

§ 417.401

flight safety system hardware in accordance with § 417.113.

(1) A flight safety crew must have knowledge of:

(i) All flight safety system assets and responsibilities, including:

(A) Communications systems and launch operations procedures;

(B) Both voice and data systems;

(C) Graphical data systems;

(D) Tracking; and

(E) Telemetry real time data;

(ii) Flight termination systems; and

(iii) Contingency operations, including hold, recycle and abort procedures.

(2) An individual who monitors vehicle performance and performs flight termination must have knowledge of and be capable of resolving malfunctions in:

(i) The application of safety support systems such as position tracking sources;

(ii) Digital computers;

(iii) Displays;

(iv) Command destruct;

(v) Communications;

(vi) Telemetry;

(vii) All electrical functions of a flight termination system;

(viii) The principles of radio frequency transmission and attenuation;

(ix) The behavior of ballistic and aerodynamic vehicles in flight under the influence of aerodynamic forces; and

(x) The application of flight termination rules.

(3) An individual who operates flight safety support systems must have knowledge of and be capable of resolving malfunctions in:

(i) The design and assembly of the flight safety support system hardware;

(ii) The operation of electromechanical systems; and

(iii) The nature and inherent tendencies of the flight safety system hardware being operated.

(4) An individual who performs flight safety analysis must have knowledge of orbital mechanics and be proficient in the calculation and production of range safety displays, impact probabilities, and casualty expectations.

(c) Flight safety crew members must complete a training and certification program to ensure launch site familiarization, launch vehicle familiarization, flight safety system functions,

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equipment, and procedures related to a launch before being called upon to support that launch. Each flight safety crew member must complete a preflight readiness training and certification program. This preflight readiness training and certification program must include:

(1) Mission specific training programs to ensure team readiness.

(2) Launch simulation exercises of system failure modes, including nominal and failure modes, that test crew performance, flight termination criteria, and flight safety data display integrity.

Subpart E—Ground Safety

§ 417.401 Scope.

This subpart contains public safety requirements that apply to launch processing and post-launch operations at a launch site in the United States. Ground safety requirements in this subpart apply to activities performed by, or on behalf of, a launch operator at a launch site in the United States. A licensed launch site operator must satisfy the requirements of part 420 of this chapter.

§ 417.402 Compliance.

(a) *General.* A launch operator's ground safety process must satisfy this subpart.

(b) *Ground safety analysis conducted for launch at a Federal launch range.* This provision applies to all sections of this subpart. The FAA will accept a ground safety process conducted for a launch from a Federal launch range without need for further demonstration of compliance to the FAA if:

(1) A launch operator has contracted with a Federal launch range for the provision of the ground safety process; and

(2) The FAA has assessed the Federal launch range, through its launch site safety assessment, and found that the Federal launch range's ground safety process satisfies the requirements of this subpart. In this case, the FAA will treat the Federal launch range's process as that of a launch operator.

(c) *Toxic release hazard analysis conducted for launch processing at a Federal launch range.* The FAA will accept a

toxic release hazard analysis conducted for launch processing from a Federal launch range provided the toxic release analysis satisfies the Federal launch range's requirements, and the FAA has assessed the Federal launch range, through its launch site safety assessment, and found that the applicable Federal launch range safety-related launch services and property satisfy the requirements of this subpart.

(d) *Demonstration of compliance.* For a licensed launch that does not satisfy paragraphs (b) and (c) of this section, a launch operator must demonstrate compliance to the FAA with the requirements of this subpart, and must include in its demonstration the analysis products required by subparts A and E of this part, and appendices I and J of this part.

(e) *Alternate methods.* The FAA will approve an alternate hazard control method if a launch operator demonstrates, in accordance with § 406.3(b), that its proposed hazard control method provides an equivalent level of safety to that required by this subpart.

§ 417.403 General.

(a) *Public safety.* A launch operator must ensure that each hazard control is in place to protect the public from each potential hazard associated with launch processing and post-launch operations.

(b) *Ground safety analysis.* A launch operator must perform and document a ground safety analysis that satisfies § 417.405 and appendix J of this part.

(c) *Local agreements.* A launch operator must coordinate and perform launch processing and post-launch operations that satisfy local agreements to ensure the responsibilities and requirements in this part and § 420.57 of this chapter are met. A launch operator, when using a launch site of a licensed launch site operator, must coordinate the launch operator's operations with the launch site operator and with any agreements that the launch site operator has with local authorities that form a basis for the launch site operator's license.

(d) *Launch operator's exclusive use of a launch site.* For a launch conducted from a launch site exclusive to its own use, a launch operator must satisfy the

requirements of this subpart and of part 420 of this chapter, including subpart D of part 420.

§ 417.405 Ground safety analysis.

(a) A launch operator must perform a ground safety analysis for launch vehicle hardware, ground hardware including launch site and ground support equipment, launch processing, and post-launch operations at a launch site in the United States. The requirements of this section apply to the performance of the ground safety analysis and to the ground safety analysis products that a launch operator must file with the FAA as required by § 417.402(d). This analysis must identify each potential hazard, each associated cause, and each hazard control that a launch operator must establish and maintain to keep each identified hazard from affecting the public. A launch operator must incorporate the launch site operator's systems and operations involved in ensuring public safety into the ground safety analysis.

(b) Technical personnel who are knowledgeable of launch vehicle systems, launch processing, ground systems, operations, and their associated hazards must prepare the ground safety analysis. These individuals must be qualified to perform the ground safety analysis through training, education, and experience.

(c) A launch operator must ensure personnel performing a ground safety analysis or preparing a ground safety analysis report will have the cooperation of the entire launch operator's organization. A launch operator must maintain supporting documentation and it must be available upon request.

(d) A launch operator must:

(1) Begin a ground safety analysis by identifying the systems and operations to be analyzed;

(2) Define the extent of each system and operation being assessed to ensure there is no miscommunication as to what the hazards are, and who, in a launch operator's organization or other organization supporting the launch, controls those hazards; and

(3) Ensure that the ground safety analysis accounts for each launch vehicle system and operation involved in