[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. 26165; Notice No.]

RIN 2120-

Turning Flight and Accelerated Stalls

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The proposed rule would eliminate the certification requirement to demonstrate an accelerated entry stall for commuter category airplanes. Modern commuter category airplanes typically have high power-to-weight ratios that require the airplane to achieve extremely high angles of attack (excessive nose high attitudes) during stall demonstrations. Recovery from accelerated entry stalls in which the airplane attains these extreme nose high angles is potentially unsafe. The proposed change would provide an additional safety margin for airplane manufacturers and test pilots during flight demonstrations required for airplane type certification, and would not compromise passenger safety.

DATES: Comments on this notice must be submitted on or before

ADDRESSES: Comments on this notice should be mailed, in triplicate, to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-10), Docket No. 26165, 800 Independence Avenue, SW., Washington, DC 20591. Comments delivered must be marked Docket No. 26165. Comments may

be examined in Room 915G weekdays between 8:30 a.m. and 5 p.m., except on Federal holidays.

In addition, the FAA is maintaining an information docket of comments in the Office of the Assistant Chief Counsel, ACE-7, Federal Aviation Administration, Central Region, 601 East 12th Street, Kansas City, Missouri 64106. Comments in the information docket may be inspected in the Office of the Assistant Chief Counsel weekdays, except Federal holidays, between the hours of 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: J. Lowell Foster, (ACE-112), Small Airplane Directorate, Federal Aviation Administration, Room 1544, 601 East 12th Street, Kansas City, Missouri 64106, telephone (816) 426-5688.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice are also invited. Substantive comments should be accompanied by cost estimates, if appropriate. Comments should identify the regulatory docket or notice number and should be submitted in triplicate to the Rules Docket address specified above. All comments received on or before the closing date for comments specified will be considered by the Administrator before taking

action on this proposed rulemaking. The proposals contained in this notice may be changed in light of comments received. All comments received will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerned with this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a preaddressed, stamped postcard on which the following statement is made: "Comments to Docket No. 26165." The postcard will be date stamped and mailed to the commenter.

Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Inquiry Center, APA-200, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3484. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's should request from the above office a copy of Advisory Circular (AC) No. 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Background

Statement of the Problem

The FAA is proposing to amend § 23.203 of the Federal Aviation Regulations (FAR) (14 CFR Part 23) to eliminate the current requirement that an accelerated entry stall be demonstrated in flight tests of commuter category airplanes. An accelerated stall is demonstrated in flight tests by establishing and maintaining a medium banked coordinated turn with an airspeed reduction of three to five knots per second with constantly increasing normal acceleration until the point at which the critical angle of attack is exceeded and the airplane stalls.

Engine technology improvements have provided manufacturers the opportunity to design commuter AIRCRAFT with high thrust-to-weight ratios. Such ratios are necessary for commuter airplanes to meet increased performance requirements. These high thrust-to-weight ratios make the demonstration of an accelerated stall difficult because a stall at the prescribed speeds and power settings may produce a situation in which the airplane is operated in an extremely nose high attitude and significantly below minimum controllable airspeed (V_{MC}), producing a potentially unsafe condition.

History

In 1987, the FAA adopted various airworthiness requirements for the certification of commuter category airplanes; this category includes airplanes with a maximum seating capacity, excluding pilot seats, of 19 or fewer, and a maximum certificated

takeoff weight of 19,000 pounds or less. Between 1953 and the early 1980's, airworthiness standards set apart small airplanes from large airplanes by a 12,500 pound maximum certificated takeoff weight limitation, regardless of the type of flight operation. The airworthiness certification standards for airplanes under the 12,500 pound limitation were contained in Part 23, and standards for airplanes over the 12,500 pound limitation were contained in the transport category airplane requirements of Part 25. During that time, however, few airplanes were designed near the 12,500 pound limitation. Airplanes were either considerably above or below that weight.

During the 1970's, a trend emerged in which airplanes were being designed with improved performance and load carrying characteristics to accommodate the 10 to 20 passenger capacities typical in commuter and charter operations. These intermediate sized airplanes slightly exceeded the 12,500 pound maximum gross takeoff weight threshold for small airplanes and did not conveniently conform to the certification requirements of either Parts 23 or 25. Although the typical flight profile of these modern, high performance airplanes was more closely aligned with the transport category airplanes (scheduled passenger transportation), their physical size and production costs were analogous to small airplanes in the normal category. By the late 1970's, the FAA proposed and adopted SFAR 41. SFAR 41 was an interim special regulation that provided additional airworthiness standards applicable to existing propeller driven multiengine

small airplanes to allow their type and airworthiness recertification at weights in excess of 12,500 pounds or with an increase in number of passenger seats, or both. A ten-year time limit was provided to allow the time needed to amend FAR Part 23 to establish a new airplane category to address specific requirements for commuter airplanes.

On January 15, 1987, the FAA issued a final rule (52 FR 1806) adopting certification standards within Part 23 for commuter category airplanes. The rule was issued, in part, in response to an FAA/Industry Commuter Airplane Weight Committee petition to amend the regulations to allow certain small airplanes to be type certificated at maximum certificated takeoff weights greater than the 12,500 pound limitation without complying with the transport category airworthiness requirements of Part 25, and was based on the outcome of a three phase program for the certification and operation of commuter category airplanes. This three phase program included: (1) revising the operating rules for air taxi and commercial operators to align them with the operating rules of domestic, flag, and supplemental air carrier and commercial operators of large aircraft; (2) issuing temporary regulations on additional airworthiness requirements for commuter category airplanes; and (3) establishing the Light Transport Airworthiness Review.

Although the final rule revised many sections of Part 23 to accommodate commuter category airplanes, the rule did not revise or delete the accelerated stall demonstration requirements

contained in § 23.203. On January 25, 1990, Fairchild Aircraft Corporation filed a petition for rulemaking with the FAA to eliminate the certification requirement that commuter category airplanes demonstrate an accelerated stall. Fairchild's petition states that its own flight testing showed that the required maneuvers of § 23.203(a)(2) are not applicable to large, twin-engine commuter category airplanes designed for airline service. Fairchild states that most large, twin-engine airplanes have high power-to-weight ratios and can attain extremely high angles of attack and relatively low airspeeds without stalling, making an inadvertent accelerated stall during flight operations extremely unlikely. Further, the Fairchild petition notes that under the airworthiness certification standards of Part 25, transport category airplanes are not required to demonstrate accelerated stalls.

A summary of the Fairchild petition was published for public comment on April 3, 1990 (55 FR 12383). No comments were received on the petition.

Following receipt of the Fairchild petition for rulemaking, the FAA requested that the Aviation Rulemaking Advisory Committee (ARAC) review the petition and make a recommendation for its disposition to the FAA. The ARAC was chartered in February 1991 to provide recommendations to the FAA Administrator, through the Associate Administrator for Regulation and Certification and the Director of Rulemaking, on FAA rulemaking activity relating to aviation safety issues.

On January 23, 1992, the Accelerated Stalls Working Group of the ARAC's General Aviation and Business Airplane Subcommittee reviewed the Fairchild petition. The working group, and subsequently the ARAC subcommittee, recommended that the FAA revise the certification standards for commuter category airplanes as proposed in the Fairchild petition.

When the FAA initially amended Part 23 to adopt certification standards for the commuter airplane category, the FAA noted that it would continue to review airworthiness standards for commuter category airplanes and would propose improvements and updates, when necessary, to maintain the level of safety intended for airplanes to be used by commuter airlines if such changes were shown to be in the public interest.

The FAA has carefully reviewed the information contained in the Fairchild petition and the ARAC recommendation, and agrees that the accelerated stall demonstration requirements of § 23.203(a)(2) are appropriate for the certification of normal, utility, and acrobatic category airplanes but appear to be inappropriate for commuter category airplanes.

Related Activity

The FAA published Notice of Proposed Rulemaking, Notice No. 90-1, entitled Small Airplane Airworthiness Review Program Notice No. 4 on June 28, 1990 (55 FR 26534). This NPRM proposed changes to the airframe and flight airworthiness standards for normal, utility, acrobatic, and commuter category airplanes in Part 23 resulting from recommendations proposed at the Small Airplane

Airworthiness Review Conference held on October 22-26, 1984, in St. Louis, Missouri. Among the proposed changes are amendments to the provisions of § 23.203(b)(4) and § 23.203(c)(4).

The proposed rule would change the roll excursion requirements in § 23.203 (b)(4) to clarify the permissible limits for recovery from an accelerated stall. The FAA also proposed to revise § 23.203 (c)(4) to differentiate between airplanes with a maximum takeoff weight of 6,000 pounds or less and those with a maximum takeoff weight exceeding 6,000 pounds with regard to the amount of power to be used in power-on stalls. The FAA stated in the proposed rule that airplanes of more than 6,000 pounds maximum takeoff weight with high power-to-weight ratios can attain extremely nose high attitudes at 75 percent of maximum continuous power. The FAA also stated that it does not consider the demonstration of stall characteristics from these extremely nose high attitudes an enhancement to safety. Accordingly, the FAA proposed to reduce the power settings at which stall demonstrations must be performed. In addition, the proposed rule would revise the required trim speed in § 23.203(c)(5) to be as near 1.5 V_{s1} as practicable during accelerated stall tests.

Intent of the Proposed Rule

The ARAC and the industry have expressed a need for a revised airworthiness certification standard for accelerated stall demonstrations for commuter category airplanes. This need would be addressed satisfactorily by the proposed changes to

§ 23.203 that would modify the certification requirements by specifying that accelerated stall demonstrations for commuter category airplanes would not be required. The airplane attitude that may result from tests required by § 23.203 could produce an unsafe situation if an engine failed during demonstration of the accelerated stall. The FAA also notes that trained, type rated pilots operate commuter category airplanes under the operating rules of Parts 91 and 135, and that an inadvertent accelerated stall would be very unlikely during normal flight operations. The FAA has determined that the adoption of this proposed rule would not result in any decrease in safety.

Specifically, § 23.203 would include new language to provide that the accelerated entry stall demonstration requirements for normal, utility, and acrobatic category airplanes would not apply to commuter category airplanes, certificated under Part 23.

General Discussion of the Proposals

Section 23.203

Section 23.203(a)(2) requires that airplanes certificated under Part 23 demonstrate an accelerated stall. Under the proposal, commuter category airplanes would be exempted from that requirement. The proposal would amend the introductory text of § 23.203 by requiring an accelerated stall demonstration for all airplane categories listed in the Part 23, except as provided in proposed § 23.203(d). A new § 23.203 (d) would except commuter category airplanes, as defined in § 23.3, from the accelerated stall provisions of § 23.203(a)(2).

Regulatory Evaluation Summary

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if the potential benefits to society outweigh the potential costs. The order also requires 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 effect on the economy of $100 million or more; a major increase in costs or prices for consumers, individual industries, or geographic regions; or a significant adverse effect on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The FAA has determined that this proposed rule is not "major" as defined in the executive order; therefore, a full regulatory analysis, that includes the identification and evaluation of cost reducing alternatives to this proposal, has not been prepared. Instead, the agency has prepared a more concise regulatory evaluation that analyzes only this proposal without identifying alternatives, as summarized below. If more detailed economic information is desired than is contained in this summary, the reader is referred to the full regulatory evaluation in the docket.

The proposed rule change would provide benefits in the form of reduced costs and additional test pilot safety during flight demonstrations required for airplane type certification, without imposing any new compliance costs or compromising passenger safety. Accordingly, the proposed rule change would be cost-beneficial.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule is expected to have "a significant economic impact on a substantial number of small entities."

Based on the standards and thresholds specified in implementing FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, the FAA has determined that the proposed rule would not have a significant impact on a substantial number of small aircraft manufacturers.

International Trade Impact Assessment

The cost saving associated with the proposed rule change are not significant enough to result in relative trade advantages to either U.S. or foreign entities. Therefore, the FAA has determined that it would have no impact on the sale of foreign

products domestically, or the sale of U.S. products in foreign markets.

Federalism Implications

The regulation proposed herein would 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 various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

The FAA proposes to revise the airworthiness standards to eliminate the current requirement that an accelerated stall be demonstrated in flight tests of commuter category airplanes. High thrust-to-weight ratios are typical of commuter category airplanes such ratios are necessary for commuter category airplanes to meet increased performance requirements. This proposal would retain the current level of airplane occupant protection while reducing the chance for a situation in which the airplane is operated on an extremely nose high attitude and significantly below minimum controllable airspeed (Vmc), producing a potentially unsafe condition.

For the reasons discussed above, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this proposed regulation is not major under Executive Order 12291. In addition, the FAA certifies that this proposal, if adopted, 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. This proposal is considered significant under DOT Order 2100.5, Policies and Procedures for Simplification, Analysis, and Review of Regulations. A draft regulatory evaluation of the proposal, including an initial Regulatory Flexibility Determination and International 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 Part 23

Air transportation, Airplane, Aviation safety, Safety.

THE PROPOSED AMENDMENT

In consideration of the foregoing, the Federal Aviation Administration proposes to amend Part 23 of the Federal Aviation Regulations (14 CFR Part 23) as follows:

PART 23--AIRWORTHINESS STANDARDS: NORMAL, UTILITY, ACROBATIC, AND COMMUTER CATEGORY AIRPLANES

The authority citation for Part 23 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1425, 1428, 1430; 49 U.S.C. 106(g).

1. Section 23.203 is amended by revising the introductory paragraph and by adding a new paragraph (d) to read as follows:

§ 23.203 Turning flight and accelerated stalls.

Except as provided in paragraph (d) of this section, turning flight and accelerated stalls must be demonstrated in flight tests as follows:

* * * * *

(d) The accelerated stall flight test requirement of paragraph (a)(2) of this section does not apply to commuter category airplanes as defined in § 23.3(d) of this part.

Issued in Kansas City, on

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REVISION TO A/C 23-5A

87. SECTION 23.203 (as amended by amendment 23-14) TURNING FLIGHT AND ACCELERATED STALLS.

a. Explanation.

(1) Explanations 86a(2) and (4) for wings level stalls also apply to turning flight and accelerated stalls.

(2) The only differences between the investigation required for turning flight and accelerated stalls are in the speed reduction rate and wing flap configurations.

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(3) Section 23.203(a) requires the rate of speed reduction for a turning flight stall not exceed one knot per second; for an accelerated stall, 3 to 5 knots per second with steadily increasing normal acceleration.

[(4) Accelerated stalls are not required for Commuter category aircraft unless the airplane has a stall prevention system. In this case, stall characteristics should be evaluated at entry rates up to 3 knots/second, to evaluate any adverse effects of entry rate on the trip point of the device.]

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To BERNARD BROWN	From BILL KEIL
Co. BAe	Co. RAA
Dept.	Phone #
Fax # 703-481-1176	Fax #