

BEFORE THE
PIPELINE AND HAZARDOUS MATERIALS
SAFETY ADMINISTRATION

PETITION FOR RULEMAKING
TO ALLOW METHANE, REFRIGERATED LIQUID
TO BE TRANSPORTED IN RAIL TANK CARS

SUBMITTED BY
THE ASSOCIATION OF AMERICAN RAILROADS

This petition is filed by the Association of American Railroads (“AAR”), on behalf of itself and its member railroads, pursuant to 49 C.F.R. § 106.100.¹ AAR petitions for rulemaking to authorize the transportation of methane, refrigerated liquid (“LNG”), by rail in DOT-113C120W and DOT-113C140W tank cars.² LNG should be authorized for rail transportation because it is a safe method of transporting this commodity, LNG shippers have indicated a desire to use rail to transport it, and because railroads potentially will need to transport LNG for their own use as a locomotive fuel.

LNG is currently missing from the list of commodities authorized for rail transportation simply due to the historical lack of interest in transporting LNG by rail. As discussed below, LNG is similar in all relevant properties to other hazardous materials that are currently authorized to be transported by rail. The current and expected future demand for transportation of LNG by rail warrant

¹ AAR is a non-profit trade association whose membership includes freight railroads that operate 83 percent of the line-haul mileage, employ 95 percent of the workers, and account for 97 percent of the freight revenues of all railroads in the United States; and passenger railroads that operate intercity passenger trains and provide commuter rail service.

² Other common names for methane are “cryogenic liquid,” “natural gas, refrigerated liquid,” “liquefied natural gas” or “LNG” (UN-1972) hazard class 2.1.

prompt authorization by the Pipeline and Hazardous Materials Safety Administration (“PHMSA”).³

There Is A Commercial Interest In Transporting LNG by Rail.

Currently, the only way to transport LNG is by obtaining special approval from PHMSA for rail transport, or by transporting it via highway.⁴ Notwithstanding the requirement for a special approval, customers have expressed interest in shipping LNG by rail from Pennsylvania to New England, and between the U.S. and Mexico. Authorizing transportation of LNG by rail likely would stimulate more interest. In addition, several railroads are actively exploring LNG as a locomotive fuel. If railroads are to use LNG-powered locomotives, they would need to supply LNG along their networks. Transporting LNG in tank cars would be an optimal, if not essential, way to transport LNG to those locations.

There Is No Safety Justification For Prohibiting The Transportation of LNG by Rail.

Rail is undeniably safer than over-the-road transportation of LNG, and transport via that mode should be facilitated.⁵ The reason the hazardous materials regulations do not currently authorize the transportation of LNG by rail is simply that there was a lack of demand for rail transport of LNG when PHMSA authorized DOT-113 tank cars for the transportation of cryogenic liquids and listed

³ Notably, Transport Canada authorizes the transportation of LNG in DOT-113 cars. There is no reason for DOT and Transport Canada to have different regulations with respect to rail transport of LNG.

⁴ Pipelines could also be used to transport LNG; however, their geographical reach is limited, particularly in the northeast.

⁵ Freight RRs have about 11% of the fatalities that large trucks do per trillion ton-miles. Large truck-related fatalities from USDOT, FMCSA, Large Truck and Bus Crash Facts, 2012, Table 4, at <http://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2012-pdf> Both rail and large truck ton-miles in 2012 from BTS Commodity Flow Survey, Table 2a, p. 3, at www.census.gov/econ/cfs/2012/ec12tcf-us.pdf

For hazmat shipments, railroads have 12% of the hazmat accidents that trucks have, despite roughly equal hazmat ton-mileage. Pipeline & Hazardous Materials Safety Administration, Hazardous Materials Incidents By Year & Mode, for 2006 through 2015, as of 7/20/2016, at <https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Dashboard>

the cryogenic liquids that could be transported in those cars. There was no determination that rail was an unsuitable mode of transporting LNG.

Indeed, PHMSA’s regulations authorize the rail transport of cryogenic liquids with similar properties. Table I, below, lists the cryogenic liquids transported in 2015 in DOT-113 cars. As one example, ethylene, refrigerated liquid has been safely transported in tank cars for 50 years. The differences between ethylene and LNG are so minor as to be insignificant. LNG has a normal boiling point of –260F, ethylene –160F. LNG weighs ~3.6 lbs./gal., ethylene 4.7 lbs./gal. Both ethylene and LNG are lighter than air at ambient temperatures and thus any spilled or vented liquid or gas disperses in the air as soon as it warms up to ambient temperature. Indeed, ethylene poses equal or greater reactive risk than LNG.

Table 1
U.S. Shipments of Cryogenic Liquids in Tank Cars in 2015⁶

Proper Shipping Name	U.S. DOT Hazard Class	UN/NA Number	US Tank Car Originations
CARBON DIOXIDE, REFRIGERATED LIQUID	2.2	UN2187	10,708
ARGON, REFRIGERATED LIQUID	2.2	UN1951	1,588
ETHYLENE, REFRIGERATED LIQUID	2.1	UN1038	356
HYDROGEN CHLORIDE, REFRIGERATED LIQUID	2.3	UN2186	118
Total			12,770

In fact, LNG would not be the most hazardous cryogenic liquid transported by rail should PHMSA authorize such transportation. Hydrogen chloride is authorized for rail shipment, and the consequences of an accidental release of

⁶ Tank car originations presented in this table come from TRAIN II, AAR’s Railinc railcar movement database, and specifically from TRAIN II waybills. All of the major freight railroads and many of the short lines and regional railroads report their waybill information, car interchanges, and other car movement events to TRAIN II.

hydrogen chloride would be far greater than a release of LNG. Likewise, oxygen, refrigerated liquid, and hydrogen, refrigerated liquid, are authorized for rail transportation in DOT-113 tank cars (although customers are not currently moving these commodities via rail). Hydrogen, refrigerated liquid, has a boiling point of -423 F and oxygen, refrigerated liquid, has a boiling point of -297 F. Both are potentially more dangerous than LNG to ship because of their low boiling points.

The record reflects that railroads transport cryogenic liquids very safely. There have been only two accidental releases of the cryogenic liquids listed in Table 1 from DOT-113 cars in the past 16 years.

Proposed Amendments to 49 C.F.R. Parts 172 and 173

Authorization of transportation of LNG by rail requires amendment of the Hazardous Materials Table in 49 C.F.R. section 102. Accordingly, the column 8(C) entry for methane, refrigerated liquid, should refer to “319,” in addition to “318.”

In addition, AAR suggests that section 173.319 be amended to include specific requirements for DOT-113 cars used for the transportation of LNG. AAR suggests that the authorized specifications be DOT-113C120W and DOT-113C140W, cars because the 120W cars should provide 40 days in transportation before the LNG might vent and the 140W cars should provide 45 days prior to venting. AAR further suggests that PHMSA include maximum filling densities comparable to the maximum filling densities specified for cargo tanks containing LNG in 173.318(f)(3). These changes could be implemented by amending 49 C.F.R. §173.319(d)(2) as follows:

“(2) Ethylene, hydrogen (minimum 95 percent parahydrogen), and methane, cryogenic liquids, must be loaded and shipped in accordance with the following table:

Pressure Control Valve Setting or Relief Valve Setting

Maximum Set-to-discharge Pressure (psig)	Maximum permitted filling density (percent by weight)				
	Ethylene	Ethylene	Ethylene	Hydrogen	<u>Methane</u>
17				6.60	
45	52.8				<u>38.4</u>
70					<u>37.5</u>
75		51.1	51.1		
Maximum pressure when offered for transportation	10 psig	10 psig	20 psig		
Design service temperature	Minus 260 °F	Minus 260 °F	Minus 155 °F	Minus 423 °F	<u>Minus 260 °F</u>
Specification (see 180.507(b)(3) of this subchapter)	113D60W	113C120W	113S120W	113A175W	<u>113C120W</u>
	113C60W			113A60W	<u>113C140W</u>

Because authorization of LNG for rail transportation is consistent with PHMSA's existing authorization of other commodities, and because rail is safer than over-the-road transportation for this commodity, and because authorization will facilitate the movement of LNG by rail, AAR requests expedited processing of this petition.

Respectfully submitted,



Robert E. Fronczak, P.E.
Assistant Vice President Environment &
Hazmat

Association of American Railroads
425 Third Street, S.W. Suite 1000
Washington, DC 20024
January 17, 2017