

APPENDIX F TO PART 417 [RESERVED]

APPENDIX G TO PART 417—NATURAL AND TRIGGERED LIGHTNING FLIGHT COMMIT CRITERIA

G417.1 GENERAL

For purposes of this section, the requirement for any weather monitoring and measuring equipment needed to satisfy the lightning flight commit criteria limits the equipment to only that which is needed. Accordingly, the equipment could include a ground-based, or airborne field mill, or a weather radar, but may or may not be limited to those items. Certain equipment, such as a field mill, when utilized with the lightning flight commit criteria, may increase launch opportunities because of the ability to verify the electric field in any cloud within 5 nautical miles of the flight path. However, a field mill is not required in order to satisfy the lightning flight commit criteria.

(a) This appendix provides flight commit criteria to protect against natural lightning and lightning triggered by the flight of a launch vehicle. A launch operator must apply these criteria under §417.113 (c) for any launch vehicle that utilizes a flight safety system.

(b) The launch operator must employ:

(1) Any weather monitoring and measuring equipment needed to satisfy the lightning flight commit criteria.

(2) Any procedures needed to satisfy the lightning flight commit criteria.

(c) If a launch operator proposes any alternative lightning flight commit criteria, the launch operator must clearly and convincingly demonstrate that the alternative provides an equivalent level of safety.

G417.3 DEFINITIONS, EXPLANATIONS AND EXAMPLES

For the purpose of appendix G417:

Anvil cloud means a stratiform or fibrous cloud produced by the upper level outflow or blow-off from thunderstorms or convective clouds.

Associated means that two or more clouds are causally related to the same weather disturbance or are physically connected. Associated does not have to mean occurring at the same time. A cumulus cloud formed locally and a cirrus layer that is physically separated from that cumulus cloud and that is generated by a distant source are not associated, even if they occur over or near the launch point at the same time.

Bright band means an enhancement of radar reflectivity caused by frozen hydrometeors falling and beginning to melt at any altitude where the temperature is 0 degrees Celsius or warmer.

Cloud means a visible mass of water droplets or ice crystals produced by condensation of water vapor in the atmosphere.

Cloud edge means the visible boundary, including the sides, base, and top, of a cloud as seen by an observer. In the absence of a visible boundary as seen by an observer, the 0 dBZ radar reflectivity boundary defines a cloud edge.

Cloud layer means a vertically continuous array of clouds, not necessarily of the same type, whose bases are approximately at the same level.

Cumulonimbus cloud means any convective cloud with any part at an altitude where the temperature is colder than -20 degrees Celsius.

Debris cloud means any cloud, except an anvil cloud, that has become detached from a parent cumulonimbus cloud or thunderstorm, or that results from the decay of a parent cumulonimbus cloud or thunderstorm.

Disturbed Weather means a weather system where dynamical processes destabilize the air on a scale larger than the individual clouds or cells. Examples of disturbed weather include fronts and troughs.

Electric field measurement aloft means the magnitude of the instantaneous vector electric field (E) at a known position in the atmosphere, such as measured by a suitably instrumented, calibrated, and located airborne-field-mill aircraft.

Electric field measurement at the surface of Earth means the 1-minute arithmetic average of the vertical electric field (Ez) at the ground measured by a ground-based field mill. The polarity of the electric field is the same as that of the potential gradient; that is, the polarity of the field at Earth's surface is the same as the dominant charge overhead. An interpolation based on electric field contours is not a measurement for purposes of this appendix.

Field mill is a specific class of electric-field sensor that uses a moving, grounded conductor to induce a time-varying electric charge on one or more sensing elements in proportion to the ambient electrostatic field.

Flight path means the planned normal flight trajectory, including its vertical and horizontal uncertainties to include the sum of the wind effects and the three-sigma guidance and performance deviations.

Moderate precipitation means a precipitation rate of 0.1 inches/hr or a radar reflectivity factor of 30 dBZ.

Nontransparent means cloud cover is non-transparent if (1) forms seen through it are blurred, indistinct, or obscured; or (2) forms are seen distinctly only through breaks in the cloud cover. Clouds with a radar reflectivity factor of 0 dBZ or greater are also non-transparent.

Ohms/Square means the surface resistance in ohms when a measurement is made from