§ 417.224 Probability of failure analysis.

(a) General. All flight safety analyses for a launch, regardless of hazard or phase of flight, must account for launch vehicle failure probability in a consistent manner. A launch vehicle failure probability estimate must use accurate data, scientific principles, and a method that is statistically or probabilistically valid. For a launch vehicle with fewer than two flights, the failure probability estimate must account for the outcome of all previous launches of vehicles developed and launched in similar circumstances. For a launch vehicle with two or more flights, launch vehicle failure probability estimates must account for the outcomes of all previous flights of the vehicle in a statistically valid manner.

(b) Failure. For flight safety analysis purposes, a failure occurs when a launch vehicle does not complete any phase of normal flight or when any
§ 417.225 Debris risk analysis.

A flight safety analysis must demonstrate that the risk to the public potentially exposed to inert and explosive debris hazards from any one flight of a launch vehicle satisfies the public risk criterion of § 417.107(b) for debris. A debris risk analysis must account for risk to populations on land, including regions of launch vehicle flight following passage through any gate in a flight safety limit established as required by § 417.217. A debris risk analysis must account for any potential casualties to the public as required by the debris thresholds and requirements of § 417.107(c).

§ 417.227 Toxic release hazard analysis.

A flight safety analysis must establish flight commit criteria that protect the public from any hazard associated with toxic release and demonstrate compliance with the public risk criterion of § 417.107(b). The analysis must account for any toxic release that will occur during the proposed flight of a launch vehicle or that would occur in the event of a flight mishap. The analysis must account for any operational constraints and emergency procedures that provide protection from toxic release. The analysis must account for all members of the public that may be exposed to the toxic release, including all members of the public on land and on any waterborne vessels, populated offshore structures, and aircraft that are not operated in direct support of the launch.

§ 417.229 Far-field overpressure blast effects analysis.

(a) General. A flight safety analysis must establish flight commit criteria that protect the public from any hazard associated with far field blast overpressure effects due to potential explosions during launch vehicle flight and demonstrate compliance with the public risk criterion of § 417.107(b).

(b) Analysis constraints. The analysis must account for:

(1) The potential for distant focus overpressure or overpressure enhancement given current meteorological conditions and terrain characteristics;

(2) The potential for broken windows due to peak incident overpressures below 1.0 psi and related casualties;

(3) The explosive capability of the launch vehicle at impact and at altitude and potential explosions resulting from debris impacts, including the potential for mixing of liquid propellants;

(4) Characteristics of the launch vehicle flight and the surroundings that would affect the population’s susceptibility to injury, such as, shelter types and time of day of the proposed launch;

(5) Characteristics of the potentially affected windows, including their size, location, orientation, glazing material, and condition; and

(6) The hazard characteristics of the potential glass shards, such as falling from upper building stories or being propelled into or out of a shelter toward potentially occupied spaces.

§ 417.231 Collision avoidance analysis.

(a) General. A flight safety analysis must include a collision avoidance analysis that establishes each launch wait in a planned launch window during which a launch operator must not initiate flight, in order to protect any maned or mannable orbiting object. A launch operator must account for uncertainties associated with launch vehicle performance and timing and ensure that any calculated launch waits incorporate all additional time periods associated with such uncertainties. A launch operator must implement any launch waits as flight commit criteria according to § 417.113(b).

(b) Orbital launch. For an orbital launch, the analysis must establish any launch waits needed to ensure that