Table E5. Average number of cars derailed (1997-2016).

Statistic	No. of Cars
Mainline Derailment Accident Speed ≤ 25 mph	5
Mainline Derailment Accident, Speed > 25 to ≤ 50 mph	11

One train configuration was evaluated, which placed LNG DOT-113 tank cars in sequence from train position 11 on to the end of the train. If a train accident leads to a derailment, the probability relationship for multiple cars being derailed at high speed (> 25 to ≤ 50 mph) is shown in the table below. Similar relationships were developed for low speed accidents.

Table E6. Probability of having X number of LNG DOT-113 cars derail in the event of a train accident, where X is the number of LNG DOT-113s involved, for mainline train movements at high speed.

Number of LNG cars Derailed (X)	0	1	2	3	4	5	6	7	8	9	10	11
Probability	0.0%	13%	2.2%	3.1%	1.5%	1.6%	1.4%	1.5%	1.2%	0.9%	1.4%	72%

Finally, the loss of containment (LOC) was modeled using a probability versus quantity released relationship developed from analysis of historical PHMSA data. Since data are relatively sparse for DOT-113 tank cars in rail accidents, pressure tank car data was used as an analog to represent pressurized DOT-113 tank car failure probability. The probabilities are shown in the table below. The release scenario probabilities were combined with the probabilities of derailment for multiple cars in an event tree model to estimate the quantity released for each distinct outcome in the accident model.

Table E7 LOC probability from PHMSA pressure tank car incident data and equivalent release scenario for one LNG DOT-113.

Quantity Released in gallons	Probability	Release Scenario
≤ 100	0.955	No Release
100 < x ≤ 1,000	0.016	½-inch Leak
1,000 < x ≤ 30,000	0.026	2-inch Leak
> 30,000	0.003	Catastrophic