

4 Release Scenario Frequencies

Several accidental release scenarios were analyzed using the PHAST Risk software for each phase of LNG ISO tank container operations. The PHAST Risk software requires definition of the release sizes (e.g., no release, small, large, and catastrophic as defined earlier), release conditions, and the LOC frequency for each size of hole for each release scenario. The following section will provide the model conditions for each scenario and discuss the event trees used to estimate the release frequencies.

The LNG ISO tank container operations were grouped into three separate categories, distinguished by the type of operations and the unique risks present:

1. Lift On at intermodal facility in Hialeah Yard and yard movement.
2. Main line movement (Route 1, 2, or 3).
3. Yard movement and Lift Off at destination intermodal facility.

For all three operations categories, the ISOs are assumed to have an LNG capacity of (b) (4) gallons, and it is expected to be handled at its boiling point temperature (-223°F/-142°C) at the design pressure of (b) (4) psig pressure. The ½-inch and 2-inch hole size scenarios conservatively assumed a constant leak source pressure of (b) (4) psig at the saturation temperature of methane; it was assumed that the LNG was released at this same pressure and temperature for the catastrophic release scenario. For calculation of vaporization rates due to the evaporation of spilled LNG, it was assumed that the LNG was spilled on dry soil. The release elevation used in the analysis was six feet, and all releases were assumed to be directed horizontally to conservatively maximize the flammable vapor dispersion distance.

4.1 LNG ISO Container Lifting Accidents

The LNG ISOs will be lifted onto well cars at Hialeah Yard intermodal facility and lifted off at the destination facility. The ISOs will be lifted by rubber tire gantry cranes or a container handler depending on the facility and the logistics for each train.

Based on the assumed daily movement of (b) (4) ISO containers, the analysis accounted for (b) (4) lifts per day at Hialeah Yard, and another (b) (4) lifts per day at the receiving intermodal facility. The frequency for dropping an ISO that results in a 50 mm hole is 6.7×10^{-7} per lift (see Section 3.1). For (b) (4) lifts per day, this results in an LOC frequency of (b) (4) ¹ for Hialeah and for each destination intermodal facility. The event frequency is provided in Table 30.