f. A quantitative comparison of the risks of LNG transportation in portable tanks to the risks from other flammable hazardous materials shipped on rail in portable tanks (using the volume of shipments and routes proposed for LNG shipments).

To address the FRA request, the risk of potential major incidents posed to surrounding populations was calculated during the QRA. The risk results have been presented in this report as Individual Risk (IR) contours around the rail yard intermodal facilities and graphically as Societal Risk (SR) through an incident frequency and severity of outcome (FN) curve on a per mile basis.

1.1 Understanding Risk

Risk, simply defined, is the potential to lose something of value. Risk is evaluated by taking the product of event likelihood with the event outcome severity, and then comparing the product to some benchmark risk which is considered by the stakeholders as being acceptable.

The likelihood of an event can be estimated using experience relating to given equipment in similar service, industry data, or engineering approximations. A challenge of quantifying risk, or affixing a number to a particular risk level, is determining how to quantify the event outcome portion of the equation. For quantifying risk at industrial facilities and operations, the outcome of an event is typically evaluated as the potential for a fatality or multiple fatalities.

In evaluating the potential for fatality, two metrics are utilized to yield the risk: (1) Individual Risk (IR) and (2) Societal Risk (SR). Individual Risk is the frequency (yr^{-1}) where an individual with continuous potential exposure may be expected to sustain a serious or fatal injury.

In this QRA report, the IR is presented in two different manners. For the intermodal facilities and rail yards at the Bowden Yard, the Hialeah Yard, Port of Miami, and Port Everglades, which are treated as fixed facilities, the IR is provided as frequency contours on aerial maps that illustrate the risk to individuals positioned within those contours. Because the LNG ISO containers will be shipped along fixed routes, release scenarios were modeled along the rail lines. There are approximately (b) miles of rail along the line of road between Bowden and Hialeah. IR contours cannot be succinctly represented for long routes such as this, but they are related to the population level along the line.[4] Thus, the highest risk along the mainline will occur at the portion of the track exposed to the highest populations.

Societal Risk (SR) is another method for evaluating the risk of a given process or operation. Unlike IR, the SR calculation considers the relationship between the number of potential fatalities versus likelihood from a series of potential events. The outcome of a SR analysis is a

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[4] IR is a weak function of population due to the population density effect on the likelihood of ignition.