

New rules for oil tank cars don't offer enough fire protection, experts say

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When a train hauling volatile crude oil derailed near Galena in March, witnesses said it took about only an hour for tank cars to explode, sending giant fireballs hundreds of feet into the sky.

Authorities said the tank cars survived the derailment intact, only to be engulfed in a flaming pool of oil that leaked from damaged cars and was ignited by a spark. The heat built up so much pressure within the cars that they blew up.

"If we could have stopped other tank cars from being impinged, it would have helped," Galena Fire Chief Randy Beadle said. "But once that first one opened up, we had to let it all burn itself out."

The federal government on May 1 unveiled new regulations aimed at making tank cars stronger to survive such fiery derailments, but critics say the new rules don't provide adequate protection against fire and heat, factors that cause cars to explode.

New and retrofitted tank cars must have thermal insulation and pressure relief valves to protect against heat and flames, under the updated standards, but the U.S. Department of Transportation retained a 20-year-old standard when it came to how long tank cars should be able to survive in a fire.

Instead of imposing a tougher regulation, as some sought, the department allowed to stand a rule that tank cars be able to survive being engulfed in a pool-type fire a minimum of 100 minutes without failing. That regulation wasn't written with crude oil in mind, experts and industry officials say.

Firefighters argue the new measures are inadequate when dealing with the threat posed by the multitude of mile-long oil trains that cross the country and pass through Chicago each day.

Even industry groups urged the U.S. Department of Transportation to order that tank cars be able to survive up to 800 minutes — more than 13 hours — in a pool of fire.

The department, however, decided to stand by the old thermal protection standard, saying that tests have shown that the 100-minute survival time should be "used as a benchmark for adequate performance."

That time "was established to provide emergency responders with adequate time to assess a derailment, establish perimeters and evacuate the public as needed, while also giving time to vent the hazardous material from the tank and prevent an energetic failure of the tank car."

First responders disagree, saying more time is better.

In Galena, the explosions were so dangerous that firefighters couldn't get close enough to extinguish the flames, Beadle said.

"The longer you've got to fight the existing fire without having to worry about impinging the adjacent tank cars and not

having to worry about them erupting, that's going to be a win-win situation for everybody," Galena's Beadle said.

"It doesn't make any sense to me if the railroads are willing to impose stricter standards ... why the government wouldn't be for it," Beadle said. "I think the railroads would have a better understanding of their product than someone behind a desk (in Washington)."

A Tribune analysis of federal records and documents show that as many as 40 mile-long crude oil trains, each carrying a million or more gallons from the Bakken shale fields in North Dakota, roll through the Chicago area each week.

If a fiery derailment were to occur in the Chicago area, it would challenge the combined manpower of several fire departments, officials say.

Jay Reardon, president of the Illinois Mutual Aid Box Alarm System, under which individual fire departments team up to respond to major emergencies, said buying more time to react to such a situation is paramount.

"Anything that would extend the durability of tank cars in harm's way would be beneficial to first responders," said Reardon, the former fire chief of Northbrook. "In a highly urbanized area, the more time to evacuate the better it's going to be for everyone."

Sean Maloy, the president of the Illinois Fire Chiefs Association and head of Bedford Park's department, said Bakken crude oil contains volatile gases that make it especially dangerous.

"We've never seen a 100-minute fire in a tank car failure," Maloy said. "We've seen 24-hour fires. You need to allow for more than 100 minutes."

Others groups support a much longer standard. The Association of American Railroads, which represents the railroad industry, called for an 800-minute threshold for tank car survivability in an oil pool fire.

Edward Hamberger, president of the Association of American Railroads, told the Tribune that the industry was disappointed that the Transportation Department did not heed that recommendation.

"If you're going to be building a new tank car, having more thermal protection, mitigating the accident, and giving emergency responders more time ... would be a big safety benefit," Hamberger said.

Other organizations, like the International Association of Fire Chiefs, say they haven't had time yet to review the nearly 400 pages of new regulations announced this month by Transportation Secretary Anthony Foxx.

Previously, the National Transportation Safety Board had recommended the new thermal protection threshold "meet or exceed" the old standard.

"We will be analyzing the rule to see how it aligns with our outstanding safety recommendations and will be releasing the results in the near future," an NTSB spokesman said.

The regulations will phase out older model tank cars that have been deemed unsafe and replace them with a "new generation" of more robust cars, known as DOT-117s, built to stronger specifications, like thicker steel shells.

According to the NTSB, when a tank car is exposed to heat from a pool fire, the internal pressure increases while the strength of the tank decreases. The tank will rupture if a pressure relief device cannot sufficiently relieve internal pressure.

"The resulting thermal tear in the shell material suddenly releases built-up pressure, ejecting vapor and liquid to ignite

in a violent fireball eruption," the NTSB said in its recent recommendation.

In addition to Galena, the NTSB said similar "thermal failures" occurred at three other derailments this year alone, including Mount Carbon, W. Va., and two incidents near Gogama, Ontario, on Feb. 14 and March 7.

The agency said its preliminary investigation showed 28 CPS-1232 model tank cars failed in the four incidents. These cars are considered more robust than DOT-111 tank cars, which are widely used to haul crude oil. Thermal protection is optional for DOT-111 cars.

The Transportation Department ordered that DOT-111s be retrofitted for crude oil use or phased out in three years and CPS-1232 in five years.

Christopher Barkan, a railroad engineering professor at the University of Illinois at Urbana-Champaign, said the new tank car design standards will make a "huge difference" in terms of impact resistance during derailments.

The DOT-117 cars are 85 percent less likely to release their contents than the DOT-111s, Barkan said.

But tank cars need to be have additional thermal protection as well as being stronger, said Barkan, who added it was hard to understand why the Transportation Department decided to retain the old standard, which was developed for liquefied petroleum gas, not crude oil.

"In 2015, we would like to have a tank car that doesn't fail after 100 minutes or, better still, never fails at all," Barkan said.

It was especially troubling, Barkan said, in light of the series of fiery oil train explosions in recent years, including one in Lac-Megantic, Quebec, that killed 47 people in 2013.

The latest explosive derailment occurred May 6 in Heimdal, N.D. Six cars were engulfed in flames and burned for more than 24 hours. Nearby residents were evacuated.

"You have this odd situation where the regulated community wants a safer standard than the Department of Transportation is requiring," Barkan said. "They are supposed to be the guardians of safety."

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