movement of LNG, but these criteria are used as a reference point for evaluating the risk in this report. The risk criteria as applied in this report are summarized in the following table.

Summary of IR and SR quantitative risk criteria developed from NFPA 59A (2016) and used in this report.

IR Criteria (yr^{-1})	SR Criteria (evaluated per mile for Mainline)
Zone 1: IR ≥ 10^{-5}	Unacceptable Above: F = 10^{-4}, N = 10 Slope = −1
Zone 2: 10^{-6} ≤ IR < 10^{-5}	ALARP: Region between curves
Zone 3: 3 × 10^{-7} ≤ IR < 10^{-6}	Broadly Acceptable Below: F = 10^{-6}, N = 10 Slope = −1

E.2 Findings

The QRA generated several findings regarding shipping LNG ISOs on the FECR routes. The analysis required development of an accident model to calculate the release scenarios, which was then used to calculate the risk for various LNG ISO movement options along the routes. The risk was calculated for the rail yards and intermodal facilities by treating them as fixed facilities while the mainline risk was evaluated on a transportation route basis. Since transportation quantitative risk criteria are not typically applied in the U.S., the risk was benchmarked against a similar hazardous commodity—liquefied petroleum gas (i.e., propane or LPG) and similar risk criteria proposed for stationary LNG plants in the U.S. Finally, the Individual Risk for the intermodal facilities and mainline transportation routes was mapped to compare against potentially sensitive targets along the routes.

E.2.1 Accident Model

An accident model was developed as part of the QRA to address yard movements and mainline movements of LNG ISOs in freight trains. The intermodal facility risk also included considerations for lifting ISOs onto and off of trains. For train movements, loss of containment of LNG from an ISO was assumed to occur as the result of a derailment accident. LNG was assumed to be the only hazardous material involved in any incident. FRA data and Pipelines and Hazardous Material Administration (PHMSA) data were used to build the accident model. A flowchart depicting the sequential steps of the accident model is provided in Figure E-1. The sections of the report where each analysis block is described are listed in Figure E-1.