

## § 29.71

at 30-minute OEI power for rotorcraft for which certification for the use of 30-minute OEI power is requested.

[Doc. No. 24802, 61 FR 21900, May 10, 1996; 61 FR 33963, July 1, 1996, as amended by Amdt. 29-44, 64 FR 45337, Aug. 19, 1999; 64 FR 47563, Aug. 31, 1999]

### § 29.71 Helicopter angle of glide: Category B.

For each category B helicopter, except multiengine helicopters meeting the requirements of § 29.67(b) and the powerplant installation requirements of category A, the steady angle of glide must be determined in autorotation—

(a) At the forward speed for minimum rate of descent as selected by the applicant;

(b) At the forward speed for best glide angle;

(c) At maximum weight; and

(d) At the rotor speed or speeds selected by the applicant.

[Amdt. 29-12, 41 FR 55471, Dec. 20, 1976]

### § 29.75 Landing: General.

(a) For each rotorcraft—

(1) The corrected landing data must be determined for a smooth, dry, hard, and level surface;

(2) The approach and landing must not require exceptional piloting skill or exceptionally favorable conditions; and

(3) The landing must be made without excessive vertical acceleration or tendency to bounce, nose over, ground loop, porpoise, or water loop.

(b) The landing data required by §§ 29.77, 29.79, 29.81, 29.83, and 29.85 must be determined—

(1) At each weight, altitude, and temperature for which landing data are approved;

(2) With each operating engine within approved operating limitations; and

(3) With the most unfavorable center of gravity.

[Doc. No. 24802, 61 FR 21900, May 10, 1996]

### § 29.77 Landing Decision Point (LDP): Category A.

(a) The LDP is the last point in the approach and landing path from which a balked landing can be accomplished in accordance with § 29.85.

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(b) Determination of the LDP must include the pilot recognition time interval following failure of the critical engine.

[Doc. No. 24802, 64 FR 45338, Aug. 19, 1999]

### § 29.79 Landing: Category A.

(a) For Category A rotorcraft—

(1) The landing performance must be determined and scheduled so that if the critical engine fails at any point in the approach path, the rotorcraft can either land and stop safely or climb out and attain a rotorcraft configuration and speed allowing compliance with the climb requirement of § 29.67(a)(2);

(2) The approach and landing paths must be established with the critical engine inoperative so that the transition between each stage can be made smoothly and safely;

(3) The approach and landing speeds must be selected by the applicant and must be appropriate to the type of rotorcraft; and

(4) The approach and landing path must be established to avoid the critical areas of the height-velocity envelope determined in accordance with § 29.87.

(b) It must be possible to make a safe landing on a prepared landing surface after complete power failure occurring during normal cruise.

[Doc. No. 24802, 61 FR 21900, May 10, 1996]

### § 29.81 Landing distance: Category A.

The horizontal distance required to land and come to a complete stop (or to a speed of approximately 3 knots for water landings) from a point 50 ft above the landing surface must be determined from the approach and landing paths established in accordance with § 29.79.

[Doc. No. 24802, 64 FR 45338, Aug. 19, 1999]

### § 29.83 Landing: Category B.

(a) For each Category B rotorcraft, the horizontal distance required to land and come to a complete stop (or to a speed of approximately 3 knots for water landings) from a point 50 feet above the landing surface must be determined with—

(1) Speeds appropriate to the type of rotorcraft and chosen by the applicant to avoid the critical areas of the

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height-velocity envelope established under § 29.87; and

(2) The approach and landing made with power on and within approved limits.

(b) Each multiengine Category B rotorcraft that meets the powerplant installation requirements for Category A must meet the requirements of—

(1) Sections 29.79 and 29.81; or

(2) Paragraph (a) of this section.

(c) It must be possible to make a safe landing on a prepared landing surface if complete power failure occurs during normal cruise.

[Doc. No. 24802, 61 FR 21900, May 10, 1996; 61 FR 33963, July 1, 1996]

**§ 29.85 Balked landing: Category A.**

For Category A rotorcraft, the balked landing path with the critical engine inoperative must be established so that—

(a) The transition from each stage of the maneuver to the next stage can be made smoothly and safely;

(b) From the LDP on the approach path selected by the applicant, a safe climbout can be made at speeds allowing compliance with the climb requirements of § 29.67(a)(1) and (2); and

(c) The rotorcraft does not descend below 15 feet above the landing surface. For elevated heliport operations, descent may be below the level of the landing surface provided the deck edge clearance of § 29.60 is maintained and the descent (loss of height) below the landing surface is determined.

[Doc. No. 24802, 64 FR 45338, Aug. 19, 1999]

**§ 29.87 Height-velocity envelope.**

(a) If there is any combination of height and forward velocity (including hover) under which a safe landing cannot be made after failure of the critical engine and with the remaining engines (where applicable) operating within approved limits, a height-velocity envelope must be established for—

(1) All combinations of pressure altitude and ambient temperature for which takeoff and landing are approved; and

(2) Weight from the maximum weight (at sea level) to the highest weight approved for takeoff and landing at each altitude. For helicopters, this weight

need not exceed the highest weight allowing hovering out-of-ground effect at each altitude.

(b) For single-engine or multiengine rotorcraft that do not meet the Category A engine isolation requirements, the height-velocity envelope for complete power failure must be established.

[Doc. No. 24802, 61 FR 21901, May 10, 1996; 61 FR 33963, July 1, 1996]

**FLIGHT CHARACTERISTICS**

**§ 29.141 General.**

The rotorcraft must—

(a) Except as specifically required in the applicable section, meet the flight characteristics requirements of this subpart—

(1) At the approved operating altitudes and temperatures;

(2) Under any critical loading condition within the range of weights and centers of gravity for which certification is requested; and

(3) For power-on operations, under any condition of speed, power, and rotor r.p.m. for which certification is requested; and

(4) For power-off operations, under any condition of speed, and rotor r.p.m. for which certification is requested that is attainable with the controls rigged in accordance with the approved rigging instructions and tolerances;

(b) Be able to maintain any required flight condition and make a smooth transition from any flight condition to any other flight condition without exceptional piloting skill, alertness, or strength, and without danger of exceeding the limit load factor under any operating condition probable for the type, including—

(1) Sudden failure of one engine, for multiengine rotorcraft meeting Transport Category A engine isolation requirements;

(2) Sudden, complete power failure, for other rotorcraft; and

(3) Sudden, complete control system failures specified in § 29.695 of this part; and

(c) Have any additional characteristics required for night or instrument operation, if certification for those kinds of operation is requested. Requirements for helicopter instrument