7.1 LNG DOT-113 Shipping Risk

The LNG DOT-113 shipping risk was analyzed with a train configuration containing a sequence of LNG DOT-113 cars where the first LNG DOT-113 is at car position eleven. This configuration leads to a probability of multiple car derailment that maximizes the chances of up to eleven cars being involved in a LOC event. Thus, this configuration provides a conservative case for risk.

The FN curves were calculated as a function of population density for one mile long sections of track. The maximum IR and SR are also influenced by the magnitude of the potentially affected population within each one mile section. The maximum population density along any route was 20,000 people per square mile. This population density will therefore correlate to the highest risk for train movement anywhere along the mainline.

7.1.1 Train at Low Speeds

A summary of the baseline risk metrics for the LNG DOT-113 mainline movement at train speeds less than or equal to 25 mph case is provided in Table 25. The SR integral is the area under the FN curves presented in Figure 9.

Table 25. Mainline train speeds up to 25 mph - summary of the risk metrics for LNG DOT-113 car train movements for different population densities.

Population density (people/mile^2)	SR Integral (total risk, yr^{-1})	Maximum IR (yr^{-1})	Maximum Distance to Zone 1 - 1×10^{-5} IR (ft)	Maximum Distance to Zone 2 - 1×10^{-6} IR (ft)	Maximum Distance to Zone 3 - 3×10^{-7} IR (ft)
500	3.61×10^{-5}	9.47×10^{-7}	N/A	N/A	455
1,000	7.56×10^{-5}	9.59×10^{-7}	N/A	N/A	460
2,000	1.64×10^{-4}	9.81×10^{-7}	N/A	N/A	462
3,000	2.64×10^{-4}	1.00×10^{-6}	N/A	1	465
4,000	3.74×10^{-4}	1.02×10^{-6}	N/A	65	470
5,000	4.93×10^{-4}	1.04×10^{-6}	N/A	92	475
7,000	7.57×10^{-4}	1.08×10^{-6}	N/A	115	485
9,000	1.05×10^{-3}	1.11×10^{-6}	N/A	145	495
11,000	1.36×10^{-3}	1.14×10^{-6}	N/A	160	500
13,000	1.70×10^{-3}	1.17×10^{-6}	N/A	174	505
15,000	5.49×10^{-3}	1.19×10^{-6}	N/A	175	507
17,500	2.49×10^{-3}	1.22×10^{-6}	N/A	185	510
20,000	2.96×10^{-3}	1.24×10^{-6}	N/A	195	512