(2) The ranges of these variables (or of the indications on instruments integrating more than one of these variables) are large enough to allow an operationally practical and safe variation of V_{NE}.

(c) For helicopters, a stabilized power-off V_{NE} denoted as V_{NE} (power-off) may be established at a speed less than V_{NE} established pursuant to paragraph (a) of this section, if the following conditions are met:

(1) V_{NE} (power-off) is not less than a speed midway between the power-on V_{NE} and the speed used in meeting the requirements of—

(i) § 27.65(b) for single engine helicopters; and

(ii) § 27.67 for multiengine helicopters.

(2) V_{NE} (power-off) is—

(i) A constant airspeed;

(ii) A constant amount less than power-on V_{NE}; or

(iii) A constant airspeed for a portion of the altitude range for which certification is requested, and a constant amount less than power-on V_{NE} for the remainder of the altitude range.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c) of the Dept. of Transportation Act (49 U.S.C. 1655(c)))

[Amdt. 27–2, 33 FR 964, Jan. 26, 1968, and Amdt. 27–14, 43 FR 2325, Jan. 16, 1978; Amdt. 27–21, 49 FR 44435, Nov. 6, 1984]

§ 27.1509 Rotor speed.

(a) *Maximum power-off (autorotation).* The maximum power-off rotor speed must be established so that it does not exceed 95 percent of the lesser of—

(1) The maximum design r.p.m. determined under § 27.309(b); and

(2) The maximum r.p.m. shown during the type tests.

(b) *Minimum power off.* The minimum power-off rotor speed must be established so that it is not less than 105 percent of the greater of—

(1) The minimum shown during the type tests; and

(2) The minimum determined by design substantiation.

(c) *Minimum power on.* The minimum power-on rotor speed must be established so that it is—

(1) Not less than the greater of—

(i) The minimum shown during the type tests; and

(ii) The minimum determined by design substantiation; and

(2) Not more than a value determined under § 27.33(a)(1) and (b)(1).

§ 27.1519 Weight and center of gravity.

The weight and center of gravity limitations determined under §§ 27.25 and 27.27, respectively, must be established as operating limitations.

[Amdt. 27–2, 33 FR 965, Jan. 26, 1968, as amended by Amdt. 27–21, 49 FR 44435, Nov. 6, 1984]

§ 27.1521 Powerplant limitations.

(a) *General.* The powerplant limitations prescribed in this section must be established so that they do not exceed the corresponding limits for which the engines are type certificated.

(b) *Takeoff operation.* The powerplant takeoff operation must be limited by—

(1) The maximum rotational speed, which may not be greater than—

(i) The maximum value determined by the rotor design; or

(ii) The maximum value shown during the type tests;

(2) The maximum allowable manifold pressure (for reciprocating engines);

(3) The time limit for the use of the power corresponding to the limitations established in paragraphs (b)(1) and (2) of this section;

(4) If the time limit in paragraph (b)(3) of this section exceeds two minutes, the maximum allowable cylinder head, coolant outlet, or oil temperatures;

(5) The gas temperature limits for turbine engines over the range of operating and atmospheric conditions for which certification is requested.

(c) *Continuous operation.* The continuous operation must be limited by—

(1) The maximum rotational speed which may not be greater than—

(i) The maximum value determined by the rotor design; or

(ii) The maximum value shown during the type tests;

(2) The minimum rotational speed shown under the rotor speed requirements in § 27.1509(c); and