

### 8.3.1 Mainline LNG ISO Risk – Influence of Train Configuration

The different train configurations were evaluated for the mainline train movement scenarios at (1) train speeds less than 25 mph and (2) train speeds between 25 mph and 60 mph. The SR and IR were calculated as a function of population density for a one mile long section of track with a surrounding population density of 11,800 people/mile<sup>2</sup>. This mile segment is the highest population density mile track along the entire main line route and will, therefore, bound the highest risk for train movement along the entire mainline.

#### 8.3.1.1 Train Speeds Less Than 25 mph

From the seven train configurations, it was found that there was little change in the risk from configurations C-4 to C-7 for the mainline train movement scenarios at train speeds less than 25 mph. Thus, the first four train configurations (C-1 through C-4) are discussed here. A summary of the risk metrics for the LNG mainline movement at train speeds less than 25 mph cases is provided in Table 48. The baseline train configuration C-1 bounds the highest risk and is used as the basis for comparison purposes. The reduction in the SR Integral for each configuration is compared against C-1 in the table. The maximum IR is always less than the Zone 3 -  $3 \times 10^{-7}$  yr<sup>-1</sup> threshold for these train configurations. Based on comparison of the SR Integral for the four configurations, a risk reduction of 38.8% may be realized by using C-4 instead of C-1 for the mainline movement at train speeds between 25 mph and 60 mph.

**Table 48. Summary of the risk metrics for slow speed LNG ISO car train movements.**

Risk Metric	Mainline Train Speeds < 25 mph			
	C-1	C-2	C-3	C-4
SR Integral (total risk, yr <sup>-1</sup> )	$3.63 \times 10^{-4}$	$2.60 \times 10^{-4}$	$2.40 \times 10^{-4}$	$2.22 \times 10^{-4}$
Maximum IR	$2.70 \times 10^{-7}$	$1.93 \times 10^{-7}$	$1.79 \times 10^{-7}$	$1.66 \times 10^{-7}$
Distance to $3 \times 10^{-7}$ yr <sup>-1</sup> IR (ft)	N/A	N/A	N/A	N/A
Risk Reduction	--	28.4%	33.9%	38.8%

The FN curves for these four train configurations are depicted in Figure 59. The results indicate that the SR for the mainline movement at train speeds less than 25 mph falls within the “ALARP” or tolerable region of acceptability, regardless of train configuration.