


3 Methodology

The QRA was conducted by applying PHAST Risk software to evaluate a series of accident scenarios involving the transportation of LNG along the three proposed routes and at the intermodal facilities. The objective of the analysis was to quantify the Individual Risk (IR) and Societal Risk (SR) for populations surrounding the Hialeah Yard, Port Everglades, Port of Miami, the Bowden Yard, and the rail lines along the three routes.

The design of the UN  ISO portable tank is final, and several ISOs have been made available for use in LNG service along FECR's routes. Engineering and administrative systems that may be employed to reduce the likelihood or the severity of releases in the intermodal facilities and along the routes were not considered in this analysis (unless otherwise stated). The objective of this QRA study is to provide the conservative maximum baseline risk levels for transporting LNG ISO containers along three proposed routes and movements within the intermodal facilities.

In consultation with FECR, a list of representative transportation scenarios was developed for analysis in the QRA. Three unique LNG handling and ISO movement scenarios are considered:

1. Lift On of LNG ISO containers onto rail cars at Hialeah Rail Yard Intermodal Facility.
2. LNG movement on rail, either in the yard or on the mainline.
3. Lift Off of LNG ISO containers from rail cars at the destination intermodal facility.

A potential incident resulting from a loss of containment of LNG would require a sequence of events to occur. QRA takes this sequence of events and assigns a frequency to the initiating event and conditional probabilities of occurrence for subsequent events. One initiating event may lead to several potential outcomes, not all of which create a potential hazard. QRA models the sequence of events through event trees with appropriate complexity to describe the most likely event outcomes. Each outcome, e.g., the consequence of a release of LNG, is then modeled to determine the impact of the flammable release event. For releases from a fixed location, the source for the release is modeled as a pseudo point source. For releases that may occur along a route, e.g., line of road for rail, the source for the release is modeled at periodic intervals along the route. In terms of a QRA for LNG transportation, only the potential flammable release hazards were evaluated for LNG. The outcome, which may be injury or fatality of onsite personnel or the public, is related not only to the physical event consequences (e.g., size of a flash fire), but also to the potentially impacted population. The PHAST Risk software incorporates the surrounding population, the phenomenological release and