

# INDEX OF KEY FACTS: NORTH AMERICAN RAIL TANK CAR FLEET

THE TANK CAR FLEET CAN BE MADE SIGNIFICANTLY SAFER: Upgrading the North American tank car fleet through retrofits and replacement will reduce likelihood of breach in a derailment.

*The likelihood of breach in derailment is dramatically reduced by adopting the HM-251 Tank Car of the Future with a 9/16" shell and other safety elements including a 1/8" steel jacket and thermal protection (HM-251) and appropriate retrofits to the legacy fleet. This can happen without a loss of payload.*

*Tank car retrofits and the HM-251 Tank Car of the Future can be deployed economically and deliver powerful economic benefits to North American GDP. The entire North American fleet in crude and ethanol will not require an upgrade. For upgrades that do occur, jobs and other beneficial spending directly and indirectly worth double the investment will follow.*

- The benefits to safety are demonstrated by the improvement in Conditional Probability of Release (CPR). CPR measures the likelihood of tank car spills in the event of a derailment at different speeds and by different car types. At a derailment speed of 50 mph CPR improves from 45% in bare DOT-111 legacy tank cars to just over 5% with the HM-251 Tank Car of the Future Design (see chart below). This improves CPR by more than **8 TIMES** from the least-protected tank car to the most-protected tank car. This makes the HM-251 tank car safer at any speed.

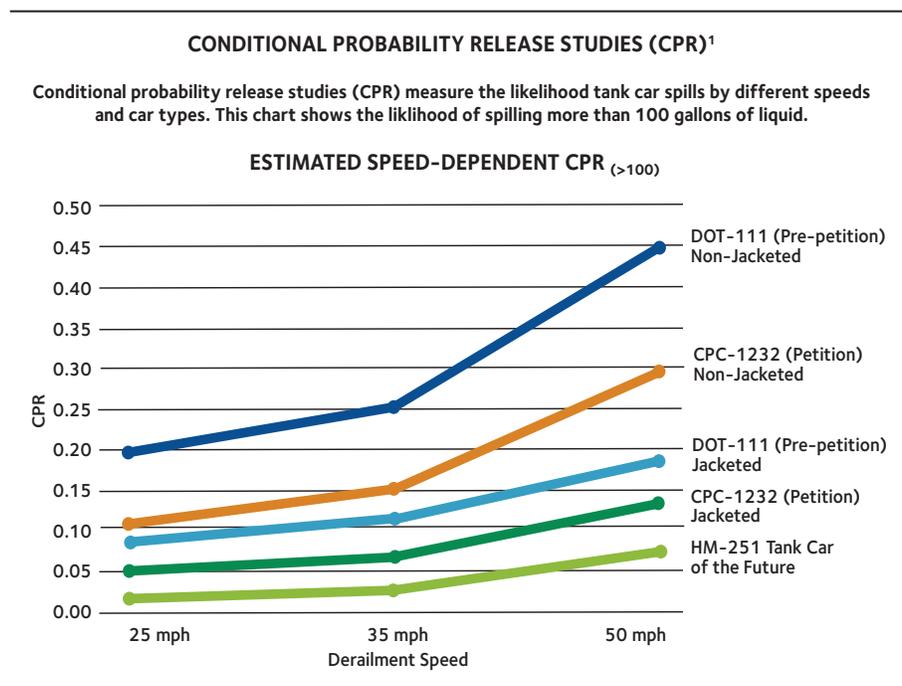
- Some have suggested that tank cars with a safer design and lower cargo capacity are actually less safe because this results in more total tank cars in service. Yet, that assertion is factually incorrect, because current designs can accommodate 30,000 gallons, a capacity volume equal to legacy DOT-111 tank cars. Moreover, newly designed tank cars perform much better in a derailment. As noted above, the HM-251 Tank Car of the Future lowers the rate of likely release upon breach by as much as **8 TIMES**—a statistic strongly favoring safer tank car design.

- The HM-251 Tank Car of the Future is **TWICE** as safe as the fully jacketed and insulated CPC-1232 when measured by CPR (see chart above).

- There are approximately 68,000 tank cars in crude and ethanol service. Because necessary retrofit configurations depend upon tank car type and individual tank car conditions, the range of retrofit costs extends from a low of \$20,000 to a high of \$60,000 in the most extreme example. The proposed HM-251 car is expected to be priced in a range of \$150,000-\$160,000.

- The North American tank car fleet in crude and ethanol service is not identical. Some tank cars do not require substantial modification like jacketing, thermal insulation and head shields. Some tank cars require only relatively minor modifications like pressure relief valves and removable bottom outlet valve handles.

- The average age of tank cars in the North American fleet is 15 years.<sup>2</sup> Tank cars that are 15 years and older will not likely receive the most extensive and most costly retrofits, since these cars are more likely to be retired



from crude and ethanol service.

- Retrofit capacity **WILL BE AVAILABLE**. For its part, Greenbrier recently announced it is teaming with Watco to build upon a network of 38 repair shops from coast-to-coast including 14 AAR certified tank repair and recertification facilities with plans to certify more tank repair shops.<sup>3</sup>

- Greenbrier believes the **TRUE TOTAL COST OF FULL TANK CAR SAFETY COMPLIANCE** will be approximately **\$3 billion**.<sup>4</sup>

## FOOTNOTES

- RSI-AAR Railroad and Car Safety Research & Test Project, April 2014.
- A Closer Look: North American Rail Tank Cars, Alltrantek LLC/FTR Associates, October 2013
- Greenbrier and Watco announce railcar repair joint venture GBW Railcar Services, June 4, 2014
- Internal Greenbrier analysis relying on industry data developed by the Railway Supply Institute and other sources

## REPLACEMENTS AND RETROFITS CREATE ECONOMIC VALUE/JOBS

- Money spent on new cars or retrofits has a multiplier effect throughout the economy. There are direct economic impacts and most importantly, jobs created to perform tank car retrofit and replacement—and these jobs will be located in regions large and small throughout America. There are indirect impacts including supply chain spending. Finally there are the multiple induced economic impacts from expenditures generated as a result of one of the largest single railcar retrofit and replacement programs in US history.<sup>5</sup>

## ENERGY RENAISSANCE POWERS U.S. ECONOMIC RECOVERY

- The recovery from the Great Recession has been slow—a recovery that has been substantially buoyed by the 50% annual increase in US shale gas and oil production since 2007 and the 1.7 million jobs created across the economy from shale energy development.<sup>6</sup>
- Total annual GDP impact of energy renaissance will nearly double from \$284 billion in 2012 to \$533 billion in 2025 producing over \$1.6 billion in government revenues from 2012-2025.<sup>6</sup>
- By 2015, 3.2% of all US manufacturing jobs will be linked (directly or indirectly) to shale energy development, supporting close to 400,000 manufacturing jobs. By 2025 this share will jump to 4.2% and over 500,000 jobs.<sup>7</sup>
- This expansion is at risk if crude by rail shipments are slowed substantially or unnecessarily curtailed.

## NETWORK-WIDE SPEED RESTRICTIONS AT 30 MPH HAVE BROAD NEGATIVE IMPACTS

- The negative impacts to velocity and capacity from slowing train speeds to 30 MPH, under review, would be severe and will impact the entire rail network and all commodities.<sup>8</sup>
- Class I railroads with the support of DOT have already undertaken risk-reduction efforts including imposing a 50 mph speed restriction for all unit trains carrying crude oil with 20 tank cars or more. This was followed by a 40 mph municipal speed restriction in May 2014 for key trains containing DOT-111 cars traversing High Threat Urban Areas. Together these actions combine to reduce kinetic energy inherent in a derailment by 56%.<sup>9</sup>
- BNSF handles a considerable amount of the nation's crude oil

transported by rail, especially Bakken crude. BNSF anticipates it would take about four years to overcome the loss of capacity caused by slowing the loaded crude trains beyond restrictions already placed into effect by agreement between Class I railroads and the DOT. BNSF reports the financial impact to it alone from the impact of slowing crude traffic would be approximately \$2.8 billion.<sup>10</sup>

- The Association of American Railroads anticipates a 10% negative impact on overall rail network velocity and a 10% negative impact on railroad capacity with a 30 mph speed restriction placed on unit trains carrying crude oil.<sup>11</sup>
- The imposition of significant maximum allowable train speed reductions for loaded crude trains will have a profound effect on railroads' ability to serve their customers. Major lines of business including grain, intermodal, stone, gravel and sand, chemicals, forest products, other agricultural products and automobiles would suffer delays as a result of lowering train speeds.<sup>12</sup>
- These impacts also threaten to move hazardous material traffic to other modes of transportation that are not as safe or reliable as rail such as diversion to highways.<sup>13</sup> Modal shift will result in other consequences like additional damage to highways and bridges.
- DOT can and should act now to publish tank car design standards which have now been postponed for almost 4 years. DOT should carefully study any additional mandatory speed restrictions in light of the potential severe negative consequences to the economy, taking time to consider the most effective railroad operating requirements that complement improved tank car design, including the HM-251 Tank Car of the Future.

## ACTION IS NEEDED NOW ON TANK CAR DESIGN; BIFURCATE THE RULE

- The design that best improves safety is now known—the time to adopt it is now. Current industry backlog is 55,400 tank cars<sup>14</sup> and growing, with plans to increase capacity.<sup>15</sup>
- A new design standard will reassure the tank car market and allow for thoughtful capital planning and purchasing processes.
- The implications of speed restrictions are complex. The most important contribution to the safer transportation of hazardous materials by rail is to get the properly classified commodity in the best designed tank car. A rule on tank car design can be published now and rules regarding railroad operating practices can follow.
- Tank car design rules should proceed without any further delay.

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### FOOTNOTES

<sup>5</sup> Assumptions based on analysis in PIH Tank Car Crashworthiness Performance Standards NPRM by Pipeline and Hazardous Materials Safety Administration, March 19, 2008, and standard economic principles

<sup>6</sup> Game changers: Five opportunities for US Growth and Renewal, McKinsey Global Institute, July 2013

<sup>7</sup> America's New Energy Future: The Unconventional Oil and Natural Gas Revolution and the US Economy, IHS Economics, February 2014

<sup>8</sup> Assumptions based on analysis in PIH Tank Car Crashworthiness Performance Standards NPRM by Pipeline and Hazardous Materials Safety Administration, Sect. 11.7, et seq., March 19, 2008

<sup>9</sup> Data supplied by BNSF

<sup>10</sup> Calculating Railroad Capacity and Performance Impacts that Result from Changing the Maximum Speed of Specific Train Types, as submitted by BNSF to OIRA, June 10, 2014

<sup>11</sup> Statement of Edward Hamberger, President & CEO AAR before Crude by Rail Conference, Arlington, VA, June 12-13, 2014

<sup>12</sup> Speed Restriction Impacts to Train Performance & Railroad Capacity, as submitted by BNSF, CSX and Union Pacific to OIRA, June 10, 2014.

<sup>13</sup> Assumptions based on analysis in PIH Tank Car Crashworthiness Performance Standards NPRM by Pipeline and Hazardous Materials Safety Administration, Sect. 11.3, March 19, 2008

<sup>14</sup> According to American Railway Car Institute data

<sup>15</sup> Greenbrier Reports Second Quarter 2014 Results; Backlog Grows to 15,200 units, April 3, 2014