

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 27 and 29

[Docket No. 25885; Amendments 27-27 and 29-31]

RIN 2120-AC27

Rotorcraft Airworthiness Amendments Based on European Joint Airworthiness Requirements Proposals

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This rule amends the airworthiness standards for systems, propulsion, and airframe for both normal and transport category rotorcraft. In addition, these amendments introduce safety improvements, clarify existing regulations, and standardize terminology. The changes are based on some of the proposals that were submitted to the FAA by the European Airworthiness Authorities. These amendments are also intended to encourage the European community's acceptance of the Federal Aviation Regulations for rotorcraft type certification, obviate development of different European standards, and achieve increased commonality of airworthiness standards among the respective countries.

EFFECTIVE DATE: October 22, 1990.

FOR FURTHER INFORMATION CONTACT: Mr. Jim S. Honaker, FAA, Regulations Group, ASW-111, Rotorcraft Directorate, Aircraft Certification Service, Fort Worth, Texas 76193-0111, telephone number (817) 624-5109.

SUPPLEMENTARY INFORMATION:**Background**

At a meeting between FAA representatives and the European Airworthiness Authorities Steering Committee (AASC) in April 1983, the AASC agreed to provide the FAA with a comprehensive list of recommended changes to Federal Aviation Regulations (FAR) part 29 to make it suitable for adoption by AASC members. The AASC subsequently established a Joint Airworthiness Requirements (JAR) group on part 29 (JAR 29 group) to develop transport category rotorcraft airworthiness standards for European type certification programs. This JAR 29 group, charged with providing recommended changes for part 29, submitted a comprehensive list of proposals in September 1984.

The initial FAA review of the JAR proposals revealed that many proposals were included in existing rulemaking projects. For those proposals not included in existing rulemaking projects, the FAA determined that several warranted public discussion by interested persons. Accordingly, a public meeting was held in Fort Worth, Texas, May 1-2, 1986 (51 FR 4504, February 5, 1986). A transcript of the meeting is included in the docket for this rulemaking. Although the AASC proposals were confined to part 29, and only part 29 proposals were discussed at the public meeting, these amendments affect the rotorcraft certification rules in both parts 27 and 29. Including part 27 in this rulemaking action will standardize parts 27 and 29 where parallel sections presently exist.

As a result of the JAR proposals and the public meeting, the FAA issued Notice of Proposed Rulemaking No. 89-10, which was published in the **Federal Register** on April 25, 1989 (54 FR 17936).

All interested persons have been given an opportunity to participate in the making of these amendments, and due consideration has been given to all matters presented. A number of nonsubstantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and upon further review by the FAA. Except as indicated herein, the proposals contained in the notice have been adopted without change.

Discussion of Comments

Three commenters, one representing an industry association and two airworthiness authorities of other countries, responded to the notice. The commenters support the notice with some recommended changes. These recommendations and their disposition are contained in the following discussions.

Section 27.401/Section 29.401 Auxiliary Rotor Assemblies; Section 27.403/Section 29.403 Auxiliary Rotor Attachment Structure

The notice proposed to remove these load requirement sections, since the references and requirements are adequately addressed in §§ 27.337/29.337, 27.339/29.339, and 27.341/29.341. Only one comment was received, which supports the proposal; therefore, these amendments are adopted as proposed.

Section 27.413/Section 29.413 Stabilizing and Control Surfaces

The notice proposed to remove these load requirement sections, since the structural requirements are addressed

by §§ 27.337/29.337, 27.339/29.339, and 27.341/29.341. One commenter responded and supports the removal of these sections; therefore, these amendments are adopted as proposed.

Section 27.427/Section 29.427 Unsymmetrical Loads

After NPRM Notice No. 89-10 was issued, these two sections were adopted as Amendments 27-26 and 29-30 (55 FR 7992, March 6, 1990). The references to §§ 27.413 and 29.413, contained in new §§ 27.427 and 29.427, are being removed by these amendments.

Section 27.775/Section 29.775 Windshields and Windows

The notice proposed to revise these sections to clarify that transparency materials other than glass may be used if "they will not break into dangerous fragments."

The AASC reiterated their original proposal that recommended a requirement in § 29.775 for a material that would not suddenly turn opaque. This specific requirement was not included in proposed § 27.775 or § 29.775, because the requirements in §§ 27.773 and 29.773 for the pilot's view "to be sufficiently extensive, clear, and undistorted to permit safe operation" obviate additional requirements. After further evaluation, the FAA continues to believe that §§ 27.773 and 29.773 provide adequate requirements for a clear and undistorted pilot's view. Therefore, these amendments are adopted as proposed.

Section 27.787/Section 29.787 Cargo and Baggage Compartments

The notice proposed to revise paragraph (c) to require occupant protection for all emergency landing loads on cargo and baggage; i.e., vertical and sideward as well as forward loads. No comments were received; however, after further FAA review, minor editorial changes have been made for clarity. Other than minor editorial changes, the amendment is adopted as proposed.

Section 29.783 Doors

The notice proposed to add a new paragraph (h) to require a means to secure a nonjettisonable door in the open position during emergency egress in a ditching. Only one comment was received, which supports the proposal; therefore, the amendment is adopted as proposed.

Section 29.811 Emergency Exit Marking

The notice proposed to revise paragraph (a) to include a requirement

that emergency exit markings must be lighted or luminous, and that, for rotorcraft equipped for overwater flight, the markings must be designed to remain visible if the rotorcraft is capsized and submerged. Only one commenter responded and supports the proposal. A minor editorial change has been made for clarity and other than that, the amendment is adopted as proposed.

Section 29.903 Engines.

The notice proposed to clarify the requirements for control of engine rotation and in-flight restart of engines. One commenter contends an independent engine starting system requirement following in-flight shutdown of all engines without considering windmilling of the engine (as in part 25) would be unnecessarily severe. The FAA does not agree; normally, rotorcraft airspeeds and location of engines do not support engine windmilling up to start speeds. However, the FAA has determined that engine restart capability following in-flight shutdown of all engines is the primary requirement, and the means of providing this capability should be a choice of the applicant. The notice addressed only electrical power requirements for starting while other factors such as windmilling speeds are permitted to be considered. Consequently, paragraph (e)(3) has been revised, and the proposal is adopted with this change.

Section 29.923 Rotor Drive System and Control Mechanism Tests

The notice proposed to add a new paragraph (p) to define qualification testing of lubricants used in the rotor drive system and control mechanism. Paragraph (p) contains a requirement for a portion of the system qualification tests to be accomplished with specific lubricating oil temperatures and pressures. One commenter suggests that all lubricants qualified to the same specification as the lubricant used during the endurance tests should also be acceptable without further testing. The same commenter also suggests that an analysis of lubricant specifications should be permitted, rather than requiring a complete rerun of the tests to qualify a new lubricant. The FAA agrees with both comments, and the suggested changes have been incorporated.

A second commenter suggests that these new test conditions should be applicable to all rotor drive system and control mechanism qualification tests, not just to qualify a lubricant. The commenter further suggests that paragraph (a) of this section include a

reference to the requirements of new paragraph (p), in addition to the current requirements. The FAA agrees, and this change has been made.

A third commenter notes that the minimum temperature tests are normally accomplished during cold weather testing rather than during the tie-down testing. The commenter further notes that the maximum oil temperature and minimum oil pressure tests could be accomplished with pump adjustments and control of cooling airflow, but that it would be almost impossible to cool the entire system to minimum temperatures during the tie-down testing. The FAA agrees, and proposed paragraph (p)(4) has been removed.

The amendment has been adopted with these changes.

Section 29.929 Flight Endurance Test; Withdrawn

The notice proposed to add a new § 29.929 to include the flight test requirement contained in § 21.35, since the AASC has no requirement similar to part 21. There are unresolved technical and economic questions relative to this requirement. In view of this, the proposal is withdrawn for further study.

Appendix B to Part 29—Airworthiness Criteria for Helicopter Instrument Flight

The notice proposed to add a new paragraph VIII(c) to include thunderstorm lights as part of the equipment for instrument flight. Only one comment was received, which supports the proposal; therefore, the amendment is adopted as proposed.

Economic Evaluation Summary

This section summarizes the full regulatory evaluation that provides more detailed estimates of the economic consequences of this regulatory action. This summary and the full evaluation quantify, to the extent practicable, estimated costs to the private sector, consumers, and Federal, State, and local governments, as well as anticipated benefits.

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if potential benefits to society for each regulatory change outweigh potential costs. The order also requires the preparation of a regulatory impact analysis of all "major" rules except those responding to emergency situations or other narrowly defined exigencies. A "major" rule is one that is likely to result in an annual increase in consumer costs, a significant adverse effect on the economy of \$100 million or more, a major increase in consumer

costs, a significant adverse effect on competition, or a high level of controversy.

The FAA has determined that this rule is not "major" as defined in the executive order, and, therefore, a full regulatory analysis that includes the identification and evaluation of cost reducing alternatives to this rule has not been prepared. Instead, the agency has prepared a more concise document termed a regulatory evaluation that analyzes only this rule without identifying alternatives. In addition to a summary of the regulatory evaluation, this section also contains a regulatory flexibility determination, required by the Regulatory Flexibility Act of 1980 (Pub. L. 96-354), and an international trade impact assessment. The full regulatory evaluation is contained in the docket for this rulemaking.

As noted in the Discussion of Comments, the proposal for § 29.929 has been withdrawn for further study. Proposed § 29.929 would have required a 150-hour flight endurance test to demonstrate the functioning and compatibility of the rotors and rotor drive system. Section 29.929 was the only proposal in the notice that was determined to have an economic impact.

The remaining regulatory amendments contained in this final rule have been determined to have negligible or no economic costs. The amendments are editorial or clarifying in nature, incorporate current industry or FAA certification practice, and can be accomplished with negligible or no economic costs. Since all the remaining amendments have either negligible or no economic costs, no attempt has been made to quantify or forecast their benefits.

The clarifying, editorial, and conforming amendments in this rule have no economic cost and are expected to produce only minor administrative and compliance benefits. By comparison, the six substantive amendments that address structural, equipment, or testing requirements have been determined to have only a negligible cost impact but will improve safety conditions. It is likely that they will reduce injuries or fatalities that would occur otherwise. The benefits derived from each of these amendments will equal or exceed the costs when the amendment prevents one serious injury.

Trade Impact Statement

Since the certification rules apply to both foreign and domestic manufacturers that sell in the United States, there will be no competitive advantage to either. Certification costs

that may be imposed by this rule will not result in a competitive trade advantage or disadvantage for American manufacturers in foreign markets. This is because foreign manufacturers must comply with the certification standards of the largest segment of their export market, which in this instance is the U.S. market. The FAA expects that, to remain competitive in overseas markets, foreign vendors will export a similarly equipped rotorcraft to both the United States and other countries.

Regulatory Flexibility Determination

The FAA has determined that under the criteria of the Regulatory Flexibility Act (RFA) of 1980, the amendments to parts 27 and 29 contained in this final rule will not have a significant economic impact on a substantial number of small entities. The RFA requires agencies to review rules that may have a "significant economic impact on a substantial number of small entities." The FAA has adopted criteria and guidelines for determining whether a proposed or existing rule has a significant economic impact on a substantial number of small entities. Under the FAA criteria, a small entity helicopter manufacturer is defined as an independently owned and operated firm having fewer than 75 employees. Only 1 of the 13 rotorcraft manufacturers subject to the certification changes in parts 27 and 29 has fewer than 75 employees. Accordingly, the amendments contained in this final rule will not impact a substantial number of small entities.

Federalism Implications

The regulations adopted herein do not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this amendment does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

For these reasons, and based on the findings in the Regulatory Flexibility Determination, the Trade Impact Statement, and the Regulatory Evaluation, the FAA has determined that these amendments are not major under Executive Order 12291. In addition, the FAA certifies that these amendments will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. These amendments are

considered nonsignificant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A regulatory evaluation of the amendments, including a Regulatory Flexibility Determination and Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

List of Subjects in 14 CFR Parts 27 and 29

Air transportation, Aircraft, Aviation safety, Rotorcraft, Safety.

Adoption of the Amendments

Accordingly, parts 27 and 29 of the Federal Aviation Regulations (14 CFR parts 27 and 29) are amended as follows:

PART 27—AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

1. The authority citation for part 27 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1425, 1428, 1429, and 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

§§ 27.401, 27.403, 27.413 [Removed]

2. Section 27.401, 27.403 and 27.413 are removed.

§ 27.427 [Amended]

3. Section 27.427 is amended by removing the words "in § 27.413" from paragraphs (b)(1) and (b)(2).

4. Section 27.775 is revised to read as follows:

§ 27.775 Windshields and windows.

Windshields and windows must be made of material that will not break into dangerous fragments.

5. Section 27.787 is amended by revising paragraph (c) to read as follows:

§ 27.787 Cargo and baggage compartments.

* * * * *

(c) Under the emergency landing conditions of § 27.561, cargo and baggage compartments must—

(1) Be positioned so that if the contents break loose they are unlikely to cause injury to the occupants or restrict any of the escape facilities provided for use after an emergency landing; or

(2) Have sufficient strength to withstand the conditions specified in § 27.561 including the means of restraint, and their attachments, required by paragraph (b) of this section. Sufficient strength must be provided for the maximum authorized weight of cargo

and baggage at the critical loading distribution.

* * * * *

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

6. The authority citation for part 29 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1424, 1425, 1428, 1429, and 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449; January 12, 1983).

§§ 29.401, 29.403, 29.413 [Removed]

7. Sections 29.401, 29.403, and 29.413 are removed.

§ 29.427 [Amended]

8. Section 29.427 is amended by removing the words "in § 29.413" from paragraphs (b)(1) and (b)(2).

9. Section 29.775 is revised to read as follows:

§ 29.775 Windshields and windows.

Windshields and windows must be made of material that will not break into dangerous fragments.

10. Section 29.783 is amended by adding a new paragraph (h) to read as follows:

§ 29.783 Doors.

* * * * *

(h) Nonjettisonable doors used as ditching emergency exits must have means to enable them to be secured in the open position and remain secure for emergency egress in sea state conditions prescribed for ditching.

11. Section 29.787 is amended by revising paragraph (c) to read as follows:

§ 29.787 Cargo and baggage compartments.

* * * * *

(c) Under the emergency landing conditions of § 29.561, cargo and baggage compartments must—

(1) Be positioned so that if the contents break loose they are unlikely to cause injury to the occupants or restrict any of the escape facilities provided for use after an emergency landing; or

(2) Have sufficient strength to withstand the conditions specified in § 29.561, including the means of restraint and their attachments required by paragraph (b) of this section. Sufficient strength must be provided for the maximum authorized weight of cargo and baggage at the critical loading distribution.

* * * * *

12. Section 29.811 is amended by revising paragraph (a) to read as follows:

§ 29.811 Emergency exit marking.

(a) Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked for the guidance of occupants using the exits in daylight or in the dark. Such markings must be designed to remain visible for rotorcraft equipped for overwater flights if the rotorcraft is capsized and the cabin is submerged.

* * * * *

13. Section 29.903 is amended by revising paragraph (c); by redesignating paragraph (f) as paragraph (d); and by adding a new paragraph (e) as follows:

§ 29.903 Engines.

* * * * *

(c) *Category A: control of engine rotation.* For each Category A rotorcraft, there must be a means for stopping the rotation of any engine individually in flight, except that, for turbine engine installations, the means for stopping the engine need be provided only where necessary for safety. In addition—

(1) Each component of the engine stopping system that is located on the engine side of the firewall, and that might be exposed to fire, must be at least fire resistant; or

(2) Duplicate means must be available for stopping the engine and the controls must be where all are not likely to be damaged at the same time in case of fire.

* * * * *

(e) *Restart capability.* (1) A means to restart any engine in flight must be provided.

(2) Except for the in-flight shutdown of all engines, engine restart capability must be demonstrated throughout a flight envelope for the rotorcraft.

(3) Following the in-flight shutdown of all engines, in-flight engine restart capability must be provided.

14. Section 29.923 is amended by revising the introductory text of paragraph (a) and by adding a new paragraph (p) to read as follows:

§ 29.923 Rotor drive system and control mechanism tests.

(a) *Endurance tests, general.* Each rotor drive system and rotor control mechanism must be tested, as prescribed in paragraphs (b) through (n) and (p) of this section, for at least 200 hours plus the time required to meet paragraphs (b)(2) and (k) of this section. These tests must be conducted as follows:

* * * * *

(p) *Endurance tests; operating lubricants.* To be approved for use in rotor drive and control systems, lubricants must meet the specifications of lubricants used during the tests prescribed by this section. Additional or alternate lubricants may be qualified by equivalent testing or by comparative analysis of lubricant specifications and rotor drive and control system characteristics. In addition—

(1) At least three 10-hour cycles required by this section must be conducted with transmission and gearbox lubricant temperatures, at the location prescribed for measurement,

not lower than the maximum operating temperature for which approval is requested;

(2) For pressure lubricated systems, at least three 10-hour cycles required by this section must be conducted with the lubricant pressure, at the location prescribed for measurement, not higher than the minimum operating pressure for which approval is requested; and

(3) The test conditions of paragraphs (p)(1) and (p)(2) of this section must be applied simultaneously and must be extended to include operation at any one-engine-inoperative rating for which approval is requested.

15. Appendix B to part 29 is amended by adding a new paragraph VIII(c) to read as follows:

Appendix B to Part 29—Airworthiness Criteria for Helicopter Instrument Flight

* * * * *

VIII * * *

(c) *Thunderstorm lights.* In addition to the instrument lights required by § 29.1381(a), thunderstorm lights which provide high intensity while flood lighting to the basic flight instruments must be provided. The thunderstorm lights must be installed to meet the requirements of § 29.1381(b).

* * * * *

Issued in Washington, DC, on September 17, 1990.

James B. Busey,
Administrator.

[FR Doc. 90-22421 Filed 9-20-90; 8:45 am]

BILLING CODE 4910-13-M