CHAPTER 4. SAFETY OBJECTIVE

4.1 **Objectives of § 25.1309(b).**

The objective of § 25.1309(b)(1), (b)(2), and (b)(3) is graphically presented in figure 4-1 as an inverse relationship between the probability and the severity of failure condition effects, such that:

4.1.1 Failure conditions with no safety effect have no probability requirement.

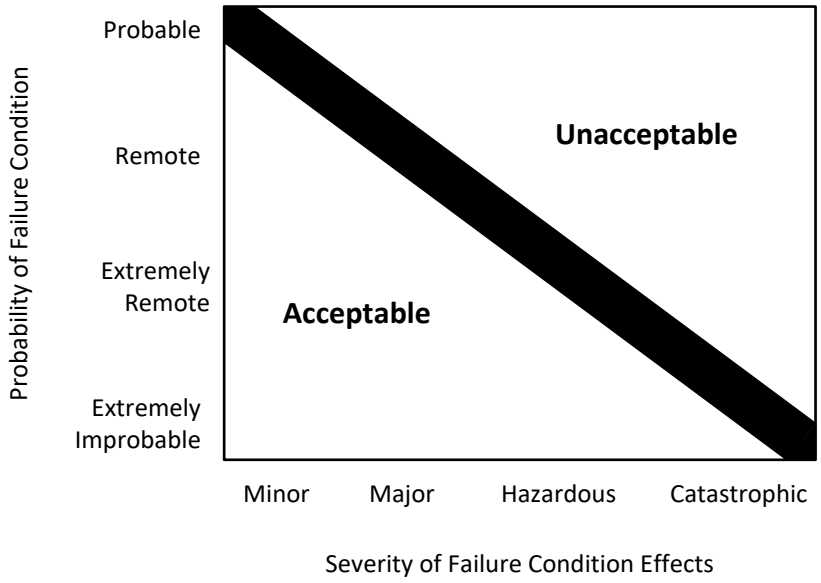
4.1.2 Minor failure conditions may be probable.

4.1.3 Major failure conditions must be no more frequent than remote.

4.1.4 Hazardous failure conditions must be no more frequent than extremely remote.

4.1.5 Catastrophic failure conditions must be extremely improbable.

Figure 4-1. Relationship between Probability and Severity of Failure Condition Effects



4.2 **Relationship between Probability and Severity of Failure Conditions.**

The relationship between probability and severity of the effects associated with failure conditions are described in table 4-1.

TABLE 4-1. RELATIONSHIP BETWEEN PROBABILITY AND SEVERITY OF FAILURE CONDITIONS

Classification of Failure Conditions	No Safety Effect	Minor	Major	Hazardous	Catastrophic
Effect on Airplane	No effect on operational capabilities or safety	Slight reduction in functional capabilities or safety margins	Significant reduction in safety margins or functional capabilities	Large reduction in functional capabilities or safety margins	Normally with hull loss
Effect on Occupants or Other Persons Excluding Flightcrew	Inconvenience	Physical discomfort	Physical distress, possibly including injuries	Serious or fatal injury to a small number of persons other than the flightcrew	Multiple fatalities
Effect on Flightcrew	No effect on flightcrew workload	Slight increase in workload	A physical discomfort or significant increase in workload or in conditions impairing the efficiency of the flightcrew	Physical distress or excessive workload such that flightcrew cannot be relied upon to perform their tasks accurately or completely	Fatalities or incapacitation
Allowable Qualitative Probability	No Probability Requirement	Probable	Remote	Extremely remote	Extremely improbable
Allowable Quantitative Probability range: Values shown are Average Probability per Flight Hour:	No Probability Requirement	⟷ On the order of 10^{-3} or less, but greater than the order of 10^{-5} *	⟷ On the order of 10^{-5} or less, but greater than the order of 10^{-7}	⟷ On the order of 10^{-7} or less, but greater than the order of 10^{-9}	On the order of 10^{-9} or less

* An allowable probability range is provided here as a reference. The applicant is not required to perform a quantitative analysis, nor substantiate by such analysis that this numerical criterion has been met for minor failure conditions. Current transport category airplane products are regarded as meeting this standard simply by using current commonly-accepted industry practice.