

TABLE E-8—SEPARATION DISTANCE CRITERIA FOR STORAGE OF LIQUID HYDROGEN AND BULK QUANTITIES OF HYDRAZINE—Continued

Pounds of energetic liquid	Pounds of energetic liquid	Public area and intraline distance to incompatible energetic liquids	Intraline distance to compatible energetic liquids	Pounds of energetic liquid	Pounds of energetic liquid	Public area and intraline distance to incompatible energetic liquids	Intraline distance to compatible energetic liquids
300 .....	400	600	45	90,000	100,000	1,200	135
400 .....	500	600	50	100,000	125,000	1,800	140
500 .....	600	600	50	125,000	150,000	1,800	145
600 .....	700	600	55	150,000	175,000	1,800	150
700 .....	800	600	55	175,000	200,000	1,800	155
800 .....	900	600	60	200,000	250,000	1,800	160
900 .....	1,000	600	60	250,000	300,000	1,800	165
1,000 .....	2,000	600	65	300,000	350,000	1,800	170
2,000 .....	3,000	600	70	350,000	400,000	1,800	175
3,000 .....	4,000	600	75	400,000	450,000	1,800	180
4,000 .....	5,000	600	80	450,000	500,000	1,800	180
5,000 .....	6,000	600	80	500,000	600,000	1,800	185
6,000 .....	7,000	600	85	600,000	700,000	1,800	190
7,000 .....	8,000	600	85	700,000	800,000	1,800	195
8,000 .....	9,000	600	90	800,000	900,000	1,800	200
9,000 .....	10,000	600	90	900,000	1,000,000	1,800	205
10,000 .....	15,000	1,200	95	1,000,000	2,000,000	1,800	235
15,000 .....	20,000	1,200	100	2,000,000	3,000,000	1,800	255
20,000 .....	25,000	1,200	105	3,000,000	4,000,000	1,800	265
25,000 .....	30,000	1,200	110	4,000,000	5,000,000	1,800	275
30,000 .....	35,000	1,200	110	5,000,000	6,000,000	1,800	285
35,000 .....	40,000	1,200	115	6,000,000	7,000,000	1,800	295
40,000 .....	45,000	1,200	120	7,000,000	8,000,000	1,800	300
45,000 .....	50,000	1,200	120	8,000,000	9,000,000	1,800	305
50,000 .....	60,000	1,200	125	9,000,000	10,000,000	1,800	310

[Doc. No. FAA-2011-0105, 77 FR 55116, Sept. 7, 2012]

431.16-431.20 [Reserved]

**PARTS 421-430 [RESERVED]**

**Subpart B—Policy Review and Approval for Launch and Reentry of a Reusable Launch Vehicle**

**PART 431—LAUNCH AND REENTRY OF A REUSABLE LAUNCH VEHICLE (RLV)**

- 431.21 General.
- 431.23 Policy review.
- 431.25 Application requirements for policy review.
- 431.27 Denial of policy approval.
- 431.28-431.30 [Reserved]

**Subpart A—General**

**Subpart C—Safety Review and Approval for Launch and Reentry of a Reusable Launch Vehicle**

- Sec.
- 431.1 General.
- 431.2 Licenses issued under this part.
- 431.3 Types of reusable launch vehicle mission licenses.
- 431.5 Policy and safety approvals.
- 431.7 Payload and payload reentry determinations.
- 431.8 Human space flight.
- 431.9 Issuance of a reusable launch vehicle mission license.
- 431.11 Additional license terms and conditions.
- 431.13 Transfer of a reusable launch vehicle mission license.
- 431.15 Rights not conferred by a reusable launch vehicle mission license.

- 431.31 General.
- 431.33 Safety organization.
- 431.35 Acceptable reusable launch vehicle mission risk.
- 431.37 Mission readiness.
- 431.39 Mission rules, procedures, contingency plans, and checklists.
- 431.41 Communications plan.
- 431.43 Reusable launch vehicle mission operational requirements and restrictions.
- 431.45 Mishap investigation plan and emergency response plan.
- 431.47 Denial of safety approval.
- 431.48-431.50 [Reserved]

## § 431.1

### Subpart D—Payload Reentry Review and Determination

- 431.51 General.
- 431.53 Classes of payloads.
- 431.55 Payload reentry review.
- 431.57 Information requirements for payload reentry review.
- 431.59 Issuance of payload reentry determination.
- 431.61 Incorporation of payload reentry determination in license application.
- 431.62–431.70 [Reserved]

### Subpart E—Post-Licensing Requirements—Reusable Launch Vehicle Mission License Terms and Conditions

- 431.71 Public safety responsibility.
- 431.73 Continuing accuracy of license application; application for modification of license.
- 431.75 Agreements.
- 431.77 Records.
- 431.79 Reusable launch vehicle mission reporting requirements.
- 431.81 Financial responsibility requirements.
- 431.83 Compliance monitoring.
- 431.85 Registration of space objects.
- 431.86–431.90 [Reserved]

### Subpart F—Environmental Review

- 431.91 General.
- 431.93 Environmental information.

AUTHORITY: 51 U.S.C. 50901–50923.

SOURCE: Docket No. FAA–1999–5535, 65 FR 56658, Sept. 19, 2000, unless otherwise noted.

EFFECTIVE DATE NOTE: At 85 FR 79717, Dec. 10, 2020, Part 431 was removed and reserved, effective Mar. 10, 2026.

### Subpart A—General

#### § 431.1 General.

(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 reusable launch vehicle (RLV) mission license and post-licensing requirements with which a licensee must comply to remain licensed. Requirements for preparing a license application are contained in part 413 of this subchapter.

## 14 CFR Ch. III (1–1–25 Edition)

(c) *Equivalent level of safety.* Each requirement of this part applies unless the applicant or licensee clearly and convincingly demonstrates that an alternative approach provides an equivalent level of safety to the requirement of this part.

[Doc. No. FAA–2019–0229, Amdt. 431–7, 85 FR 79717, Dec. 10, 2020]

#### § 431.2 Licenses issued under this part.

(a) *Definitions.* For the purposes of this subpart, 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. 431–7, 85 FR 79717, Dec. 10, 2020]

#### § 431.3 Types of reusable launch vehicle mission licenses.

(a) *Mission-specific license.* A mission-specific license authorizing an RLV mission authorizes a licensee to launch and reenter, or otherwise land, one model or type of RLV from a launch site approved for the mission to a reentry site or other location approved for the mission. A mission-specific license authorizing an RLV mission may authorize more than one RLV mission and identifies each flight of an RLV authorized under the license. A licensee's authorization to conduct RLV missions terminates upon completion of all activities authorized by the license or the expiration date stated in the reentry license, whichever occurs first.

(b) *Operator license.* An operator license for RLV missions authorizes a licensee to launch and reenter, or otherwise land, any of a designated family of RLVs within authorized parameters, including launch sites and trajectories, transporting specified classes of payloads to any reentry site or other location designated in the license. An operator license for RLV missions is valid for a two-year renewable term.

(c) *Duration of license.* Notwithstanding the duration for a license established in paragraphs (a) and (b) of this section, no license issued under

## Commercial Space Transportation, FAA, DOT

## § 431.13

this part will be valid after March 10, 2026.

[Docket No. FAA-1999-5535, 65 FR 56658, Sept. 19, 2000, as amended by Doc. No. FAA-2019-0229, Amdt. 431-7, 85 FR 79717, Dec. 10, 2020]

### § 431.5 Policy and safety approvals.

To obtain either type of RLV mission license, an applicant must obtain policy and safety approvals from the FAA. Requirements for obtaining these approvals are contained in subparts B and C of this part. Only the 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.

### § 431.7 Payload and payload reentry determinations.

(a) A payload determination is required to launch a payload unless the proposed payload is exempt from payload review under § 415.53 of this chapter. Requirements for obtaining a payload determination are set forth in part 415, subpart D of this chapter.

(b) A payload reentry determination is required to reenter a payload to Earth on an RLV unless the proposed payload is exempt from payload reentry review.

(c) A payload reentry determination made under a previous license application under this subchapter may satisfy the requirements of paragraph (b) of this section.

(d) The FAA conducts a review, as described in subpart D of this part, to make a payload reentry determination. Either an RLV mission license applicant or a payload owner or operator may request a review of the proposed payload using the application procedures contained in part 413 of this subchapter. Upon receipt of an application, the FAA may conduct a payload reentry review independently of an RLV mission license application.

### § 431.8 Human space flight.

To obtain a license, an applicant proposing to conduct a reusable launch vehicle mission 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. 431-8, 89 FR 76726, Sept. 19, 2024]

### § 431.9 Issuance of a reusable launch vehicle mission license.

(a) The FAA issues either a mission-specific or operator license authorizing RLV missions to an applicant who has obtained all approvals and determinations required under this chapter for the license.

(b) An RLV mission license authorizes a licensee to launch and reenter, or otherwise land, an RLV and payload, if any, 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.

### § 431.11 Additional license terms and conditions.

The FAA may amend an RLV mission license at any time by modifying or adding license terms and conditions to ensure compliance with 51 U.S.C. Subtitle V, chapter 509, and applicable regulations.

[Doc. No. FAA-2012-0232, 77 FR 20533, Apr. 5, 2012]

### § 431.13 Transfer of a reusable launch vehicle mission license.

(a) Only the FAA may transfer an RLV mission license.

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

## § 431.15

### § 431.15 Rights not conferred by a reusable launch vehicle mission license.

Issuance of an RLV mission license does not relieve a licensee of its obligation to comply with requirements of law that may apply to its activities.

### §§ 431.16–431.20 [Reserved]

## Subpart B—Policy Review and Approval for Launch and Reentry of a Reusable Launch Vehicle

### § 431.21 General.

The FAA issues a policy approval to an RLV mission license applicant upon completion of a favorable policy review. A policy approval is part of the licensing record on which the licensing determination is based.

### § 431.23 Policy review.

(a) The FAA reviews an RLV mission license application to determine whether the proposed mission presents any issues, other than those issues addressed in the safety review, that would adversely affect U.S. national security or foreign policy interests, would jeopardize public health and safety or the safety of property, or would not be consistent with international obligations of the United States.

(b) Interagency consultation is conducted as follows:

(1) The FAA consults with the Department of Defense to determine whether an RLV mission license application presents any issues adversely affecting U.S. national security.

(2) The FAA consults with the Department of State to determine whether an RLV mission license application presents any issues adversely 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 RLV mission proposal.

(c) The FAA advises an applicant, in writing, of any issue raised during a

## 14 CFR Ch. III (1–1–25 Edition)

policy review that would impede issuance of a policy approval. The applicant may respond, in writing, or revise its license application.

### § 431.25 Application requirements for policy review.

In its RLV mission license application, an applicant must—

(a) Identify the model, type, and configuration of any RLV proposed for launch and reentry, or otherwise landing on Earth, by the applicant.

(b) Identify all vehicle systems, including structural, thermal, pneumatic, propulsion, electrical, and avionics and guidance systems used in the vehicle(s), and all propellants.

(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 and reentry flight profile(s), including—

(1) Launch and reentry site(s), including planned contingency abort locations, if any;

(2) Flight trajectories, reentry trajectories, associated ground tracks, and instantaneous impact points for nominal operations, and contingency abort profiles, if any;

(3) Sequence of planned events or maneuvers during the mission; and for an orbital mission, the range of intermediate and final orbits of the vehicle and upper stages, if any, and their estimated orbital life times.

### § 431.27 Denial of policy approval.

The FAA notifies an applicant, in writing, if the FAA has denied policy approval for an RLV mission 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.

§§ 431.28–431.30 [Reserved]

### Subpart C—Safety Review and Approval for Launch and Reentry of a Reusable Launch Vehicle

#### § 431.31 General.

(a) The FAA conducts a safety review to determine whether an applicant is capable of launching an RLV and payload, if any, from a designated launch site, and reentering the RLV and payload, if any, to a designated reentry site or location, or otherwise landing it on Earth, without jeopardizing public health and safety and the safety of property.

(b) The FAA issues a safety approval to an RLV mission license applicant that satisfies the requirements of this Subpart. The FAA evaluates on an individual basis all public safety aspects of a proposed RLV mission to ensure they are sufficient to support safe conduct of the mission. A safety approval is part of the licensing record on which the FAA's licensing determination is based.

(c) 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.

#### § 431.33 Safety organization.

(a) An applicant shall maintain a safety organization and document it by identifying lines of communication and approval authority for all mission decisions that may affect public safety. Lines of communication within the applicant's organization, between the applicant and the launch site, and between the applicant and the reentry site, shall be employed to ensure that personnel perform RLV mission operations in accordance with plans and procedures required by this subpart. Approval authority shall be employed to ensure compliance with terms and conditions stated in an RLV mission license and with the plans and procedures required by this subpart.

(b) An applicant must designate a person responsible for the conduct of all licensed RLV mission activities.

(c) An applicant shall designate by name, title, and qualifications, a qualified safety official authorized by the applicant to examine all aspects of the applicant's operations with respect to safety of RLV mission activities and to monitor independently compliance by vehicle safety operations personnel with the applicant's safety policies and procedures. The safety official shall report directly to the person responsible for an applicant's licensed RLV mission activities, who shall ensure that all of the safety official's concerns are addressed both before a mission is initiated and before reentry or descent flight of an RLV is initiated. The safety official is responsible for—

(1) Monitoring and evaluating operational dress rehearsals to ensure they are conducted in accordance with procedures required by § 431.37(a)(4) and under § 431.37(a)(1)(iv) to ensure the readiness of vehicle safety operations personnel to conduct a safe mission under nominal and non-nominal conditions; and

(2) Completing a mission readiness determination as required by § 431.37 before an RLV mission is initiated. The safety official must monitor and report to the person responsible for the conduct of licensed RLV mission activities any non-compliance with procedures listed in §§ 431.37 and 431.43, or any representation contained in the application, and the readiness of the licensee to conduct mission operations in accordance with the license and this part. The safety official is responsible for compliance with §§ 431.37 and 431.43, and with representations contained in the application.

#### § 431.35 Acceptable reusable launch vehicle mission risk.

(a) To obtain safety approval for an RLV mission, an applicant must demonstrate that the proposed mission does not exceed acceptable risk as defined in this subpart. For purposes of this section, the mission commences upon initiation of the launch phase of flight and consists of launch flight through orbital insertion of an RLV or vehicle stage or flight to outer space, whichever is applicable, and reentry or descent flight, and concludes upon landing on Earth of the RLV.

**§ 431.37**

**14 CFR Ch. III (1–1–25 Edition)**

(b) Acceptable risk for a proposed mission is measured in terms of the expected average number of casualties ( $E_c$ ).

(1) To obtain safety approval, an applicant must demonstrate the following for public risk:

(i) The risk to the collective members of the public from the proposed launch meets the public risk criteria of § 417.107(b)(1) of this chapter;

(ii) The risk level to the collective members of the public, excluding persons in water-borne vessels and aircraft, from each proposed reentry does not exceed an expected number of  $1 \times 10^{-4}$  casualties from impacting inert and explosive debris and toxic release associated with the reentry; and

(iii) The risk level to an individual does not exceed  $1 \times 10^{-6}$  probability of casualty per mission.

(2) [Reserved]

(c) To demonstrate compliance with acceptable risk criteria in this section, an applicant shall employ a system safety process to identify the hazards and assess the risks to public health and safety and the safety of property associated with the mission, including nominal and non-nominal operation and flight of the vehicle and payload, if any. An acceptable system safety analysis identifies and assesses the probability and consequences of any reasonably foreseeable hazardous event, and safety-critical system failures during launch flight or reentry that could result in a casualty to the public.

(d) As part of the demonstration required under paragraph (c) of this section, an applicant must—

(1) Identify and describe the structure of the RLV, including physical dimensions and weight;

(2) Identify and describe any hazardous materials, including radioactive materials, and their container on the RLV;

(3) Identify and describe safety-critical systems;

(4) Identify and describe all safety-critical failure modes and their consequences;

(5) Provide drawings and schematics for each safety-critical system identified under paragraph (d)(3) of this section;

(6) Provide a timeline identifying all safety-critical events;

(7) Provide data that verifies the risk elimination and mitigation measures resulting from the applicant's system safety analyses required by paragraph (c) of this section; and

(8) Provide flight trajectory analyses covering launch or ascent of the vehicle through orbital insertion and reentry or descent of the vehicle through landing, including its three-sigma dispersion.

[Doc. No. FAA-1999-5535, 65 FR 56658, Sept. 19, 2000, as amended by Amdt. 431-2, 72 FR 17019, Apr. 6, 2007; Docket No. FAA-2014-0418, Amdt. No. 431-4, 81 FR 47027, July 20, 2016]

**§ 431.37 Mission readiness.**

(a) *Mission readiness requirements.* An applicant shall submit the following procedures for verifying mission readiness:

(1) Mission readiness review procedures that involve the applicant's vehicle safety operations personnel, and launch site and reentry site personnel involved in the mission. The procedures shall ensure a mission readiness review is conducted during which the designated individual responsible for the conduct of licensed activities under § 431.33(b) is provided with the following information to make a judgment as to mission readiness—

(i) Readiness of the RLV including safety-critical systems and payload for launch and reentry flight;

(ii) Readiness of the launch site, personnel, and safety-related launch property and launch services to be provided by the launch site;

(iii) Readiness of the reentry site, personnel, and safety-related property and services for reentry flight and vehicle recovery;

(iv) Readiness of vehicle safety operations personnel to support mission flight, including results of dress rehearsals and simulations conducted in accordance with paragraph (a)(4) of this section;

(v) Mission rules and constraints, including contingency abort plans and procedures, if any, as required under § 431.39;

(vi) Unresolved safety issues identified during the mission readiness review and plans for addressing them; and

(vii) Any additional safety information required by the individual designated under §431.33(b) to determine launch and reentry readiness.

(2) Procedures that ensure mission constraints, rules, contingency abort and emergency abort procedures are listed and consolidated in a safety directive or notebook approved by the person designated by the applicant under §431.33(b), the launch site operator, and the reentry site operator, if any;

(3) Procedures that ensure currency and consistency of licensee, launch site operator, and reentry site operator 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 or add one or more dress rehearsals; and

(iii) Verify currency and consistency of licensee, launch site operator, and reentry site operator checklists; and

(5) Procedures for ensuring the licensee's vehicle safety operations personnel adhere to crew rest rules of this part.

(b) [Reserved]

**§ 431.39 Mission rules, procedures, contingency plans, and checklists.**

(a) An applicant shall submit mission rules, procedures, checklists, emergency plans, and contingency abort plans, if any, that ensure safe conduct of mission operations during nominal and non-nominal vehicle flight.

(b) Mission rules, procedures, checklists, emergency plans, and contingency abort plans must be contained in a safety directive, notebook, or other compilation that is approved by the safety official designated under §431.33(c) and concurred in by the launch site operator and reentry site operator, if any.

(c) Vehicle safety operations personnel must have current and consistent mission checklists.

**§ 431.41 Communications plan.**

(a) An applicant shall submit a plan providing vehicle safety operations personnel communications procedures during the mission. Procedures for effective issuance and communication of safety-critical information during the mission shall include hold/resume, go/no go, contingency abort, if any, and emergency abort commands by vehicle safety operations personnel. The communications plan shall describe the authority of vehicle safety operations personnel, by individual or position title, to issue these commands. The communications plan shall ensure that—

(1) Communication networks are assigned so that personnel identified under this section have direct access to real-time, safety-critical information required for making decisions and issuing commands;

(2) Personnel identified under this section monitor a common intercom channel for safety-critical communications during launch and reentry;

(3) A protocol is established for utilizing defined radio communications terminology; and

(4) Communications affecting the safety of the mission are recorded in a manner that accurately reflects communications made on individual channels, synchronized time coding, and sequence of communications.

(b) An applicant shall submit procedures to ensure that licensee and reentry site personnel, if any, receive a copy of the communications plan required by this section and that the reentry site operator, if any, concurs with the communications plan.

**§ 431.43 Reusable launch vehicle mission operational requirements and restrictions.**

(a) An applicant for RLV mission safety approval shall submit procedures—

(1) That ensure RLV mission risks do not exceed the criteria set forth in §§ 431.35, 450.169, and in §450.101(a)(4) and (b)(4) for nominal and non-nominal operations;

(2) That ensure conformance with the system safety process and associated hazard identification and risk assessment required under § 431.35(c);

§ 431.45

14 CFR Ch. III (1–1–25 Edition)

(3) That ensure conformance with operational restrictions listed in paragraphs (c) through (e) of this section;

(4) To monitor and verify the status of RLV safety-critical systems sufficiently before enabling both launch and reentry flight to ensure public safety and during mission flight unless technically infeasible; and

(5) For human activation or initiation of a flight safety system that safely aborts the launch of an RLV if the vehicle is not operating within approved mission parameters and the vehicle poses risk to public health and safety and the safety of property in excess of acceptable flight risk as defined in § 431.35.

(b) To satisfy risk criteria set forth in § 431.35(b)(1), an applicant for RLV mission safety approval shall identify suitable and attainable locations for nominal landing and vehicle staging impact or landing, if any. An application shall identify such locations for a contingency abort if necessary to satisfy risk criteria contained in § 431.35(b)(1) during launch of an RLV. A nominal landing, vehicle staging impact and contingency abort location are suitable for launch or reentry if—

(1) For any vehicle or vehicle stage, the area of the predicted three-sigma dispersion of the vehicle or vehicle stage can be wholly contained within the designated location; and

(2) The location is of sufficient size to contain landing impacts, including debris dispersion upon impact and any toxic release.

(c) For an RLV mission—

(1) [Reserved]

(2) The projected instantaneous impact point (IIP) of the vehicle shall not have substantial dwell time over densely populated areas during any segment of mission flight;

(3) There will be no unplanned physical contact between the vehicle or its components and payload after payload separation and debris generation will not result from conversion of energy sources into energy that fragments the vehicle or its payload. Energy sources include, but are not limited to, chemical, pneumatic, and kinetic energy; and

(4) Vehicle safety operations personnel shall adhere to the following work and rest standards:

(i) A maximum 12-hour work shift with at least 8 hours of rest after 12 hours of work, preceding initiation of an RLV reentry mission or during the conduct of a mission;

(ii) A maximum of 60 hours worked in the 7 days, preceding initiation of an RLV mission;

(iii) A maximum of 14 consecutive work days; and

(iv) A minimum 48-hour rest period after 5 consecutive days of 12-hour shifts.

(d) In addition to requirements of paragraph (c) of this section, any unproven RLV may only be operated so that during any portion of flight—

(1) The projected instantaneous impact point (IIP) of the vehicle does not have substantial dwell time over populated areas; or

(2) The expected number of casualties to members of the public does not exceed  $1 \times 10^{-4}$  given a probability of vehicle failure equal to 1 (pf=1) at any time the IIP is over a populated area;

(e) Any RLV that enters Earth orbit may only be operated such that the vehicle operator is able to—

(1) Monitor and verify the status of safety-critical systems before enabling reentry flight to assure the vehicle can reenter safely to Earth; and

(2) Issue a command enabling reentry flight of the vehicle. Reentry flight cannot be initiated autonomously under nominal circumstances without prior enable.

[Docket No. FAA-1999-5535, 65 FR 56658, Sept. 19, 2000, as amended by Docket No. FAA-2014-0418, Amdt. No. 431-4, 81 FR 47027, July 20, 2016; Doc. No. FAA-2019-0229, Amdt. 431-7, 85 FR 79717, Dec. 10, 2020]

§ 431.45 Mishap investigation plan and emergency response plan.

(a) *Mishap investigation plan and emergency response plan.* An applicant shall submit a mishap investigation plan (MIP) containing the applicant's procedures for reporting and responding to launch and reentry accidents, launch and reentry incidents, or other mishaps, as defined in § 401.5 of this chapter, that occur during the conduct of an RLV mission. An acceptable MIP

satisfies the requirements of paragraphs (b)–(d) of this section. An applicant shall also submit an emergency response plan (ERP) that contains procedures for informing the affected public of a planned RLV mission. An acceptable ERP satisfies the requirements of paragraph (e) of this section. The MIP and ERP shall be signed by an individual authorized to sign and certify the application in accordance with § 413.7(c) of this chapter, the person responsible for the conduct of all licensed RLV mission activities designated under § 431.33(b) of this subpart, and the safety official designated under § 431.33(c) of this subpart.

(b) *Report requirements.* A MIP shall provide for—

(1) Immediate notification to the FAA Washington Operations Center in case of a launch or reentry accident, launch or reentry incident, or a mishap that involves a fatality or serious injury (as defined in 49 CFR 830.2);

(2) Notification within 24 hours to the Associate Administrator for Commercial Space Transportation in the event of a mishap that does not involve a fatality or serious injury, as defined in 49 CFR 830.2; and

(3) Submission of a written preliminary report to the FAA Associate Administrator for Commercial Space Transportation in the event of a launch accident or launch incident occurring in the conduct of an RLV mission, or reentry accident or reentry incident, occurring in the conduct of an RLV mission, within 5 days of the event. The report shall identify the event as either a launch or reentry accident or incident and must include the following information:

- (i) Date and time of occurrence;
- (ii) Description of the event and sequence of events leading to the accident or incident, to the extent known;
- (iii) Intended and actual location of launch and reentry or other landing on Earth;
- (iv) Identification of the vehicle;
- (v) Identification of the payload, if applicable;
- (vi) Number and general description of any fatalities and injuries;
- (vii) Property damage, if any, and an estimate of its value;

(viii) Identification of hazardous materials, as defined in § 401.5 of this chapter, involved in the event, whether on the vehicle, payload, or on the ground;

(ix) Action taken by any person to contain the consequences of the event;

(x) Weather conditions at the time of the event; and

(xi) Potential consequences for other vehicles or systems of similar type and proposed operations.

(c) *Response plan.* A MIP must contain procedures to—

(1) Ensure the consequences of a launch accident, launch incident, reentry accident, reentry incident, or other mishap occurring in the conduct of an RLV mission are contained and minimized;

(2) Ensure data and physical evidence are preserved;

(3) Require the licensee to report and to cooperate with FAA and the National Transportation Safety Board investigations and designate one or more points of contact for the FAA or NTSB; and

(4) Require the licensee to identify and adopt preventive measures for avoiding recurrence of the event.

(d) *Investigation plan.* A MIP shall contain—

(1) Procedures for investigating the cause of an event described in paragraph (c)(1) of this section;

(2) Procedures for reporting investigation results to the FAA;

(3) Delineated responsibilities, including reporting responsibilities, for personnel assigned to conduct investigations and for any unrelated entities retained by the licensee to conduct or participate in investigations.

(e) *Emergency response plan.* An ERP shall provide for—

(1) Notification to local officials in the event of an off-site or unplanned landing so that vehicle recovery can be conducted safely and effectively and with minimal risk to public safety. The plan must provide for the quick dissemination of up to date information to the public, and for doing so in advance of reentry or other landing on Earth to the extent practicable; and

(2) A public information dissemination plan for informing the potentially affected public, in laymen's terms and in advance of a planned reentry, of the

## § 431.47

estimated date, time and landing location for the reentry activity.

### § 431.47 Denial of safety approval.

The FAA notifies an applicant, in writing, if the FAA has denied safety approval for an RLV mission 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.

## §§ 431.48–431.50 [Reserved]

### Subpart D—Payload Reentry Review and Determination

#### § 431.51 General.

(a) A payload reentry review is conducted to examine the policy and safety issues related to the proposed reentry of a payload, other than a U.S. Government payload or a payload whose reentry is subject to regulation by another Federal agency, to determine whether the FAA will approve reentry of the payload.

(b) A payload reentry review may be conducted as part of an RLV mission license application review or may be requested by a payload owner or operator in advance of or separate from an RLV mission license application.

(c) A payload reentry determination will be made part of the licensing record on which the FAA's licensing determination is based.

#### § 431.53 Classes of payloads.

(a) The FAA may approve the return of a type or class of payload (for example, communications or microgravity/scientific satellites).

(b) The RLV mission licensee that will return a payload approved for reentry under this section, is responsible for providing current information in accordance with § 431.57 regarding the payload proposed for reentry no later than 60 days before a scheduled RLV mission involving that payload.

#### § 431.55 Payload reentry review.

(a) In conducting a payload reentry review to decide if the FAA should approve reentry of a payload, the FAA determines whether its reentry presents any issues that would adversely

## 14 CFR Ch. III (1–1–25 Edition)

affect U.S. national security or foreign policy interests, would jeopardize public health and safety or the safety of property, or would not be consistent with international obligations of the United States.

(b) The FAA consults with the Department of Defense to determine whether reentry of a proposed payload presents any issues adversely affecting U.S. national security.

(c) The FAA consults with the Department of State to determine whether reentry of a proposed payload presents any issues adversely affecting U.S. foreign policy interests or international obligations.

(d) 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.

(e) The FAA advises a person requesting a payload reentry determination, in writing, of any issue raised during a payload reentry review that would impede the issuance of a favorable determination to reenter that payload. The person requesting a payload reentry review may respond, in writing, or revise its application.

#### § 431.57 Information requirements for payload reentry review.

A person requesting reentry review of a particular payload or payload class must identify the following:

(a) Payload name or class and function;

(b) Physical characteristics, dimensions, and weight of the payload;

(c) Payload owner and operator, if different from the person requesting the payload reentry review;

(d) Type, amount, and container of hazardous materials, as defined in § 401.5 of this chapter, and radioactive materials in the payload;

(e) Explosive potential of payload materials, alone and in combination with other materials found on the payload or RLV during reentry;

(f) Designated reentry site(s); and

(g) Method for securing the payload on the RLV.

**§ 431.59 Issuance of payload reentry determination.**

(a) The FAA issues a favorable payload reentry determination unless it determines that reentry of the proposed payload would adversely affect U.S. national security or foreign policy interests, would jeopardize public health and safety or the safety of property, or would not be consistent with international obligations of the United States. The FAA responds to any person who has requested a payload reentry 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 reentry determination may respond to the reasons for the determination and request reconsideration.

**§ 431.61 Incorporation of payload reentry determination in license application.**

A favorable payload reentry determination issued for a payload or class of payload may be included by an RLV mission license applicant as part of its application. Before the conduct of an RLV mission involving a payload approved for reentry, any change in information provided under § 431.57 must be reported by the licensee in accordance with § 413.17 of this chapter. The FAA determines whether a favorable payload reentry determination remains valid and may conduct an additional payload reentry review.

**§§ 431.62–431.70 [Reserved]****Subpart E—Post-Licensing Requirements—Reusable Launch Vehicle Mission License Terms and Conditions****§ 431.71 Public safety responsibility.**

(a) A licensee is responsible for ensuring the safe conduct of an RLV mission and for protecting public health and safety and the safety of property during the conduct of the mission.

(b) A licensee must conduct a licensed RLV mission and perform RLV safety procedures in accordance with representations made in its license application. A licensee's failure to perform safety procedures in accordance

with the representations made in the license application or comply with any license condition is sufficient basis for the revocation of a license or other appropriate enforcement action.

**§ 431.73 Continuing accuracy of license application; application for modification of license.**

(a) A licensee is responsible for the continuing accuracy of representations contained in its application for the entire term of the license.

(b) After a license has been issued, a licensee must apply to the FAA for modification of the license if—

(1) The licensee proposes to conduct an RLV mission or perform a safety-critical operation in a manner not authorized by the license; or

(2) Any representation contained in the license application that is material to public health and safety or the safety of property is no longer accurate and complete or does not reflect the licensee's procedures governing the actual conduct of an RLV mission. A change is material to public health and safety or the safety of property if it alters or affects the—

(i) Mission rules, procedures, checklists, emergency plans, and contingency abort plans, if any, submitted in accordance with § 431.39

(ii) Class of payload;

(iii) Type of RLV;

(iv) Any safety-critical system;

(v) Type and container of the hazardous material carried by the vehicle;

(vi) Flight trajectory;

(vii) Launch site or reentry site or other landing location; or

(viii) Any safety system, policy, procedure, requirement, criteria, or standard.

(c) An application to modify an RLV mission license must be prepared and submitted in accordance with part 413 of this chapter. The licensee must indicate any part of its license or license application that would be changed or affected by a proposed modification.

(d) The FAA reviews determinations and approvals required by this chapter to determine whether they remain valid after submission of a proposed modification.

## § 431.75

(e) Upon approval of a modification, the FAA issues either a written approval to the licensee or a license order amending the license if a stated term or condition of the license is changed, added, or deleted. An approval has the full force and effect of a license order and is part of the licensing record.

(f) The Administrator may determine that a modification to a license issued under this part must comply with the requirements in part 450 of this chapter. The Administrator will base the determination on the extent and complexity of the modification, whether the applicant proposes to modify multiple parts of the application, or if the application requires significant evaluation.

[Docket No. FAA-1999-5535, 65 FR 56658, Sept. 19, 2000, as amended by Doc. No. FAA-2019-0229, Amdt. 431-7, 85 FR 79717, Dec. 10, 2020]

## § 431.75 Agreements.

(a) *Launch and reentry site use agreements.* Before conducting a licensed RLV mission using property and services of a Federal launch range or licensed launch or reentry site operator, a licensee or applicant shall enter into an agreement with the Federal launch range and/or licensed site operator that provides for access to and use of property and services required to support a licensed RLV mission or reentry and for public safety related operations and support. The agreement shall be in effect before any licensed RLV mission or reentry. A licensee shall comply with any requirements of the agreement that may affect public health and safety and the safety of property during the conduct of its licensed activity.

(b) *Agreements for notices to mariners and airmen.* Unless otherwise addressed in agreements between a licensed launch site operator and the U.S. Coast Guard and the FAA, respectively, a licensee authorized to conduct an RLV mission using a launch site or reentry site other than a Federal launch range shall complete the following:

(1) An agreement between the licensee and the local U.S. Coast Guard district to establish procedures for the issuance of a Notice to Mariners prior to a launch or reentry and other measures as the Coast Guard deems nec-

## 14 CFR Ch. III (1-1-25 Edition)

essary to protect public health and safety; and

(2) An agreement between the licensee and the FAA regional office having jurisdiction over the airspace through which a launch and reentry will take place, to establish procedures for the issuance of a Notice to Airmen prior to the conduct of a licensed launch or reentry and for closing of air routes during the respective launch and reentry windows and other measures deemed necessary by the FAA regional office in order to protect public health and safety.

## § 431.77 Records.

(a) Except as specified in paragraph (b) of this section, a licensee shall maintain for 3 years all records, data, and other material necessary to verify that a licensed RLV mission is conducted in accordance with representations contained in the licensee's application.

(b) In the event of a launch accident, reentry accident, launch incident or reentry incident, as defined in § 401.5 of this chapter, a licensee shall preserve all records related to the event. Records must be retained until completion of any Federal investigation and the FAA advises the licensee that the records need not be retained. The licensee shall make all records required to be maintained under the regulations available to Federal officials for inspection and copying.

## § 431.79 Reusable launch vehicle mission reporting requirements.

(a) Not less than 60 days before each RLV mission conducted under a license, a licensee shall provide the FAA with the following information:

(1) Payload information in accordance with 14 CFR § 415.59 of this chapter and § 431.57; and

(2) Flight information, including the vehicle, launch site, planned launch and reentry flight path, and intended landing sites including contingency abort sites.

(3) Launch or reentry waivers, approved or pending, from a Federal range from which the launch or reentry will take place, that are unique and may affect public safety.

(b) Not later than 15 days before each licensed RLV mission, a licensee must notify the FAA, in writing, of the time and date of the intended launch and reentry or other landing on Earth of the RLV and may utilize the FAA/U.S. Space Command Launch Notification Form, contained in part 415, Appendix A, of this subchapter for doing so.

(c) A licensee must report a launch accident, launch incident, reentry accident, reentry incident, or other mishap immediately to the FAA Washington Operations Center and provide a written preliminary report in the event of a launch accident, launch incident, reentry accident, or reentry incident, in accordance with the mishap investigation and emergency response plan submitted as part of its license application under § 431.45.

[Docket No. FAA-1999-5535, 65 FR 56658, Sept. 19, 2000, as amended by Amdt. No. 431-5, 81 FR 59440, Aug. 30, 2016]

**§ 431.81 Financial responsibility requirements.**

A licensee under this part must comply with financial responsibility requirements specified in its license.

**§ 431.83 Compliance monitoring.**

A licensee shall allow access by, and cooperate with, Federal officers or employees or other individuals authorized by the FAA to observe any activities of the licensee, or of the licensee's contractors or subcontractors, associated with the conduct of a licensed RLV mission.

**§ 431.85 Registration of space objects.**

(a) To assist the U.S. Government in implementing Article IV of the 1975 Convention on Registration of Objects Launched into Outer Space, each licensee shall provide to the FAA the information required by paragraph (b) of this section for all objects placed in space by a licensed RLV mission, including an RLV and any components, except:

(1) Any object owned and registered by the U.S. Government; and

(2) Any object owned by a foreign entity.

(b) For each object that must be registered in accordance with this section, a licensee shall submit the following

information not later than thirty (30) days following the conduct of a licensed RLV mission :

(1) The international designator of the space object(s);

(2) Date and location of the RLV mission initiation;

(3) General function of the space object; and

(4) Final orbital parameters, including:

(i) Nodal period;

(ii) Inclination;

(iii) Apogee; and

(iv) Perigee.

(c) A licensee shall notify the FAA when it removes an object that it has previously placed in space.

**§§ 431.86–431.90 [Reserved]**

**Subpart F—Environmental Review**

**§ 431.91 General.**

An applicant shall provide the FAA with sufficient information to analyze the environmental impacts associated with proposed operation of an RLV, including the impacts of anticipated activities to be performed at its reentry site. The information provided by an applicant must be sufficient to enable the FAA to comply with the requirements of the National Environmental Policy Act, 42 U.S.C. 4321 *et seq.*, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR parts 1500–1508, and the FAA's Procedures for Considering Environmental Impacts, FAA Order 1050.1D. Copies of FAA Order 1050.1D may be obtained from the Office of Environment and Energy, AEE-300, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591, (202) 267-3553. Copies of FAA Order 1050.1D may be inspected in the Rules Docket at the Federal Aviation Administration, Office of the Chief Counsel, AGC-200, Room 915G, 800 Independence Avenue SW., Washington, DC 20591 weekdays between 8:30 a.m. and 5:00 p.m.

**§ 431.93 Environmental information.**

An applicant shall submit environmental information concerning—

(a) A designated launch and reentry site, including contingency abort locations, if any, not covered by existing FAA or other Federal environmental documentation;

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

(c) A proposed reentry to an established reentry site involving an RLV with characteristics falling measurably outside the parameters of existing environmental impact statements covering that site;

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

(e) Other factors as necessary to comply with the National Environmental Policy Act.

## PART 432 [RESERVED]

### PART 433—LICENSE TO OPERATE A REENTRY SITE

Sec.

433.1 General.

433.3 Issuance of a license to operate a reentry site.

433.5 Operational restrictions on a reentry site.

433.7 Environmental.

AUTHORITY: 51 U.S.C. 50901–50923.

SOURCE: Docket No. FAA–1999–5535, 65 FR 56665, Sept. 19, 2000, unless otherwise noted.

#### § 433.1 General.

The FAA evaluates on an individual basis an applicant's proposal to operate a reentry site.

#### § 433.3 Issuance of a license to operate a reentry site.

(a) The FAA issues a license to operate a reentry site when it determines that an applicant's operation of the reentry site does not jeopardize public health and safety, the safety of property, U.S. national security or foreign policy interests, or international obligations of the United States.

(b) A license to operate a reentry site authorizes a licensee to operate a reentry site in accordance with the representations contained in the licensee's application, subject to the licensee's

compliance with terms and conditions contained in any license order accompanying the license.

#### § 433.5 Operational restrictions on a reentry site.

A license to operate a reentry site authorizes the licensee to offer use of the site to support reentry of a reentry vehicle for which the three-sigma footprint of the vehicle upon reentry is wholly contained within the site.

#### § 433.7 Environmental.

(a) *General.* The FAA is responsible for complying with the procedures and policies of the National Environmental Policy Act (NEPA) and other applicable environmental laws, regulations, and Executive Orders prior to issuing a reentry site license. An applicant must provide the FAA with information needed to comply with such requirements. The FAA will consider and document the potential environmental effects associated with issuing a license for a reentry site.

(b) *Environmental impact statement or environmental assessment.* When directed by the FAA, an applicant must—

(1) Prepare an Environmental Assessment with FAA oversight;

(2) Assume financial responsibility for preparation of an Environmental Impact Statement by an FAA-selected and -managed consultant contractor; or

(3) Submit information to support a written re-evaluation of a previously submitted Environmental Assessment or Environmental Impact Statement.

(c) *Categorical exclusion.* The FAA may determine that a categorical exclusion is appropriate upon receipt of supporting information from an applicant.

(d) *Environmental information.* An application must include an approved FAA Environmental Assessment, Environmental Impact Statement, categorical exclusion determination, or written re-evaluation covering all planned licensed activities in compliance with NEPA and the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA.

[Doc. No. FAA–2019–0229, Amdt. 433–3, 85 FR 79717, Dec. 10, 2020]