requirements for cryogenic materials, and the mandated requirements for redundant pressure relief systems (valves and safety vents) that are built into each car. The number of cars that could be impacted by this type of exposure would be dependent on multiple factors. Some of these include, but are not limited to: type of fire, duration of the fire, whether the flames are impinging upon the neighboring cars or whether the exposure is only by radiant heat, defensive actions of responders, etc.

Exposure to heat from an LNG pool fire or ignition of LNG vapors could result in fatalities, serious injuries, and property damage for those within the limited zone of hazard. These risks also exist in the transportation of LNG via highway, existing rail transportation, and pipeline. However, given the safety history of the DOT-113C120W tank cars, it is expected that the risk of a tank car failure and ignition is low.

Cryogenic Temperature Exposure

In a scenario involving cryogenic temperature exposure, the risk to an undamaged DOT-113 specification tank car is the embrittlement of the tank car's outer tank carbon steel due to exposure to the extremely cold temperatures; the inner stainless-steel tank will not be affected. As stated previously, if a DOT-113 specification tank car has its outer tank compromised, it would lose its insulating vacuum and would eventually start to build pressure within the product tank. This pressure build would lead to the activation of the tank car's PRDs and the controlled venting of LNG vapors.

Incident data with (non-LNG) hazard materials may suggest that incidents involving rail tank cars can lead to a larger area of consequence as compared to hazard areas arising from incidents involving MC-338s cargo tank motor vehicles (or ISO portable tanks moved by rail). This is because of the larger volume of LNG in each tank car compared to that in a MC-338 cargo tank. However, the impact on people may be more (depending upon the location of the accident) in the case of a cargo tank because of the highway proximity to densely populated areas compared to the location of rail tracks. It is also noted that highway incidents in general are more common than rail incidents; so PHMSA assumes that this trend applies regardless of the cargo.[11] Therefore, PHMSA believes that from an overall risk to the public perspective rail transportation is a safer option considering the quantity and distance transported.

No Action Alternative

It is important to note that the risks of transporting LNG via rail also apply to the shipment of LNG via highway. As discussed above, the transportation of LNG by cargo tank is already permitted by the HMR. Under the No Action Alternative, ETS would likely opt to transport most of the LNG it wishes to move to market over roadways in MC-338 cargo tank motor vehicles. The risks discussed above, inherent to the transportation of LNG, including, damage to human tissues and container integrity due to -162 ºC (-260 °F) cryogenic materials and the radiant heat from fires that could result from vapor ignition could increase with the selection of the No Action

[11] It appears highway accidents are increasing with the growing economy and the rise in distracted driving, while rail incidents slightly declined in 2018. https://www.statista.com/statistics/204569/rail-accidents-in-the-us/ ; https://www.motus.com/car-accidents-increase-12-3-percent-finds-new-motus-distracted-driving-report/ (last accessed June 3, 2019).