Contents

The Civil Air Regulations in this manual are those in effect on December 20, 1956, as amended by Amendments 6–1 through 6–3.

General

Applicability and Definitions

	Section	Page
Applicability of this part	6.0	1
Definitions	6.1	1

Certification

Eligibility for type certificates	6.10	4
Designation of applicable regulations	6.11	4
Recording of applicable regulations	6.12	5
Type certificate	6.13	5
Data required	6.14	5
Inspections and tests	6.15	5
Flight tests	6.16	5
Airworthiness, experimental, and production certificates	6.17	6
Approval of materials, parts, processes, and appliances	6.18	6
Approval of aircraft components (*CAA rules which apply to sec. 6.18*)	6.18–1	6
Manufacturer (*CAA interpretations which apply to sec. 6.18 (b)*)	6.18–2	6
Products approved as a part of the rotorcraft (*CAA policies which apply to sec. 6.18*)	6.18–3	6

Changes

Changes in type design	6.19	6–1

Flight

General

Proof of compliance	6.100	6–1
Weight limitations	6.101	6–1
Center of gravity limitations	6.102	7
Rotor limitations and pitch settings	6.103	7
Empty weight	6.104	7
Use of ballast	6.105	8

Performance

General	6.110	8
Takeoff	6.111	8
Climb	6.112	8
Minimum operating speed performance	6.113	8
Autorotative or one-engine-inoperative landing	6.114	8
[Autorotative or one-engine-inoperative landing for helicopters with float installations (*FAA policies which apply to sec. 6.114*)	6.114–1]	9
Power-off landings for multiengine rotorcraft	6.115	9

Flight Characteristics

General	6.120	9
Controllability	6.121	9
Trim	6.122	9
Stability	6.123	9

Ground and Water Handling Characteristics

General	6.130	10
Ground resonance	6.131	10
Spray characteristics	6.132	10

to bounce, nose over, ground loop, porpoise, or water loop.

[6.114–1 *Autorotative or one-engine-inoperative landing for helicopters with float installations (FAA policies which apply to sec. 6.114).*

[(a) Helicopters equipped with float installations* should comply with the following:

[(1) Landings should be conducted on water at wave heights selected by the applicant to show compliance with sections 6.114 and 6.715.

[(2) When approval is requested under the air carrier operating regulations (see secs. 46.70, 46.71, and 46.206 of this chapter) for operations involving takeoff or landing over water with helicopters certificated under this part, compliance should be shown with subparagraph (1) of this paragraph.

[(3) For approval of night operations, landings from cruising altitude should be conducted in accordance with subparagraph (1) or (2) of this paragraph.

[(4) Pertinent information concerning the operating procedures investigated and the surface conditions prevailing during these landings should be included in the operating procedure section of the Rotorcraft Flight Manual.]

(24 F. R. 965, Feb. 10, 1959, effective Feb. 26, 1959.)

6.115 *Power-off landings for multiengine rotorcraft.* For all multiengine rotorcraft it shall be possible to make a safe landing following complete failure of all power during normal operating conditions.

Flight Characteristics

6.120 *General.*

(a) The rotorcraft shall comply with the requirements prescribed in sections 6.120 through 6.123 at all normally expected operating altitudes, under all critical loading conditions within the range of weight and center of gravity, and for all speeds, power, and rotor rpm conditions for which certification is sought.

(b) It shall be possible to maintain a flight condition and to make a smooth transition from one flight condition to another without requiring an exceptional degree of skill, alertness, or strength on the part of the pilot, and without danger of exceeding the limit load factor under all conditions of operation probable for the type, including those conditions normally encountered in the event of sudden powerplant failure.

(c) For night or instrument certification the rotorcraft shall have such additional flight characteristics as the Administrator finds are required for safe operation under those conditions.

6.121 *Controllability.*

(a) The rotorcraft shall be safely controllable and maneuverable during steady flight and during the execution of any maneuver appropriate to the type of rotorcraft, including take-off, climb, level flight, turn, glide, and power-on or power-off landings.

(b) The margin of longitudinal and lateral cyclic control shall allow satisfactory pitching and rolling control at V_{NE} (see sec. 6.711) with: (1) Maximum weight, (2) critical center of gravity, (3) power on and power off, (4) critical rotor rpm.

(c) Compliance with paragraph (b) of this section shall include a demonstration with a power failure at V_H or V_{NE} whichever is the lesser.

(d) There shall be established a wind velocity in which the rotorcraft can be operated without loss of control on or near the ground at the critical weight and center of gravity and the critical rotor rpm in any maneuver appropriate to the type of rotorcraft (e. g. cross-wind take-offs, sideward or rearward flight). This wind velocity shall not be less than 20 mph.

6.122 *Trim.* It shall be possible in steady level flight at any speed appropriate to the type of rotorcraft to trim the steady longitudinal and lateral control forces to zero. The trim device shall not introduce any undesirable discontinuities in the force gradients.

6.123 *Stability.*

(a) *General.* It shall be possible to fly the rotorcraft in normal maneuvers, including a minimum of three take-offs and landings, for a continuous period of time appropriate to the

[*"Salvage float gear" constitutes means to keep the helicopter afloat for salvage purposes only and is not to be regarded as a float installation.]

Miscellaneous Flight Requirements

	Section	Page
Flutter and vibration	6.140	10

Structure

General

Loads	6.200	10
Strength and deformation	6.201	10–1
Proof of structure	6.202	10–1
Structural and dynamic tests	6.203	11
Fixed or ground adjustable stabilizing surfaces (*CAA policies which apply to secs. 6.10 and 6.203 (b)*)	6.203–1	11
Design limitations	6.204	11

Flight Loads

General	6.210	11
Flight load factors	6.211	11
Maneuvering conditions	6.212	11
Gust conditions	6.213	12

Control Surface and System Loads

General	6.220	12
Auxiliary rotor assemblies	6.221	12
Service life of auxiliary rotor assemblies (*CAA interpretations which apply to sec. 6.221*)	6.221–1	12
Auxiliary rotor attachment structure	6.222	12
Tail rotor guard	6.223	12
Stabilizing and control surfaces	6.224	12
Primary control systems	6.225	12

Landing Loads

General	6.230	13
Level landing conditions	6.231	13
Distribution of vertical ground reaction loads and determination of angular inertia loads (*CAA interpretations which apply to sec. 6.231 (b) (2)*)	6.231–1	13
Nose-up landing conditions	6.232	14
One-wheel landing condition	6.233	14
Lateral-drift landing condition	6.234	14
Brake roll conditions	6.235	14
Taxiing conditions	6.236	14
Shock absorption tests	6.237	14
Ski landing conditions	6.240	15
Float landing conditions	6.245	15
Tail-wheel type landing gear ground loading conditions	6.246	16
Skid gear ground loading condition	6.247	16–1

Main Component Requirements

Main rotor structure	6.250	16–2
Service life of main rotors (*CAA policies which apply to sec. 6.250 (a)*)	6.250–1	16–2
Fuselage, landing gear, and rotor pylon structure	6.251	16–2

Emergency Landing Conditions

General	6.260	16–2

operational use of the particular type of rotorcraft without the pilot experiencing undue fatigue or strain. In addition, the rotorcraft shall comply with the requirements of paragraph (b) of this section.

(b) *Static longitudinal stability.* In the following configurations the characteristics of the longitudinal cyclic control shall be such that, with constant throttle and collective pitch settings, a rearward displacement of longitudinal control shall be necessary to obtain and maintain speeds below the specified trim speed, and a forward displacement shall be necessary to obtain and maintain speeds above the specified trim speed for the ranges of altitude and rotor rpm for which certification is sought:

(1) *Climb.* The stick position curve shall have a stable slope over a speed range from 15 percent of V_Y or 15 mph, whichever is greater, below V_Y to 20 percent of V_Y or 15 mph, whichever is greater, above V_Y, but in no case greater than 1.1 V_{NE}, with:

(i) Critical weight and center of gravity,

(ii) Maximum continuous power,

(iii) Landing gear retracted, and

(iv) Trim at best rate-of-climb speed (V_Y).

(2) *Cruise.* The stick position curve shall have a stable slope over a speed range from 0.7 V_H or 0.7 V_{NE}, whichever is less, to 1.1 V_H or 1.1 V_{NE}, whichever is less, with:

(i) Critical weight and center of gravity,

(ii) Power for level flight at 0.9 V_H or 0.9 V_{NE}, whichever is less,

(iii) Landing gear retracted, and

(iv) Trimmed at 0.9 V_H or 0.9 V_{NE}, whichever is less.

(3) *Autorotation.* The stick position curve shall have a stable slope throughout the speed range for which certification is sought, with: (i) Critical weight and center of gravity, (ii) power off, (iii) landing gear both retracted and extended, (iv) trim at the speed for minimum rate of descent.

(4) *Hovering.* In the case of helicopters the stick position curve shall have a stable slope between the maximum approved rearward speed and a forward speed of 20 mph with: (i) Critical weight and center of gravity, (ii) power required for hovering in still air, (iii) landing gear retracted, (iv) trim for hovering.

Ground and Water Handling Characteristics

6.130 *General.* The rotorcraft shall be demonstrated to have satisfactory ground and water handling characteristics. There shall be no uncontrollable tendencies in any operating condition reasonably expected for the type.

6.131 *Ground resonance.* There shall be no uncontrollable tendency for the rotorcraft to oscillate when the rotor is turning and the rotorcraft is on the ground.

6.132 *Spray characteristics.* For rotorcraft equipped with floats, the spray characteristics during taxying, take-off, and landing shall be such as not to obscure the vision of the pilot nor produce damage to the rotors, propellers, or other parts of the rotorcraft.

Miscellaneous Flight Requirements

6.140 *Flutter and vibration.* All parts of the rotorcraft shall be demonstrated to be free from flutter and excessive vibration under all speed and power conditions appropriate to the operation of the type of rotorcraft. (See also secs. 6.203 (f) and 6.711.)

Structure

General

6.200 *Loads.*

(a) Strength requirements of this subpart are specified in terms of limit and ultimate loads. Unless otherwise stated, the specified loads shall be considered as limit loads. In determining compliance with these requirements the provisions set forth in paragraphs (b) through (e) of this section shall apply.

(b) The factor of safety shall be 1.5 unless otherwise specified. The factor of safety shall apply to the external and inertia loads, unless its application to the resulting internal stresses is more conservative.

(c) Unless otherwise provided, the specified air, ground, and water loads shall be placed in equilibrium with inertia forces, considering all items of mass in the rotorcraft.

CIVIL AERONAUTICS MANUALS—Volume II

Federal Aviation Agency

Civil Aeronautics Manuals and supplements thereto are issued by the Bureau of Flight Standards, Federal Aviation Agency, for the guidance of the public and are published in the Federal Register and the Code of Federal Regulations.

Supplement No. 26 **February 15, 1959**

SUBJECT: Revision to Civil Aeronautics Manual 6 dated November 1956.

Attached are revised pages for insertion in Civil Aeronautics Manual 6.

A new section 6.114–1 contains FAA policy with regard to autorotative or one-engine-inoperative landing for helicopters with float installations.

The new material is indicated by brackets.

Remove and destroy the following pages:	*Insert the following new pages:*
CAM 6—v and vi	CAM 6—v and vi
9 and 10	9 through 10–1

William B. Davis

WILLIAM B. DAVIS, *Director,*
Bureau of Flight Standards.

Attachments.