

New PHMSA Rule Allows Rail LNG Transport

On July 24, 2020, the Pipeline and Hazardous Materials Safety Administration (PHMSA or the Agency) published a [Final Rule](#) (Rule) in the *Federal Register* allowing railroads to transport liquefied natural gas (LNG) in modified DOT-113C120W (DOT-113) railcars designed to hold cryogenic flammable liquids. The rule was prompted by a 2017 Association of American Railroads (AAR) rulemaking [petition](#) to allow LNG transport by rail and [Executive Order 13868](#), directing PHMSA to conduct a rulemaking allowing LNG to travel by rail tank car. In developing the Rule, PHMSA relied on safety data from other cryogenic flammable liquid shipments and from an existing [special permit](#) that already allows limited transportation of LNG by rail to demonstrate LNG could safely be transported. The Rule follows PHMSA's October 24, 2019, [Notice of Proposed Rulemaking](#) (NPRM). It takes effect on August 24, 2020, and PHMSA is allowing immediate voluntary compliance.



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The rulemaking attracted significant attention from industry eager to meet increased natural gas demand, safety organizations such as the National Transportation Safety Board that raised concerns about transporting LNG, and from environmental groups. Numerous media reports on the Executive Order also increased public attention. Over 450 individuals and organizations [submitted comments](#) on the NPRM. In the NPRM and in the Rule, PHMSA noted that it lacks data about how many LNG rail shipments are likely to occur under the new rules. Currently, cryogenic flammable gases are transported rarely by railcar, but most commenters expect LNG rail shipments to quickly outstrip shipments of other cryogenic flammable gases.

Previously, LNG could only be transported by rail tank car with a special permit, or in smaller, portable tanks loaded onto a railcar. However, other cryogenic liquids that pose risks similar to LNG, such as ethylene and hydrogen, can be transported on DOT-113 railcars under the current Hazardous Materials Regulations. In the NPRM, PHMSA proposed allowing railroads to transport LNG on DOT-113 rail tank cars, and sought comment on additional design requirements and other safety measures the Agency should consider. In response to public comments, the Rule allows LNG to be transported in DOT-113 tank cars that meet additional design requirements, indicated by adding a "9" at the end of the DOT-113C120W Standard name. This will differentiate LNG railcars from existing DOT-113 railcars. The Rule also requires railroads and entities offering LNG to implement additional operational controls over LNG shipments.

What Did PHMSA Change in the Final Rule?

PHMSA is allowing LNG shipment by rail tank car, subject to additional design requirements for DOT-113 railcars:

- LNG may be transported by rail in DOT-113 railcars, provided that they meet the following additional design requirements:
 - o The outer shell must be made of AAR TC 128, Grade B normalized steel plate, previously required only for railcars transporting hazmat that presents poisonous inhalation hazards and toxic inhalation hazards.
 - o The outer steel jacket thickness is increased from 7/16 inches to 9/16 inches and the outer jacket head thickness is increased from 1/2 inch to 9/16 inches.
 - o PHMSA is designating this enhanced standard as DOT-113C120W9 and requiring railcars that meet it to be marked to distinguish them from DOT-113 railcars designed to transport other cryogenic flammable liquids
- Railcars transporting LNG must meet the following railcar design and loading requirements:
 - o A start-to-discharge pressure valve setting of 75 psig
 - o A design service temperature of -260° F
 - o A maximum pressure when offered for transportation of 15 psig
 - o A filling density of 37.3% by weight, increased from 32.5% in the NPRM

- PHMSA is allowing DOT-113 railcars carrying LNG to be loaded up to a gross weight of 286,000 lbs., with approval from the Federal Railroad Administration (FRA), because an unladen railcar meeting the enhanced DOT-113 standard will weigh at least 138,050 lbs.

The Final Rule also imposes additional operational controls on LNG shippers and railroads:

- Shippers must remotely track and monitor railcars transporting LNG for pressure and location and inform the railroad if tank pressure rise exceeds 2 psig in a 24-hour period. Shippers must also notify the FRA if an LNG railcar does not reach its destination within 20 days.
- In the NPRM, PHMSA considered incorporating two AAR operating standards for hazmat trains by reference, OT-55 and HM-1. PHMSA chose not to, so that railroads would have the option to adopt operational practices that exceed those standards. FRA tracks railroad voluntary compliance with these standards, and PHMSA indicated it would reverse course if FRA finds railroads are not operating in accordance with these standards or exceeding them.
- Before a railroad may transport LNG, it must perform a routing analysis considering 27 safety and security risk factors listed in 49 C.F.R. Part 172, Appendix D. After the routing analysis is complete, railroads must comply with the safety and security plan requirements and commodity flow data gathering requirements currently required for High-Hazard Flammable Trains (HHFT).
- A train with a block of 20 or more LNG tank cars, or 35 or more total LNG tank cars, must be equipped with an end of train device or a distributed power system to facilitate faster breaking, as is required for HHFTs.

Commentary

- The Hazardous Materials Regulations prescribe requirements for separation between railcars carrying hazmat based on the type of hazmat carried, whether a car is occupied by a crewperson, the distance from the locomotive or other power unit, and other factors. Several commenters proposed that PHMSA should adopt more stringent railcar separation requirements for LNG shipments. PHMSA declined to do so, and cited several ongoing research projects into hazardous materials railcar separation safety. PHMSA indicated it might impose more restrictive separation requirements for LNG if that research demonstrates a safety benefit in doing so. In the Rule, PHMSA also noted that it lacks an effective method for estimating the number of LNG railcars that may be loaded onto a train. PHMSA stated that the number of railcars could also affect potential future separation requirement changes.



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Led by three former Pipeline and Hazardous Materials Safety Administration (PHMSA) attorneys, our Pipeline and Hazardous Materials Safety practice group counsels pipeline and midstream companies, gas utilities, terminal operators, investors, trade associations, and other stakeholders, throughout the United States. James Curry, Keith Coyle and Brianne Kurdock together have more than 25 years of experience with a multitude of pipeline safety issues. They partner with client engineering and legal personnel to address day-to-day compliance questions and develop business and regulatory strategies.