

judge, on petition or on their own initiative, determines that an oral presentation is required.

(b) Submissions must include a detailed exposition of the evidence or arguments supporting the petition.

(c) Petitions must be filed as soon as practicable, but in no event more than 30 days after issuance of decision or finding under § 414.37.

**§ 414.45 Administrative law judge's recommended decision in safety element approval actions.**

(a) The Associate Administrator, who will make the final decision on the matter at issue, will review the recommended decision of the administrative law judge. The Associate Administrator will make such final decision within 30 days of issuance of the recommended decision.

(b) The authority and responsibility to review and decide rests solely with the Associate Administrator and may not be delegated.

## PART 415—LAUNCH LICENSE

### Subpart A—General

Sec.

- 415.1 Applicability and scope.
- 415.2 Licenses issued under this part.
- 415.3 Types of launch licenses.
- 415.5 Policy and safety approvals.
- 415.7 Payload determination.
- 415.8 Human space flight.
- 415.9 Issuance of a launch license.
- 415.11 Additional license terms and conditions.
- 415.13 Transfer of a launch license.
- 415.15 Rights not conferred by launch license.
- 415.16–415.20 [Reserved]

### Subpart B—Policy Review and Approval

- 415.21 General.
- 415.23 Policy review.
- 415.25 Application requirements for policy review.
- 415.27 Denial of policy approval.
- 415.28–415.30 [Reserved]

### Subpart C—Safety Review and Approval for Launch From a Federal Launch Range

- 415.31 General.
- 415.33 Safety organization.
- 415.35 Acceptable flight risk.
- 415.37 Flight readiness and communications plan.
- 415.39 Safety at end of launch.

- 415.41 Accident investigation plan.
- 415.43 Denial of safety approval.
- 415.44–415.50 [Reserved]

### Subpart D—Payload Review and Determination

- 415.51 General.
- 415.53 Payloads not subject to review.
- 415.55 Classes of payloads.
- 415.57 Payload review.
- 415.59 Information requirements for payload review.
- 415.61 Issuance of payload determination.
- 415.63 Incorporation of payload determination in license application.
- 415.64–415.70 [Reserved]

### Subpart E [Reserved]

### Subpart F—Safety Review and Approval for Launch of an Expendable Launch Vehicle From a Non-Federal Launch Site

- 415.91–415.100 [Reserved]
- 415.101 Scope and applicability.
- 415.102 Definitions.
- 415.103 General.
- 415.105 Pre-application consultation.
- 415.107 Safety review document.
- 415.109 Launch description.
- 415.111 Launch operator organization.
- 415.113 Launch personnel certification program.
- 415.115 Flight safety.
- 415.117 Ground safety.
- 415.119 Launch plans.
- 415.121 Launch schedule.
- 415.123 Computing systems and software.
- 415.125 Unique safety policies, requirements and practices.
- 415.127 Flight safety system design and operation data.
- 415.129 Flight safety system test data.
- 415.131 Flight safety system crew data.
- 415.133 Safety at end of launch.
- 415.135 Denial of safety approval.
- 415.136–415.200 [Reserved]

### Subpart G—Environmental Review

- 415.201 General.
- 415.203 Environmental information.
- 415.204–415.400 [Reserved]

#### APPENDIX A TO PART 415—[RESERVED]

#### APPENDIX B TO PART 415—SAFETY REVIEW DOCUMENT OUTLINE

AUTHORITY: 51 U.S.C. 50901–50923.

SOURCE: Amdt. 415–03, 64 FR 19616, Apr. 21, 1999, unless otherwise noted.

EFFECTIVE DATE NOTE: At 85 FR 79715, Dec. 10, 2020, Part 415 was removed and reserved, effective Mar. 10, 2026.

## Subpart A—General

### § 415.1 Applicability and scope.

(a) *Applicability.* This part applies to the following:

(1) Licenses issued under this part before June 8, 2021; and

(2) Licenses issued on or after June 8, 2021, if the FAA accepted the application under § 413.11 of this chapter before that date.

(b) *Scope.* This part prescribes requirements for obtaining a license to launch an expendable launch vehicle and post-licensing requirements with which a licensee must comply to remain licensed. Requirements for preparing a license application are in part 413 of this subchapter.

[Doc. No. FAA–2019–0229, Amdt. 415–7, 85 FR 79715, Dec. 10, 2020]

### § 415.2 Licenses issued under this part.

(a) *Definitions.* For the purposes of this part, the definitions of § 401.5 of this chapter apply.

(b) *Compliance with part 450 of this chapter.* Operations under this part must comply with launch and reentry collision avoidance requirements in § 450.169 of this chapter and critical asset protection requirements in §§ 450.101(a)(4) and (b)(4) of this chapter.

[Doc. No. FAA–2019–0229, Amdt. 415–7, 85 FR 79715, Dec. 10, 2020]

### § 415.3 Types of launch licenses.

(a) *Launch-specific license.* A launch-specific license authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site. The license identifies, by name or mission, each launch authorized under the license. A licensee's authorization to launch terminates upon completion of all launches authorized by the license or the expiration date stated in the license, whichever occurs first.

(b) *Launch operator license.* A launch operator license authorizes a licensee to conduct launches from one launch site, within a range of launch parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads. A launch operator license remains in effect for five years from the date of issuance.

(c) Notwithstanding the duration for a license established in paragraphs (a) and (b) of this section, no license issued under this part will be valid after March 10, 2026.

[Amdt. 415–03, 64 FR 19616, Apr. 21, 1999, as amended by Doc. No. FAA–2019–0229, Amdt. 415–7, 85 FR 79715, Dec. 10, 2020]

### § 415.5 Policy and safety approvals.

To obtain a launch license, an applicant must obtain policy and safety approvals from the FAA. Requirements for obtaining these approvals are contained in subparts B, C and F of this part. Only a launch license applicant may apply for the approvals, and may apply for either approval separately and in advance of submitting a complete license application, using the application procedures contained in part 413 of this subchapter.

### § 415.7 Payload determination.

A payload determination is required for a launch license unless the proposed payload is exempt from payload review under § 415.53 of this part. The FAA conducts a payload review, as described in subpart D of this part, to make the determination. Either a launch license applicant or a payload owner or operator may request a review of its proposed payload using the application procedures contained in part 413 of this subchapter. Upon receipt of an application, the FAA may conduct a payload review independently of a launch license application.

### § 415.8 Human space flight.

To obtain a launch license, an applicant proposing to conduct a launch with a space flight participant, crew, or government astronaut on board must demonstrate compliance with §§ 460.5, 460.7, 460.11, 460.13, 460.15, 460.17, 460.51, 460.53, 460.59, 460.61, and 460.67 of this subchapter.

[Doc. No. FAA–2023–1656, Amdt. No. 415–8, 89 FR 76726, Sept. 19, 2024]

### § 415.9 Issuance of a launch license.

(a) The FAA issues a launch license to an applicant who has obtained all approvals and determinations required under this chapter for a license.

(b) A launch license authorizes a licensee to conduct a launch or launches in accordance with the representations contained in the licensee's application, subject to the licensee's compliance with terms and conditions contained in license orders accompanying the license, including financial responsibility requirements, and part 417 of this chapter.

[Amdt. 415-03, 64 FR 19616, Apr. 21, 1999, as amended by Amdt. 415-4, 71 FR 50531, Aug. 25, 2006]

#### **§ 415.11 Additional license terms and conditions.**

The FAA may modify a launch license at any time by modifying or adding license terms and conditions to ensure compliance with the Act and regulations.

#### **§ 415.13 Transfer of a launch license.**

(a) Only the FAA may transfer a launch license.

(b) An applicant for transfer of a launch license shall submit a license application in accordance with part 413 of this subchapter and shall meet the requirements of part 415 of this subchapter. The FAA will transfer a license to an applicant who has obtained all of the approvals and determinations required under this chapter for a license. In conducting its reviews and issuing approvals and determinations, the FAA may incorporate by reference any findings made part of the record to support the initial licensing determination. The FAA may modify a license to reflect any changes necessary as a result of a license transfer.

#### **§ 415.15 Rights not conferred by launch license.**

Issuance of a launch license does not relieve a licensee of its obligation to comply with all applicable requirements of law or regulation that may apply to its activities, nor does issuance confer any proprietary, property or exclusive right in the use of any federal launch range or related facilities, airspace, or outer space.

#### **§§ 415.16–415.20 [Reserved]**

### **Subpart B—Policy Review and Approval**

#### **§ 415.21 General.**

The FAA issues a policy approval to a license applicant unless the FAA determines that a proposed launch would jeopardize U.S. national security or foreign policy interests, or international obligations of the United States. A policy approval is part of the licensing record on which the FAA's licensing determination is based.

#### **§ 415.23 Policy review.**

(a) The FAA reviews a license application to determine whether it presents any issues affecting U.S. national security or foreign policy interests, or international obligations of the United States.

(b) *Interagency consultation.* (1) The FAA consults with the Department of Defense to determine whether a license application presents any issues affecting U.S. national security.

(2) The FAA consults with the Department of State to determine whether a license application presents any issues affecting U.S. foreign policy interests or international obligations.

(3) The FAA consults with other federal agencies, including the National Aeronautics and Space Administration, authorized to address issues identified under paragraph (a) of this section, associated with an applicant's launch proposal.

(c) The FAA advises an applicant, in writing, of any issue raised during a policy review that would impede issuance of a policy approval. The applicant may respond, in writing, or revise its license application.

#### **§ 415.25 Application requirements for policy review.**

In its launch license application, an applicant shall—

(a) Identify the model and configuration of any launch vehicle proposed for launch by the applicant.

(b) Identify structural, pneumatic, propellant, propulsion, electrical and avionics systems used in the launch vehicle and all propellants.

## § 415.27

(c) Identify foreign ownership of the applicant as follows:

(1) For a sole proprietorship or partnership, identify all foreign ownership;

(2) For a corporation, identify any foreign ownership interests of 10% or more; and

(3) For a joint venture, association, or other entity, identify any participating foreign entities.

(d) Identify proposed launch vehicle flight profile(s), including:

(1) Launch site;

(2) Flight azimuths, trajectories, and associated ground tracks and instantaneous impact points;

(3) Sequence of planned events or maneuvers during flight;

(4) Range of nominal impact areas for all spent motors and other discarded mission hardware, within three standard deviations of the mean impact point (a 3-sigma footprint); and

(5) For each orbital mission, the range of intermediate and final orbits of each vehicle upper stage, and their estimated orbital lifetimes.

### § 415.27 Denial of policy approval.

The FAA notifies an applicant, in writing, if it has denied policy approval for a license application. The notice states the reasons for the FAA's determination. The applicant may respond to the reasons for the determination and request reconsideration.

### §§ 415.28–415.30 [Reserved]

## Subpart C—Safety Review and Approval for Launch From a Federal Launch Range

### § 415.31 General.

(a) The FAA conducts a safety review to determine whether an applicant is capable of launching a launch vehicle and its payload without jeopardizing public health and safety and safety of property. The FAA issues a safety approval to a license applicant proposing to launch from a Federal launch range if the applicant satisfies the requirements of this subpart and has contracted with the Federal launch range for the provision of safety-related launch services and property, as long as an FAA launch site safety assessment shows that the range's launch

## 14 CFR Ch. III (1–1–25 Edition)

services and launch property satisfy part 417 of this chapter. The FAA evaluates on an individual basis all other safety-related launch services and property associated with an applicant's proposal, in accordance with part 417 of this chapter. A safety approval is part of the licensing record on which the FAA's licensing determination is based.

(b) The FAA advises an applicant, in writing, of any issue raised during a safety review that would impede issuance of a safety approval. The applicant may respond, in writing, or revise its license application.

[Amdt. 415-03, 64 FR 19616, Apr. 21, 1999, as amended by Amdt. 415-4, 71 FR 50531, Aug. 25, 2006]

### § 415.33 Safety organization.

(a) An applicant shall maintain a safety organization and document it by identifying lines of communication and approval authority for all launch safety decisions. Lines of communication, both within the applicant's organization and between the applicant and any federal launch range providing launch services, shall be employed to ensure that personnel perform launch safety operations in accordance with range safety requirements and with plans and procedures required by this subpart. Approval authority shall be employed to ensure compliance with range safety requirements and with plans and procedures required by this subpart.

(b) *Safety official.* An applicant shall identify by name, title, and qualifications, a qualified safety official authorized to examine all aspects of the applicant's launch safety operations and to monitor independently personnel compliance with the applicant's safety policies and procedures. The safety official shall report directly to the person responsible for an applicant's licensed launches, who shall ensure that all of the safety official's concerns are addressed prior to launch.

### § 415.35 Acceptable flight risk.

(a) *Flight risk through orbital insertion or impact.* Acceptable flight risk through orbital insertion for an orbital launch vehicle, and through impact for a suborbital launch vehicle, is measured in terms of the expected average

number of casualties ( $E_c$ ) to the collective members of the public exposed to debris hazards from any one launch. To obtain safety approval, an applicant must demonstrate that the risk level associated with debris from an applicant's proposed launch meets the public risk criteria of § 417.107(b)(1) of this chapter for impacting inert and impacting explosive debris.

(b) *Hazard identification and risk assessment.* To demonstrate compliance with paragraph (a) of this section, an applicant must file an analysis that identifies hazards and assesses risks to public health and safety and safety of property associated with nominal and non-nominal flight of its proposed launch.

(c) *Design.* A launch vehicle must be designed to ensure that flight risks meet the criteria of paragraph (a) of this section. An applicant must identify and describe the following:

(1) Launch vehicle structure, including physical dimensions and weight;

(2) Hazardous and safety critical systems, including propulsion systems; and

(3) Drawings and schematics for each system identified under paragraph (c)(2) of this section.

(d) *Operation.* A launch vehicle must be operated in a manner that ensures that flight risks meet the criteria of paragraph (a) of this section and in accordance with collision avoidance requirements in § 450.169 and critical asset protection requirements in § 450.101(a)(4) and (b)(4). An applicant must identify all launch operations and procedures that must be performed to ensure acceptable flight risk.

[Doc. No. FAA-2000-7953, 71 FR 50531, Aug. 25, 2006, as amended by Amdt. No. 415-6, 81 FR 59439, Aug. 30, 2016; Doc. No. FAA-2019-0229, Amdt. 415-7, 85 FR 79715, Dec. 10, 2020]

#### **§ 415.37 Flight readiness and communications plan.**

(a) *Flight readiness requirements.* An applicant must designate an individual responsible for flight readiness. The applicant must file the following procedures for verifying readiness for safe flight:

(1) Launch readiness review procedures involving the applicant's flight safety personnel and Federal launch

range personnel involved in the launch, as required by § 417.117(b)(3) of this chapter.

(2) Procedures that ensure mission constraints, rules and abort procedures are listed and consolidated in a safety directive or notebook approved by licensee flight safety and Federal launch range personnel.

(3) Procedures that ensure currency and consistency of licensee and Federal launch range countdown checklists.

(4) Dress rehearsal procedures that—

(i) Ensure crew readiness under nominal and non-nominal flight conditions;

(ii) Contain criteria for determining whether to dispense with one or more dress rehearsals; and

(iii) Verify currency and consistency of licensee and Federal launch range countdown checklists.

(5) Procedures for ensuring the licensee's flight safety personnel adhere to the crew rest rules of § 417.113(f) of this chapter.

(b) *Communications plan requirements.* An applicant must file a communications plan that meets § 417.111(k) of this chapter, and that provides licensee and Federal launch range personnel communications procedures during countdown and flight.

(c) An applicant must file procedures that ensure that licensee and Federal launch range personnel receive a copy of the communications plan required by paragraph (b) of this section, and that the Federal launch range concurs in the communications plan.

[Doc. No. FAA-2000-7953, 71 FR 50531, Aug. 25, 2006, as amended by Amdt. No. 415-6, 81 FR 59439, Aug. 30, 2016]

#### **§ 415.39 Safety at end of launch.**

To obtain safety approval, an applicant must demonstrate compliance with § 417.129 of this chapter, for any proposed launch of a launch vehicle with a stage or component that will reach Earth orbit.

[Doc. No. FAA-2000-7953, 71 FR 50531, Aug. 25, 2006]

#### **§ 415.41 Accident investigation plan.**

An applicant must file an accident investigation plan (AIP), that satisfies § 417.111(h) of this chapter, and contains the applicant's procedures for reporting and responding to launch accidents,

## § 415.43

launch incidents, or other mishaps, as defined by § 401.5 of this chapter.

[Doc. No. FAA-2000-7953, 71 FR 50531, Aug. 25, 2006, as amended by Amdt. No. 415-6, 81 FR 59439, Aug. 30, 2016]

## § 415.43 Denial of safety approval.

The FAA notifies an applicant, in writing, if it has denied safety approval for a license application. The notice states the reasons for the FAA's determination. The applicant may respond to the reasons for the determination and request reconsideration.

## §§ 415.44–415.50 [Reserved]

### Subpart D—Payload Review and Determination

## § 415.51 General.

The FAA reviews a payload proposed for launch to determine whether a license applicant or payload owner or operator has obtained all required licenses, authorization, and permits, unless the payload is exempt from review under § 415.53 of this subpart. If not otherwise exempt, the FAA reviews a payload proposed for launch to determine whether its launch would jeopardize public health and safety, safety of property, U.S. national security or foreign policy interests, or international obligations of the United States. A payload determination is part of the licensing record on which the FAA's licensing determination is based. The safety requirements of subpart C and F of this part and of part 417 of this chapter apply to all payloads, whether or not the payload is otherwise exempt.

[Amdt. 415-03, 64 FR 19616, Apr. 21, 1999, as amended by Amdt. 415-4, 71 FR 50531, Aug. 25, 2006]

## § 415.53 Payloads not subject to review.

The FAA does not review payloads that are—

(a) Subject to regulation by the Federal Communications Commission (FCC) or the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA); or

(b) Owned or operated by the U.S. Government.

## 14 CFR Ch. III (1–1–25 Edition)

## § 415.55 Classes of payloads.

The FAA may review and issue findings regarding a proposed class of payload, e.g., communications, remote sensing or navigation. However, each payload is subject to compliance monitoring by the FAA before launch to determine whether its launch would jeopardize public health and safety, safety of property, U.S. national security or foreign policy interests, or international obligations of the United States. The licensee is responsible for providing current information, in accordance with § 417.17(b)(2), regarding a payload proposed for launch not later than 60 days before a scheduled launch.

[Amdt. 415-03, 64 FR 19616, Apr. 21, 1999, as amended by Amdt. No. 415-6, 81 FR 59439, Aug. 30, 2016]

## § 415.57 Payload review.

(a) *Timing.* A payload review may be conducted as part of a license application review or may be requested by a payload owner or operator in advance of or apart from a license application.

(b) *Interagency consultation.* The FAA consults with other agencies to determine whether launch of a proposed payload or payload class would present any issues affecting public health and safety, safety of property, U.S. national security or foreign policy interests, or international obligations of the United States.

(1) The FAA consults with the Department of Defense to determine whether launch of a proposed payload or payload class would present any issues affecting U.S. national security.

(2) The FAA consults with the Department of State to determine whether launch of a proposed payload or payload class would present any issues affecting U.S. foreign policy interests or international obligations.

(3) The FAA consults with other federal agencies, including the National Aeronautics and Space Administration, authorized to address issues identified under paragraph (b) of this section associated with an applicant's launch proposal.

(c) The FAA advises a person requesting a payload determination, in writing, of any issue raised during a payload review that would impede issuance

of a license to launch that payload or payload class. The person requesting payload review may respond, in writing, or revise its application.

**§ 415.59 Information requirements for payload review.**

(a) A person requesting review of a particular payload or payload class shall identify the following:

- (1) Payload name;
  - (2) Payload class;
  - (3) Physical dimensions and weight of the payload;
  - (4) Payload owner and operator, if different from the person requesting payload review;
  - (5) Orbital parameters for parking, transfer and final orbits;
  - (6) Hazardous materials, as defined in § 401.5 of this chapter, and radioactive materials, and the amounts of each;
  - (7) Intended payload operations during the life of the payload; and
  - (8) Delivery point in flight at which the payload will no longer be under the licensee's control.
- (b) [Reserved]

**§ 415.61 Issuance of payload determination.**

(a) The FAA issues a favorable payload determination unless it determines that launch of the proposed payload would jeopardize public health and safety, safety of property, U.S. national security or foreign policy interests, or international obligations of the United States. The FAA advises any person who has requested a payload review of its determination, in writing. The notice states the reasons for the determination in the event of an unfavorable determination.

(b) Any person issued an unfavorable payload determination may respond to the reasons for the determination and request reconsideration.

**§ 415.63 Incorporation of payload determination in license application.**

A favorable payload determination issued for a payload or class of payload may be included by a license applicant as part of its application. However, any change in information provided under section 415.59 of this subpart must be reported in accordance with section 413.17 of this chapter. The FAA deter-

mines whether a favorable payload determination remains valid in light of reported changes and may conduct an additional payload review.

**§§ 415.64–415.70 [Reserved]**

**Subpart E [Reserved]**

**Subpart F—Safety Review and Approval for Launch of an Expendable Launch Vehicle From a Non-Federal Launch Site**

SOURCE: Docket No. FAA-2000-7953, 71 FR 50532, Aug. 25, 2006, unless otherwise noted.

**§§ 415.91–415.100 [Reserved]**

**§ 415.101 Scope and applicability.**

(a) This subpart F contains requirements that an applicant must meet to obtain a safety approval when applying for a license to launch an expendable launch vehicle from a non-Federal launch site. This subpart also contains administrative requirements for a safety review, such as when and how an applicant files the required information, and the requirements for the form and content of each submission.

(b) The requirements of this subpart apply to both orbital and suborbital expendable launch vehicles.

(c) An applicant must demonstrate, through the material filed with the FAA, its ability to comply with the requirements of part 417 of this chapter. To facilitate production of the information required by this subpart, an applicant should become familiar with the requirements of part 417 of this chapter.

(d) For a launch from an exclusive use launch site, where there is no licensed launch site operator, a launch operator must satisfy the requirements of this part and the public safety application requirements of part 420 of this chapter.

**§ 415.102 Definitions.**

For the purposes of this subpart, the definitions of §§ 417.3 and 401.5 of this chapter apply.

**§415.103 General.**

(a) The FAA conducts a safety review to determine whether an applicant is capable of conducting launch processing and flight without jeopardizing public health and safety and safety of property. The FAA issues a safety approval to a license applicant if the applicant satisfies the requirements of this subpart and demonstrates that it will meet the safety responsibilities and requirements of part 417 of this chapter.

(b) The FAA advises an applicant, in writing, of any issue raised during a safety review that would impede issuance of a safety approval. The applicant may respond, in writing, or amend its license application as required by §413.17 of this chapter.

(c) An applicant must make available to the FAA upon request a copy of any information incorporated into a license application by reference.

(d) A safety approval is part of the licensing record on which the FAA bases its licensing determination.

**§415.105 Pre-application consultation.**

(a) An applicant must participate in a pre-application consultation meeting, as required by §413.5 of this chapter, prior to an applicant's preparation of the initial flight safety analysis required by §415.115.

(b) At a pre-application consultation meeting, an applicant must provide as complete a description of the planned launch or series of launches as available at the time. An applicant must provide the FAA the following information:

- (1) *Launch vehicle.* Description of:
  - (i) Launch vehicle;
  - (ii) Any flight termination system; and
  - (iii) All hazards associated with the launch vehicle and any payload, including the type and amounts of all propellants, explosives, toxic materials and any radionuclides.

(2) *Proposed mission.* (i) For an applicant applying for a launch specific license under §415.3(a), the apogee, perigee, and inclination of any orbital objects and each impact location of any stage or other component.

(ii) For an applicant applying for a launch operator license under §415.3(b),

the planned range of trajectories and flight azimuths, and the range of apogees, perigees, and inclinations of any orbital objects and each impact location of any stage or other component.

(3) *Potential launch site.* (i) Name and location of the proposed launch site, including latitude and longitude of the proposed launch point;

(ii) Identity of any launch site operator of that site; and

(iii) Identification of any facilities at the launch site that will be used for launch processing and flight.

**§415.107 Safety review document.**

(a) An applicant must file a safety review document that contains all the information required by §§415.109–415.133. An applicant must file the information for a safety review document as required by the outline in appendix B of this part. An applicant must file a sufficiently complete safety review document, except for the ground safety analysis report, no later than six months before the applicant brings any launch vehicle to the proposed launch site.

(b) A launch operator's safety review document must:

- (1) Contain a glossary of unique terms and acronyms used in alphabetical order;
- (2) Contain a listing of all referenced standards, codes, and publications;
- (3) Be logically organized, with a clear and consistent page numbering system and must identify cross-referenced topics;
- (4) Use equations and mathematical relationships derived from or referenced to a recognized standard or text, and must define all algebraic parameters;
- (5) Include the units of all numerical values provided; and
- (6) Include a legend or key that identifies all symbols used for any schematic diagrams.

(c) An applicant's safety review document may include sections not required by appendix B of this part. An applicant must identify each added section by using the word "added" in front of the title of the section. In the first paragraph of the section, an applicant must explain any addition to the outline in appendix B of this part.



(d) If a safety review document section required by appendix B of this part does not apply to an applicant's proposed launch, an applicant must identify the sections in the application by the words "not applicable" preceding the title of the section. In the first paragraph of the section, an applicant must describe and justify why the section does not apply.

(e) An applicant may reference documentation previously filed with the FAA.

#### §415.109 Launch description.

An applicant's safety review document must contain the following information:

(a) *Launch site description.* An applicant must identify the proposed launch site and include the following:

- (1) Boundaries of the launch site;
- (2) Launch point location, including latitude and longitude;
- (3) Identity of any launch site operator of that proposed site; and
- (4) Identification of any facilities at the launch site that will be used for launch processing and flight.

(b) *Launch vehicle description.* An applicant must provide the following:

- (1) A written description of the launch vehicle. The description must include a table specifying the type and quantities of all hazardous materials on the launch vehicle and must include propellants, explosives, and toxic materials; and
- (2) A drawing of the launch vehicle that identifies:
  - (i) Each stage, including strap-on motors;
  - (ii) Physical dimensions and weight;
  - (iii) Location of all safety critical systems, including any flight termination hardware, tracking aids, or telemetry systems;
  - (iv) Location of all major launch vehicle control systems, propulsion systems, pressure vessels, and any other hardware that contains potential hazardous energy or hazardous material; and
  - (v) For an unguided suborbital launch vehicle, the location of the rocket's center of pressure in relation to its center of gravity for the entire flight profile.

(c) *Payload description.* An applicant must include or reference documentation previously filed with the FAA that contains the payload information required by §415.59 for any payload or class of payload.

(d) *Trajectory.* An applicant must provide two drawings depicting trajectory information. An applicant must file additional trajectory information as part of the flight safety analysis data required by §415.115.

(1) One drawing must depict the proposed nominal flight profile with downrange depicted on the abscissa and altitude depicted on the ordinate axis. The nominal flight profile must be labeled to show each planned staging event and its time after liftoff from launch through orbital insertion or final impact; and

(2) The second drawing must depict instantaneous impact point ground traces for each of the nominal trajectory, the three-sigma left lateral trajectory and the three-sigma right lateral trajectory determined under §417.207 of this chapter. The trajectories must be depicted on a latitude/longitude grid, and the grid must include the outlines of any continents and islands.

(e) *Staging events.* An applicant must provide a table of nominal and  $\pm$ three-sigma times for each major staging event and must describe each event, including the predicted impact point and dispersion of each spent stage.

(f) *Vehicle performance graphs.* An applicant must provide graphs of the nominal and  $\pm$ three-sigma values as a function of time after liftoff for the following launch vehicle performance parameters: thrust, altitude, velocity, instantaneous impact point arc-range measured from the launch point, and present position arc-range measured from the launch point.

#### §415.111 Launch operator organization.

An applicant's safety review document must contain organizational charts and a description that shows that the launch operator's organization satisfies the requirements of §417.103 of this chapter. An applicant's safety review document must also identify all persons with whom the applicant has

contracted to provide safety-related goods or services for the launch of the launch vehicle.

**§415.113 Launch personnel certification program.**

(a) A safety review document must describe how the applicant will satisfy the personnel certification program requirements of §417.105 of this chapter and identify by position those individuals who implement the program.

(b) An applicant's safety review document must contain a copy of its documentation that demonstrates how the launch operator implements the personnel certification program.

(c) An applicant's safety review document must contain a table listing each hazardous operation or safety critical task that certified personnel must perform. For each task, the table must identify by position the individual who reviews personnel qualifications and certifies personnel for performing the task.

**§415.115 Flight safety.**

(a) *Flight safety analysis.* An applicant's safety review document must describe each analysis method employed to meet the flight safety analysis requirements of part 417, subpart C, of this chapter. An applicant's safety review document must demonstrate how each analysis method satisfies the flight safety analysis requirements of part 417, subpart C, of this chapter. An applicant's safety review document must contain analysis products and other data that demonstrate the applicant's ability to meet the public risk criteria of §417.107 of this chapter and to establish launch safety rules as required by §417.113 of this chapter. An applicant's flight safety analysis must satisfy the following requirements:

(1) An applicant must file the proposed flight safety analysis methodology and the preliminary flight safety analysis products no later than 18 months for any orbital or guided suborbital launch vehicle, and nine months for any unguided suborbital launch vehicle, prior to bringing any launch vehicle to the proposed launch site.

(2) For a launch operator license, an applicant must file flight safety anal-

ysis products that account for the range of launch vehicles and flight trajectories applied for, or the worst case vehicle and trajectory under which flight will be attempted, no later than 6 months before the applicant brings any launch vehicle to the proposed launch site. For a launch specific license, an applicant must file flight safety analysis products that account for the actual flight conditions, no later than 6 months before the applicant brings any launch vehicle to the proposed launch site.

(3) The flight safety analysis performed by an applicant must be completed as required by subpart C of part 417 of this chapter. An applicant may identify those portions of the analysis that it expects to refine as the first proposed flight date approaches. An applicant must identify any analysis product subject to change, describe what needs to be done to finalize the product, and identify when before flight it will be finalized. If a license allows more than one launch, an applicant must demonstrate the applicability of the analysis methods to each of the proposed launches and identify any expected differences in the flight safety analysis methods among the proposed launches. Once licensed, a launch operator must perform a flight safety analysis for each launch using final launch vehicle performance and other data as required by subpart C of part 417 of this chapter and using the analysis methods approved by the FAA through the licensing process.

(b) *Radionuclides.* An applicant's safety review document must identify the type and quantity of any radionuclide on a launch vehicle or payload. For each radionuclide, an applicant must include a reference list of all documentation addressing the safety of its intended use and describe all approvals by the Nuclear Regulatory Commission for launch processing. An applicant must provide radionuclide information to the FAA at the pre-application consultation as required by §415.105. The FAA will evaluate launch of any radionuclide on a case-by-case basis, and issue an approval if the FAA finds that the launch is consistent with public health and safety.

(c) *Flight safety plan.* An applicant's safety review document must contain a flight safety plan that satisfies §417.111(b) of this chapter. The plan need not be restricted to public safety related issues and may combine other flight safety issues as well, such as employee safety, so as to be all-inclusive.

(d) *Natural and triggered lightning.* For any orbital or guided suborbital expendable launch vehicle, an applicant must demonstrate that it will satisfy the flight commit criteria of §417.113(c) of this chapter and appendix G of part 417 of this chapter for natural and triggered lightning. If an applicant's safety review document states that any flight commit criterion that is otherwise required by appendix G of part 417 of this chapter does not apply to a proposed launch or series of launches, the applicant's safety review document must demonstrate that the criterion does not apply.

#### §415.117 Ground safety.

(a) *General.* An applicant's safety review document must include a ground safety analysis report, and a ground safety plan for its launch processing and post-flight operations as required by this section, §417.109 of this chapter, and subpart E of part 417 of this chapter when launching from a launch point in the United States. Launch processing and post-launch operations at a launch point outside the United States may be subject to the requirements of the governing jurisdiction.

(b) *Ground safety analysis.* A ground safety analysis must review each system and operation used in launch processing and post-flight operations as required by §417.109 of this chapter, and subpart E of part 417 of this chapter.

(1) An applicant must file an initial ground safety analysis report no later than 12 months for any orbital or guided suborbital launch vehicle, and nine months for an unguided suborbital launch vehicle, before the applicant brings any launch vehicle to the proposed launch site. An initial ground safety analysis report must be in a proposed final or near final form and identify any incomplete items. An applicant must document any incomplete items and track them to completion. An applicant must resolve any FAA

comments on the initial report and file a complete ground safety analysis report, no later than two months before the applicant brings any launch vehicle to the proposed launch site. Furthermore, an applicant must keep its ground safety analysis report current. Any late developing change to a ground safety analysis report must be coordinated with the FAA as an application amendment as required by §413.17 of this chapter as soon as the applicant identifies the need for a change.

(2) An applicant must file a ground safety analysis report that satisfies the ground safety analysis requirements of §417.109 of this chapter, and subpart E of part 417 of this chapter.

(3) The person designated under §417.103(b)(1) of this chapter and the person designated under §417.103(b)(2) of this chapter must approve and sign the ground safety analysis report.

(c) *Ground safety plan.* An applicant's safety review document must contain a ground safety plan that satisfies §417.111(c) of this chapter. The applicant must file this plan with the FAA no later than six months prior to bringing the launch vehicle to the proposed launch site. This ground safety plan must describe implementation of the hazard controls identified by an applicant's ground safety analysis and implementation of the ground safety requirements of subpart E of part 417 of this chapter. A ground safety plan must address all public safety related issues and may include other ground safety issues if an applicant intends it to have a broader scope.

#### §415.119 Launch plans.

An applicant's safety review document must contain the plans required by §417.111 of this chapter, except for the countdown plan of §417.111(1) of this chapter. An applicant's launch plans do not have to be separate documents, and may be part of other applicant documentation. An applicant must incorporate each launch safety rule established under §417.113 of this chapter into a related launch safety plan.

#### §415.121 Launch schedule.

An applicant's safety review document must contain a generic launch processing schedule that identifies

## §415.123

each review, rehearsal, and safety critical preflight operation to be conducted as required by §§417.117, 417.119, and 417.121 of this chapter. The launch schedule must also identify day of flight activities. The launch processing schedule must show each of these activities referenced to liftoff, such as liftoff minus three days.

### §415.123 Computing systems and software.

(a) An applicant's safety review document must describe all computing systems and software that perform a safety-critical computer system function for any operation performed during launch processing or flight that could have a hazardous effect on the public as required by §417.123 of this chapter.

(b) An applicant's safety review document must list and describe all safety-critical computer system functions involved in a proposed launch, including associated hardware and software interfaces. For each system with a safety-critical computer system function, an applicant's safety review document must:

(1) Describe all safety-critical computer system functions, including each safety-critical interface with any other system;

(2) Describe all systems, including all hardware and software, and the layout of each operator console and display;

(3) Provide flow charts or diagrams that show all hardware data busses, hardware interfaces, software interfaces, data flow, and power systems, and all operations of each safety-critical computer system function;

(4) Provide all logic diagrams and software designs;

(5) List all operator user manuals and documentation by title and date;

(6) Describe the computing system and software system safety process as required by §417.123(a).

(7) Provide all results of computing system and software hazard analyses as required by §417.123(c).

(8) Provide all plans and results of computing systems and software validation and verification as required by §417.123(d).

(9) Provide all plans for software development as required by §417.123(e).

## 14 CFR Ch. III (1–1–25 Edition)

### §415.125 Unique safety policies, requirements and practices.

An applicant's safety review document must identify any public safety-related policy, requirement, or practice that is unique to the proposed launch, or series of launches, as required by §417.127 of this chapter. An applicant's safety review document must describe how each unique safety policy, requirement, or practice ensures the safety of the public.

### §415.127 Flight safety system design and operation data.

(a) *General.* This part applies to an applicant launching an orbital or guided sub-orbital expendable launch vehicle that uses a flight safety system to protect public safety as required by §417.107(a) of this chapter. An applicant's safety review document must contain the flight safety system data identified by this section. The applicant must file all data required by this section no later than 18 months before bringing any launch vehicle to a proposed launch site.

(b) *Flight safety system description.* A safety review document must describe an applicant's flight safety system and its operation. Part 417, subpart D of this chapter and appendices D, E, and F of part 417 of this chapter contain the flight safety system and subsystems design and operational requirements.

(c) *Flight safety system diagram.* An applicant's safety review document must contain a block diagram that identifies all flight safety system subsystems. The diagram must include the following subsystems defined in part 417, subpart D of this chapter: flight termination system; command control system; tracking; telemetry; communications; flight safety data processing, display, and recording system; and flight safety official console.

(d) *Subsystem design information.* An applicant's safety review document must contain all of the following data that applies to each subsystem identified in the block diagram required by paragraph (c) of this section:

(1) *Subsystem description.* A physical description of each subsystem and its components, its operation, and interfaces with other systems or subsystems.

(2) *Subsystem diagram.* A physical and functional diagram of each subsystem, including interfaces with other systems and subsystems.

(3) *Component location.* Drawings showing the location of all subsystem components, and the details of the mounting arrangements, as installed on the vehicle, and at the launch site.

(4) *Electronic components.* A physical description of each subsystem electronic component, including operating parameters and functions at the system and piece-part level. An applicant must also provide the name of the manufacturer and any model number of each component and identify whether the component is custom designed and built or off-the-shelf-equipment.

(5) *Mechanical components.* An illustrated parts breakdown of all mechanically operated components for each subsystem, including the name of the manufacturer and any model number.

(6) *Subsystem compatibility.* A demonstration of the compatibility of the onboard launch vehicle flight termination system with the command control system.

(7) *Flight termination system component storage, operating, and service life.* A listing of all flight termination system components that have a critical storage, operating, or service life and a summary of the applicant's procedures for ensuring that each component does not exceed its storage, operating, or service life before flight.

(8) *Flight termination system element location.* For a flight termination system, a description of where each subsystem element is located, where cables are routed, and identification of mounting attach points and access points.

(9) *Flight termination system electrical connectors and connections and wiring diagrams and schematics.* For a flight termination system, a description of all subsystem electrical connectors and connections, and any electrical isolation. The safety review document must also contain flight termination system wiring diagrams and schematics and identify the test points used for integrated testing and checkout.

(10) *Flight termination system batteries.* A description of each flight termination system battery and cell, the

name of the battery or cell manufacturer, and any model numbers.

(11) *Controls and displays.* For a flight safety official console, a description of all controls, displays, and charts depicting how real time vehicle data and flight safety limits are displayed. The description must identify the scales used for displays and charts.

(e) *System analyses.* An applicant must perform the reliability and other system analyses for a flight termination system and command control system of §417.309 of this chapter. An applicant's safety review document must contain the results of each analysis.

(f) *Environmental design.* An applicant must determine the flight termination system maximum predicted environment levels required by section D417.7 of appendix D of part 417 of this chapter, and the design environments and design margins of section D417.3 of appendix D of part 417 of this chapter. An applicant's safety review document must summarize the analyses and measurements used to derive the maximum predicted environment levels. The safety review document must contain a matrix that identifies the maximum predicted environment levels and the design environments.

(g) *Flight safety system compliance matrix.* An applicant's safety review document must contain a compliance matrix of the function, reliability, system, subsystem, and component requirements of part 417 of this chapter and appendix D of part 417 of this chapter. This matrix must identify each requirement and indicate compliance as follows:

(1) "Yes" if the applicant's system meets the requirement of part 417 of this chapter. The matrix must reference documentation that demonstrates compliance;

(2) "Not applicable" if the applicant's system design and operational environment are such that the requirement does not apply. For each such case, the applicant must demonstrate, in accordance with section 406.3(b), the non-applicability of that requirement as an attachment to the matrix; or

(3) "Equivalent level of safety" in each case where the applicant proposes to show that its system provides an

equivalent level of safety through some means other than that required by part 417 of this chapter. For each such case, an applicant must clearly and convincingly demonstrate, as required by § 406.3(b), through a technical rationale within the matrix, or as an attachment, that the proposed alternative provides a level of safety equivalent to satisfying the requirement that it would replace.

(h) *Flight termination system installation procedures.* An applicant's safety review document must contain a list of the flight termination system installation procedures and a synopsis of the procedures that demonstrates how each of those procedures meet the requirements of section D417.15 of appendix D of part 417 of this chapter. The list must reference each procedure by title, any document number, and date.

(i) *Tracking validation procedures.* An applicant's safety review document must contain the procedures identified by § 417.121(h) of this chapter for validating the accuracy of the launch vehicle tracking data supplied to the flight safety crew.

**§ 415.129 Flight safety system test data.**

(a) *General.* An applicant's safety review document must contain the flight safety system test data required by this section for the launch of an orbital and guided suborbital expendable launch vehicle that uses a flight safety system to protect public safety as required by § 417.107(a) of this chapter. This section applies to all testing required by part 417, subpart D of this chapter and its appendices, including qualification, acceptance, age surveillance, and preflight testing of a flight safety system and its subsystems and individual components. An applicant must file all required test data, no later than 12 months before the applicant brings any launch vehicle to the proposed launch site. An applicant may file test data earlier to allow greater time for addressing issues that the FAA may identify to avoid possible impact on the proposed launch date. Flight safety system testing need not be completed before the FAA issues a launch license. Prior to flight, a licensee must successfully complete all

required flight safety system testing and file the completed test reports or the test report summaries required by § 417.305(d) of this chapter and section E417.1(i) of appendix E of part 417 of this chapter.

(b) *Testing compliance matrix.* An applicant's safety review document must contain a compliance matrix of all the flight safety system, subsystem, and component testing requirements of part 417 of this chapter and appendix E to part 417 of this chapter. This matrix must identify each test requirement and indicate compliance as follows:

(1) "Yes" if the applicant performs the system or component testing required by part 417 of this chapter. The matrix must reference documentation that demonstrates compliance;

(2) "Not applicable" if the applicant's system design and operational environment are such that the test requirement does not apply. For each such case, an applicant must demonstrate, as required by § 406.3(b), of the non-applicability of that requirement as an attachment to the matrix;

(3) "Similarity" if the test requirement applies to a component whose design is similar to a previously qualified component. For each such case, an applicant must demonstrate similarity by performing the analysis required by appendix E of part 417 of this chapter. The matrix, or an attachment, must contain the results of each analysis; or

(4) "Equivalent level of safety" in each case where the applicant proposes to show that its test program provides an equivalent level of safety through some means other than that required by part 417 of this chapter. For each such case, an applicant must clearly and convincingly demonstrate through a technical rationale, within the matrix or as an attachment, that the alternative provides a level of safety equivalent to satisfying the requirement that it replaces, as required by § 406.3(c).

(c) *Test program overview and schedule.* A safety review document must contain a summary of the applicant's flight safety system test program that identifies the location of the testing and the personnel who ensure the validity of the results. A safety review document must contain a schedule for

successfully completing each test before flight. The applicant must reference the schedule to the time of lift-off for the first proposed flight attempt.

(d) *Flight safety system test plans and procedures.* An applicant's safety review document must contain test plans that satisfy the flight safety system testing requirements of subpart D of part 417 of this chapter and appendix E of part 417 of this chapter. An applicant's safety review document must contain a list of all flight termination system test procedures and a synopsis of the procedures that demonstrates how they meet the test requirements of part 417 of this chapter. The list must reference each procedure by title, any document number, and date.

(e) *Test reports.* An applicant's safety review document must contain either the test reports, or a summary of the test report which captures the overall test results, including all test discrepancies and their resolution, prepared as required by § 417.305(d) of this chapter and section E417.1(i) of appendix E of part 417 of this chapter, for each flight safety system test completed at the time of license application. An applicant must file any remaining test reports or summaries before flight as required by § 417.305(d) and section E417.1(i) of appendix E of part 417 of this chapter. Upon request, the launch operator must file the complete test report with the FAA for review, if the launch operator previously filed test report summaries with the FAA.

(f) *Reuse of flight termination system components.* An applicant's safety review document must contain a reuse qualification test, refurbishment plan, and acceptance test plan for the use of any flight termination system component on more than one flight. This test plan must define the applicant's process for demonstrating that the component can satisfy all its performance specifications when subjected to the qualification test environmental levels plus the total number of exposures to the maximum expected environmental levels for each of the flights to be flown.

#### **§ 415.131 Flight safety system crew data.**

(a) An applicant's safety review document must identify each flight safety system crew position and the role of that crewmember during launch processing and flight of a launch vehicle.

(b) An applicant's safety review document must describe the certification program for flight safety system crewmembers established to ensure compliance with §§ 417.105 and 417.311 of this chapter.

#### **§ 415.133 Safety at end of launch.**

An applicant must demonstrate compliance with § 417.129 of this chapter, for any proposed launch of a launch vehicle with a stage or component that will reach Earth orbit.

#### **§ 415.135 Denial of safety approval.**

The FAA notifies an applicant, in writing, if it has denied safety approval for a license application. The notice states the reasons for the FAA's determination. The applicant may respond to the reasons for the determination and request reconsideration.

#### **§§ 415.136–415.200 [Reserved]**

### **Subpart G—Environmental Review**

#### **§ 415.201 General.**

An applicant shall provide the FAA with information for the FAA to analyze the environmental impacts associated with a proposed launch. The information provided by an applicant must be sufficient to enable the FAA to comply with the requirements of the National Environment Policy Act, 42 U.S.C. 4321 *et seq.* (NEPA), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA, 40 CFR parts 1500–1508, and the FAA's Procedures for Considering Environmental Impacts, FAA Order 1050.1D.

[Amdt. 415–03, 64 FR 19616, Apr. 21, 1999. Redesignated by Amdt. 415–4, 71 FR 50532, Aug. 25, 2006]

#### **§ 415.203 Environmental information.**

An applicant shall submit environmental information concerning:

## §§ 415.204–415.400

(a) A proposed launch site not covered by existing environmental documentation;

(b) A proposed launch vehicle with characteristics falling measurably outside the parameters of existing environmental documentation;

(c) A proposed launch from an established launch site involving a vehicle with characteristics falling measurably outside the parameters of any existing environmental impact statement that applies to that site;

(d) A proposed payload that may have significant environmental impacts in the event of a mishap; and

(e) Other factors as determined by the FAA.

[Amdt. 415–03, 64 FR 19616, Apr. 21, 1999. Redesignated by Amdt. 415–4, 71 FR 50532, Aug. 25, 2006]

## §§ 415.204–415.400 [Reserved]

### APPENDIX A TO PART 415 [RESERVED]

#### APPENDIX B TO PART 415—SAFETY REVIEW DOCUMENT OUTLINE

This appendix contains the format and numbering scheme for a safety review document to be filed as part of an application for a launch license as required by subpart F of part 415. The applicable sections of parts 413, 415, and 417 of this chapter are referenced in the outline below.

#### SAFETY REVIEW DOCUMENT

- 1.0 Launch Description (§415.109)
- 1.1 Launch Site Description
- 1.2 Launch Vehicle Description
- 1.3 Payload Description
- 1.4 Trajectory
- 1.5 Staging Events
- 1.6 Vehicle Performance Graphs
- 2.0 Launch Operator Organization (§415.111)
- 2.1 Launch Operator Organization (§415.111 and §417.103 of this chapter)
  - 2.1.1 Organization Summary
  - 2.1.3 Organization Charts
  - 2.1.4 Office Descriptions and Safety Functions
- 3.0 Launch Personnel Certification Program (§415.113 and §417.105 of this chapter)
  - 3.1 Program Summary
  - 3.2 Program Implementation Document(s)
  - 3.3 Table of Safety Critical Tasks Performed by Certified Personnel
- 4.0 Flight Safety (§415.115)
- 4.1 Initial Flight Safety Analysis

## 14 CFR Ch. III (1–1–25 Edition)

- 4.1.1 Flight Safety Sub-Analyses, Methods, and Assumptions
- 4.1.2 Sample Calculation and Products
- 4.1.3 Launch Specific Updates and Final Flight Safety Analysis Data
- 4.2 Radionuclide Data (where applicable)
- 4.3 Flight Safety Plan
  - 4.3.1 Flight Safety Personnel
  - 4.3.2 Flight Safety Rules
  - 4.3.3 Flight Safety System Summary and Preflight Tests
  - 4.3.4 Trajectory and Debris Dispersion Data
  - 4.3.5 Flight Hazard Areas and Safety Clear Zones
  - 4.3.6 Support Systems and Services
  - 4.3.7 Flight Safety Operations
  - 4.3.8 Unguided Suborbital Launch Vehicles (where applicable)
- 5.0 Ground Safety (§415.117)
- 5.1 Ground Safety Analysis Report
- 5.2 Ground Safety Plan
- 6.0 Launch Plans (§415.119 and §417.111 of this chapter)
  - 6.1 Launch Support Equipment and Instrumentation Plan
  - 6.2 Configuration Management and Control Plan
  - 6.3 Frequency Management Plan
  - 6.4 Flight Termination System Electronic Piece Parts Program Plan
  - 6.5 Accident Investigation Plan
  - 6.6 Local Agreements and Public Coordination Plan
  - 6.7 Hazard Area Surveillance and Clearance Plan
  - 6.8 Communications Plan
  - 7.0 Launch Schedule (§415.121)
  - 7.1 Launch Processing Schedule
  - 8.0 Computing Systems and Software (§415.123)
    - 8.1 Hardware and Software Descriptions
    - 8.2 Flow Charts and Diagrams
    - 8.3 Logic Diagrams and Software Design Descriptions
    - 8.4 Operator User Manuals and Documentation
    - 8.5 Software Hazard Analyses
    - 8.6 Software Test Plans, Test Procedures, and Test Results
    - 8.7 Software Development Plan
  - 9.0 Unique Safety Policies, Requirements and Practices (§415.125)
  - 10.0 Flight Safety System Design and Operation Data (§415.127)
    - 10.1 Flight Safety System Description
    - 10.2 Flight Safety System Diagram
    - 10.3 Flight Safety System Subsystem Design Information
    - 10.4 Flight Safety System Analyses
    - 10.5 Flight Termination System Environmental Design
    - 10.6 Flight Safety System Compliance Matrix
    - 10.7 Flight Termination System Installation Procedures
    - 10.8 Tracking System Validation Procedures



- 11.0 Flight Safety System Test Data (§415.129)
  - 11.1 Testing Compliance Matrix
  - 11.2 Test Program Overview and Schedule
  - 11.3 Flight Safety System Test Plans and Procedures
  - 11.4 Test Reports
  - 11.5 Reuse of Flight Termination System Components
  - 12.0 Flight Safety System Crew Data (§415.131)
  - 12.1 Position Descriptions
  - 12.2 Certification and Training Program Description
  - 13.0 Safety at End of Launch (§415.133)
- [Doc. No. FAA-2000-7953, 71 FR 50536, Aug. 25, 2006]

## PART 417—LAUNCH SAFETY

### Subpart A—General and License Terms and Conditions

- Sec.
- 417.1 General information.
- 417.3 Definitions and acronyms.
- 417.5 [Reserved]
- 417.7 Public safety responsibility.
- 417.9 Launch site responsibility.
- 417.11 Continuing accuracy of license application; application for modification of license.
- 417.13 Agreement with Federal launch range.
- 417.15 Records.
- 417.17 Launch reporting requirements and launch specific updates.
- 417.19 Registration of space objects.
- 417.21 Financial responsibility requirements.
- 417.23 Compliance monitoring.
- 417.25 Post launch report.
- 417.26–417.100 [Reserved]

### Subpart B—Launch Safety Responsibilities

- 417.101 Scope.
- 417.103 Safety organization.
- 417.105 Launch personnel qualifications and certification.
- 417.107 Flight safety.
- 417.109 Ground safety.
- 417.111 Launch plans.
- 417.113 Launch safety rules.
- 417.115 Tests.
- 417.117 Reviews.
- 417.119 Rehearsals.
- 417.121 Safety critical preflight operations.
- 417.123 Computing systems and software.
- 417.125 Launch of an unguided suborbital launch vehicle.
- 417.127 Unique safety policies, requirements, and practices.
- 417.129 Safety at end of launch.
- 417.130–417.200 [Reserved]

### Subpart C—Flight Safety Analysis

- 417.201 Scope and applicability.
- 417.203 Compliance
- 417.205 General.
- 417.207 Trajectory analysis.
- 417.209 Malfunction turn analysis.
- 417.211 Debris analysis.
- 417.213 Flight safety limits analysis.
- 417.215 Straight-up time analysis.
- 417.217 Overflight gate analysis.
- 417.218 Hold-and-resume gate analysis.
- 417.219 Data loss flight time and planned safe flight state analyses.
- 417.221 Time delay analysis.
- 417.223 Flight hazard area analysis.
- 417.224 Probability of failure analysis.
- 417.225 Debris risk analysis.
- 417.227 Toxic release hazard analysis.
- 417.229 Far-field overpressure blast effects analysis.
- 417.231 [Reserved]
- 417.233 Analysis for an unguided suborbital launch vehicle flown with a wind weighting safety system.

### Subpart D—Flight Safety System

- 417.301 General.
- 417.303 Command control system requirements.
- 417.305 Command control system testing.
- 417.307 Support systems.
- 417.309 Flight safety system analysis.
- 417.311 Flight safety system crew roles and qualifications.

### Subpart E—Ground Safety

- 417.401 Scope.
- 417.402 Compliance.
- 417.403 General.
- 417.405 Ground safety analysis.
- 417.407 Hazard control implementation.
- 417.409 System hazard controls.
- 417.411 Safety clear zones for hazardous operations.
- 417.413 Hazard areas.
- 417.415 Post-launch and post-flight-attempt hazard controls.
- 417.417 Propellants and explosives.

APPENDIX A TO PART 417—FLIGHT SAFETY ANALYSIS METHODOLOGIES AND PRODUCTS FOR A LAUNCH VEHICLE FLOWN WITH A FLIGHT SAFETY SYSTEM

APPENDIX B TO PART 417—FLIGHT HAZARD AREA ANALYSIS FOR AIRCRAFT AND SHIP PROTECTION

APPENDIX C TO PART 417—FLIGHT SAFETY ANALYSIS METHODOLOGIES AND PRODUCTS FOR AN UNGUIDED SUBORBITAL LAUNCH VEHICLE FLOWN WITH A WIND WEIGHTING SAFETY SYSTEM

APPENDIX D TO PART 417—FLIGHT TERMINATION SYSTEMS, COMPONENTS, INSTALLATION, AND MONITORING

APPENDIX E TO PART 417—FLIGHT TERMINATION SYSTEM TESTING AND ANALYSIS