

Risks Associated With Rail Transport of Hazmat and Crude Oil October, 2014

Introduction

The issue of railroad liability in the United States as it relates to the transport of hazardous materials is a fascinating and complex mix of risks and liabilities. At the same time, there is an increasing use of American railroads to transport hazardous materials, most especially Bakken derived oil products. This white paper will begin by presenting a simple discussion of the regulatory environment in which railroads operate and the risks which American railroads are mandated by law to undertake.

Regulatory Framework

At the federal level, railroads are regulated by the Department of Transportation. Within the Department of Transportation, the Surface Transportation Board is given extensive authority to regulate railroad activities. In addition to the STB, railroads must also deal with the Federal Railroad Authority. The FRA is charged with safety regulations for railroads. For example, the FRA sets train speeds. In addition, there is the National Transportation Safety Board. The NTSB has investigatory powers but no direct ability to mandate courses of action for the railroad. Nonetheless, it is very powerful since it is charged with investigating significant accidents, doing failure analysis and ultimately assessing causation. It is important to note that the NTSB does not apportion liability, but only makes a determination relative to causation.

In addition, while state laws are of lesser importance¹ they do make at least one key contribution to the railroad liability mix. Various state statutes set the standard of care for railroads. For example, OCGA § 46-9-1 in Georgia says:

Common carriers as such are bound to use extraordinary diligence, and in cases of loss, the presumption of the law is against them, and no excuse unveils them unless the loss was occasioned by the act of God or the public enemies of the state.

If we want a look at state laws which specifically address the liability of railroads when they transport goods or property, we can find a good example in the Illinois Common Carrier Liability Act.² The statute says that a railroad may not limit its liability when transporting property, whether inside or outside the state. These two statutes, one from Georgia and one from Illinois, illustrate the fundamental risk management dilemma to which American railroads are subject. The law frustrates two bedrock principles of risk management: the railroads are hamstrung by an elevated standard of care, and are usually prevented from limiting their liability contractually (a standard risk management procedure.)

¹ See: "Runaway Train? Federal Preemption of State and Local Laws Concerning Railroads – A Report Prepared for the Shoreham Area Advisory Commission," Kara Slaughter, February 14, 2005 (relative to Minnesota State Law.)

² 740 ICLS 25/0.01 *et seq.*

Railroads Must Transport HazMat

The legal environment within which American railroads operate also denies railroads another fundamental risk management tool. If a railroad does not want to transport a particular hazardous material, it generally is unable to effectively refuse to transport the cargo. This is clearly a government mandated subsidy for the transporters of hazardous materials. How?

The railroad can be forced to transport hazardous material, even if it does not wish to do so and may not impose higher costs for the risks it assumes in the transport of the hazardous material. The railroad cannot limit its liability in connection with such transport. The railroad is subject to an elevated standard of care in many cases the state law level.³ Moreover, if there is an accident in the course of transporting the hazardous materials, liability is focused upon the railroad and not upon the owner or shipper of the hazardous materials.

Recently, in May of 2013, Union Pacific Railroad attempted to undertake an action before the STB⁴ which would allow them to require indemnities from hazardous materials shippers on their railroad line. The STB refused the request from Union Pacific. The regulators agreed with arguments made by shippers that this would restrict their ability to move their hazardous materials. So, for the time being, the liability focus here in America remains focused upon railroads.

This is not the case in Canada. In Canada, there is what essentially amounts to joint and several liability as between the shipper of the hazardous material and the railroad. This liability-spreading approach may become quite relevant in light of a catastrophic loss in Canada which we will discuss later.

Railroad Insurance Approaches

It is abundantly clear that railroads are risk pessimists. In 2008, citing an official from the brokerage house AON, one writer from Best's (A.M. Best, the insurance industry rating organization) asserted that the global insurance market capacity for railroads declined from a high in 2005 of \$1.3 billion to about \$1 billion in 2008.⁵ The article goes on to state that a railroad such as Norfolk Southern may pay as much as \$10 million each year for up to \$1 billion in insurance coverage. Importantly for our later discussions, the article states that the greatest risk for railroads performing hazardous material shipments is ethanol, primarily with smaller railroads – not petroleum risks. However, we must keep in mind that this article *predates* the enormous increase in the shipment of Bakken oil products by rail, an increase which began in 2008.

³ See, for example: Association of American Railroads, "Hazmat Transportation by Rail: An Unfair Liability" (2009) at www.aar.org/safety/-/media/aar/backgroundpapers/hazmattransportationbyrailunfairliability.ashx

⁴ The STB is the "Surface Transportation Board", a part of the US DOT. Their website is here: <http://www.stb.dot.gov/stb/index.html> .

⁵ www.thefreelibrary.com/Risk-on-the-rails ; see also: "The Transportation of Hazardous Materials: Insurance, Security and Safety Costs: A report to Congress as required by Section 1555(b) of the Implementing Recommendations of the 9/11 Commission Act of 2007 (Pub. L. 110-53), prepared by the US Department of Transportation, December, 2009.

This same 2008 article also states that insurance companies underwriting the risks associated with railroads use a fairly formulaic approach when looking at their hazardous materials exposures. Underwriters consider the percentage of hazardous materials cars in relation to the total cars hauled and how far the cars are hauled with hazardous materials on board. Percentages between 5% and 8% are, according to this article, considered acceptable. The article reports that total premium in America in 2008 for railroad liability insurance came to some \$200 million US.

At the same time, the shipment of hazardous materials by American railroads is big business. An excellent law review article addressing the issues of rail shipments of hazardous materials tells us this:

“... [E]ach year, American freight railroads transport an average of 1.7 million carloads of hazmat shipments. This figure represents the majority of the 2.04 million carloads of hazardous and nonhazardous chemicals shipped via rail in 2008. Despite the financial risks posed by transportation of these dangerous chemicals, the notion of Class I railroads taking action that would result in foregoing \$7.7 billion in annual revenue is arguably irrational, especially when noting that in 2007, 99.996% of rail hazmat shipments reach their destinations incident free...”⁶

Reportedly, the seven large “Class I” railroads have continued to seek \$1 billion in insurance coverage. This is so, even though it appears that the events associated with hazardous material shipments by rail and liability have, over the long term, decreased. For example, the 2008 article on insurance referenced above asserts that there has been an 88% decline in railroad hazmat accidents since 1980 with 39% decline since 1990.

The railroad industry itself touts its safety. CSX railroad has said on its website that for every billion ton-miles of hazardous materials transported, trucks are involved in more than 10 times as many accidents as railroads. The American Association of Railroads cites two statistics in particular. In 2005, some 99.997% of rail hazardous material shipments proceeded without incident. In 2007 that number was 99.996%. In looking at the numbers, we should recall that 2005 was the year of the Graniteville catastrophic loss and remember that a single event, while not impacting overall statistics, can generate enormous dollar losses.

At the same time, there has been a dramatic increase in the shipment of hazardous materials by rail, most notably Bakken related products. In 2008, the US DOT said that some 9,500 rail-carloads of crude moved through the US. Five years later, that number was 415,000 rail-carloads. This is an increase of more than 4000% in a five-year period. It is quite noteworthy from an underwriting viewpoint that losses have not grown at the NTSB level accordingly.

The risk-averse approach of the large railroad companies becomes much more understandable in light of this drastic increase in the shipment of hazardous materials by rail since 2008 and their exposure should a catastrophic loss occur. Readers may refer to the NTSB materials in the Reference and Resource section of this white paper to gain a sense of loss magnitude. For example, the NTSB materials indicate that in the last 15 years (1999-2013) losses generally

⁶ Z. T. Abel, Note, “Getting Hazmat Transportation Back on Track: The Need for Hazmat Liability Reform for Rail Carriers”, 35 [William and Mary Environmental Law and Policy Review](#) Issue 3, Article 6, 973 *et seq.* (2011).

range from \$1.9 million to \$30 million. It is important to note that these NTSB numbers reflect *only* property damage and environmental cleanup. They do *not*, as a rule, include claims for personal injury and private litigation against the railroads. In point of fact, these investigations are generally completed before any such litigation is either settled or tried.

Nonetheless, railroads (and perhaps insurance underwriters) look at the so-called Graniteville event as an example of how a catastrophic claim might unfold. The Graniteville case and the recent Canadian case will be discussed later in this paper. In light of those two events, the desire to put together a program with \$1 billion in limits begins to seem less risk-averse.

HazMat Losses: What Was On Board

Clearly, the NTSB materials show that the primary hazardous materials involved in accidents which are of sufficient magnitude to be investigated by the NTSB are generally more likely to be methanol, ethanol, vinyl chloride, phosphoric acid, hydrochloric acid, formaldehyde, liquid chlorine and the like. The Graniteville catastrophic loss was based upon an accident involving chlorine. Most of the NTSB reportable accidents do not involve any type of refined or crude petroleum materials. However, the Canadian loss⁷, discussed below, *did* involve Bakken product. It may be the largest loss yet, outstripping the Graniteville event.

Changing Technology and Equipment

As discussed above, the shipment of Bakken crude oil by rail has grown exponentially since 2008. At the same time, the government has concluded that shipment of Bakken crude oil is more dangerous than other types of crude. “Operation Classification” was a joint operation conducted by FRA⁸ and the Pipeline and Hazardous Materials Safety Administration⁹ (PHMSA). The result of this study was to conclude that Bakken crude from North Dakota is “more volatile and flammable than other crude oils.”¹⁰ DOT also takes the position that Bakken risks are higher due to the increasing volume of Bakken on the rails, and the fact that the average shipment travels over 1000 miles by rail. Research indicates that it is not unusual to have 100 or more crude carrying cars in a train. This is a significant increase over past practices in terms of the number of cars carrying crude on a single train.

In addition, following the 2009 Cherry Valley, Illinois accident (see NTSB materials) the regulatory focus has turned again to strengthening railcars. Specifically, regulators are focusing on so-called DOT 111 tank cars. Federal regulators have studied the problem but have not yet

⁷ The Lac-Megantic, Quebec catastrophe in July, 2013.

⁸ The Federal Railroad Administration, also part of the US DOT. Their web can be found here: <http://www.fra.dot.gov/Page/P0001>.

⁹ PHMSA is part of the US DOT. Its web site can be found here: <http://www.phmsa.dot.gov/>. PHMSA also tracks spills and the like, but without NTSBs “large incident” filter. As a result, if we look at PHMSA numbers, we would conclude that there are an enormous number of spills nationwide. PHMSA numbers seem to be frequently quoted when advocates are seeking more aggressive regulatory action. However, even advocates for regulatory action admit that these spills are generally small. For example, a recent California report states that reported rail spills in California effectively doubled between 2010 and 2013, citing PHMSA data and *not* the NTSB. “Oil by Rail Safety in California: Preliminary Findings and Recommendations”, State of California Interagency Rail Safety Working Group, June 10, 2014. The report is available on line here: <http://www.caloes.ca.gov/HazardousMaterials/Pages/Oil-By-Rail.aspx>. The report does state that: “Most reported incidents document a relatively small volume of oil released, but as detailed below, the potential for high-consequence incidents will increase as more oil is transported by rail.” The report goes on to refer to the tragic events in the Canadian loss which are discussed later in this paper.

¹⁰ DOT Press Release, “U.S. DOT Announces Comprehensive Proposed Rule Making for the Safe Transportation of Crude Oil, Flammable Materials,” <http://www.dot.gov/briefing-room/us-dot-announces-comprehensive-proposed-rulemaking-safe-transportation-crude-oil>.

promulgated specific design upgrades for these cars, which are the primary cars used in transporting Bakken crude. The industry has already responded. Since October of 2011, all new DOT 111 cars have had improvements, including stronger steel, heat shields, shelf couplers and bottom pallet files that are less prone to opening in a derailment. The market is also responding by phasing out the use of these cars altogether in anticipation of a new generation of further improved tank cars, once the Federal regulators conclude their deliberations and promulgate new standards.

New technology has been mandated by the Federal government as well. The concept of Positive Train Control (PTC) is presently being implemented, albeit slower than anticipated and with greater costs. The four key concepts involved in PTC are: train separation and collision avoidance, line speed limit enforcement, temporary speed restrictions and worker safety. The FRA wants to have a nationwide GPS system providing continuous positioning information for PTC. Congress set a deadline of December 2015 for the nationwide implementation of PTC. However, testimony in early 2014 to Congress indicates this target will not be met.

The Two Catastrophes

GRANITEVILLE

To assist underwriters, the full NTSB report on the Graniteville catastrophe in 2005 is provided through the References and Resources at the conclusion of this Paper. In January of 2005, a Norfolk Southern train collided with another standing Norfolk Southern train at Graniteville, South Carolina. The speed involved was 47 mph. The root cause of the accident as assessed by NTSB was human error. An improperly set line switch diverted the moving train from the main line onto the industry track. Three cars which contained chlorine derailed and at least one breached, releasing chlorine gas.

A total of nine people died and 554 people complained of respiratory difficulties. 75 people were admitted to hospital for treatment. NTSB says the total property damages exceeded \$5.9 million. But there are other, much more significant, costs. The accident occurred in the vicinity of an Avondale Mills textile plant. There were a total of four such Avondale plants in the area, all of which eventually closed. There were over 5000 residents within a 1 mile radius and they were evacuated for a period of nearly 2 weeks as environmental cleanup was conducted.

The cost of such catastrophic losses can be very difficult to establish early on. For example, Norfolk Southern announced at one point that it expected the total loss to be in the range of \$30 million-\$40 million. There were numerous claims by evacuated residents and businesses but which didn't involve any claims for medical attention. These issues were reportedly settled within a few months. The amounts of the settlements are undisclosed, but some reports say the amount was a flat \$2000 per person, plus \$200 per person per day for the evacuation period.

About a year after the crash, the president of Avondale Mills announced that all of its operations would be closed due to the inability of the company to recover from the financial losses attendant to the train crash. Notably, the mill had to pay more than \$140 million for repair and environmental cleanup costs. This mill closure created thousands of unemployed workers. Some

reports state that there was a settlement of \$215 million between Avondale Mills and its own insurance carriers. However, the settlement apparently did not cover all losses. As result the mill filed suit against Norfolk Southern. The case was settled for “an undisclosed amount” after trial began in 2008.

During the pendency of the trial, the US EPA sued the railroad for violations of the Clean Water Act. Subsequently, the EPA also alleged the discharge of tons of chlorine and thousands of gallons of diesel fuel into a nearby waterway. This case was eventually settled by the payment of some \$3.9 million by Norfolk Southern. It is not unrealistic to say that ultimate losses were in the neighborhood of \$400-\$500 million. As a result, it would seem that \$1 billion in insurance coverage is not an unrealistic amount to seek if there is a catastrophic loss.

LAC-MEGANTIC, QUEBEC / CANADA

We do not have the advantage of access to NTSB documents in assessing this catastrophe. Also, not enough time has passed at the time of the writing of this White Paper to allow for sufficient facts to be disclosed (or leaked to reporters) to create a fulsome understanding of the incident or its losses. Like the Graniteville loss, this event seems to have been based upon human error. A runaway train derailed in the center of Lac-Megantic; 63 tank cars were carrying crude oil in the event. Even the most superficial review of the NTSB materials available on the intranet will reveal that the majority of the NTSB-reportable US events occurred late at night or early in the morning and in generally remote locations. The catastrophic loss at Graniteville unfortunately occurred in an industrial area surrounded by a comparatively dense population cluster. The Canadian loss was an even worse situation: it occurred in the center of a small town.

A giant fireball from the explosion caused by the train crash in the town center killed at least 42 people and, according to one report, effectively destroyed the center of Lac-Megantic.

The railroad involved in the incident carried \$25 million of insurance coverage. Despite some initial "lowball" estimates of environmental cleanup costs, more recent reports indicate that number will approach \$200 million US. Other reports have stated that various claims for property damage and business loss, as well as the significant loss of life, injuries and other claims (emotional harm, etc.) will likely amount to "hundreds of millions of dollars." This may become the claim which approaches the \$1 billion loss number the industry fears. For an even worse scenario, one need only imagine a similar event occurring in Atlanta or some other large US population center.

Conclusion

Because of the enormous (and still-evolving) loss in Luc-Megantic, there is wide spread speculation that Canadian law is likely to change significantly. Since the railroad in this case had only \$25 million of insurance, it has filed bankruptcy. The Canadian government, as a result, is considering requiring much more insurance coverages for railroads as a matter of law. This white paper speculates that if such a requirement (with very large mandated amounts) comes to pass, the requirement could have an impact upon demand for (and subsequent availability of)

insurance coverages for other railroads... especially those which suffer the greatest risk, the Class I lines.

Earlier this year, the American Association of Railroads published a two page paper detailing industry actions in the wake of the Quebec tragedy. The industry says that it has self-policed and that it has imposed higher standards on itself than those presently required by the US government. These changes include route selection protocols, safety requirements, enhanced equipment inspections and lower speeds on trains with 20 or more tank cars of crude oil when those trains include at least one old (pre-2011) DOT 111 car. A 50 mph speed limit nationwide has also been unilaterally imposed by the industry upon itself. Between the fears of an industry concerned about a worst-case one billion dollar loss scenario and increased regulatory pressure, it appears that the future for the American railroad industry is one of improving loss mitigation and risk management processes in an attempt to avoid the industry's (and government's) nightmare scenario.

Additionally, the implementation of PTC will attack the source of the two worst-case/catastrophe losses described in this paper: Graniteville and Lac-Megantic. Both of those enormous losses had their root in human error. The dramatic increase in automation mandated by PTC should hopefully have the effect of lessening those risks, although to what extent this will be the case remains to be seen.

To sum up, we might properly observe that the frequency of large losses, especially given the dramatic increase in shipments by rail of crude and hazardous material since 2008, is low. We might even say that the frequency is actually decreasing, given the enormous increase in activity. The presently unknowable risk is whether or not the dramatic increase in activity on the rails since 2008 will ultimately result in multiple worst-case/billion-dollar losses or an increase in losses in the hundreds of millions of dollars. So far, the losses at Graniteville and in Canada have been statistical outliers. What remains to be seen is whether or not the increased rail activity with crude and hazmat will change that situation. One thing is clear: both industry and government regulators are moving (at varying speeds) in an attempt to prevent such eventualities.

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