

have been less than 1000 volts/meter for 15 minutes or longer; and

(3) The maximum radar return from any part of the debris cloud within 5 nautical miles of the flight path has been less than 10 dBZ for 15 minutes or longer.

G417.15 DISTURBED WEATHER

(a) A launch operator must not initiate flight if the flight path will carry the launch vehicle through a nontransparent cloud associated with disturbed weather that has clouds with cloud tops at altitudes where the temperature is colder than 0 degrees Celsius and that contains, within 5 nautical miles of the flight path:

- (1) Moderate or greater precipitation; or
- (2) Evidence of melting precipitation such as a radar bright band.

G417.17 THICK CLOUD LAYERS

(a) A launch operator must not initiate flight if the flight path will carry the launch vehicle through a nontransparent part of a cloud layer that is:

- (1) Greater than 4,500 feet thick and any part of the cloud layer along the flight path is located at an altitude where the temperature is between 0 degrees Celsius and –20 degrees Celsius; or
- (2) Connected to a thick cloud layer that, within 5 nautical miles of the flight path, is greater than 4,500 feet thick and has any part located at any altitude where the temperature is between 0 degrees Celsius and –20 degrees Celsius.

(b) A launch operator need not apply the lightning commit criteria in paragraphs (a)(1) and (a)(2) of this section if the thick cloud layer is a cirriform cloud layer that has never been associated with convective clouds, is located only at temperatures of –15 degrees Celsius or colder, and shows no evidence of containing liquid water.

G417.19 SMOKE PLUMES

(a) A launch operator must not initiate flight if the flight path will carry the launch vehicle through any cumulus cloud that has developed from a smoke plume while the cloud is attached to the smoke plume, or for the first 60 minutes after the cumulus cloud is observed to be detached from the smoke plume.

(b) Section G417.7 applies to cumulus clouds that have formed above a fire but have been detached from the smoke plume for more than 60 minutes.

G417.21 SURFACE ELECTRIC FIELDS

(a) A launch operator must not initiate flight for 15 minutes after the absolute value of any electric field measurement at the Earth's surface within 5 nautical miles of the flight path has been greater than 1500 volts/meter.

(b) A launch operator must not initiate flight for 15 minutes after the absolute value of any electric field measurement at the Earth's surface within 5 nautical miles of the flight path has been greater than 1000 volts/meter unless:

- (1) All clouds within 10 nautical miles of the flight path are transparent; or
- (2) All nontransparent clouds within 10 nautical miles of the flight path have cloud tops at altitudes where the temperature is warmer than +5 degrees Celsius and have not been part of convective clouds that have cloud tops at altitudes where the temperature is colder than –10 degrees Celsius within the last 3 hours.

G417.23 TRIBOELECTRIFICATION

(a) A launch operator must not initiate flight if the flight path will go through any part of a cloud at an altitude where the temperature is colder than –10 degrees Celsius up to the altitude at which the launch vehicle's velocity exceeds 3000 feet/second; unless

- (1) The launch vehicle is "treated" for surface electrification; or
- (2) A launch operator demonstrates by test or analysis that electrostatic discharges on the surface of the launch vehicle caused by triboelectrification will not be hazardous to the launch vehicle or the spacecraft.

(b) A launch vehicle is treated for surface electrification if

- (1) All surfaces of the launch vehicle susceptible to ice particle impact are such that the surface resistivity is less than 10^9 ohms/square; and
- (2) All conductors on surfaces (including dielectric surfaces that have been treated with conductive coatings) are bonded to the launch vehicle by a resistance that is less than 10^5 ohms.

APPENDIX H TO PART 417 [RESERVED]

APPENDIX I TO PART 417—METHODOLOGIES FOR TOXIC RELEASE HAZARD ANALYSIS AND OPERATIONAL PROCEDURES

I417.1 GENERAL

This appendix provides methodologies for performing toxic release hazard analysis for the flight of a launch vehicle as required by §417.229 and for launch processing at a launch site in the United States as required by §417.407(f). The requirements of this appendix apply to a launch operator and the launch operator's toxic release hazard analysis unless the launch operator clearly and convincingly demonstrates that an alternative approach provides an equivalent level of safety.