The cryogenic temperatures of LNG pose unique hazards to rail and intermodal personnel. Due to a large difference in temperature, the rapid transfer of heat from an object into the cryogenic liquid can cause burns if direct contact with skin occurs or if PPE is inadequate to prevent cold-temperature injury due to an exposure. Additionally, large spills of the liquid onto metal structures can cause embrittlement and fracturing. Methane is odorless and LNG contains no odorant (unlike residential natural gas supplies), making detection difficult without a flammable gas detector device.

The behavior of a spill of LNG is unique due to the cryogenic temperature of the liquid. For example, a spill of LNG will vaporize rapidly when it contacts ambient air and even faster when in contact with warm solids such as the ground. The cold vapors may condense humid air, causing fog formation and decreased visibility. After vaporization, the cold vapors are denser than ambient air, will tend to stay close to the ground as they disperse, and will get pushed by prevailing winds. The dense vapors can travel great distances without significant dilution, as the mixing with ambient air is limited near the ground, and the vapor will tend to accumulate in low spots or trenches along the ground.

The operational hazards of handling LNG were not considered in this study; only large scale releases and ignition that could cause fire and explosion events were explored. The specific fire and explosion scenarios, as well as release, ignition, and consequence probabilities will be discussed in more detail later in this report.

1.3 Robustness of FECR Engineering and Administrative Safeguards

The Florida East Coast Railway (FECR) system includes several aspects of engineering and administrative safeguards that are consistent with FRA best practices and are anticipated to minimize the risk of train accidents such as derailments and collisions. These are discussed in detail in Appendix B. In summary, the FECR system has the following features to complement the overall safety of rail operations:

1. Automatic Train Control
2. Low elevation changes
3. Concrete ties
4. Active crossing lights and gates
5. Equipment Defect Detector system along mainline route

For example, FECR uses Automatic Train Control (ATC) on all locomotives, which is integrated into the existing full aspect cab signal system (Engineer has an illuminated color coded signal in the locomotive cab as well as a similar corresponding signal on the wayside), that mitigates the following accident risks: