carriers and railroads, respectively. Since 1996, regulations have been in place at 49 CFR Part 130 to require comprehensive response plans for oil shipments in bulk packages (cargo tank motor vehicles and railroad tank cars) in a quantity that exceeds 42,000 gallons in a single package. For smaller petroleum oil shipments—in bulk packages of 3,500 to 42,000 gallons—the regulations require a less detailed basic response plan.

A spill response plan is intended to help the transporter develop a response organization and ensure the availability of resources needed to respond to an oil release. According to 49 CFR 130.31, the plan also should demonstrate that the response resources will be available in a timely manner to reduce the severity and impact of a discharge. Federal regulations require all railroads that transport liquid petroleum oil to develop basic written response plans that describe the manner of response to discharges that may occur during transportation, take into account the maximum potential discharge, identify the private personnel and equipment available to respond to a discharge, and retain that plan on file at its principal place of business and at the dispatcher's office. A comprehensive written plan is required for carriers transporting bulk shipments that exceed the 42,000-gallon package size. Each of these carriers also is required to have a comprehensive written plan that

- is consistent with the requirements of the National Contingency Plan (40 CFR Part 300) and Area Contingency Plans;
- identifies a qualified individual having full authority to implement removal actions;

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<sup>15</sup> National Transportation Safety Board, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010*, PAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

<sup>16</sup> *Federal Register* 56 (October 22, 1991): 54757.

- ensures by contract or other means the availability of private personnel and equipment necessary to remove a worst-case discharge;
- describes training, equipment testing, drills, and exercises; and
- is submitted to the FRA.

When a discharge occurs into navigable waters of the United States, the carrier is responsible for implementing the basic or comprehensive response plan.

In the preamble to the June 17, 1996, final rule,<sup>17</sup> the Research and Special Programs Administration (RSPA)<sup>18</sup> stated its belief that 42,000 gallons in a single packaging is an appropriate and reasonable liquid quantity for a finding that a release would cause substantial harm to the environment, and thus should be the threshold for comprehensive planning. However, RSPA noted that on the basis of available information, no rail carrier was transporting oil in a quantity greater than 42,000 gallons in tank cars. During 1996, when the rulemaking was being considered, there were only 67 tank cars listed in the AAR UMLER<sup>19</sup> file with a capacity equal to or greater than 42,000 gallons. Only six of these cars were being used to transport oil or petroleum products.

The NTSB finds that as currently written, the regulation circumvents the need for railroads to comply with spill response planning mandates of the federal Clean Water Act. Although the DOT 42,000-gallon threshold for comprehensive response plan development is equivalent to an unrelated threshold contained in a spill prevention, control, and countermeasures rule administered by the US Environmental Protection Agency for nontransportation related oil storage facilities,<sup>20</sup> the DOT regulation is rendered ineffective because of its lack of applicability to any real-world transportation scenario. By limiting the comprehensive planning threshold for a single tank size that is greater than any currently in use, spill-planning regulations do not take into account the potential of a derailment of large numbers of 30,000-gallon tank cars, such as in Lac-Mégantic where 60 tank cars together released about 1.6 million gallons of crude oil.

RSPA stated further that the risk to the marine environment posed by oil in transport is proportional to the quantity of oil that could be discharged in an accident, and when the rule was developed 17 years ago, it was based on the relatively few petroleum shipments by tank car that were not being assembled as unit trains. The NTSB believes that because conditions have significantly changed with the recent massive growth in crude oil transportation, the regulations are no longer sufficient to mitigate the risks of petroleum product releases in accidents. Although no one tank car meets the current threshold for comprehensive spill planning, the Lac-Mégantic accident and the well-known poor lading retention performance history of DOT-111 tank cars

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<sup>17</sup> *Federal Register* 61, no. 117 (June 17, 1996): 30533.

<sup>18</sup> RSPA was abolished by act of November 30, 2004 (118 Stat. 2424-2426), and certain duties were transferred to both PHMSA and the Administrator of the Research and Innovative Technology Administration, DOT.

<sup>19</sup> UMLER refers to the Universal Machine Language Equipment Register, which is a file of vital statistics for each rail car in service.

<sup>20</sup> Under 40 CFR Part 112, if the facility transfers oil over water to or from vessels and has a total oil storage capacity greater than or equal to 42,000 gallons it could, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil on the navigable waters or adjoining shorelines.

have demonstrated that the worst-case release potential of these unit trains, in many cases greater than 2 million gallons, must be considered in the oil and hazardous materials spill planning process.

US Coast Guard regulations for marine tank vessels require spill response planning to address a worst-case discharge, which is defined as the entire cargo on the vessel. Planning to respond to maximum potential releases for trains transporting crude oil, many of which are configured in unit trains as “virtual pipelines” of tank cars, also must take into account the entire quantity of lading. Therefore, the NTSB recommends that PHMSA revise the spill response planning thresholds contained in 49 CFR Part 130 to require comprehensive response plans to effectively provide for the carriers’ ability to respond to worst-case discharges resulting from accidents involving unit trains or blocks of tank cars transporting oil and petroleum products.

### **Hazardous Materials Packing Group Classification**

The MMA train originated from a tank truck-to-rail car transloading facility in New Town, North Dakota, operated by Strobel Starostka Transfer (SST) on behalf of subsidiaries of World Fuel Services Corporation. The original bills of lading that SST provided to Canadian Pacific Railway described the hazardous material as a Hazard Class 3 flammable material, Packing Group III.

Packing groups indicate the degree of danger presented by the material as either high, medium, or low (Packing Group I, II, or III, respectively).<sup>21</sup> The table below shows the flash point and initial boiling point criteria for each packing group.

**Table.** Hazardous Liquids Class 3 Packing Group Criteria

<b>Packing Group</b>	<b>Flash Point</b>	<b>Boiling Point</b>
I	N/A	≤ 35°C
II	< 23°C	> 35°C
III	≥ 23°C ≤ 60°C	> 35°C

The intensity of the postaccident fire in Lac-Mégantic and the apparent low viscosity of the crude oil product prompted the TSB to collect and analyze samples of the product from nine undamaged tank cars in the train and from two tank cars in a second crude oil train stationed in Farnham, Quebec, to determine if the shipments had been properly described and the appropriate packing group assigned. Test results indicate the flash point was less than -35°C and the initial boiling point was between 43.9°C and 48.5°C, which placed this product in the lower end of the crude oil flash point range, well below the parameters for Packing Group III materials. Thus, the test results confirmed the crude oils on these trains had been incorrectly assigned to Packing Group III, and they should have been assigned to the more hazardous Packing Group II.

<sup>21</sup> Packing groups for Class 3 materials are defined in 49 CFR 173.121.

The crude oil on the accident train was derived from 11 different suppliers from producing wells in the Bakken Shale formation region of North Dakota, and the suppliers classified it as a Class 3 hazardous material with the packing group varying from Packing Group I to Packing Group III. Investigators determined that the hazardous materials shipping papers provided by trucking companies transporting crude oil from the wells to the tank transloading facility indicate the crude oil was Packing Group II, although these companies could not provide evidence that the oil had been tested to assign the appropriate packing group. Investigators learned that after these loads were placed into rail tank cars, the bills of lading SST provided to the Canadian Pacific Railway described the crude oil as Packing Group III. The accident train with the same incorrect Packing Group III waybill information was interchanged to the MMA in Montréal.

On September 11, 2013, the TSB issued Rail Safety Advisory Letter 13/13, which recommended that PHMSA review its procedures for suppliers and companies transporting these products to ensure the product properties are accurately determined and documented for safe transportation.

The packing group classification requirements of the Hazardous Materials Regulations include the packaging that must be used to ship the material. The packing group classification determines authorized filling densities and outage requirements, hazard communications (marking, labeling, and placards), transportation safety and operational controls, and safety and security planning. Proper identification of hazardous materials is required to ensure emergency responders understand the hazards associated with the shipped material.

The NTSB investigated several accidents involving DOT-111 general service tank cars, and identified the vulnerability of tank heads, shells, and fittings to damage and subsequent release of lading during derailments. In the most recent accident report focusing on the crashworthiness of DOT-111 tank cars as a result of the derailment of a CN freight train transporting denatured ethanol in Cherry Valley, Illinois,<sup>22</sup> the NTSB issued the following safety recommendation to PHMSA:

R-12-5

Require that all newly manufactured and existing general service tank cars authorized for transportation of denatured fuel ethanol and crude oil in Packing Groups I and II have enhanced tank head and shell puncture-resistance systems and top fittings protection that exceeds existing design requirements for DOT-111 tank cars. (Currently classified “Open—Acceptable Response.”)

Additionally, the AAR developed new design criteria for tank cars built for the transportation of Packing Groups I and II materials with the proper shipping names Petroleum Crude Oil, Alcohols, n.o.s., and Ethanol and Gasoline Mixture.<sup>23</sup> These standards published in

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<sup>22</sup> National Transportation Safety Board, *Derailment of CN Freight Train U70691 With Subsequent Hazardous Materials Release and Fire, Cherry Valley, Illinois, June 19, 2009*, RAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

<sup>23</sup> n.o.s. means not otherwise specified.

the AAR *Manual of Standards and Recommended Practices, Specifications for Tank Cars*, M-1002, require that all such tank cars ordered after October 1, 2011, in Packing Groups I and II service must meet the following criteria:

Class 111 tank cars used to transport Packing Group I and II materials with the proper shipping names Petroleum Crude Oil, Alcohols, n.o.s., and Ethanol and Gasoline Mixture, must have heads and shells constructed on normalized TC128 Grade B steel or normalized A516-70 steel. Tank car heads must be normalized after forming, unless approval is granted by the AAR Executive Director of Tank Car Safety on the basis that a facility has demonstrated that its equipment and controls provide an equivalent level of safety. For tanks constructed of normalized TC128 Grade B steel, non-jacketed tanks must be at least 1/2-in. thick and jacketed cars must be at least 7/16-in. thick. For tanks constructed of normalized A516-70 steel, non-jacketed cars must be at least 9/16-in. thick and jacketed cars must be at least 1/2-in. thick. In all cases the cars must be equipped with at least 1/2-in. half-head shields.

Federal regulations at 49 CFR Part 179, Subpart D, do not provide the same level of protection as the industry standard, and they allow DOT-111 tank cars to be built of nonnormalized steel to a lesser plate thickness of 7/16 inch, with no provision for a jacket or head shield.

The August 2, 2013, FRA and PHMSA joint safety advisory recommended that shippers evaluate their processes to ensure that all hazardous materials are properly classed and described in accordance with the Hazardous Materials Regulations. Although the NTSB agrees with the broad scope of this recommendation, the absence of a product testing requirement to properly classify hazardous materials may lead shippers or carriers to rely on incorrect information or refer to generic data sheets that may not accurately represent the nature of the material being shipped. Such was the case with 10 inconsistent safety data sheets for the crude oil that was loaded in the tank cars that derailed in Lac-Mégantic. Several of these data sheets were developed by companies that had no involvement in the production of crude oil in the Bakken Shale region. Two of the data sheets indicated it was necessary to “determine the flash point accurately to classify the packing group.”

Although PHMSA issued an Advanced Notice of Proposed Rulemaking on September 6, 2013, to address safety improvements for DOT-111 tank cars,<sup>24</sup> the regulations do not require the use of currently available, improved tank cars for Packing Groups I and II crude oil or other hazardous materials.

On October 17, 2013, Transport Canada issued Protective Direction No. 31 directing any person engaged in importing or offering crude oil for transportation in Canada to provide results for packing group classification testing and a safety data sheet for the tested product to Transport Canada. Until such time as testing is completed, any person transporting crude oil in Canada must ship the oil as a Class 3 flammable liquid, Packing Group I, and meet the requirements established for this classification.

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<sup>24</sup> *Federal Register* 78, no. 173 (September 6, 2013): 54849.

The shipper's responsibility under the Hazardous Materials Regulations at 49 CFR 173.22 mandate classifying and describing the hazardous material in accordance with Parts 172 and 173. The regulations at 49 CFR 172.204 also require the shipper to declare that the contents of a consignment are fully and accurately described and classified. In several interpretation letters issued on these regulations, PHMSA has stated it is the shipper's responsibility to properly classify and describe a hazardous material and that such determinations are not required to be verified by PHMSA. However, proper classification of hazardous materials is one of the most important responsibilities of the shipper because all other requirements for safe transportation are dependent on accurate identification.

Although the regulations prescribe test methods to assign the appropriate classification, there is an assumption that shippers have exercised the necessary due diligence and testing to ensure their shipments are properly described.<sup>25</sup> However, the record-keeping requirements of the Hazardous Materials Regulations do not require shippers to maintain evidence to demonstrate that the physical and chemical properties of a hazardous material have been sufficiently evaluated to justify the description and classification used for transportation. For example, for classification of a flammable material, 49 CFR 173.120 and 173.121 provide specific flash points and initial boiling points for determining if the material meets the definition of a flammable material and for classification into the appropriate packing group. The regulations are silent on whether a shipper must test the product or whether the shipper may rely on manufacturer data or even the shipper's own undocumented knowledge for determining the applicable shipping requirements.

On November 20, 2013, PHMSA and the FRA jointly issued Safety Advisory 2013-07 to reinforce the importance of proper characterization, classification, and selection of packing group for flammable materials.<sup>26</sup> The safety advisory emphasized specific definitions for the proper classification of petroleum crude oil and selection of shipping names and packing groups. The advisory also announced that PHMSA recently initiated the "Operation Classification" initiative, in which PHMSA and the FRA will conduct unannounced inspections and testing to verify hazardous material classifications selected and certified by shippers of petroleum crude oil. Although the NTSB applauds this enforcement initiative, product testing or other acceptable forms of proof are needed to document the decisions made by shippers of crude oil and other hazardous materials when they classify materials for transportation. Moreover, shippers should be required to maintain these records so inspectors are able to evaluate the accuracy of hazardous materials classifications.

On January 2, 2014, PHMSA issued a safety alert addressing the flammability characteristics of the crude oil produced from the Bakken Shale region in the United States.<sup>27</sup> When it announced the safety alert, PHMSA noted that the alert reinforces "the requirement to properly test, characterize, classify, and where appropriate sufficiently degasify hazardous

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<sup>25</sup> Certain Class 1 explosive materials have specific testing and records retention requirements. See 49 CFR Part 173, Subpart C.

<sup>26</sup> *Federal Register* 78, no. 224 (November 20, 2013): 69745.

<sup>27</sup> Pipeline and Hazardous Materials Safety Administration, *Safety Alert, January 2, 2014: Preliminary Guidance from Operation Classification* (Washington, DC: US Department of Transportation, Pipeline and Hazardous Materials Safety Administration, 2014).

materials prior to and during transportation.” It also stresses that offerors<sup>28</sup> “must ensure that all potential hazards of the materials are properly characterized,” and assign the appropriate classification and packing group of crude oil shipments.

The NTSB believes that properly classified shipments are paramount for appropriate package selection, for assessment of risks to develop meaningful safety and security plans, and for the safety of emergency responders and other individuals who may come into contact with hazardous materials in transportation. Therefore, in support of TSB Safety Advisory Letter 13/13 the NTSB recommends that PHMSA require shippers to sufficiently test and document the physical and chemical characteristics of hazardous materials to ensure the proper classification, packaging, and record-keeping of products offered in transportation.

Investigators are still examining issues related to the Lac-Mégantic, Quebec, accident. At this time, the TSB has not made any final conclusions about this accident. Nonetheless, the NTSB has identified the safety issues described above, which should be addressed expeditiously. Therefore, the National Transportation Safety Board makes the following safety recommendations to the Pipeline and Hazardous Materials Safety Administration:

Work with the Federal Railroad Administration to expand hazardous materials route planning and selection requirements for railroads under Title 49 *Code of Federal Regulations* 172.820 to include key trains transporting flammable liquids as defined by the Association of American Railroads Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas. (R-14-4)

Revise the spill response planning thresholds contained in Title 49 *Code of Federal Regulations* Part 130 to require comprehensive response plans to effectively provide for the carriers’ ability to respond to worst-case discharges resulting from accidents involving unit trains or blocks of tank cars transporting oil and petroleum products. (R-14-5)

Require shippers to sufficiently test and document the physical and chemical characteristics of hazardous materials to ensure the proper classification, packaging, and record-keeping of products offered in transportation. (R-14-6)

The NTSB also issued three safety recommendations to the Federal Railroad Administration.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in these recommendations.

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<sup>28</sup> Title 49 CFR 171.8 defines *offeror* as any person who (1) performs, or is responsible for performing, any pre-transportation function required under this subchapter for transportation of the hazardous material in commerce and/or (2) tenders or makes the hazardous material available to a carrier for transportation in commerce.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate receiving a response from you within 90 days detailing the actions you have taken or intend to take to implement them. When replying, please refer to the safety recommendations by number. We encourage you to submit your response electronically to [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov).

[Original Signed]

By: Deborah A.P. Hersman,  
Chairman



# National Transportation Safety Board

Washington, DC 20594

## Safety Recommendation

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**Date:** January 23, 2014

**In reply refer to:** R-14-1 through -3

The Honorable Joseph C. Szabo  
Administrator  
Federal Railroad Administration  
Washington, DC 20590

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The National Transportation Safety Board (NTSB) is providing the following information to urge the Federal Railroad Administration (FRA) to take action on the safety recommendations issued in this letter. These recommendations are derived from the NTSB's participation in the Transportation Safety Board of Canada's (TSB) investigation of the July 6, 2013, derailment of a Montreal, Maine & Atlantic (MMA) freight train in Lac-Mégantic, Quebec, Canada.

These recommendations address shipping classification for hazardous materials and safety and security plans for hazardous materials in railroad freight transportation. As a result of this investigation to date, and consistent with the evidence found and the observations made, the NTSB is issuing three safety recommendations to the FRA. Information supporting these recommendations is discussed below.

### **The Accident**

On July 5, 2013, at 10:45 p.m. eastern daylight time, MMA freight train MMA-002 was proceeding eastbound on the MMA Sherbrooke Subdivision, en route from Montréal, Quebec, to Saint John, New Brunswick, Canada. The train was 4,700 feet long and weighed more than 10,000 tons. The train was composed of 5 head-end locomotives, a special-purpose caboose equipped to remotely control the locomotives, 1 loaded boxcar used as a buffer car, and 72 US Department of Transportation (DOT) Specification 111 general service tank cars (DOT-111) loaded with petroleum crude oil. The waybills described the product in the tank cars as Petroleum Crude Oil, UN1267, Class 3, Packing Group III. The crude oil originated from a tank truck-to-rail car transloading facility in New Town, North Dakota, and was destined for an oil refinery in Saint John, New Brunswick. The Canadian Pacific Railway transported the tank cars from New Town to Montréal, where the train was conveyed to the MMA with the same waybill information.

About 11:00 p.m., the engineer stopped the train at the designated MMA crew change point at milepost 7.40 near Nantes, Quebec. He left the lead locomotive idling and then departed

the area, leaving the train unattended on the mainline track. The track had a descending grade of about 1.2 percent toward the town of Lac-Mégantic.

About 11:40 p.m., a nearby resident called the 911 emergency call center to report a fire on the idling locomotive. The local fire department responded, and the MMA dispatched an employee to assist the fire department personnel. About midnight, the responders initiated emergency shutdown procedures on the locomotive and extinguished the fire. The fire department and MMA personnel then departed the location, leaving the train unattended.

Shortly before 1:00 a.m. on July 6, 2013, the unattended train started to move, and it gathered speed, rolling uncontrolled for 7.4 miles down the descending grade into Lac-Mégantic. As the train entered the center of Lac-Mégantic, it was moving well over the authorized speed. The boxcar and 63 loaded crude oil tank cars derailed near the center of Lac-Mégantic. The locomotives separated from the train and came to rest about 1/2 mile east of the derailment.

At least 60 of the 63 derailed DOT-111 tank cars released about 1.6 million gallons of crude oil. Some of the spilled oil ignited immediately. The fire engulfed the derailed cars and the surrounding area. Forty-seven people died as a result of the fire, and nearby structures were destroyed or extensively damaged. The fire was extinguished by noon on July 7, 2013. About 2,000 people evacuated the surrounding area.

### **DOT Postaccident Actions**

On August 2, 2013, the FRA issued Emergency Order No. 28 to address safety issues related to securement of unattended trains containing the following:

- (1) five or more tank car loads of any one or any combination of materials poisonous by inhalation as defined in Title 49 *Code of Federal Regulations* (CFR) 171.8, and including anhydrous ammonia (UN1005) and ammonia solutions (UN3318); or (2) 20 rail car loads or intermodal portable tank loads of any one or any combination of materials listed in (1) above, or, any Division 2.1 flammable gas, Class 3 flammable liquid or combustible liquid, Class 1.1 or 1.3 explosive, or hazardous substance listed in 49 CFR 173.31(f)(2).<sup>1</sup>

These quantities of specific hazardous materials addressed in Emergency Order No. 28 are the same as those that define a key train<sup>2</sup> as outlined in the Association of American Railroads (AAR) Circular No. OT-55-N, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials*, effective August 5, 2013. Emergency Order No. 28 “was intended to address some of the human factors failures that may cause unattended equipment to be improperly secured and to protect against a derailment situation similar to that which occurred in Lac-Mégantic.”

<sup>1</sup> *Federal Register* 78, no. 152 (August 7, 2013): 48218.

<sup>2</sup> The Association of American Railroads revised the definition of *key train* on August 5, 2013, to mean “any train with one tank car load of Poison or Toxic Inhalation Hazard (Hazard Zone A, B, C, or D), anhydrous ammonia (UN1005), or ammonia solutions (UN3318); 20 car loads or intermodal portable tank loads of any combination of hazardous material; or one or more car loads of spent nuclear fuel or high level radioactive waste.”

Emergency Order No. 28 prohibits railroads from leaving trains or vehicles transporting the specified hazardous materials unattended on mainline track or siding outside of a yard or terminal unless the railroad adopts and complies with a plan that provides sufficient justification for leaving them unattended under specific circumstances and locations. The order also requires railroads to develop specific processes for securing, communicating, and documenting the securement of applicable unattended trains and vehicles, including locking the controlling locomotive cab door or removing the reverser<sup>3</sup> and setting a sufficient number of hand brakes before leaving the equipment unattended. In addition, the order requires railroads to review, verify, and adjust as necessary existing requirements and instructions related to the number of hand brakes to be set on unattended trains; conduct train securement job briefings among crewmembers and employees; and develop procedures to ensure qualified employees inspect equipment for proper securement after emergency response actions that involve the equipment.

On August 2, 2013, the FRA and the Pipeline and Hazardous Materials Safety Administration (PHMSA) issued joint Safety Advisory 2013-06.<sup>4</sup> The advisory recommends eight additional actions that railroads and shippers should take to ensure the safe transportation of hazardous materials:

- Review the details and lessons learned from the Lac-Mégantic accident;
- Review crew staffing levels;
- Require the train reverser to be removed and secured when unattended;
- Review all railroad operating procedures, testing, and operating rules concerning train securement;
- Review the Transport Canada<sup>5</sup> directives to secure and safely operate a train;
- Conduct a systemwide assessment of security risks when a train is unattended and identify mitigation efforts for those risks;
- Evaluate processes to ensure proper classification of hazardous materials for shipment; and
- Review shippers' and carriers' safety and security plans and amend the plans as necessary.

On January 2, 2014, PHMSA issued a safety alert addressing the flammability characteristics of the crude oil produced from the Bakken Shale formation region in the United States.<sup>6</sup> When it announced the safety alert, PHMSA noted that the alert reinforces “the requirement to properly test, characterize, classify, and where appropriate sufficiently degasify

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<sup>3</sup> The *reverser* is the directional control for the locomotive. Removing it would put the locomotive in neutral, preventing it from moving forward or backward under power of the engine.

<sup>4</sup> *Federal Register* 78, no. 152 (August 7, 2013): 48224.

<sup>5</sup> *Transport Canada* is the Canadian government department responsible for regulating transportation safety in Canada.

<sup>6</sup> Pipeline and Hazardous Materials Safety Administration, *Safety Alert, January 2, 2014: Preliminary Guidance from Operation Classification* (Washington, DC: US Department of Transportation, Pipeline and Hazardous Materials Safety Administration, 2014).

hazardous materials prior to and during transportation.” It also stresses that offerors<sup>7</sup> “must ensure that all potential hazards of the materials are properly characterized” and assign the appropriate classification and packing group of crude oil shipments.

The NTSB is concerned that major loss of life, property damage, and environmental consequences can occur when large volumes of crude oil or other flammable materials are on a single train involved in an accident, as seen in the Lac-Mégantic accident. The sharp increase in crude oil rail shipments in recent years as the United States experiences unprecedented growth in oil production has significantly increased safety risks to the public.<sup>8</sup> The NTSB agrees with the following safety concerns identified in Emergency Order No. 28:

- Crude oil is problematic when released because it is flammable, and the risk is compounded because it is commonly shipped in large units.
- Similar dangers exist with other hazardous materials such as ethanol, which was transported via rail more than any other hazardous material in 2012.
- Although the Lac-Mégantic accident occurred in Canada, the freight railroad operating environment in Canada is similar to that in the United States.
- The MMA train in the Lac-Mégantic accident was transporting 72 carloads of petroleum crude oil in a single consist. Rail lines in the United States commonly configure trains to transport crude oil by a unit train that consists virtually entirely of tank cars containing crude oil.

The Lac-Mégantic accident demonstrates the destructive effects of large numbers of derailed DOT-111 tank cars containing flammable materials as seen in several recent NTSB accident investigations:

- The December 30, 2013, BNSF Railway Company crude oil unit train that derailed near Casselton, North Dakota, after striking another derailed freight train. Several of the DOT-111 tank cars ruptured and released crude oil that ignited. The postaccident fire destroyed two locomotives and thermally damaged several additional tank cars causing violent, fiery eruptions. Dense, toxic smoke forced a temporary evacuation of the town.
- The July 11, 2012, Norfolk Southern Railway Company train derailment in a Columbus, Ohio, industrial area in which three derailed DOT-111 tank cars released about 53,000 gallons of ethanol, with energetic rupture of one tank car in a postaccident fire.

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<sup>7</sup> Title 49 CFR 171.8 defines *offeror* as any person who (1) performs, or is responsible for performing, any pre-transportation function required under this subchapter for transportation of the hazardous material in commerce and/or (2) tenders or makes the hazardous material available to a carrier for transportation in commerce.

<sup>8</sup> Bureau of Explosives, *Annual Report of Hazardous Materials Transported by Rail*, BOE 12-1 (Washington, DC: Association of American Railroads, Bureau of Explosives, 2013).

- The October 7, 2011, derailment in Tiskilwa, Illinois, of 10 DOT-111 tank cars resulting in fire, energetic rupture of several tank cars, and the release of 162,000 gallons of ethanol.<sup>9</sup>
- The June 19, 2009, Canadian National Railway derailment in Cherry Valley, Illinois, in which 13 of 19 derailed DOT-111 tank cars were breached, caught fire, and released about 324,000 gallons of ethanol. The postaccident fire resulted in one death, nine injuries, and the evacuation of 600 houses within 1/2 mile of the accident.<sup>10</sup>
- The October 20, 2006, derailment in New Brighton, Pennsylvania, in which 23 DOT-111 tank cars in a unit train derailed, fell from a bridge, caught fire, and released more than 485,000 gallons of ethanol.<sup>11</sup>

The NTSB is aware that the FRA investigated the February 6, 2011, derailment in Arcadia, Ohio, of a unit train of loaded DOT-111 tank cars that released about 786,000 gallons of ethanol from 32 derailed tank cars. The FRA also investigated the August 5, 2012, derailment of 18 DOT-111 tank cars of ethanol in Plevna, Montana, where 5 cars caught fire resulting in some explosions. Most recently, the FRA is investigating the November 7, 2013, derailment of 26 tank cars of a 90-car unit train of crude oil in Aliceville, Alabama, in which breached tank cars caught fire and released crude oil into a wetland.

### **Planning Requirements for Rail Transportation of Hazardous Materials**

Title 49 CFR Part 172, Subpart I, prescribes requirements for the development and implementation of plans to address security risks related to the commercial transportation of hazardous materials. On November 26, 2008, PHMSA, in coordination with the FRA and the Transportation Security Administration (TSA), issued a final rule requiring, among other things, that rail carriers compile annual data on certain shipments of explosive, toxic by inhalation, and radioactive materials; use the data to analyze safety and security risks along rail routes where those materials are transported; assess alternative routing options; and make routing decisions based on those assessments. The final rule also addresses section 1551(e) of the Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. 110-53, that requires rail carriers transporting “security sensitive materials” to select the safest and most secure route to be used in transporting those materials, based on the carrier’s analysis of the safety and security risks on primary and alternate transportation routes over which the carrier has authority to operate.

Route planning and route selection requirements have been incorporated into the Hazardous Materials Regulations at 49 CFR 172.820. The regulation requires that a rail carrier

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<sup>9</sup> National Transportation Safety Board, *Derailment and Hazardous Materials Release and Fire, Tiskilwa, Illinois, October 7, 2011*, RAB-13/02 (Washington, DC: National Transportation Safety Board, 2013).

<sup>10</sup> National Transportation Safety Board, *Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire, Cherry Valley, Illinois, June 19, 2009*, RAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

<sup>11</sup> National Transportation Safety Board, *Derailment of Norfolk Southern Railway Company Train 68QB119 with Release of Hazardous Materials and Fire, New Brighton, Pennsylvania, October 20, 2006*, RAR-08/02 (Washington, DC: National Transportation Safety Board, 2008).

that transports more than 5,000 pounds of a Division 1.1, 1.2, or 1.3 explosive in a single car load; a single bulk package of a material toxic by inhalation; or a highway route-controlled quantity of a Hazard Class 7, radioactive material, must annually compile commodity data to identify routes on which these materials are transported. The rail carrier also must annually analyze the safety and security risks for the transportation routes to include 27 risk factors, such as the volume of hazardous materials transported; track type, class, and maintenance schedule; track grade and curvature; environmentally sensitive or significant areas; population density along the route; emergency response capability along the route; and areas of high consequence along the route as defined in 49 CFR 172.820(c). The carrier also must identify alternative routes over which it has authority to operate and perform a safety and security risk assessment of those routes for comparison. The carrier must use the analysis to select the practicable route posing the least overall safety and security risk.

According to the regulations, if the FRA finds the carrier's route selection documentation and underlying analyses to be deficient, the carrier may be required to revise the analyses or make changes in the route selection. If the FRA finds that a selected route is not the safest and most secure practicable route available, in consultation with the TSA, the FRA may require the use of an alternative route.

A primary safety and security concern related to rail transportation of hazardous materials that was considered in the interim final rule published on April 16, 2008,<sup>12</sup> is the prevention of catastrophic release or explosion in proximity to densely populated areas, including urban areas and events or venues with large numbers of people in attendance, iconic buildings, landmarks, or environmentally sensitive areas. The goal of the PHMSA-required routing analysis is to ensure that each route used for the transportation of the specified hazardous materials presents the fewest overall safety and security risks. PHMSA also noted that even in the absence of alternative routes, assessing the safety and security risks along the route is critical to enhancing rail transportation safety and should prompt rail carriers to address identified vulnerabilities.

With the notable exception of the Lac-Mégantic accident, in which 47 people died and the town center was destroyed, none of the accidents cited above that involved fires and explosions on blocks of tank cars and unit trains carrying flammable materials occurred in densely populated areas. However, each of these accidents exhibited the potential for severe catastrophic outcomes had they occurred in such critical areas.

PHMSA has considered suggestions that other classes of hazardous materials, such as flammable gases, flammable liquids, hydrogen peroxide, oxidizers, poisons, and corrosives, should be included in the requirements for route selection. While evaluating the final rule, PHMSA, the FRA, and the TSA assessed the safety and security vulnerabilities associated with the transportation of different types and classes of hazardous materials based on accident scenarios and on scenarios that depict how hazardous materials could be used deliberately to cause significant casualties and property damage. In the interim final rule, the DOT and the TSA concluded the following:

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<sup>12</sup> *Federal Register* 73, no. 74 (April 16, 2008): 20752.

The risks are not as great as those posed by the explosive, poison inhalation hazards, and radioactive materials specified in the interim final rule, and we are not persuaded that they warrant the additional precautions required by the interim final rule.

Significant changes to the regulatory landscape have occurred since the issuance of the 2008 final rule. Major growth in crude oil and ethanol transportation volumes has occurred in recent years, yet this market did not exist when the rule was developed. According to the AAR *Annual Report of Hazardous Materials Transported by Rail* for 2012, crude oil shipments have increased 443 percent since 2005.<sup>13</sup> The first quarter of 2013 saw a 166 percent increase in crude oil shipment by rail over the first quarter of 2012, and growth is expected to continue for the foreseeable future.<sup>14</sup> Furthermore, in response to the US Environmental Protection Agency's 2005 Renewable Fuel Standard, ethanol traffic by railroad increased 441 percent between 2005 and 2011, and it was the most frequently transported hazardous material in 2012.

In the April 16, 2008, interim final rule, PHMSA stated that route planning and selection regulations were intended to protect against an event such as the one that occurred on January 6, 2005, in Graniteville, South Carolina, in which a release of chlorine, a material classified as a toxic inhalation hazard, caused 9 fatalities and 554 injuries.<sup>15</sup> The Lac-Mégantic accident and other recent accidents have demonstrated that the same potential for loss of life and damage to communities and the environment exists when accidents occur involving blocks of tank cars and unit trains transporting large volumes of flammable materials. Although the FRA actions under Emergency Order No. 28 acknowledge that better security is needed for unattended key trains, route planning and route selection protections currently required for explosive, toxic by inhalation, or radioactive materials are not required for trains transporting large bulk quantities of volatile flammable liquids through populated communities. The NTSB believes that at a minimum, the route assessments, alternative route analysis, and route selection requirements of 49 CFR 172.820 should be extended to key trains transporting large volumes of flammable liquid. Therefore, the NTSB recommends that the FRA work with PHMSA to expand hazardous materials route planning and selection requirements for railroads under 49 CFR 172.820 to include key trains transporting flammable liquids as defined by AAR Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas.

### Oil Spill Response Plans

Executive Order 12777<sup>16</sup> delegates to the DOT various responsibilities identified in section 311(j) of the Clean Water Act regarding discharges of oil and hazardous substances from transportation-related on-shore facilities. The PHMSA authority for on-shore transportation facilities (motor vehicles and rolling stock) is limited to promulgating regulations. Spill response

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<sup>13</sup> Bureau of Explosives, *Annual Report of Hazardous Materials Transported by Rail*, BOE 12-1 (Washington, DC: Association of American Railroads, Bureau of Explosives, 2013).

<sup>14</sup> J. Karl Alexy, "Crude Oil and Ethanol Transportation Trends" (presentation, 49th Railroad Safety Advisory Committee, Washington, DC, August 29, 2013).

<sup>15</sup> National Transportation Safety Board, *Collision of Norfolk Southern Freight Train 192 With Standing Norfolk Southern Local Train P22 With Subsequent Hazardous Materials Release at Graniteville, South Carolina, January 6, 2005*, RAR-05/04 (Washington, DC: National Transportation Safety Board, 2005).

<sup>16</sup> *Federal Register* 56 (October 22, 1991): 54757.

plans are submitted to the Federal Motor Carrier Safety Administration and the FRA for highway carriers and railroads, respectively. Since 1996, regulations have been in place at 49 CFR Part 130 to require comprehensive response plans for oil shipments in bulk packages (cargo tank motor vehicles and railroad tank cars) in a quantity that exceeds 42,000 gallons in a single package. For smaller petroleum oil shipments—in bulk packages of 3,500 to 42,000 gallons—the regulations require a less detailed basic response plan.

A spill response plan is intended to help the transporter develop a response organization and ensure the availability of resources needed to respond to an oil release. According to 49 CFR 130.31, the plan also should demonstrate that the response resources will be available in a timely manner to reduce the severity and impact of a discharge. Federal regulations require all railroads that transport liquid petroleum oil to develop basic written response plans that describe the manner of response to discharges that may occur during transportation, take into account the maximum potential discharge, identify the private personnel and equipment available to respond to a discharge, and retain that plan on file at its principal place of business and at the dispatcher's office. A comprehensive written plan is required for carriers transporting bulk shipments that exceed the 42,000-gallon package size. Each of these carriers also is required to have a comprehensive written plan that

- is consistent with the requirements of the National Contingency Plan (40 CFR Part 300) and Area Contingency Plans;
- identifies a qualified individual having full authority to implement removal actions;
- ensures by contract or other means the availability of private personnel and equipment necessary to remove a worst-case discharge;
- describes training, equipment testing, drills, and exercises; and
- is submitted to the FRA.

When a discharge occurs into navigable waters of the United States, the carrier is responsible for implementing the basic or comprehensive response plan.

Because trains typically travel many hundreds of miles, the response environments can present varied equipment needs, logistics, and containment strategies. Along a selected route, carriers would be better prepared to mitigate damage caused by releases of petroleum products if they identify and ensure by contract the personnel and equipment necessary to respond to petroleum product spills. Because there is no mandate for railroads to develop comprehensive plans or ensure the availability of necessary response resources, carriers have effectively placed the burden of remediating the environmental consequences of an accident on local communities along their routes.

Although railroad industry recommended practices for key trains contained in AAR Circular OT-55-N state that railroads will assist local emergency planning committees and emergency response organizations in developing plans and preparations for handling hazardous materials transportation accidents, these practices are not mandated, and the burden of responding to an accident and remediating the aftermath is still left with communities.

In the case of the Lac-Mégantic accident, the MMA did not have sufficient resources available to mitigate the release. About 1.6 million gallons of crude oil were released from the derailed tank cars in Lac-Mégantic with initial cleanup costs estimated at more than \$200 million, significantly exceeding the MMA's ability to respond to the accident and mitigate the release. According to a report released by the Quebec Ministry of Sustainable Development, Environment and Parks, the released crude oil covered about 77 acres of surface area in the center of Lac-Mégantic, and petroleum related contaminants that entered the Chaudière River were transported as far as 74 miles away.<sup>17</sup> The operational and financial responsibility for containing and remediating the release was placed on the provincial and federal governments.

The MMA is based in Maine, and it was similarly unprepared to respond to a worst-case discharge occurring within its US territory because it was not required to develop a comprehensive response plan. Had the regulatory threshold for comprehensive response planning included trains carrying large volumes of petroleum products, the FRA could have required the MMA to develop a plan to prepare for response to a release on the scale of the one that occurred in Lac-Mégantic.<sup>18</sup>

Although 49 CFR 130.31 requires comprehensive response plans to be submitted to the FRA, there is no provision for the FRA to review and approve plans, which calls into question why these plans are required to be submitted. The FRA would be better prepared to identify deficient response plans if it had a program to thoroughly review and approve each plan before carriers are permitted to transport petroleum oil products. In comparison to other DOT regulations for oil transportation in pipelines, an operator may not handle, store, or transport oil in a pipeline unless it has submitted a response plan for PHMSA approval.<sup>19</sup> The NTSB strongly believes there must be an equivalent level of preparedness across all modes of transportation to respond to major disasters involving releases of flammable liquid petroleum products. Therefore, the NTSB recommends that the FRA develop a program to audit response plans for rail carriers of petroleum products to ensure that adequate provisions are in place to respond to and remove a worst-case discharge to the maximum extent practicable and to mitigate or prevent a substantial threat of a worst-case discharge.

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<sup>17</sup> Quebec Ministry of Sustainable Development, Environment and Parks, *Déraillement ferroviaire raiement de Lac-Mégantic (Environmental Characterization, Lac-Mégantic Derailment, Preliminary Report)*, (Quebec: Golder Associates, 2013).

<sup>18</sup> Concurrently, the NTSB has issued Safety Recommendation R-14-5 to PHMSA: "Revise the spill response planning thresholds contained in Title 49 *Code of Federal Regulations* Part 130 to require comprehensive response plans to effectively provide for the carriers' ability to respond to worst-case discharges resulting from accidents involving unit trains or blocks of tank cars transporting oil and petroleum products."

<sup>19</sup> As a result of its investigation of the rupture of a crude oil pipeline in Marshall, Michigan, on July 25, 2010, the NTSB issued Safety Recommendation P-12-9 to PHMSA: "Amend Title 49 *Code of Federal Regulations* Part 194 to harmonize onshore oil pipeline response planning requirements with those of the US Coast Guard and the US Environmental Protection Agency for facilities that handle and transport oil and petroleum products to ensure that pipeline operators have adequate resources available to respond to worst-case discharges." National Transportation Safety Board, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010*, PAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

## Hazardous Materials Packing Group Classification

The MMA train originated from a tank truck-to-rail car transloading facility in New Town, North Dakota, operated by Strobel Starostka Transfer (SST) on behalf of subsidiaries of World Fuel Services Corporation. The original bills of lading that SST provided to Canadian Pacific Railway described the hazardous material as a Hazard Class 3 flammable material, Packing Group III.

Packing groups indicate the degree of danger presented by the material as either high, medium, or low (Packing Group I, II, or III, respectively).<sup>20</sup> The table below shows the flash point and initial boiling point criteria for each packing group.

**Table. Hazardous Liquids Class 3 Packing Group Criteria**

Packing Group	Flash Point	Boiling Point
I	N/A	≤ 35°C
II	< 23°C	> 35°C
III	≥ 23°C ≤ 60°C	> 35°C

The intensity of the postaccident fire in Lac-Mégantic and the apparent low viscosity of the crude oil product prompted the TSB to collect and analyze samples of the product from nine undamaged tank cars in the train and from two tank cars in a second crude oil train stationed in Farnham, Quebec, to determine if the shipments had been properly described and the appropriate packing group assigned. Test results indicate the flash point was less than -35°C and the initial boiling point was between 43.9°C and 48.5°C, which placed this product in the lower end of the crude oil flash point range, well below the parameters for Packing Group III materials. Thus, the test results confirmed the crude oils on these trains had been incorrectly assigned to Packing Group III, and they should have been assigned to the more hazardous Packing Group II.

The crude oil on the accident train was derived from 11 different suppliers from producing wells in the Bakken Shale region of North Dakota, and the suppliers classified it as a Class 3 hazardous material with the packing group varying from Packing Group I to Packing Group III. Investigators determined that the hazardous materials shipping papers provided by trucking companies transporting crude oil from the wells to the transloading facility indicate the crude oil was Packing Group II, although these companies could not provide evidence that the oil had been tested to assign the appropriate packing group. Investigators learned that after these loads were placed into rail tank cars, the bills of lading SST provided to the Canadian Pacific Railway described the crude oil as Packing Group III. The accident train with the same incorrect Packing Group III waybill information was interchanged to the MMA in Montréal.

The provisions of 49 CFR 172.800(6) for Hazard Class 3 Packing Groups I and II materials shipped in large bulk quantities require that each person who offers for transportation

<sup>20</sup> Packing groups for Class 3 materials are defined in 49 CFR 173.121.

in commerce or transports in commerce such hazardous materials must develop and adhere to a transportation security plan for the hazardous materials. The security plan must include an assessment of possible security risks for shipments and appropriate measures to address the assessed risks. The plan elements must include provisions for personnel security, prevention of unauthorized access to the hazardous materials, and provisions for en route security from origin to destination, including shipments stored incidental to transportation. Packing Group III materials are excluded from this requirement.

The August 2, 2013, FRA and PHMSA joint safety advisory recommended that shippers review their safety and security plans and evaluate whether the existing plans adequately address personnel security, unauthorized access, and en route security, and as necessary, amend the plans to ensure the continued safe and secure transportation of railroad tank cars containing hazardous materials.

In addition, on November 20, 2013, the FRA and PHMSA jointly published Safety Advisory 2013-07 that announced the "Operation Classification" compliance initiative that involves unannounced inspections and testing to verify material classification and packing group assignments selected by shippers of petroleum crude oil.<sup>21</sup> The advisory also announced that FRA and PHMSA inspectors are auditing safety and security plans to determine whether the plans address the vulnerabilities highlighted in Emergency Order No. 28 and the August 2, 2013, safety advisory.

Pending publication of a report on the scope and findings of the FRA and PHMSA enforcement initiatives, the NTSB remains concerned that the practice of mischaracterizing the packing group of crude oil shipments may allow shippers to avoid the security requirements necessary for transporting large quantities of volatile crude oil. Further, although the safety advisory recommends that shippers evaluate and update their plans as necessary, it is essential that a system of compliance monitoring combined with FRA assistance is implemented to ensure these plans are adequate and the provisions fully operational. Therefore, the NTSB recommends that the FRA audit shippers and rail carriers of crude oil to ensure they are using appropriate hazardous materials shipping classifications, have developed transportation safety and security plans, and have made adequate provision for safety and security.

Investigators are still examining issues related to the Lac-Mégantic, Quebec, accident. At this time, the TSB has not made any final conclusions about this accident. Nonetheless, the NTSB has identified the safety issues described above, which should be addressed expeditiously. Therefore, the National Transportation Safety Board makes the following safety recommendations to the Federal Railroad Administration:

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<sup>21</sup> *Federal Register* 78, no. 224 (November 20, 2013): 69745.

Work with the Pipeline and Hazardous Materials Safety Administration to expand hazardous materials route planning and selection requirements for railroads under Title 49 *Code of Federal Regulations* 172.820 to include key trains transporting flammable liquids as defined by the Association of American Railroads Circular No. OT-55-N and, where technically feasible, require rerouting to avoid transportation of such hazardous materials through populated and other sensitive areas. (R-14-1)

Develop a program to audit response plans for rail carriers of petroleum products to ensure that adequate provisions are in place to respond to and remove a worst-case discharge to the maximum extent practicable and to mitigate or prevent a substantial threat of a worst-case discharge. (R-14-2)

Audit shippers and rail carriers of crude oil to ensure they are using appropriate hazardous materials shipping classifications, have developed transportation safety and security plans, and have made adequate provision for safety and security. (R-14-3)

The NTSB also issued three safety recommendations to the Pipeline and Hazardous Materials Safety Administration.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in these recommendations.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate receiving a response from you within 90 days detailing the actions you have taken or intend to take to implement them. When replying, please refer to the safety recommendations by number. We encourage you to submit your response electronically to [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov).

[Original Signed]

By: Deborah A.P. Hersman,  
Chairman

## Amy Million - Crude By Rail

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**From:** Mary Frances Kelly Poh <mf poh@pacbell.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/24/2014 1:05 PM  
**Subject:** Crude By Rail  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, George Oakes <oakes@earthlink.ne...

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Dear Brad and Amy,

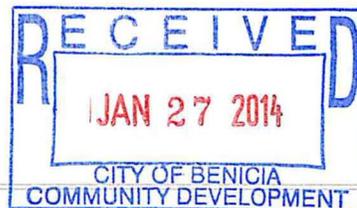
Please add this submission to the public legal record on Valero's proposed Crude by Rail Project for its upcoming CEQA review.

This appeared on January 23, 2014 on KPIX (Channel 5) news.

<http://sanfrancisco.cbslocal.com/video/9763450-feds-raise-concerns-over-transporting-crude-oil-by-rail/>

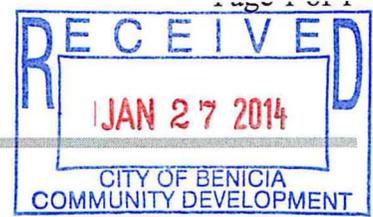
Thank you,

Mary Frances Kelly-Poh  
[707-745-5461](tel:707-745-5461)



**Amy Million - Living on Earth Radio program on Crude by Rail**

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**From:** "Steve & Marty Young" <escazuyoungs@gmail.com>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Kat Wellman <katwellman@gmail.com>  
**Date:** 1/25/2014 5:13 PM  
**Subject:** Living on Earth Radio program on Crude by Rail

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The Commission has had lots of articles sent to us by people about this topic, and I appreciate that.

Sometimes they are duplicative, and do take some time to dig through.

I am not complaining at all, as that is part of the job.

Today I heard an interesting radio piece on oil trains that might be a welcome change of format.

Can you pass this on to the rest of the commission?

<http://www.loe.org/shows/shows.html?programID=14-P13-00004>

steve young

**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/26/2014 7:02 PM  
**Subject:** Excellent review of Crude-By-Rail situation: "Living On Earth" radio interview, Canadian  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, George Oakes <oakes@earthlink.ne...>  
**Attachments:** 8-11168901784\_8b25eb8473\_o.jpeg; 9-9511098617\_03a3d48f20\_o.jpeg; 11-bigstock-midwest-drilling-rig-31191287.jpeg; 12-bigstock-Oil-transportation-by-rail-14692028.jpeg; 13-McNish-headshot.jpg

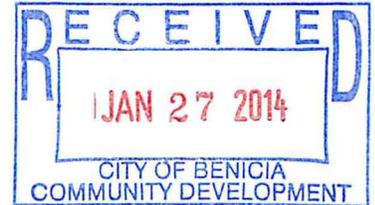
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Hello Amy and Brad,

The following radio interview with Canadian journalist, Jacquie McNish, for nationally syndicated program, "Living On Earth," is one of the best summaries to date of information coming out of the investigation that followed on the July 2013 derailment, fire, and explosion, death of 47 citizens, and decimation of the small historic downtown of Lac Megantic, Quebec, caused by the derailment of a train carrying Bakken crude, which has now been recognized as a highly explosive 'unconventional' crude. Still being reviewed for all of its ramifications across Canada and the US in the wake of more recent derailments of trains carrying Bakken, the Lac Megantic tragedy and its investigation is alerting communities across America and Canada to the myriad conditions – including human error, the out-dated construction of DOT-111 rail cars for purpose of transport of fossil fuels, and the chemistry of the crude being transported – that can produce such horrendous disasters.

Please add this interview into the legal public record on Valero's proposed Crude-By-Rail Project and its upcoming review under CEQA.

Thank you,  
Marilyn  
[707-745-9094](tel:707-745-9094)



[Living on Earth: Explosive Oil Trains](#)

stream MP3 download:

<http://www.loe.org/content/2014-01-24/explosive-oil-trains.mp3>

living on earth®

PRI's Environmental News Magazine

## Explosive Oil Trains

**Air Date: Week of January 24, 2014**

*Oil train making the return trip to North Dakota for more Bakken oil (photo: Roy Luck, Creative Commons 2.0)*

In the past year a number of explosive oil train derailments, including the deadly accident in Lac-Mégantic in Quebec that killed 47 people, have raised important questions about how we transport oil in North America. Canadian journalist Jacquie McNish has written extensively about oil trains, and tells host Steve Curwood how we got here.

### Transcript

CURWOOD: It's Living on Earth, I'm Steve Curwood. The US Secretary of Transportation, Anthony Fox, has called for the rail and oil industry to make voluntary changes aimed at preventing accidents. On January 16 Fox said industry executives have agreed to cooperate and will implement changes within the next thirty days, given the epidemic of disastrous accidents that has recently plagued North America. The immediate measures will likely include slowing the trains down and making risk assessments where trains pass through densely populated areas.

The litany of recent oil train disasters is long. Let me remind you of a couple: on December 30, a crude oil train went off the tracks near Casselton, North Dakota, exploding in a ball of flame and spilling 400,000 gallons of crude oil onto the plains. And last July's catastrophic oil train derailment in Lac-Mégantic, Quebec set off fires visible from space and killed 47 people. Joining us now is Jacquie McNish. She's a senior writer with the Globe and Mail in Toronto and has been covering the issue throughout the past year.



A fireball from the Lac-Megantic train derailment (photo: Public Herald, Creative Commons 2.0)

MCNISH: This is a story of a boom, a black gold rush in North Dakota of crude oil that had no other place to go. There were no pipelines, they started putting it on trucks, and then in 2009, a couple of folks in North Dakota, a couple of producers and shippers came up with an idea of moving it on the rails. And you will recall all the debate and all the fury that continues today over the pipelines...well, while everyone was focusing on pipelines, this quiet migration of oil shifted to the railways, a century-old infrastructure and cars that were designed for passengers, drygoods and lumber. We went from 4,000 tank cars of oil in 2009 to 400,000 tank cars in November.

CURWOOD: Where is all this Bakken shale oil going?



Lac-Mégantic the day after the explosion (photo: Michel Gagnon, Creative Commons 2.0)

MCNISH: Most of it is being refined in the United States. Much of it done in the southern parts of United States. Also in Canada, in a province called New Brunswick on the east coast. One of the largest refineries in Canada owned by Irving Oil actually ships the stuff across the country from North Dakota on the rails and also by ships up the Hudson River to refine it there.

CURWOOD: Am I a customer of this oil here in Boston if I go to an Irving gas station? Am I buying this Bakken shale oil?

MCNISH: That's part of it. We're all using it. It's blended and transferred into all sorts of...whether it's heating oil, whether it's gasoline oil, whether it's motor oil, it's being refined everywhere, and it's making its way into the market for broad use.

CURWOOD: Now, to what extent is this heavy traffic causing more derailments?

MCNISH: There's two things happening here. One, the railways themselves – they're centuries old. Yes, they've upgraded the tracks, and yes, they've upgraded the cars, and the axles, but this is such a huge surge that it's...you know, you have to wonder that it's putting stress on the rails, and the interesting thing about the derailments that we're seeing now is that most of them are occurring on what we call short lines.

The big class one railways - Burlington Northern or Canadian Pacific or Canadian National here in Canada - they take the oil out of the Bakken region, but to get it to the refineries often they have to use the regional short line railways. Lac-Mégantic, it was Montreal, Maine Railway, a very small troubled rail organization whose tracks were not up to the same levels as the tracks of the class one. In Aliceville, Alabama, they had a derailment of Bakken oil in November, it was a small short line going through a swamp. In Casselton, North Dakota, once again it was a smaller line, feeder line, before it got onto the big line.

CURWOOD: Describe for us the Aliceville, Alabama, accident?

MCNISH: Aliceville, Alabama, happened in November. This was oil from the Bakken region that originated from North Dakota, made its way across the Midwest and was traveling through Alabama in mid- November, and according to the local reports, late in the evening, some of the cars were going over...the entire train was going over a trestle, slightly raised trestle about 10 feet above the swamp... and very open space surrounded by swamp, and a couple of the cars derailed and the next thing you know there are fireballs unleashing into the air, and this train burned for three days. Now the good news about the derailment, it was just a mile or so outside of the small town of Aliceville. It was not an inhabited area, it was in a swampland area, but it's amazing looking at the pictures of the fire and of the trains themselves crumpled like an accordion of burned tankers, very much like Lac-Mégantic.

CURWOOD: How much oil was in the Aliceville derailment?

MCNISH: I don't know the exact number, but I believe it was 12 to 14 cars that derailed, and there was a lot of spillage into the swamp. It's, it's interesting how the railways respond to these things. They say, well, fortunately there was a beaver dam so it protected the oil from getting into other parts of the swamp. [LAUGHS] That was one of my favorite responses to that accident.

CURWOOD: So who are the regulators that are keeping track of the quality of the rail lines that this stuff is being transported on?

MCNISH: Well, that is a good question. You know, what we discovered both in the US and Canada is that no one publicly called for any scrutiny, any new rules, or even a review of the potential dangers posed by the largest increase in hazardous materials ever on the rails.

CURWOOD: Talk to me about the oil itself. You know, when you look at some of the pictures of the accident it seems to be pretty explosive.

MCNISH: And that was how we got involved in this story. When Lac-Mégantic occurred, there was a lot of video footage because it happened in the downtown and the residents that survived and were able to run, they all turned on their cell phones and took these images, and it was...it looked like a war zone...mushroom clouds of burning oil. And if you know crude, it doesn't behave like that. You can throw a lit match into a tank of crude oil, because it's so thick, and the chances are, it will extinguish itself because it just doesn't have a low flammability point.

This stuff exploded immediately on impact, and at first, the theory was that there were propane tanks in the town - that has been discounted. And then the industry responsible by the rail and the petroleum sector was, this was a once-in-a-lifetime accident - there was a hill, the brakes broke loose and the rail cars had nowhere to go, they crashed into each other, and punctured and exploded. So that was the narrative. And then we had Aliceville, Alabama, happen, and if you look at the pictures and you lay them side-by-side, the sort of accordion of burning tank cars, and again, mushroom clouds... Casselton, the same thing. So something is going on here, and initially people would say they're focusing on improving the security and the emergency response of the trains. Now they're actually looking at the oil itself.

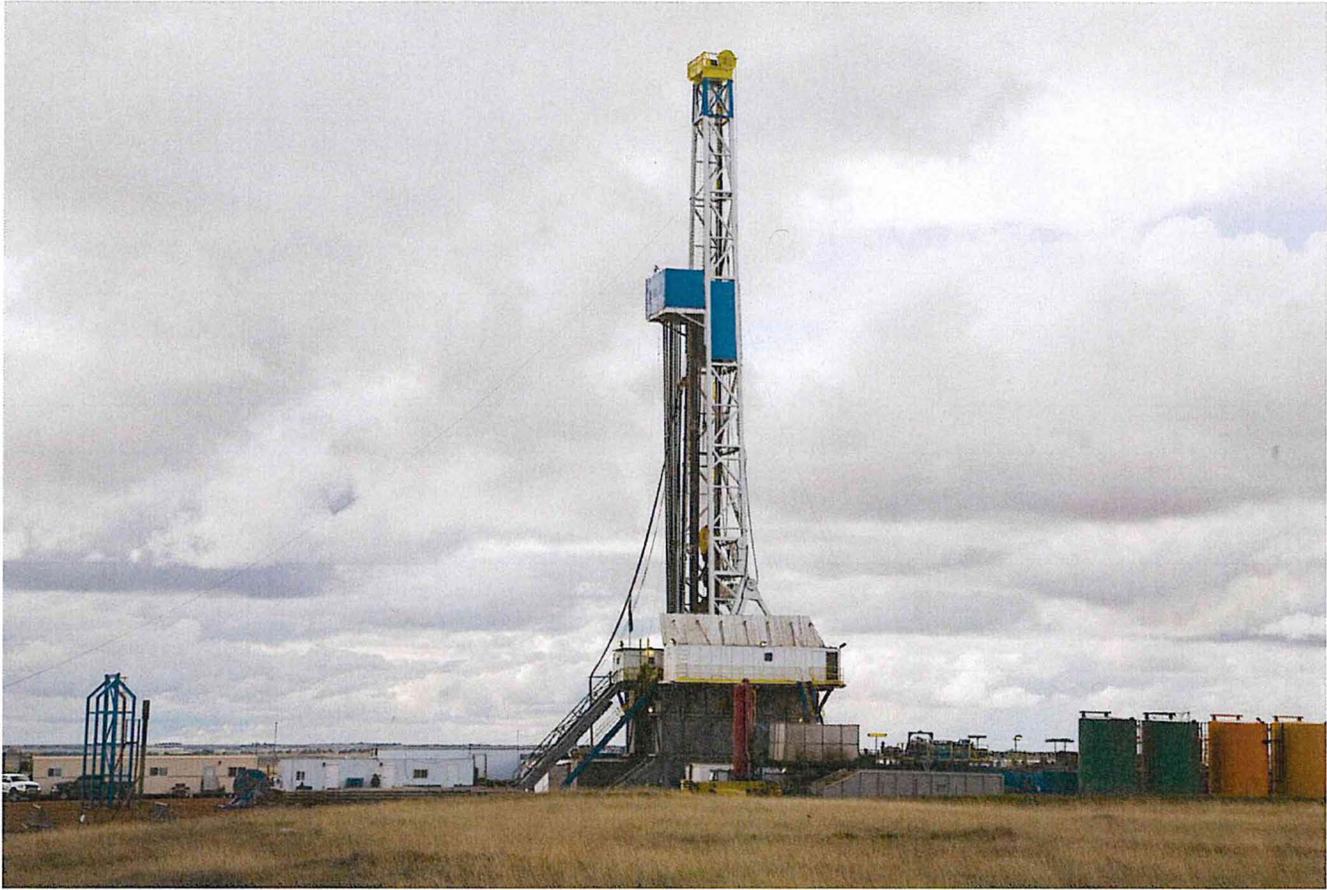
CURWOOD: What about the properties of the oil? Is it somehow more volatile?

MCNISH: I wish I could say I knew a lot about it, but the sad fact is, is that no one's really taken a hard look at it. We went to Newtown, North Dakota, and you look at this oil and it looks like honey in a mason jar. It's very light, and the light qualities are part of the story here. The other story is what are the other elements? And one of the elements that people started to look at in 2010 at a joint government and industry think tank was hydrogen sulfide. Now hydrogen sulfide does exist in all oils, but in this particular oil - it's called a sweet light crude and that's why it's prized, easy to refine, not so much sulfide you have to remove, but if you talk to geologists and scientists they say inevitably sulfides do creep into sweet light oil, and so we wonder and we can only wonder because no one's actually studied this, you know, are we seeing this light sweet oil become contaminated four or five years into this gold rush, has it become a problem? And the reason it's a more of a particular problem for light oil is it if you transport this stuff and if there's heat or if there are disturbances you can start to see the oil actually stratify and begin the refining itself in the tank car, which means you're producing gases that are highly combustible on impact or if they don't vent properly.

CURWOOD: To what extent do you think the chemicals involved in the fracking process of the oil might be part of the problem?

MCNISH: That is at this point only a theory. We do know that that the oil producers in the fracking process use benzene and other chemicals to help remove the oil that's locked into the shale below the surface. They will tell you that it's only minute amounts that are used of benzene and other chemicals, so it's inconceivable to them that it would be a problem. We also know from the first emergency responders at Lac-Mégantic that there was a lot of benzene - pools of benzene, they described - pooling outside the area where the trains derailed after the fire had been doused so that you know it's hard to understand why there would be so much benzene. Was it a chemical reaction after the fires? Was there an excess amount in those tank cars? These are all good questions. There's no, there's no solid scientific proof or testing to prove it one way or another, and, you know, clearly there is a need to ask that question in a much more thorough scientific manner.

CURWOOD: So it may well be that relatively volatile, indeed, explosive materials were going through all these towns along the rail lines. To what extent are folks informed that this stuff is coming through and what say do they have about it coming through?



A North Dakota oilrig. (photo: [bigstockphoto.com](http://bigstockphoto.com))

MCNISH: That's a very good question, and I find it fascinating as a journalist that everyone is so focused on Keystone and all for legitimate reasons. And people will talk about the corruption of the Boreal forests in western Canada where they are planning to put part of the pipeline, but no one is thinking about these pipelines of oil that are moving to their communities. Railways were built before many towns were built, so as a result the railways travel right through the center of most towns and cities, and people seem to not be focused on the potential dangers. In the wake of these accidents they are paying attention. You're seeing more communities having standoffs with the railways, asking for information. Communities are now talking about getting some sort of 24 hour notice. What the railway will say, and what the government will say is that they're very careful about any information they provide. They're worried about terrorism and other risks, so there's a lot of push and pull here to get better information and more coordination. We're not there yet. A lot of the railways, particularly in Canada, constitutionally have more rights than the communities. They get to decide when and how they push the trains through. That's causing a lot of friction. There's so many trains now in parts of Canada, particularly in the oil districts, where you have to wait 20 minutes to get from one part of town to another. It can be a small town of 400 people, but there's nothing you can do, the train will go when it wants to go.

CURWOOD: Which of these towns is mounting a fairly active protest?

MCNISH: We have Calgary, Alberta, it's the largest city in the Midwest of Canada, and they have had a couple of derailments and a couple of standoffs with the Canadian Pacific Railway, one of our largest railways, and they seem to be working out a healthier dialogue right now. There is a conference taking place next month in Calgary, citizens' action group holding a discussion on the safety of oil and other hazardous materials on the rail, so people are starting to think more more of this. And the interesting thing is there is still a lot of inertia...there was a deadly ethanol explosion in Illinois in 2009 that killed some people that were waiting in their cars - the fires immediately killed those people - and as early as 2009, the regulators after investigating this were recommending studier cars.



In the absence of pipelines, trains have become a primary transportation option for North American crude oil. (photo: [bigstockphoto.com](http://bigstockphoto.com))

18 of those tankers were punctured in that derailment, unleashing a fiery ethanol explosion, and the industry -- the regulators calling for some time for upgraded double-walled tank cars that have shields on both sides to help prevent puncturing when there is a derailment, and better venting so if there are gases they can get out. And the shippers actually own these tank cars, not the railways. The railways just carry them. The shippers have pushed back on a lot of that, and now we're seeing in the wake of Lac-Mégantic and these accidents, more initiative, even the Railway Association of the United States has issued a public statement in November saying that they favor conversion to the secure cars.

CURWOOD: So how has the string of oil train accidents had an impact on the pipeline debate, both in Canada and here in the United States?

MCNISH: I think people have ignored this, they have ignored it because they basically created a new pipeline on the rails through the back door and nobody stopped them. Nobody said you can't do this, nobody said you have to take extra security measures, and people just stood there watching these large black trains of oil go by their communities without asking questions. I mean, we all have to look at ourselves and say how did this happen? Why didn't anyone intervene? We didn't do it as citizens and our government certainly didn't raise any questions or increase their scrutiny.

CURWOOD: In view of the danger of these oil train accidents, how do you think that affects the argument of the necessity to get off of fossil fuels?

MCNISH: That's a big question. That's a big geopolitical question. I think that in this case, in this story, the story of North Dakota oil and all that oil going on the trains, there was a geopolitical economic imperative, that imperative was the United States is dependent on oil, and suddenly this little place called North Dakota is rapidly becoming the largest producer of oil in the United States. It's now number two behind Texas, and by 2015 the US is destined to be oil independent. What government is going to stand in the way of that? What consumers are going to give up driving their cars to work for the jobs that they need? I mean it's a very complicated question, our dependency on fossil fuels. I think a more reasonable manageable way of approaching this is, what are we doing to ensure safety? Not enough.

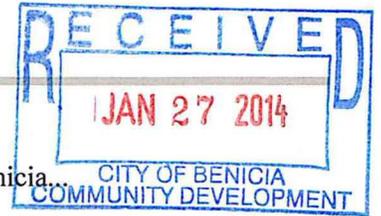
One of the things that was very revealing about the investigation that we did is that the US Federal Transportation Department was doing what they called the Bakken blitz - they were investigating complaints about the corrosive nature of the Bakken oil that was corroding the cars, leading to some puncturing, lots of complaints about something was wrong with this oil. That was two months before the Lac-Mégantic accident. Did they do anything about it? No. They are doing a lot more now because there's been this tragedy and there's 47 people dead. At a baseline, we could be a lot smarter about how we transport this stuff.

CURWOOD: Jacquie McNish is a senior writer with the Globe and Mail in Toronto. Thanks so much, Jacquie, for taking the time.

MCNISH: Thank you.



Jacquie McNish (photo: Globe and Mail)



**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/27/2014 2:23 PM  
**Subject:** NY Times article: Accidents Surge As Oil Industry Takes Train  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, George Oakes <oakes@earthlink.ne...>  
**Attachments:** Rail-slide-GF1O-jumbo.jpeg

Hello Amy and Brad,

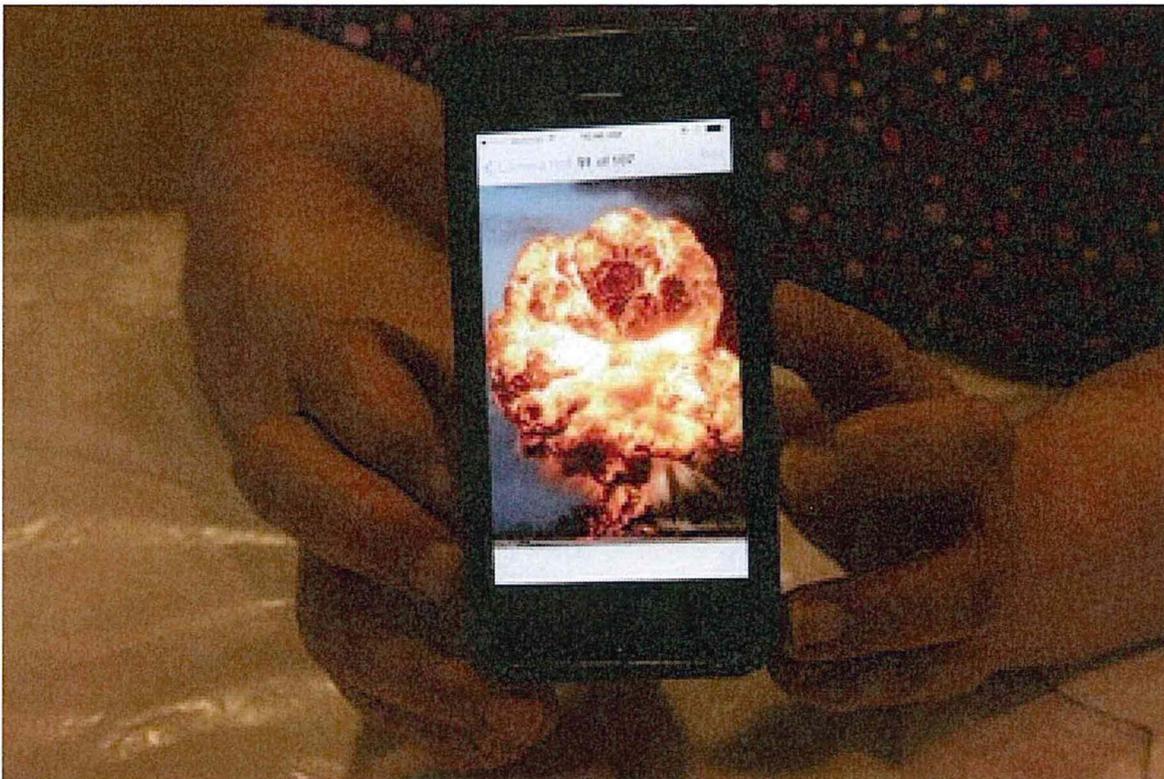
The Sunday NY Times first page story (Jan 26 2014), "Accidents Surge As Oil Industry Takes Train" discusses the impact and investigation of the recent Casselton, North Dakota crude train derailment involving an 108 car unit train carrying explosive Bakken from North Dakota's shale fields. Of the 20 DOT-111 tanker cars that derailed, 18 were punctured and exploded. Casselton residents and their city government are concerned about the speed of the oil trains passing through their city, and worry about the increased chance of future catastrophic derailments. In the last year alone, "the number of gallons of oil spilled" [caused by derailments] "far outpaced the total amount spilled by railroads from 1975 to 2012."

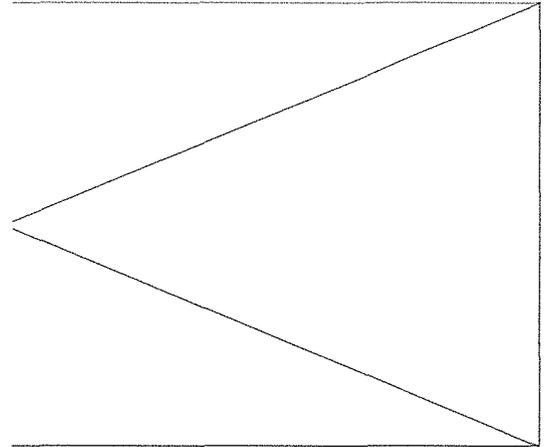
[Accidents Surge as Oil Industry Takes the Train - NYTimes.com](http://www.nytimes.com)

## ENERGY & ENVIRONMENT

# *Accidents Surge as Oil Industry Takes the Train*

By CLIFFORD KRAUSS and JAD MOUAWADJAN. 25, 2014





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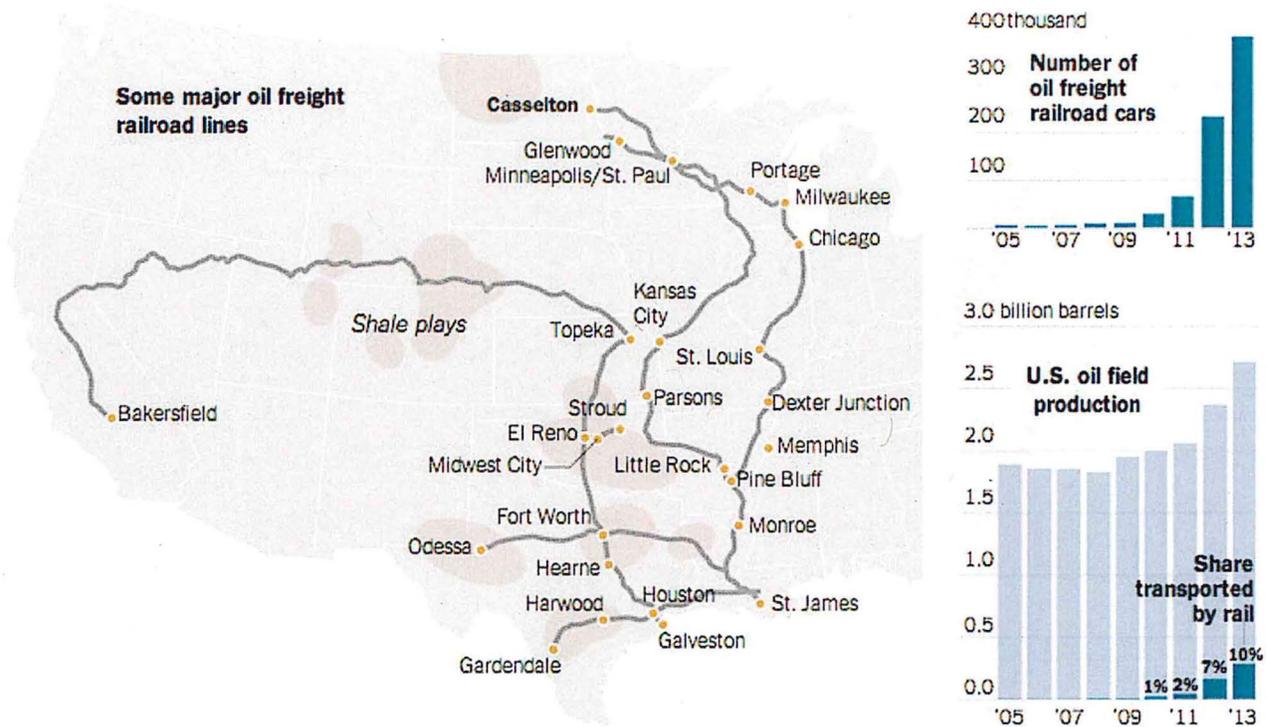
SAVE

MORE

CASSELTON, N.D. — Kerry’s Kitchen is where Casselton residents gather for gossip and comfort food, especially the caramel rolls baked fresh every morning. But a fiery rail accident last month only a half mile down the tracks, which prompted residents to evacuate the town, has shattered this calm, along with people’s confidence in the crude-oil convoys that rumble past Kerry’s seven times a day.

What was first seen as a stopgap measure in the absence of pipelines has become a fixture in the nation’s energy landscape — about 200 “virtual pipelines” that snake in endless processions across the horizon daily. It can take more than five minutes for a single oil train, made up of about 100 tank cars, to pass by Kerry’s, giving this bedroom community 20 miles west of Fargo a front-row seat to the growing practice of using trains to carry oil.

“I feel a little on edge — actually very edgy — every time one of those trains passes,” said Kerry Radermacher, who owns the coffee shop. “Most people think we should slow the production, and the trains, down.”



Source: Union Pacific; Energy Information Administration; Association of American Railroads

Casselton is near the center of the great oil and gas boom unleashed these last few years. And it has seen up close how trains have increasingly been used to transport the oil from the new fields of Colorado, Wyoming and North Dakota, in part as a result of delays in the approval of the Keystone XL pipeline. About 400,000 carloads of crude oil traveled by rail last year to the nation's refineries, up from 9,500 in 2008, according to the Association of American Railroads.

But a series of recent accidents — including one in Quebec last July that killed 47 people and another in Alabama last November — have prompted many to question these shipments and have increased the pressure on regulators to take an urgent look at the safety of the oil shipments.

In the race for profits and energy independence, critics say producers took shortcuts to get the oil to market as quickly as possible without weighing the hazards of train shipments. Today about two-thirds of the production in North Dakota's Bakken shale oil field rides on rails because of a shortage of pipelines. And more than 10 percent of the nation's total oil production is shipped by rail. Since March there have been no fewer than 10 large crude spills in the United States and Canada because of rail accidents. The number of gallons spilled in the United States last year, federal records show, far outpaced the total amount spilled by railroads from 1975 to 2012.

Railroad executives, meeting with the transportation secretary and federal regulators recently, pledged to look for ways to make oil convoys safer — including slowing down the trains or rerouting them from heavily populated areas. (Trains go up to roughly 35 miles an hour through towns and at higher speeds outside populated areas.) They also agreed to speed up a review of tougher standards for the train cars used for oil. And last Thursday, safety officials urged regulators to quickly [improve industry standards](#).

“This is an industry that has developed overnight, and they have been playing catch-up with the infrastructure,” said Deborah A. P. Hersman, the chairwoman of the National Transportation Safety Board, which is investigating the Casselton accident. “A lot of what we’ve seen could have been a lot worse.”

But given the fragmented nature of the business — different companies produce the oil, own the rail cars, and run the railroads — there is no firm consensus on what to do. And few analysts expect new regulations this year.

“There was no political pressure to address this issue in the past, but there clearly is now,” said Brigham A. McCown, a former administrator of the Pipeline and Hazardous Materials Safety Administration. “Producers need to understand that rail-car safety can become an impediment to production.”

The stakes are high. In five years, [domestic oil production](#) has jumped by 50 percent, to reach 7.5 million barrels a day last year.

But with little pipeline infrastructure, energy producers had to scramble for new ways to get their oil to refiners. Rail was the answer.

“The reality is that this came out of nowhere,” said Anthony B. Hatch, a rail transport consultant. “Rail has gone from near-obsolescence to being critical to oil supplies. It’s as if the buggy-whips were back in style.”

Far more toxic products are shipped on trains. But those products, like chlorine, are transported in pressurized vessels designed to survive an accident. Crude oil, on the other hand, is shipped in a type of tank car that entered service in 1964 and that has been traditionally used for nonflammable hazardous liquids like liquid fertilizers.

Safety officials have warned for more than two decades that these cars were unsuited to carry flammable cargo: their shell can puncture and tears up too easily in a crash.

In 2009, a train carrying ethanol derailed and exploded, killing one person in Cherry Valley, Ill. The National Transportation Safety Board said the inadequate design of the tank cars made them “[subject to damage](#) and catastrophic loss of hazardous materials.”

After that accident, railroads and car owners agreed in 2011 to beef up new cars with better protections and thicker steel. But they resisted improving safety features on the existing fleet because of cost. They also argued that thousands of new cars were being ordered anyway, so it would be just a matter of time before the fleet was replaced.

But analysts said that time has run out; railroads and car owners can no longer ignore the liabilities associated with oil trains, which could reach \$1 billion in the Quebec accident.

“Quebec shocked the industry,” Mr. Hatch said, adding that while rail safety has improved over all, “the consequences of any accident are rising.”

Last November, the Association of American Railroads said it would support requiring that the 92,000 tank cars used to transport flammable liquids, including crude oil, be retrofitted with better safety features or “aggressively phased out.”

Still, other groups have resisted. The Railway Supply Institute, which represents freight car owners, told regulators three weeks before the Casselton accident that existing cars “already provide substantial protection in the event of a derailment” and suggested minor modifications to be phased in over 10 years.

While the safety record of railroads has improved in recent years, the surge in oil transportation has meant a spike in spill rates. From 1975 to 2012, federal records show, railroads spilled 800,000 gallons of crude oil. Last year alone, they spilled more than 1.15 million gallons, according to the Pipeline and Hazardous Materials Safety Administration. And that figure does not include the Casselton spill, estimated at about 400,000 gallons.

The accidents have also created a sense of weariness among elected officials and even staunch oil backers.

North Dakota Gov. Jack Dalrymple, a Republican, insisted that the first priority was improving tank cars. “These exploding tank cars are obviously very powerful and very dangerous,” he said.

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## RECENT COMMENTS

**joe**

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Although the Canadian accident may have been human error, the recent high profile US train derailments can be almost wholly be blamed on...

**Steve**

17 hours ago

The whole thing is laughable. We know exactly what the problems are, \$\$\$. We've given up plastic bags, we are recycling bottles and paper ....

**cfranck**

20 hours ago

The left waxes indignant about people dying in traffic tieups at Ft Lee, NJ (a reprehensible act by the NJ state government regardless of...

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The accidents have brought another problem to light. Crude oil produced in the Bakken appears to be a lot more volatile than other grades of oil, something that could explain why the oil trains have had huge explosions.

Here too, the warnings came too late.

Federal regulators started analyzing samples from a few Bakken wells last year to test their flammability. In an alert issued on Jan. 2, P.H.M.S.A. said the crude posed a “significant fire risk” in an accident.

The Federal Railroad Administration also pointed to rising numbers of oil cars that showed a “form of severe corrosion” on the inside of the tanks, covers and valves.

After the recent meeting with regulators, the American Petroleum Institute pledged it would share its own test data about the oil, which they have said is proprietary.

While the tank cars themselves have not caused any accident, they failed to contain their cargo. That happened on the outskirts of Casselton when a 106-car oil train crashed into a soybean train that derailed on a parallel

track.

In a preliminary report, the N.T.S.B. said 18 of the 20 oil tank cars that derailed were punctured. Much of the oil spilled was incinerated by the explosions, and some soaked into nearby corn fields.

Aside from evacuating nearby farms, there was little the fire department could do but watch the train burn.

Tim McLean, Casselton's fire chief, pictured what the town would look like if an oil train derailed. The large propane supply tank would explode "like a bomb" and incinerate two multifamily houses next to it. Five blocks to the west are a lumber yard and two gasoline stations. Oil might accumulate in storm sewers and possibly spread a fire underground.

"There's virtually no way we could protect these buildings," he said as he passed the barber shops, drugstore and pizza parlor, all occupying sturdy brick buildings more than a century old. "It would be too hot."

The terror of what might have happened hit many here immediately.

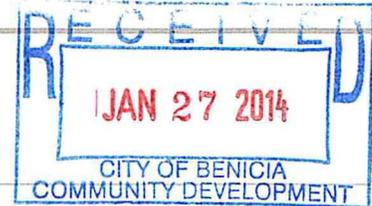
Adrian Kieffer, the assistant fire chief, rushed to the accident and spent nearly 12 hours there, finishing at 3 a.m. "When I got home that night, my wife said let's sell our home and move," he said.

***Correction: January 27, 2014***

*An earlier version of a picture caption with this article misidentified the person who took a photograph of the fiery rail accident in Casselton, N.D. The photo was shot by Dawn Faught, a local photographer, not by the son of a coffee shop owner whose phone it appeared on. The error was repeated in an earlier version of a slide show with the article. An earlier version of a chart with the article omitted a label in one section. The bar chart of oil freight rail cars should have indicated the numbers were in thousands.*

**Amy Million - Call by Nat'l Transportation Safety Board for RR emergency planning for crude oil shipments**

**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/27/2014 2:49 PM  
**Subject:** Call by Nat'l Transportation Safety Board for RR emergency planning for crude oil shipments  
**Attachments:** web-rail-safety22nw1.jpg



Hello Amy and Brad,

The article below cites call by National Transportation Safety Board for railroad companies to plan for (pay for) emergency response in the case of accidents involving shipment of fossil fuels. Heretofore, there was no legal obligation for RR companies to provide emergency response service, which was left up to individual communities. As we know, smaller cities and towns are already strapped for funding for basic local fire protection services. The information in this article alone about how much foam was required to staunch the fatally raging fire at Lac Mégantic, Quebec, is a case in point.

Other article (previously sent) from yesterday's Sunday NY Times suggests the possibility that fire can spread underground through sewer pipes, etc., if fire, caused by ruptured tankers or leaking tankers carrying Bakken crude ignites nearby facilities such as gas stations and other commercial venues within a city. Consider that metal on metal friction (train couplings) can cause sparks and that there would be ignitable fugitive gases and potential spills at the off-loading racks at Valero: there's need to consider the extent of conflagration possible and what would be the emergency response in such an event.

Please add this article to the legal public record on Valero's proposed Crude-By-Rail Project and its CEQA review. The reason that I am submitting articles as they appear is because the research and investigation being done on the recent catastrophic derailments of trains carrying explosive fossil fuels is unfolding on a daily basis, with new evidence of hazards and new policy edicts from federal regulators flowing from those investigations.

Thank you,

Marilyn  
[707-745-9094](tel:707-745-9094)

[U.S., Canada issue rail safety warnings - The Globe and Mail](#)

**THE GLOBE AND MAIL** 



A tanker continues to burn as fire fighters douse rail containers in downtown Lac Mégantic, Quebec early July 7, 2013 a day after a train carrying crude oil tankers derailed and burst into flames. (Moe Doiron/The Globe and Mail) (Moe Doiron/The Globe and Mail)

Canadian and U.S. safety officials have issued unprecedented joint warnings that North American communities are at risk of exposure to deadly crude oil derailments if new safety regulations are not adopted.

Transportation safety agencies in both countries called for a suite of reforms Thursday, including new requirements for railways to analyze the risks associated with moving crude on specific routes and ensuring that specialized crews and fire retardants are available to combat explosive fires such as those that occurred in Lac-Mégantic, Que., Alabama, North Dakota and New Brunswick.

Deborah Hersman, chair of the Washington-based National Transportation Safety Board, said the agency is "concerned that major loss of life, property damage and environmental consequences can occur" as a result of a 400-per-cent increase in oil shipments on the rails since 2005. "Our safety regulations need to catch up with this new reality," she said.

Her fears were echoed by her Canadian counterpart Wendy Tadros, chair of the Transportation Safety Board, who warned an Ottawa news conference Thursday about serious safety concerns linked to the "staggering" increase in crude shipped on the rails. New safety measures are needed to keep the communities located along rail lines safe, she said. The TSB issued its warning as part of a continuing investigation into the Lac-Mégantic crude-oil rail disaster, which killed 47 people last summer.

Transport Minister Lisa Raitt said in a statement that Ottawa would review the recommendations "on an urgent basis." A spokeswoman for the minister said she was unavailable for an interview on Thursday.

Ms. Tadros highlighted the need for more effective emergency-response supplies and protocols to cope with future derailments of oil cars. For example, she said, it was fortunate that a refinery within hours of Lac-Mégantic was able to bring in more than 30,000 litres of foam needed to battle explosive fires that burned for days. "But what if the specialized resources needed to fight the fire were not so accessible?" Ms. Tadros said. "We simply cannot leave this to chance."

A letter from the U.S. safety agency, addressed to the Federal Railroad Administration, said railways are not required to develop detailed emergency response plans for crude oil. As a result, "the burden of responding to an accident and remediating the aftermath is still left with communities," the letter said.

Montreal, Maine & Atlantic, the railway whose train derailed in Lac-Mégantic, was not required to develop a comprehensive plan and was "unprepared to respond to a worse case discharge," according to the letter. These shortcomings were highlighted in a Globe and Mail investigation in December.

Ms. Raitt has asked an advisory group to develop Emergency Response Assistance Plans (ERAPs) for crude oil by the end of this month, and told The Globe and Mail that she expects that plan to be in place by the middle of 2014. The advisory group is also looking at ERAPs for other flammable liquids including ethanol.

Claude Dauphin, president of the Federation of Canadian Municipalities, said the latest recommendations from the TSB underscore the need to act quickly on rail safety. He said he expects ERAPs to be put in place for all flammable liquids that pose a danger to communities they are moving through, adding, "We cannot afford to wait to make this important change."

The safety boards did not address the specific dangers of Bakken crude Thursday, but investigators have previously said that oil from the Bakken region, which covers North Dakota and parts of Saskatchewan and Manitoba, may be much more volatile than they initially believed.

Both boards called for swift changes to the DOT-111 tank cars commonly used to haul crude oil by rail, which have insufficient lining, external shields and venting to protect against the punctures or gas buildups that have been factors in recent fiery derailments involving crude. "A long and gradual phase-out of older model cars simply isn't good enough," Ms. Tadros said. "It leaves too much risk in the system."

NDP transport critic Olivia Chow called for a clear timeline for older-model DOT-111 tank cars to be phased out for volatile crude oil. "Phasing out doesn't mean it has to be done tomorrow, but you have to have a plan with a timeline," she said.

A spokeswoman from Ms. Raitt's office said she could not comment on a timeline for halting shipments of crude in the older model DOT-111 tank cars.

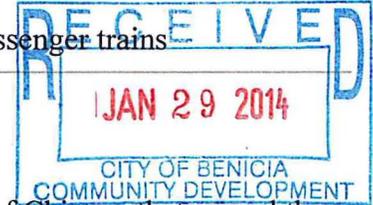
The U.S. safety agency also called for an audit system to be put in place to ensure crude oil is properly tested and classified before it is loaded onto trains. Transport Canada issued new rules on classification and testing for crude after the Lac-Mégantic disaster and has proposed a new regime that would require specific individuals sign off on test results.

- 
- **INVESTIGATION** Last moments of Lac-Mégantic: Survivors share their stories
  - **GLOBE INVESTIGATION** Inside the oil-shipping free-for-all that brought disaster to Lac-Mégantic
  - **LAC-MÉGANTIC** Rail service to resume in Lac-Mégantic after fatal derailment
-

## Amy Million - Today, train derailment outside Chicago halts other freight and passenger trains

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**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/29/2014 5:12 PM  
**Subject:** Today, train derailment outside Chicago halts other freight and passenger trains



Hello Amy and Brad,

The following report, dated Jan 28, 2014, tells of a train derailment outside of Chicago that caused the halting of other freight and passenger trains for an entire day. This begs the question of the reliability of schedules for trains loaded with crude oil coming from North Dakota's Bakken shale fields. Impacts caused by this kind of accident causing delay of other trains using the same mainline tracks is of particular concern to our review of Valero's proposed Crude-By-Rail Project, especially in light of the Solano Transportation Authority's goals (2012 Report) of increasing rail freight and rail passenger trains, all using either UP and/or BNSF rail lines throughout the region. The CC County's recently adopted "Northern Waterfront Shoreline Development Initiative" also projects increased numbers of freight and passenger trains. . .

Please add this report to the legal public record on the Valero CBR project and for its upcoming review.

[Freight Train Derailment Halts Metra North Central Service « CBS Chicago](#)

## Freight Train Derailment Halts Metra North Central Service

*Updated 01/28/14 – 11:49 a.m.*

**MUNDELEIN, Ill. (CBS)** – Metra passengers in many north suburbs had to find another way to get around on Tuesday, after a freight train derailment forced Metra to halt North Central Service trains until further notice.

CBS 2's Vince Gerasole reports a Canadian National Railway train derailed in Mundelein early Tuesday, blocking all other trains that use the same tracks, including Metra North Central Service — which runs between Antioch and Union Station.

All trains on the North Central line have been halted for the entire day on Tuesday, as crews worked to get several cars from that CN freight train back on the tracks, and get the train moving again. North Central Service trains will not run again until Wednesday morning.

"CN crews have been working to re-rail their freight train, move it from the scene of the derailment in Mundelein, and inspect and repair damage to the tracks. They also have several other freight trains that were stopped due to the accident that must be moved before our service can resume," Metra said in a statement on its website. "They expect this process to take at least until early evening today. In order to give them time to make a full recovery from the accident, Metra will not resume service on the line until

Wednesday morning, January 29, when we expect to provide our normal weekday schedule. We apologize for the inconvenience and we thank you for your patience and understanding.”

North Central Service handles about 5,800 passenger trips a day — or approximately 2,900 passengers taking round trips.

Metra commuters who normally use North Central Service were encouraged to use the Milwaukee District/North Line — which operates between Fox Lake and Union Station — or some other mode of transportation.

The derailed freight train also was blocking several intersections in the Mundelein area. Workers were using heavy equipment to get the car back on the tracks and move the train and fix the rails.

## Amy Million - Oil producers ask regulators not to rush rail safety rules



**From:** Marilyn Bardet <njbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/29/2014 10:00 AM  
**Subject:** Oil producers ask regulators not to rush rail safety rules  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, George Oakes <oakes@earthlink.ne...>  
**Attachments:** 0809-rail-safety-e1390949461620.jpg

Hello Amy and Brad,

The following article confirms the pressure federal regulators are under by oil producers who are anticipating new policies to address rail safety issues for trains carrying fossil fuels. Oil producers, heavily invested in tar sands extraction mining, say the new policies would undercut their profits and competitiveness.

Please add this article to the legal public record on Valero's proposed Crude-By-Rail Project and its upcoming DEIR review.

Thank you,  
Marilyn  
[707-745-9094](tel:707-745-9094)

[Oil producers ask regulators not to rush rail safety rules | canada.com](#)



## NEWS

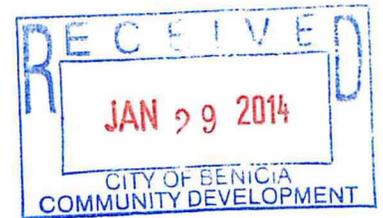
### Oil producers ask regulators not to rush rail

# safety rules

Mike De Souza

Published: January 28, 2014, 5:24 pm

Updated: 19 hours ago



A A A

OTTAWA – Lobby groups representing Canadian and U.S. oil producers are asking regulators in North America not to rush into new rail safety rules that could affect the “competitiveness” of shipping products by rail.

Responding to sweeping joint recommendations made last week by the Canadian and American transportation safety agencies to retrofit existing tank cars, as well as to improve planning and analysis, two lobby groups called for more consultations and analysis on proposed regulations – which came in the wake of the 2013 Lac-Mégantic train disaster – in order to ensure that new rules don’t disrupt existing shipping services.

“We look to governments to implement these standards to ensure public safety, to ensure their implementation does not interrupt service and respects the competitiveness of transporting our products by rail, and that the pace of implementation is aligned with the capacity to construct or retrofit any new or existing rail cars,” said David Pryce, the vice-president of operations of the Canadian Association of Petroleum Producers. He added that existing regulations were “extensive.”

Pryce said his association also expected a dialogue and definition of liability for accidents to “evolve over the next few weeks and months.”

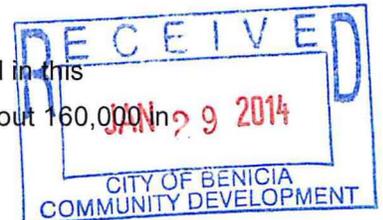
In the U.S., the American Petroleum Institute told U.S. regulators in December that it opposed new regulations, in the absence of “complete data and analysis” on the costs and benefits of retrofit options.

A spokesman for the institute told Postmedia News that it is now reviewing the new safety recommendations, saying that industry is “leading the effort” to improve safety standards.

“But the first step is to prevent derailments by addressing track defects and other root causes of train accidents,” said institute spokesman Brian Straessle.

The oil and gas industry, railway companies and tank car manufacturers say they’ve been building next-generation tank cars since 2011 that exceed federal standards and now make up nearly 30 per cent of the fleet.

But tens of thousands of tank cars would need to be replaced or retrofitted if the recommendations from the Transportation Safety Boards in the U.S. and Canada were turned into regulations.



The Transportation Safety Board of Canada said last week that shipments of oil by rail in this country have increased exponentially from about 500 car loads per year in 2009 to about 160,000 in 2013, contributing to the safety risks.

A spokeswoman for Canadian Transport Minister Lisa Raitt said that all industry stakeholders were expected to comply with regulations.

“While the new reality of oil shipment is economically beneficial, it is the Canadians and our environment along the rail lines that must be protected,” said Ashley Kelahear in an email. “As we have stated before, should a rail company fail to follow the rules, we will not hesitate to take action. We are examining whether we need further measures to strengthen rail safety and the transportation of dangerous goods.”

Raitt’s office also said the government was pursuing its review by listening to industry and an industry-led panel giving advice on the transportation of dangerous goods.

The Canadian railway industry said last week that it fully supported the transportation safety board recommendations.

Greenpeace Canada argued that this shows that only one group is blocking action.

“The oil industry is the only major player left resisting the move to safer rail cars,” said Keith Stewart, a climate and energy campaigner at the environmental group. “Every day they successfully delay action puts our communities and environment at risk. It’s time for Minister Raitt to listen to her safety experts, not the oil industry lobbyists.”

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**[Read more Articles from Mike De Souza](#)**

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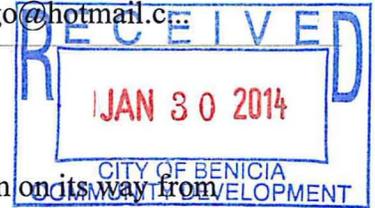
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**! [REPORT AN ERROR](#)**

## Amy Million - Fwd: Union Pacific train cars derail near Redding

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**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/29/2014 11:59 PM  
**Subject:** Fwd: Union Pacific train cars derail near Redding  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, Belinda Smith <bsmitgo@hotmail.c...



Hello Amy and Brad,

Yet another derailment, this one on Jan 28 near Redding: a 67 car freight train on its way from Roseville CA to Portland OR.

[Union Pacific train cars derail near Redding](#)

Again, though this derailment didn't involve fossil fuels or spill of any cargo, it inevitably disrupted schedules of other trains due to run on the same track. Amtrak passengers had to be bussed to Sacramento...

Please include this report in the legal public record for review of Valero's Crude-By-Rail Project and CEQA review.

Thank you,  
Marilyn  
[707-745-9094](tel:707-745-9094)

Begin forwarded message:

**From:** "Cmbeutel@sbcglobal.net" <cmbeutel@sbcglobal.net>  
**Date:** January 29, 2014 11:25:37 PM PST  
**To:** Marilyn Bardet <mjbardet@comcast.net>  
**Subject:** Union Pacific train cars derail near Redding

[http://www.huffingtonpost.com/huff-wires/20140128/apfn-ca--train-derailment/?utm\\_hp\\_ref=technology&ir=technology](http://www.huffingtonpost.com/huff-wires/20140128/apfn-ca--train-derailment/?utm_hp_ref=technology&ir=technology)

Marilyn  
While not tanker cars, more derailments  
Constance

**Amy Million - ATTACHMENT! Fwd: "Texas Vies with Saudi Arabian Oil in California Supply: Freight" Washington Post - Business**

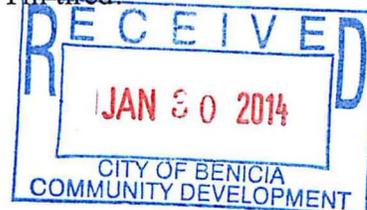
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**From:** Marilyn Bardet <mjbardet@comcast.net>  
**To:** Amy Million <amillion@ci.benicia.ca.us>, Brad Kilger <bkilger@ci.benicia...>  
**Date:** 1/29/2014 6:37 PM  
**Subject:** ATTACHMENT! Fwd: "Texas Vies with Saudi Arabian Oil in California Supply: Freight" Washington Post - Business  
**CC:** Rod Sherry <rsherry@csa-engineers.com>, Belinda Smith <bsmitgo@hotmail.c...>

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Thank you, Amy, for letting me know I'd forgotten the attachment! I know I'm tired!

:) Marilyn  
707-745-9094



Here it is:  
Business: Washington Post Business Page, Business News.

Lynn Doan and Isaac Arnsdorf Jan 29, 2014 6:55 pm ET

## **Texas Vies With Saudi Arabian Oil in California Supply: Freight**

(To get alerts for freight columns: SALT FRMC <GO>)

Jan. 29 (Bloomberg) -- Texas is poised to join Saudi Arabia as a supplier of oil to California as the mounting glut of crude on the U.S. Gulf Coast makes the trade profitable.

Kinder Morgan Energy Partners LP, the pipeline operator that's buying U.S. oil tankers, said it's in talks to ship Texas crude to California through the Panama Canal. The 4,500-mile voyage would cost about \$10 a barrel, broker Poten & Partners Inc. estimates, making Texas crude competitive with imports traveling 11,400 miles from Saudi Arabia, the West Coast's largest supplier, data compiled by Bloomberg show.

Until now, a U.S. law that makes domestic shipping more expensive left Californians buying oil from the Middle East instead. If a shortage of qualifying ships can be overcome, Texas crude will become affordable on the West Coast as the highest domestic output in a quarter century creates a surplus of light oil and drives down prices.

"The West Coast has been short crude over the last couple of decades with Alaska North Slope and California oil production down," Andy Lipow, president of Lipow Oil Associates LLC in Houston, said by telephone. "Getting more crude from other areas of North America into the West is going to help refiners, and if you have a big glut of light, sweet crude on the Gulf Coast, tankers will load."

Jones Act

The posted price for light crude from Texas's Eagle Ford shale formation has climbed 0.5 percent in the past year to \$93.75 a barrel, according to the marketing division of Plains All American Pipeline LP. That compares with \$98.79 for light Saudi Arabian crude and \$96.29 for the equivalent Iraqi grade, plus \$3.38 for shipping to the U.S. West Coast, according to data compiled by Bloomberg.

Shipping between U.S. ports costs more than international voyages in part because a 94-year-old law called the Jones Act requires domestic cargoes to travel on U.S.-built, -owned and -crewed vessels. A qualifying tanker commands record rates close to \$100,000 a day, according to MJLF & Associates, a broker. That's about 10 times more than a tanker of the same size that doesn't meet the requirements, according to data from Clarkson Plc, the world's largest shipbroker.

Using a Jones Act tanker may still beat the cost of transporting oil by train, Court Smith, head of research at Poten in New York, said Jan. 17. He has since left the company.

Rail costs to Washington State from North Dakota's Bakken field run at about \$9 a barrel, while Alberta, Canada, to California costs \$13 to \$15, Valero Energy Corp., the world's largest independent refiner, said in a Nov. 13 presentation. The company said it would consider the trade if it's economical.

#### 'Most Expensive'

Crude-by-rail operations are facing more regulatory scrutiny after the derailment of a train carrying oil that killed 47 people in Quebec in July and a Dec. 30 explosion in North Dakota involving a train carrying Bakken crude.

"Rail is the most expensive, it takes a long time and obviously you can see clearly what happened over the last few weeks and few months of accidents," Fadel Gheit, a New York-based energy analyst for Oppenheimer & Co., said in a Jan. 21 interview on Bloomberg Radio.

Kinder Morgan, the country's second-largest natural gas pipeline operator by market value, agreed to buy APT New Intermediate Holdco LLC and State Class Tankers II LLC from private-equity firms Blackstone Group LP and Cerberus Capital Management LP for \$962 million in cash. Once final, the deal will give Kinder Morgan five Jones Act tankers and four more under construction, each able to carry 330,000 barrels, according to a Dec. 23 statement.

#### Kinder Tankers

"Increasingly we're talking to people, no firm commitments, who think that they will use Jones Act tankers, that have to be Jones Act, to take production out of Texas and move it through the canal and back up to California," Richard Kinder, the company's chairman and chief executive officer, said on a Jan. 15 conference call. Richard Wheatley, a spokesman, declined to elaborate.

Kinder Morgan's net income will rise 31 percent to \$1.3 billion this year, according to the average of 11 analyst estimates compiled by Bloomberg. Its shares will rebound from a 12 percent decline in the past year to gain 9.1 percent to \$86.56 in 12 months, the average of nine estimates shows.

The oceangoing Jones Act fleet of about 85 ships is fully booked, with no tankers available for one-time cargoes, said Pat Calahan, a broker and project consultant at MJLF in Stamford, Connecticut. The ships Kinder Morgan is buying from American Petroleum Tankers are all booked for several years on long-term contracts, according to a Dec. 23 company statement. The State Class ships are scheduled for delivery in 2015 and 2016.

#### Panama Canal

The vessels are able to cross the Panama Canal, even before the \$5.3 billion expansion that will double the waterway's capacity. The project is scheduled to finish next year, with contractor Sacyr SA pledging to continue construction after threatening to suspend work unless the canal authority paid for cost overruns. The parties will continue talks until Feb. 1. The expanded canal could allow larger tankers to reposition from Alaska, according to Poten.

The Texas-to-California trade will be more feasible when there are surplus Jones Act tankers, Calahan said. There are 32 oceangoing tankers and 42 barges, plus 11 dedicated to shuttling between Alaska and the West Coast, and 16 more under construction, according to MJLF.

#### Eagle Ford

"There needs to be more length built into the Jones Act fleet before the industry takes a look at shipping to the West Coast," Glenn Simpson, general manager of crude and international supply at Phillips 66, said Jan. 22 during a conference in Houston. Phillips 66 runs three refineries in California and Washington state that can process a combined 315,000 barrels a day. The company has used Jones Act tankers to send Eagle Ford oil to its 238,000-barrel-a-day Bayway refinery in New Jersey.

Kinder Morgan has tried to move Texas oil to California before. The company shelved plans in May to build a pipeline that would have carried 277,000 barrels a day from West Texas's Permian Basin to California's refiners by late 2016. Citing lack of customer interest for the pipeline, Kinder Morgan said at the time that it would focus on rail projects instead.

There are no pipelines linking the Gulf and California. The last time a ship carried crude between the Gulf and West Coasts was in August 2012, Energy Department data through October 2013 show.

#### U.S. Flags

In the past six months, two U.S.-flagged tankers crossed the Panama Canal. Chevron Corp.'s California Voyager left Freeport, Texas, on Jan. 9 and was anchored near San Francisco, ship-tracking data compiled by Bloomberg show. The S/R American Progress, a Jones Act tanker owned by Exxon Mobil Corp.'s SeaRiver Maritime Inc., left Los Angeles on Jan. 5 and is anchored near Beaumont, Texas, signals show.

Spokesmen for Chevron and SeaRiver declined to comment.

The West Coast imports about 1.25 million barrels a day, with 24 percent coming from Saudi Arabia, according to October data compiled by the Energy Information Administration, the Energy Department's statistical arm. Ecuador supplies 16 percent, with another 15 percent from Canada and 13 percent from Iraq, data show.

California's daily output dropped from as much as 1.1 million barrels in 1986 to 547,000 barrels in October, Energy Department data show. Alaskan production slumped to 521,000 barrels a day from more than 2 million barrels a day in 1988. The state's supplies are poised to rebound as the repeal of a production tax triggers investments that may boost output by at least 90,000 barrels a day within four years.

#### Energy Independence

The West Coast's reliance on imports contrasts with the country as a whole, which is meeting the largest share of its own energy needs since 1986, Energy Department data show. Nationwide production topped 8 million barrels a day in November and rose to the highest since 1988 as hydraulic fracturing and horizontal drilling unlock resources in shale rocks deep underground.

Because West Coast fuel producers can't get that oil, their refining margins of \$13.64 a barrel are lower than the \$15.21 on the Gulf Coast, data compiled by Bloomberg show. A gallon of regular gasoline costs \$3.486 on the West Coast and \$3.092 on the Gulf Coast, according to the Energy Department.

#### Domestic Oil

The Gulf Coast may even have more domestic oil than it can handle because refineries are configured for heavier grades. The glut is leading to calls -- from Senator Lisa Murkowski, the top Republican on the Energy and Natural Resources Committee, to the American Petroleum Institute, the oil industry's lobbyist -- to lift the ban on most crude exports. Moving Texas oil to California would provide another outlet.

"The West Coast is struggling through a decline in oil production and having that additional Eagle Ford oil there -- what are the disadvantages at this point?" Taryn Slimm, an oil and gas analyst who covers U.S. unconventional plays for London-based GlobalData, said by telephone from New York. "It is an opportunity for the West Coast, and it's going to relieve the projected glut that we have on the Gulf."

Valero, which runs refineries in the San Francisco and Los Angeles areas, doesn't ship crude through the Panama Canal to its California plants, "although we would certainly consider it if it made economic sense," Bill Day, a spokesman at the company's headquarters in San Antonio, said by e-mail Jan. 16.

#### Benicia Plan

The company is planning a complex at the 170,000-barrel-a-day Benicia refinery in Northern California that would allow the plant to unload as much as 70,000 barrels of crude a day from rail cars. The project is pending city approval.

Tesoro Corp., the largest refiner on the U.S. West Coast, leases space on Petroterminal de Panama SA's Trans-Panama pipeline, Tina Barbee, a spokeswoman at company headquarters in San Antonio, said by e-mail. The 131-kilometer (81-mile) line can carry as much as 800,000 barrels of oil a day. She declined to comment on the Tesoro's future strategies.

"Someone might say right now, 'Let's see if we can make this work,'" said David Hackett, president of oil consulting firm Stillwater Associates in Irvine, California. "Straight up, on a freight basis, Eagle Ford to California works."

--With assistance from Dan Murtaugh in Houston. Editors: Philip Revzin, Dan Stets

Begin forwarded message:

**From:** Marilyn Bardet <[mjbardet@comcast.net](mailto:mjbardet@comcast.net)>  
**Date:** January 29, 2014 5:50:41 PM PST  
**To:** Amy Million <[amillion@ci.benicia.ca.us](mailto:amillion@ci.benicia.ca.us)>, Brad Kilger <[bkilger@ci.benicia.ca.us](mailto:bkilger@ci.benicia.ca.us)>  
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**Subject:** "Texas Vies with Saudi Arabian Oil in California Supply: Freight" Washington Post - Business

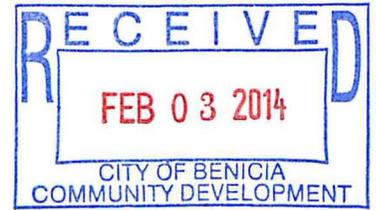
Hello Amy and Brad,

The following article, dated Jan 29, from Washington Post's business page outlines plans in the making for Kinder Morgan to import Texas light sweet crude into California via tankers coming through the Panama Canal from Gulf terminals. Valero's CEO Bill Day says he's interested, (depending on the economics). This is pertinent to the review of Valero's proposed Crude-By-Rail Project.

Please add this article to the public legal record on the CBR project for its upcoming CEQA review.

Thank you,  
Marilyn  
[707-745-9094](tel:707-745-9094)

**From:** Pat Toth Smith <pattothsmith@aol.com>  
**To:** "amillion@ci.benicia.ca.us" <amillion@ci.benicia.ca.us>  
**Date:** 2/2/2014 9:10 AM  
**Subject:** Comment for the record - Valero Crude By Rail



Dear mr. Kilter, We are Benicia residents and are very opposed to the crude by rail project, first there is the danger of a derailment, which in the past year has shown that to be a very real problem. The small derailment in Benicia and the very serious derailment in North Dakota. The Benicia city council would be to blame if this happens after the project was approved. Having had the prior warnings of how unsafe this mode of transport is, Benicia would be at fault because we could have prevented it. Also, with the severe water shortages Benicia faces in the upcoming year/s how can we promote the process of hydro-fracking and the potential for water pollution and the overuse of water that it causes? Pat Toth-Smith, Andy Smith and Alia Toth-Smith (11 years old).

Sent from my iPad