

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

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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, in-

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cluding 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