



M O V I N G T H E  
**AMERICAN  
ECONOMY**

*Federal Railroad Administration  
Background*

**U.S. DEPARTMENT OF TRANSPORTATION  
PROPOSED RULE: RAILROAD TANK CAR SAFETY STANDARDS**

**Background**

The primary safety concern in the transportation of hazardous materials by rail is the prevention of a catastrophic release in close proximity to populated or environmentally sensitive areas where the consequences of an accident could include significant loss of life, widespread injuries, or environmental damage. Of paramount importance in this context is the safety of hazmat commodities classified as toxic or poison inhalation hazards (PIH) such as chlorine and anhydrous ammonia, that pose especially serious threats to human health.

While the vast majority of hazardous materials shipped by railroad tank car each year arrive at their destinations safely and without incident, there have been accidents in which the tank car head or shell was breached and PIH material was released. As a result of such accidents--including those in Macdonia, TX, Graniteville, SC, and Minot, ND--the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Federal Railroad Administration (FRA) initiated a comprehensive review of design and operational factors that affect rail tank car safety and developed this Proposed Rule to dramatically improve the accident survivability of railroad tank cars hauling PIH materials.

**Summary of the Proposed Rule**

**The proposed rule will apply to all rail tank cars used to transport PIH materials.**

The goal of the proposal is to provide improved tank car integrity under the most commonly identified derailment and collision scenarios, significantly enhancing the safety of the public from these very low probability, but high-consequence, incidents.

**The proposal sets forth a combination of enhanced tank car performance standards and decreased operating speeds to accomplish this goal.**

The proposed new performance-based standard will increase by 500 percent on average the amount of energy the hazmat tank car must absorb during a train accident before a catastrophic failure will occur. This can be achieved with innovative designs, materials, and technologies available today and in combination with operating speed restrictions.

**The proposal establishes a maximum speed limit of 50 mph for PIH tank cars.**

The proposed speed limitation would restrict the operating speed of all tank cars transporting PIH materials to a maximum of 50 mph; a measure effectively already in place today through voluntary actions adopted by the rail industry for the majority of PIH shipments.

**As a temporary measure, the proposed rule also requires a maximum speed limit of 30 mph for PIH tank cars that do not meet the performance standards and are operating in non-signalized or “dark” territory.**

The 30 mph speed restriction is based on FRA’s finding that a disproportionate number of incidents resulting in loss of PIH material occurred in dark (non-signalized) territory. In lieu of complying with the 30 mph speed restriction, railroads may implement alternative safety measures, such as switch position monitoring systems, track integrity circuits, enhanced operational safeguards, or positive train control technology. As tank cars meeting the enhanced performance standard enter the fleet, this 30 mph restriction will be phased out.

**The proposal requires PIH tank cars to be designed and manufactured with enhanced tank car head and shell puncture-resistance systems capable of withstanding the proposed performance tests without loss of lading.**

The proposed rule requires that PIH tank cars have a shell puncture-resistance system capable of withstanding a side impact at 25 mph. Derailment dynamics modeling results indicate that the secondary car-to-car impact speed is approximately one-half of initial train speed. Thus, requiring tank cars to withstand head and shell impacts of at least 25 mph by limiting the speed of those tank cars to 50 mph ensures that, in most instances, a tank car would not be breached if involved in a derailment or other similar type of accident. To address the higher forces associated with direct impacts in train-to-train collisions, the tank-head puncture-resistance system would be required to survive an impact at 30 mph.

**The proposed rule requires that certain older PIH tank cars in use today be removed on an accelerated schedule from carrying PIH materials.**

Additionally, because of concerns that have been raised about the ability of PIH tank cars manufactured prior to 1989 with non-normalized steel to resist the propagation of fractures that can lead to catastrophic failure, such tank cars will be phased out of PIH service no later than five years after the effective date of the rule. This portion of the tank car fleet represents the oldest cars and those that are the most cost and safety efficient for early replacement.

**The proposal permits an increase in the gross weight of tank cars from 263,000 pounds to 286,000 pounds to offset the potentially increased weight of an enhanced tank car.**

This measure should enable shippers to continue meeting customer demands without significantly increasing the total number of PIH shipments.

**The proposed rule allows eight years for compliance with the enhanced tank-head and shell puncture-resistance standards.**

FRA anticipates that it will take two years to design and begin construction of tank cars meeting the new performance standard. In the remaining six years of the implementation period, the proposal requires steady replacement of existing tank cars with those meeting the enhanced tank-head and shell performance standard. Fifty percent of each tank car owner’s fleet must comply with the enhanced performance standards five years into the implementation period.

## **Cost/Benefit Summary**

The proposed rule requires replacement of the entire fleet of tank cars used to transport PIH materials, estimated at 15,300 tank cars, within eight years from the final rule's effective date. FRA evaluated the costs and benefits of the proposed rule over a thirty-year period – the economic life cycle of a typical tank car.

The majority of the benefits are expected to accrue from the reduction in the number of casualties arising from accidents and derailments involving tank cars that transport PIH materials. In addition, additional savings should be realized from a decrease in property damages, including damages to tank cars and railroad track; environmental remediation; track closures; road closures; evacuations; and litigation. In total, FRA believes that these accrued benefits over a thirty year time frame will total approximately \$665 million.

Taking into consideration actual and planned voluntary industry initiatives to introduce more crashworthy PIH tank cars, FRA estimates the implementation costs over the thirty-year period will total approximately \$350 million.

For more information contact:  
Federal Railroad Administration Public Affairs  
202-493-6024  
March 31, 2008

###