DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. 28643; Amdt. No. 25–97]

RIN 2120–AF83

Braked Roll Conditions

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This amendment to the airworthiness standards for transport category airplanes adds a new design standard that requires that the airplane be designed to withstand main landing gear maximum braking forces during ground operations. This amendment will ensure that the landing gear and fuselage are capable of withstanding the dynamic loads associated with the maximum dynamic braking condition. It also relieves a burden on industry by eliminating differences between the Federal Aviation Regulations (FAR) and European Joint Aviation Requirements (JAR), while maintaining a level of safety provided by the current regulations and industry practices.

EFFECTIVE DATE: June 26, 1998.

FOR FURTHER INFORMATION CONTACT: Jim Haynes, FAA, Airframe and Airworthiness Branch (ANM–115), Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055–4056; telephone (425) 227–2131; facsimile (425) 227–1320.

SUPPLEMENTARY INFORMATION:

Availability of Final Rule

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: 202–512–1661) or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board service (telephone: 800–FAA–ARAC).

Internet users may reach the FAA's web page at http://www.faa.gov or the **Federal Register**'s webpage at http://www.access.gpo.gov/su—docs for access to recently published rulemaking documents.

Any person may obtain a copy of this final rule by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9680. Communications must identify the amendment number or document number of this final rule.

Persons interested in being placed on the mailing list for future notices of proposed rulemaking and final rules 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.

Small Entity Inquiries

The Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA) requires the FAA to report inquiries from small entities concerning information on, and advice about, compliance with statutes and regulations within the FAA's jurisdiction, including interpretation and application of the law to specific sets of facts supplied by a small entity.

The FAA's definitions of small entities may be accessed through the FAA's web page (http://www.faa.gov.avr/arm/sbrefa.htm), by contacting a local FAA official, or by contacting the FAA's Small Entity Contact listed below.

If you are a small entity and have a question, contact your local FAA official. If you do not know how to contact your local FAA official, you may contact Charlene Brown, Program Analyst Staff, Office of Rulemaking, ARM–27, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, 1–888–551–1594. Internet users can find additional information on SBREFA in the ''Quick Jump'' section of the FAA's web page at http://www.faa.gov and may send electronic inquiries to the following internet address: 9–AWA–SBREFA@faa.dot.gov.

Background

This amendment is based on Notice of Proposed Rulemaking (NPRM) 96–10, which was published in the **Federal Register** on August 5, 1996 (61 FR 40710). The notice was based on a need to protect the airframe structure from damage during hard application of the brakes.

The current 14 CFR part 25 airworthiness standards, § 25.493, and its predecessor rule, § 4b.235(b) of the Civil Air Regulations (CAR), prescribe braked roll conditions that the airplane structure and landing gear must be designed to withstand during airplane taxiing with a constant (steady) application of brakes (''braked roll'' condition). The taxi condition is generally the most critical condition regarding nose gear and forward fuselage loading during the braking event, due to the increased braking coefficient of friction at low speeds and the lack of lift on the wings and lack of aerodynamic damping. Both rules treat the braked roll condition as a static equilibrium condition. Neither rule accounts for the dynamic loads on the nose gear and fuselage associated with pitch inertia of the airplane due to rapid application of main landing gear brakes. Adequate strength has been achieved on existing airplanes by application of other part 25 design requirements and by the manufacturers' need to comply with the more stringent British Civil Airworthiness Requirements (BCAR).

For many years the BCAR have included a dynamic braking condition that requires that consideration be given to the maximum likely combination of dynamic vertical reaction and sudden increase in drag load that could occur on the nose gear as a result of sudden main gear braking while encountering obstacles. The BCAR address obstacles such as overruns onto semi-prepared surfaces during rejected takeoffs, running off the edge then back on to the runway during avoidance maneuvers, running over displaced or lowered edges of runway paving, and inadvertent use of runways under repair. In application of the BCAR requirement, it was found that U.S. designed airplanes generally have had adequate strength to meet this condition without requiring any modifications. However, this may not always be the case, especially if new airplane designs are significantly different from past conventional configurations in vertical and longitudinal mass distributions of fuel, payload, engine location, etc. As the takeoff weight increases with respect to landing weight, the dynamic braked roll condition can become more critical for the nose gear and fuselage. This amendment will ensure that all future airplanes will be provided with adequate strength in the fuselage and nose landing gear to carry these loads.

In 1988, the FAA, in cooperation with the JAA and other organizations representing the American and European aerospace industries, began a process to harmonize the airworthiness requirements of the United States and the airworthiness requirements of Europe. The objective was to achieve common requirements for the certification of transport airplanes without a substantive change in the level of safety provided by the regulations. Other airworthiness authorities such as Transport Canada also participated in this process.

In 1992, the harmonization effort was undertaken by the Aviation Rulemaking Advisory Committee (ARAC). A working group of industry and government structural loads specialists of Europe, the United States, and

Canada was chartered by notice in the **Federal Register** (58 FR 13819, March 15, 1993) to harmonize the design loads sections of Subpart C of part 25. The harmonization effort on the braked roll rule was accomplished and a specific proposal was recommended to the FAA by letter dated November 6, 1995. The FAA concurred with the recommendation, and published Notice 96–10 in the **Federal Register** on August 5, 1996, for public comment.

Interested persons have been given an opportunity to participate in this rulemaking and due consideration has been given to all matters presented. Comments received in response to Notice 96–10 are discussed below.

Discussion of Comments

The FAA received three comments in response to Notice 96–10. Two of these commenters support the proposal, one with comment, while the third commenter objects to the proposal.

One commenter, representing the aviation industry, supports the proposal but expresses concern about possible interpretation of the rule. This commenter states that it is industry's belief that the proposed rule represented a harmonized position on both the rule and the interpretative advisory material; specifically, the commenter supports JAA interpretation and advisory material which allows use of a coefficient of friction less than 0.80, when substantiated, in the formula of § 25.493(c). The commenter requests that this interpretation be clarified. The coefficient of friction of 0.80 between the tire and ground surface has been used for structural design of the landing gear and structure since it was codified in the Civil Air Regulations (CAR Part 4b). The FAA has allowed a lower drag reaction in those cases where it can be substantiated that an effective drag force of 0.80 times the vertical reaction cannot be attained under any likely loading condition. This has generally been interpreted to mean that a lower drag force may be used where maximum brake torque is the limiting factor. This allowance is provided in the current regulation and is unchanged by this amendment. A value of 0.80 remains as the value of the coefficient of friction in the regulatory formula of § 25.493(e).

One commenter, an aircraft manufacturer, believes the proposed regulation is unnecessary because the braked roll condition is not the loading condition that determines the design of the nose gear and fuselage. The commenter states that a three point landing is typically the load condition which determines the design of the landing gear structure, which is far more severe than the braked roll conditions addressed in the notice. The FAA agrees that this may be true for most airplane designs; however, it is not always the case. The FAA considers the rule necessary to ensure proper landing gear designs for those airplanes that are affected by the braked roll condition.

In view of the above, part 25 is amended as proposed in Notice 96–10.

Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic effects of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation). In conducting these analyses, which are summarized below (and available in the docket), the FAA has determined that this rule is not ''a significant regulatory action'' under section 3(f) of Executive Order 12866 and therefore was not reviewed by the Office of Management and Budget. The rule is not considered significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). In addition, for the reasons stated under the ''Regulatory Flexibility Determination,'' the ''International Trade Impact Assessment,'' and the ''Unfunded Mandates Assessment,'' the FAA certifies that this rule will not have a significant economic impact on a substantial number of small entities, will not constitute a barrier to international trade, and will not result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually.

Regulatory Evaluation Summary

As stated in the preamble to the notice, the rule change will codify current industry practice (thus maintaining at least the current level of safety) and will not impose additional costs on manufacturers of transport category airplanes. Adequate strength has been achieved on existing airplanes by application of other part 25 design requirements and by manufacturers' needs to comply with the more stringent BCAR in order to sell airplanes overseas. Moreover, by conforming § 25.493 of the FAR with § 25.493 of the JAR, the new amendment will increase harmonization between American and European airworthiness standards and potentially reduce duplicate certification costs.

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, in which alternatives are identified and evaluated, if a rule is expected to have ''a significant economic impact on a substantial number of small entities.'' The Small Business Administration (SBA) has established standards for complying with RFA review requirements in Federal rulemaking actions; the standards specify small entity size by Standard Industrial Classification (SIC). The rule change will affect manufacturers of transport category airplanes produced under new type certificates. The SBA specifies a size threshold for classification as a small entity as 1,500 or fewer employees. Since the rule will impose no incremental costs on airplane manufacturers (and, additionally, no part 25 airplane manufacturer has 1,500 or fewer employees), the rule change will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Assessment

Consistent with the Administration's belief in the general superiority, desirability, and efficacy of free trade, it is the policy of the Administrator to remove or diminish, to the extent feasible, barriers to international trade, including barriers affecting the export of American goods and services to foreign countries and barriers affecting the import of foreign goods and services into the United States.

In accordance with that policy, the FAA is committed to develop as much as possible its aviation standards and practices in harmony with its trading partners. Significant cost savings can result from this, both to United States

companies doing business in foreign markets, and foreign companies doing business in the United States.

This rule is a direct action to respond to this policy by increasing the harmonization of the U.S. Federal Aviation Regulations with the European Joint Aviation Requirements. The result will be a positive step toward removing impediments to international trade.

Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104–4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed ''significant intergovernmental mandate.'' A ''significant intergovernmental mandate'' under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

The FAA has determined that this rule does not contain a significant intergovernmental or private sector mandate as defined by the Act.

Federalism Implications

The regulation amended herein will 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 regulation will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

International Civil Aviation Organization (ICAO) and Joint Aviation Regulations

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with ICAO Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that this rule does not conflict with any international agreement of the United States.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), there are no reporting or recordkeeping requirements associated with this rule.

Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in Title 14 of the CFR in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish such regulatory distinctions as he or she considers appropriate. Because this final rule applies to the certification of future designs of transport category airplanes and their subsequent operation, it could affect intrastate aviation in Alaska. The Administrator has considered the extent to which Alaska is not served by transportation modes other than aviation, and how the final rule could have been applied differently to intrastate operations in Alaska. However, the Administrator has determined that airplanes operated solely in Alaska would present the same safety concerns as all other affected airplanes; therefore, it would be inappropriate to establish a regulatory distinction for the intrastate operation of affected airplanes in Alaska.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Adoption of the Amendment

In consideration of the foregoing, the Federal Aviation Administration (FAA) amends 14 CFR part 25 of the Federal Aviation Regulations (FAR) as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for part 25 continues to read:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, and 44704.

2. Section 25.493 is amended by revising paragraph (c) and by adding new paragraphs (d) and (e) to read as follows:

§ 25.493 Braked roll conditions.

* * * * *

(c) A drag reaction lower than that prescribed in this section may be used if it is substantiated that an effective drag force of 0.8 times the vertical reaction cannot be attained under any likely loading condition.

(d) An airplane equipped with a nose gear must be designed to withstand the loads arising from the dynamic pitching motion of the airplane due to sudden application of maximum braking force. The airplane is considered to be at design takeoff weight with the nose and main gears in contact with the ground, and with a steady-state vertical load factor of 1.0. The steady-state nose gear reaction must be combined with the maximum incremental nose gear vertical reaction caused by the sudden application of maximum braking force as described in paragraphs (b) and (c) of this section.

(e) In the absence of a more rational analysis, the nose gear vertical reaction prescribed in paragraph (d) of this section must be calculated according to the following formula:

$$V_N = \frac{W_T}{A+B}\left[B + \frac{f\mu AE}{A+B+\mu E}\right]$$

Where:

V_N=Nose gear vertical reaction.

W_T=Design takeoff weight.

A=Horizontal distance between the c.g. of the airplane and the nose wheel.

B=Horizontal distance between the c.g. of the airplane and the line joining the centers of the main wheels.

E=Vertical height of the c.g. of the airplane above the ground in the 1.0 g static condition.

μ=Coefficient of friction of 0.80.

f=Dynamic response factor; 2.0 is to be used unless a lower factor is substantiated. In the absence of other information, the dynamic response factor f may be defined by the equation:

$$f = 1 + \exp\left(\frac{-\pi\xi}{\sqrt{1-\xi^2}}\right)$$

Where:

ξ is the effective critical damping ratio of the rigid body pitching mode about the main landing gear effective ground contact point.

Issued in Washington, DC, on May 18, 1998.

Jane F. Garvey,

Administrator.

[FR Doc. 98–13999 Filed 5–26–98; 8:45 am]

BILLING CODE 4910–13–P