Federal Aviation Administration
Aviation Rulemaking Advisory Committee

Transport Airplane and Engine Issue Area
General Structures Harmonization Working Group

Task 3 – Material Strength Properties and Design Values

Task Assignment

[Federal Register: January 20, 1995 (Volume 60, Number 13)]
[Notices]
[Page 4222-4223]
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DEPARTMENT OF TRANSPORTATION

Aviation Rulemaking Advisory Committee; Transport Airplane and Engine Issues--New Tasks

AGENCY: Federal Aviation Administration (**FAA**), DOT.

ACTION: Notice of new task assignments for the Aviation Rulemaking Advisory Committee.

SUMMARY: Notice is given of new tasks assigned to the Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of ARAC.

FOR FURTHER INFORMATION CONTACT:
Stewart R. Miller, Manager, Transport Standards Staff, ANM-110, Transport Airplane Directorate, Federal Aviation Administration, 1601 Lind Avenue SW, Renton, Washington, 98055-4056; telephone (206) 227-2190; (206) 227-1320.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (**FAA**) has established an Aviation Rulemaking Advisory Committee (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993). One area the ARAC deals with is transport airplane and engine issues. These issues involve the airworthiness standards for transport category airplanes and engines in parts 25, 33, and 35 of the Federal Aviation Regulations (FAR) and parallel provisions in parts 121 and 135 of the FAR.

The **FAA** announced at the Joint Aviation Authorities (JAA)-Federal Aviation Administration (**FAA**) Harmonization Conference in Toronto, Canada, June 2-5, 1992, that it would consolidate within the ARAC structure an ongoing objective to ``harmonize'' the Joint Aviation Requirements (JAR) and the Federal Aviation Regulations (FAR).

Tasks

The following three new harmonization tasks are being assigned to ARAC:

Task 1--Material Strength Properties and Design Values

Review Title 14 Code of Federal Regulations, Section 25.613, corresponding Paragraph 25.613 of the European Joint Aviation Requirements (JAR), and supporting policy and guidance material, and recommend to the **FAA** appropriate revisions for harmonization, including advisory material.

Task 2--Proof of Structure

Review Title 14 Code of Federal Regulations, Section 25.307, corresponding Paragraph 25.307 of the JAR, and supporting policy and guidance material, and recommend to the **FAA** appropriate revisions relative to the issue concerning limit load tests, ultimate load tests, and structural testing for harmonization, including advisory material.

Task 3--Damage Tolerance and Fatigue

Review Title 14 Code of Federal Regulations, Section 25.571, [[Page 4223]] corresponding Paragraph 25.571 of the JAR, and supporting policy and guidance material and recommend to the **FAA** appropriate revisions for harmonization, including advisory material.

ARAC recommendations to the **FAA** should be accompanied by appropriate documents. Recommendations for rulemaking should be accompanied by a complete draft of the notice of proposed rulemaking, including the Benefit/Cost Analysis and other required analyses. Recommendations for the issuance of guidance material should be accompanied by a complete draft advisory circular.

ARAC normally forms working groups to analyze and recommend to it solutions to issues contained in assigned tasks. If ARAC accepts the working group's recommendations, it forwards them to the **FAA**. At this point, ARAC has not identified working groups for these tasks.

ARAC working groups are comprised of technical experts on the subject matter. A working group member need not necessarily be a representative of one of the member organizations of ARAC. An individual who has expertise in the subject matter and wishes to become a member of the working group should write the person listed under the caption FOR FURTHER INFORMATION CONTACT expressing that desire, describing his or her interest in the task, and the expertise he or she would bring to the working group. The request will be reviewed by the ARAC assistant chair and working group leader, and the individual will be advised whether or not the request can be accommodated.

Working Group Reports

Each working group formed to consider ARAC tasks is expected to comply with the procedures adopted by ARAC and given to the working group chair. As part of the procedures, the working group is expected to:

A. Recommend time line(s) for completion of the tasks, including rationale, for consideration at the meeting of the ARAC to consider transport airplane and engine issues held following publication of this notice.

B. Give a detailed conceptual presentation on the tasks to the ARAC before proceeding with the work stated under item C below.

C. Give a status report on the tasks at each meeting of ARAC held to consider transport airplane and engine issues.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary in the public interest in connection with the performance of duties imposed on the **FAA** by law. Meetings of the ARAC will be open to the public except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the working group will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate.

No public announcement of working group meetings will be made.

Issued in Washington, DC, on January 13, 1995.
Chris A. Christie,
Executive Director, Aviation Rulemaking Advisory Committee.
[FR Doc. 95-1539 Filed 1-19-95; 8:45 am]
BILLING CODE 4910-13-M

Recommendation Letter

400 Main Street
East Hartford, Connecticut 06108

Pratt & Whitney
A United Technologies Company

May 1, 1998

Action: ANM-111

Department of Transportation
Federal Aviation Administration
800 Independence Avenue
Washington, DC 20591

Attn: Mr. Guy S. Gardner, Associate Administrator for Regulation and Certification

Subject: ARAC Rulemaking Package

Dear Guy:

The ARAC Transport Airplane and Engine Issues Group (TAEIG) is pleased to forward the attached rulemaking package and associated advisory material to the FAA for further action. This package has been approved by the TAEIG and contains proposals for the revision of FAR sections 25.731 and 25.735 (Standards for Brake Certification) and sections 25.613 (Material Strength Properties and Design Values), proposed Advisory Circulars and a proposed Technical Standard Order (TSO-C 135).

TAEIG requests that the FAA consider tasking the disposition any substantive comments relating to sections 25.731 and 25.735 to the Brake System Harmonization Working Group and comments relating to section 25.613 to the General Structures Harmonization Working Group. Please feel free to contact us if we can be of assistance in any way.

Sincerely,

Craig R. Bolt

Craig R. Bolt
Assistant Chair, ARAC TAEIG
boltcr@pweh.com
(Ph: 860-565-9348/Fax: 860-565-5794)

CRB/amr

Attachment (to addressee only)

cc: Bob Amberg
Bob Benjamin
Jean Casciano
Brenda Courtney
Herb Lancaster
Stu Miller

Acknowledgement Letter

JUN 3 1998

Mr. Craig R. Bolt
Aviation Rulemaking Advisory Committee
Pratt & Whitney
400 Main Street
East Hartford, CT 06106

Dear Craig:

Thank you for your May 1 letter transmitting recommendations of the Aviation Rulemaking Advisory Committee (ARAC). You provided proposed rulemakings for the revision of sections 25.613, 25.731, and 25.735 of the Federal Aviation Regulations, proposed advisory circulars to the associated rule proposals, and a proposed technical standard order (TSO-C-135). The Federal Aviation Administration (FAA) accepts these recommendations provided there are no legal or other reasons why we cannot adopt them.

The complete rulemaking package will be reviewed and coordinated within the FAA and the Offices of the Secretary of Transportation and Management and Budget, if appropriate. The FAA will publish the Notice of Proposed Rulemaking for public comment as soon as the coordination process is complete. The proposed advisory circulars and TSO will also be made available for public comment when the coordination process is complete. We will make every effort to handle these recommendations expeditiously. Although no decision will be made at this time, the FAA will look at tasking the disposition of comments to the working groups at the end of the comment periods.

I would like to thank the ARAC, and particularly the Braking Systems Harmonization Working Group and the General Structures Harmonization Working Group for their actions on these tasks.

Sincerely,

Original Signed By
Margaret Gilligan

for Guy S. Gardner
Associate Administrator for
Regulation and Certification

Recommendation

[4910-13] 11/24/97

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[14 CFR Part 25]

[Docket No. ; Notice No.]

RIN 2120-

Revised Requirement for Material Strength Properties and Design Values for Transport Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Federal Aviation Administration proposes to revise the material strength properties and material design values requirement of the Federal Aviation Regulations (FAR) for transport category airplanes by incorporating changes developed in cooperation with the Joint Aviation Authorities (JAA) of Europe and the U.S. and European aviation industry through the Aviation Rulemaking Advisory Committee (ARAC). This action is necessary because differences between the current U.S. and European requirements impose unnecessary costs on airplane manufacturers. These proposals are intended to achieve common requirements and language between the requirements of the U.S. regulations and the Joint Aviation Requirements (JAR) of Europe, while maintaining at least the level of safety provided by the current regulations and industry practice.

DATES: Comments must be received on or before [insert a date 90 days after the date of publication in the Federal Register]

ADDRESSES: Comments on this notice may be mailed in triplicate to: Federal Aviation Administration (FAA), Office of the Chief Counsel, Attention: Rules Docket (AGC-200), Docket No. , 800 Independence Avenue SW., Washington, DC 20591; or delivered in triplicate to: Room 915G, 800 Independence Avenue SW., Washington,

DC 20591. Comments delivered must be marked Docket No. . Comments may also be submitted electronically to: 9-NPRM-CMTS@faa.dot.gov. Comments may be examined in Room 915G weekdays, except Federal holidays, between 8:30 a.m. and 5:00 p.m. In addition, the FAA is maintaining an information docket of comments in the Transport Airplane Directorate (ANM-100), FAA, 1601 Lind Avenue SW., Renton, WA 98055-4056. Comments in the information docket may be examined weekdays, except Federal holidays, between 7:30 a.m. and 4:00 p.m.

FOR FURTHER INFORMATION CONTACT: William Perrella, FAA, Airframe and Propulsion Branch, ANM-112, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, WA 98055-4056; telephone (425) 227-2116, facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in this proposed rulemaking by submitting such written data, views, or arguments as they may desire. Comments relating to any environmental, energy, or economic impact that might result from adopting the proposals contained in this notice are invited. Substantive comments should be accompanied by cost estimates. Commenters should identify the regulatory docket or notice number and submit comments in triplicate to the Rules Docket address above. All comments received on or before the closing date for comments 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 in the Rules Docket, both before and after the comment period closing date, for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Persons wishing the FAA to acknowledge receipt of their comments must submit with

those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. ." The postcard will be date stamped and returned to the commenter.

Availability of NPRM

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: 703-321-3339), the *Federal Register's* electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board service (telephone : 202-267-5948).

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

Any person may obtain a copy of this NPRM 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) 267-9677. Communications must identify the notice number of this NPRM. Persons interested in being placed on a mailing list for future rulemaking documents should request from the Office of Public Affairs, Attention: Public Inquiry Center, APA-230, 800 Independence Avenue SW., 20591, or by calling (202) 267-3484, a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Background

The manufacturing, marketing and certification of transport airplanes is increasingly an international endeavor. In order for U. S. manufacturers to export transport airplanes to other countries the airplane must be designed to comply, not only with the U.S. airworthiness requirements for transport airplanes (14 CFR part 25), but

also with the transport airworthiness requirements of the countries to which the airplane is to be exported.

The European countries have developed a common airworthiness code for transport airplanes that is administered by the Joint Aviation Authorities (JAA) of Europe. This code is the result of a European effort to harmonize the various airworthiness codes of the European countries and is called the Joint Aviation Requirements (JAR)-25. It was developed in a format similar to 14 CFR part 25. Many other countries have airworthiness codes that are aligned closely to part 25 or to JAR-25, or they use these codes directly for their own certification purposes.

Although JAR-25 is very similar to part 25, there are differences in methodologies and criteria that often result in the need to address the same design objective with more than one kind of analysis or test in order to satisfy both part 25 and JAR airworthiness codes. These differences result in additional costs to the transport airplane manufacturers and additional costs to the U.S. and foreign authorities that must continue to monitor compliance with different airworthiness codes.

In 1988, the FAA, in cooperation with the JAA and other organizations representing the U.S. and European aerospace industries, began a process to harmonize the airworthiness requirements of the United States and the European authorities. The objective was to achieve common requirements for the certification of transport category airplanes without a substantive change in the level of safety provided by the regulations and industry practices. In 1992, the harmonization effort was undertaken by the Aviation Rulemaking Advisory Committee (ARAC). The Aviation Regulatory Advisory Committee (ARAC) was established by the FAA on February 15, 1991, with the purpose of providing information, advice, and recommendations to be considered in rulemaking activities. By notice in the Federal Register (60 FR 4222, January 20, 1995), the FAA tasked an ARAC working group of industry and government structural specialists from

Europe, the United States, and Canada to review § 25.613 of part 25, along with corresponding paragraph 25.613 of the JAR, and supporting policy and guidance material, and to recommend to the FAA appropriate revisions for harmonization, including advisory material.

The proposal described in this notice was developed by the ARAC and submitted to the FAA as a recommendation for rulemaking.

Discussion

Section 25.613 of part 25 prescribes requirements for material static strength properties and design values. Metallic material strength properties for aircraft manufactured in the U.S. have traditionally been based on those specified in Military Handbook (MIL-HDBK)-5. For metallic materials not listed in that handbook, the statistical procedures in the handbook were normally used to determine material strength properties. Prior to Amendment 25-72 to part 25 of the FAR (55 FR 29786, July 20, 1990), the "A" or "B" material strength properties listed in MIL-HDBK-5, or those listed in MIL-HDBK-17, and -23, or Army-Navy-Commerce (ANC)-18, were required to be used unless specific FAA approval was granted to use other properties. With Amendment 25-72, §§ 25.613 and 25.615 were combined into one requirement, § 25.613, and the references to MIL-HDBK-5, -17, -23, and ANC-18 were removed. As part of that amendment, the requirement to use "A" and "B" properties of the military handbook was replaced by a more general requirement specifying probabilities and confidence levels for material strength properties, with the test procedures and statistical methods unspecified. Those probability and confidence levels apply to metallic as well as non-metallic materials. In Europe, other standards have been used in showing compliance with JAR 25.613, such as Euronorm (EN), International Standard Organization (ISO), and Defense (DEF) Standard 00-932.

Because Amendment 25-72 removed the provision which permitted the Administrator to approve "other design values," such an approval requires an equivalent safety finding. This finding results in additional administrative time for both the manufacturer and the FAA. To reduce this administrative burden, the FAA proposes to revise the rule to reinstate the pre-amendment 25-72 provision. In addition, other changes of a clarifying nature are proposed.

This proposal would revise § 25.613 as follows:

The heading of § 25.613 would be revised to read, "Material Strength Properties and Material Design Values." This change would clarify that the design values are material design values.

Section 25.613 (a) would remain unchanged.

Section 25.613(b) would be revised to clarify that the design values are material design values. The "A" and "B" properties published in MIL-HDBK-5 and -17, or in equivalent handbooks, would be acceptable without further statistical analysis. The statistical methods specified in MIL-HDBK-5 and -17 would be acceptable for use in establishing material design values. Other statistical methods, amounts of data, and material property data might also be accepted by the FAA, including those specified in the European Standards previously noted.

Section 25.613(c) currently requires consideration of the effects of temperature on allowable stresses used for design. The proposed revision would require consideration of environmental conditions in general, such as temperature and moisture, on material design values used in an essential component or structure, where those effects are significant in the airplane operating envelope.

Section 25.613(d) would be removed by this proposal as fatigue is now adequately addressed in § 25.571.

The premium selection process of § 25.613(e) would be revised to clarify that the design values are material design values.

A new § 25.613(f) is proposed, which would permit the use of other design values if they are approved by the Administrator.

A draft Advisory Circular, AC 25.613-1, which describes acceptable methods of compliance with this proposed rule, is being developed concurrently with this proposal. Public comments concerning the proposed AC are invited by separate notice published elsewhere in this issue of the Federal Register.

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

Proposed 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 effect 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. In conducting these analyses, the FAA has determined that this rule: (1) will generate benefits that justify its costs and is not a "significant regulatory action" as defined in the Executive Order; (2) is not significant as defined in DOT's Regulatory Policies and Procedures; (3) will not have a significant impact on a substantial number of small entities; and (4) will not constitute a barrier to international trade. These analyses, available in the docket, are summarized below.

Cost/Benefit Analysis

The FAA estimates that the proposed rule would result in cost savings to manufacturers of transport category airplanes of at least $100,000 by reinstating a provision that permits the Administrator to approve design values published in accepted

military and industry handbooks. In addition, the FAA would realize an estimated administrative cost savings of approximately $1,350 per certification. Based on these estimates, the FAA has determined that the proposed rule is 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 proposed rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. The Order defines "small entities" in terms of size thresholds, "significant economic impact" in terms of annualized cost thresholds, and "substantial number" as a number which is not less than eleven and which is more than one-third of the small entities subject to the proposed or final rule. Order 2100.14A specifies a size threshold for classification as a small manufacturer as 75 or fewer employees. Since none of the manufacturers affected by this proposed rule has 75 or fewer employees, the proposed rule would not have a significant economic impact on a substantial number of small manufacturers.

International Trade Impact Assessment

The FAA has determined that the proposed rule would not constitute a barrier to international trade, including the export of American airplanes to foreign countries and the import of foreign airplanes into the United States. The proposed requirements in this rule would harmonize with those of the JAA and would, in fact, lessen any restraints on trade.

Unfunded Mandates Reform Act

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 proposed rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Federalism Implications

The regulations 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 the various levels of government. Thus, 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.

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 proposed rule would not conflict with any international agreement of the United States.

Paperwork Reduction Act

There are no new requirements for information collection associated with this proposed rule that would require approval from the Office of Management and Budget pursuant to the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)).

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 proposed rule would apply to the certification of future designs of transport category airplanes and their subsequent operation, it could, if adopted, affect intrastate aviation in Alaska. The FAA therefore specifically requests comments on whether there is justification for applying the proposed rule differently to intrastate operations in Alaska.

Conclusion

Because the changes proposed in this notice are not expected to result in any substantial economic costs, the FAA has determined that this proposal would not be significant under Executive Order 12866. Because this is an issue that has not prompted a great deal of public concern, the FAA has determined that this action is not significant

under DOT Regulatory Policies and Procedures (44 FR 11034; February 25, 1979). In addition, since there are no small entities affected by this rulemaking, the FAA certifies that the rule, if promulgated, would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act, since none would be affected. A copy of the regulatory evaluation prepared for this project may be examined in the Rules Docket or obtained from the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

List of Subjects in 14 CFR part 25

Aircraft, Aviation safety, Federal Aviation Administration, Reporting and recordkeeping requirements.

The Proposed Amendment

Accordingly, the Federal Aviation Administration (FAA) proposes to amend 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 as follows:

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

2. Section 25.613 would be amended by revising the heading and paragraphs (b) (c) and (e), by removing paragraph (d) and marking it "reserved," and by adding a new paragraph (f) to read as follows:

§ 25.613 Material Strength Properties and Material Design Values

(a) ***

(b) Material design values must be chosen to minimize the probability of structural failures due to material variability. Except as provided in paragraphs (e) and (f) of this section, compliance must be shown by selecting material design values which assure material strength with the following probability:

(1) * * *

(2) * * *

(c) The effects of environmental conditions, such as temperature and moisture, on material design values used in an essential component or structure must be considered where these effects are significant within the airplane operating envelope.

(d) [Reserved]

(e) Greater material design values may be used if a " premium selection " of the material is made in which a specimen of each individual item is tested before use to determine that the actual strength properties of that particular item will equal or exceed those used in design.

(f) Other material design values may be used if approved by the Administrator.

Issued in Washington D.C. on

First Draft: Bill Perrella June 11, 1996
Second draft: Bill Perrella Oct 17, 1996 incorporates GSHWG revisions from mtg # 12, plus some informal ANM-7 comments.
8/12/97:ps:revised per editorial comments.
9/30/97:ps/rm/wp/hl:revised per add'l. counsel cmnts and WG chair/FAA rep. review
10/21/97:ps:minor editorial correction to amendatory language
11/24/97:ps:minor editorial revisions per final counsel review

U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject:	Date:	AC No:
MATERIAL STRENGTH PROPERTIES AND DESIGN VALUES	DRAFT 11/24/97	25.613-1X
	Initiated by:	**Change:**

1. PURPOSE. This advisory circular (AC) provides guidance for compliance with the provisions of Part 25 of the Federal Aviation Regulations (FAR) which specify the requirements for material strength properties and design values. Like all advisory circular material, this advisory circular is not, in itself, mandatory and does not constitute a regulation. It is issued to provide an acceptable means, but not the only means, of compliance with the rules. Terms used in this AC, such as "shall" and "must" are used only in the sense of ensuring applicability of this particular method of compliance when the acceptable method of compliance described herein is used. While these guidelines are not mandatory, they are derived from extensive FAA and industry experience in determining compliance with the pertinent FAR. This advisory circular does not change, create any additional, authorize changes in, or permit deviations from, regulatory requirements.

2. RELATED FAR SECTIONS. Section 25.613 of 14 CFR part 25.

3. RELATED ADVISORY CIRCULARS. Advisory Circular (AC) 25.571-1C, Damage-Tolerance and Fatigue Evaluation of Structure; and AC 20-107A, Composite Aircraft Structure.

4. DEFINITIONS.

a. Material Strength Properties. Material properties that define the strength related characteristics of any given material. Typical examples of material strength properties are ultimate and yield values for compression, tension, bearing, shear, etc.

b. Material Design Values. Material strength properties that have been established based on the requirements of § 25.613 (b), or by other means as defined in this AC. These values are generally statistically determined based on enough data that, when used for design, the probability of structural failure due to material variability will be minimized. Typical values for moduli are used.

c. Airplane Operating Envelope. The operating limitations defined by the applicant under subpart G of part 25.

5. BACKGROUND. Metallic material strength properties and design values for airplanes manufactured in the U.S. have traditionally been based on those contained in Military Handbook (MIL-HDBK)-5. For materials not listed in that handbook, the statistical procedures in the handbook were normally used by U.S. manufacturers to determine design values. European

manufacturers additionally used design values and methods specified in Defense Standard (DEF STAN) 00-932 (published by ESDU International), or other equivalent approved material data. Until Amendment 25-72 to Part 25 of the FAR, the "A" or "B" material design values listed in MIL-HDBK-5, or those listed in MIL-HDBK-17, -23, or Army-Navy-Commerce (ANC) -18, were required to be used unless specific FAA approval was granted for other approaches. Sections 25.613 and 25.615 were amended in 1992, combining them into one requirement, § 25.613, and deleting the reference to MIL-HDBK-5. As part of the revision, the requirement to use A and B allowables of the military handbook was replaced by a requirement to attain certain levels of probability and confidence for strength, with the statistical method unspecified. Those probability and confidence levels apply to metallic as well as non-metallic materials. AC 20-107A contains information regarding compliance with § 25.613 for composite materials, and the use of MIL-HDBK-17.

6. DISCUSSION.

a. Statistically Based Design Values. Design values required by § 25.613 must be based on sufficient testing to assure a high degree of confidence in the values. In all cases, a statistical analysis of the test data must be performed.

(1) The A and B properties published in MIL-HDBK-5 or DEF STAN 00-932 are acceptable, as are the statistical methods specified in the applicable chapters/sections of those handbooks. Other methods of developing material design values may be acceptable to the FAA.

(2) The test specimens used for material property certification testing should be made from material produced using production processes. Test specimen design, test methods, and testing should:

(a) Conform to universally accepted standards such as those of the American Society for Testing Materials (ASTM), European Aerospace Series Standards (EN), International Standard Organization (ISO), or other national standards acceptable to the FAA; or

(b) Conform to those detailed in the applicable chapters/sections of MIL-HDBK-5, MIL-HDBK-17, DEF STAN 00-932, or other accepted equivalent material data handbooks; or

(c) Be accomplished in accordance with an approved test plan which includes definition of test specimens and test methods. This provision would be used, for example, when the material design values are to be based on tests that include effects of specific geometry and design features as well as material.

(3) The FAA may approve the use of other material test data after review of test specimen design, test methods, and test procedures that were used to generate the data.

b. Consideration of Environmental Conditions. The material strength properties of a number of materials, such as non-metallic composites and adhesives, can be significantly affected

U.S. Department of Transportation
Federal Aviation Administration
Office of Aviation Policy and Plans

PRELIMINARY REGULATORY EVALUATION, INITIAL REGULATORY FLEXIBILITY DETERMINATION, TRADE IMPACT ASSESSMENT , AND UNFUNDED MANDATES ACT DETERMINATION

REVISED REQUIREMENT FOR MATERIAL STRENGTH PROPERTIES AND MATERIAL DESIGN VALUES FOR TRANSPORT AIRPLANES PART 25

AIRCRAFT REGULATORY ANALYSIS BRANCH, APO-320
Marilyn DonCarlos
September 1997

TABLE OF CONTENTS

I. INTRODUCTION AND EXECUTIVE SUMMARY

This regulatory evaluation examines the impacts of a proposed rule to revise the certification requirements for material strength properties and material design values for transport category airplanes. The proposed rule would incorporate changes developed in cooperation with the Joint Aviation Authorities (JAA) of Europe and the U.S. and European aviation industry through the Aviation Rulemaking Advisory Committee (ARAC). The proposed amendment would harmonize FAA requirements with those proposed by the European Joint Aviation Requirements (JAR).

There would be no incremental costs as a result of the proposed rule. Rather, the proposed rule would result in cost savings to manufacturers and to the FAA by reinstating a provision that permits the Administrator to approve design values published in accepted military and industry handbooks. A draft Advisory Circular (AC) accompanies this proposed rule and describes acceptable methods of compliance.

Because the affected transport category airplane manufacturers are not small entities, the proposed rule would not impose a significant impact on a substantial number of small entities. The proposed changes would harmonize with those proposed by the JAA and would not constitute a barrier to international trade. In addition, the proposed rule does not contain any Federal intergovernmental or private sector mandate.

II. BACKGROUND

Section 25.613 of 14 CFR part 25 (part 25) of the Federal Aviation Regulations (FAR) prescribes requirements for material strength properties and design values. Prior to Amendment 25-72 (55 FR 29776, July 20, 1980), the rule required design values to be those found in certain military or industry handbooks.[1] Amendment 25-72 combined §§ 25.613 and 25.615 Design properties into one requirement and removed the references to the handbooks. Instead, the amendment specified probabilities and confidence levels for material strength properties, leaving test procedures and statistical methods

[1] The handbooks are: MIL-HDBK-5, "Metallic Materials and Elements for Flight Vehicle Structure;" MIL-HDBK-17, "Plastics for Flight Vehicles;" ANC-18, "Design of Wood Aircraft Structures;" and MIL-HDBK-23, "Composite Construction for Flight Vehicles."

unspecified. Amendment 25-72 also removed the provision that permitted the Administrator to approve "other design values." The applicant whose transport category airplane's material design values meet either the standards referenced in § 25.613 prior to Amendment 25-72 or comparable European standards,[2] but has not shown that those values meet the probability and confidence level in current § 25.613(b), must now show an equivalent level of safety as part of the FAA's certification of the airplane. This has resulted in unnecessary administrative costs to both the manufacturer and the FAA.

III. DISCUSSION OF THE PROPOSED RULE

The proposed amendment was developed by the Aviation Rulemaking Advisory Committee (ARAC) and presented to the FAA as a recommendation for rulemaking. If adopted, the proposal would harmonize material strength properties and design values with those being proposed by the Joint Aviation Authorities (JAA).

The heading of § 25.613 would be revised to read "Material Strength Properties and Material Design Values." Section 25.613(b) would also be revised to clarify that the design values are material design values. Section 25.613(b) would also reference proposed new § 25.613(f), described below.

The current rule at § 25.613(c) requires consideration of the effects of temperature on allowable stresses used for design. The proposed rule would require consideration of environmental conditions in general, including temperature and moisture, on material design values used in an essential component or structure, where those effects are significant within the airplane operating envelope. Moisture can affect material design values of composites. Although not currently required in the current rule, manufacturers take into account the effect of moisture on design values. This change codifies current practice.

Section 25.613(d) would be removed. It is addressed in § 25.571 Damage tolerance and fatigue evaluation of structure, and is not needed in this section.

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[2] European standards include those of Euronorm (EN), International Standards Organization (ISO), and Defence (DEF) Standard 00-932.

Section 25. 613(e) would be revised to clarify that design values are material design values.

Section 25.613(f) would reinstate the provision that permits the Administrator to approve other design values. (A draft Advisory Circular, AC 25.613-1, developed concurrently with the proposed rule, would describe acceptable methods of compliance, including those published in the handbooks referenced in the rule prior to Amendment 25-72 and other standards, such as those of ASTM, the European Standards (EN), and ISO.)

IV. COSTS AND BENEFITS

Under the current rule, there are three potential options on which to base material strength properties and design values. First, a manufacturer can conduct a material properties development program for each material, product form, and heat treatment. The FAA estimates that a program for a typical material (e.g., titanium, high-strength steels) costs between $300,000 and $500,000. The total cost is a function of the number of materials, product forms, and heat treatments. Second, a manufacturer can also test each part (on a sampling basis) to verify strength characteristics. Based on the cost of materials, testing, and analysis, the FAA estimates the cost is $6,000 to $60,000 for each part over an assumed 300-airplane production run. Again, the total cost is be a function of the numbers of parts to be tested. Third, a manufacturer can request FAA approval of an equivalent safety finding. The FAA estimates that this cost is between $100,000 and $150,000.

Under the proposed rule, manufacturers of transport category airplanes would no longer need to use one of the options, described above. The proposed rule would reinstate the provision permitting the Administrator to approve other material design values, such as those listed in the draft AC. Based on the estimates of the available options described above, the FAA estimates that these cost savings would be at least $100,000 per certification (the lower estimate of the least costly option). In addition, the FAA would realize an estimated cost savings of $1,350 in administrative costs.

Based on the analysis presented above, the FAA has determined that the proposed rule would be cost-beneficial.

V. 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 proposed rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. The Order defines "small entities" in terms of size thresholds, "significant economic impact" in terms of annualized cost thresholds, and "substantial number" as a number which is not less than eleven and which is more than one-third of the small entities subject to the proposed or final rule.

Order 2100.14A specifies a size threshold for classification as a small manufacturer as 75 or fewer employees. Since none of the manufacturers affected by this proposed rule has 75 or fewer employees, the proposed rule would not have a significant economic impact on a substantial number of small manufacturers.

VI. TRADE IMPACT ASSESSMENT

The proposed rule would not constitute a barrier to international trade, including the export of American airplanes to foreign countries and the import of foreign airplanes into the United States. The proposed requirements in this rule would harmonize with those of the JAA and would, in fact, lessen any restraints on trade.

VII. UNFUNDED MANDATES REFORM ACT

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

FAA Action: Revised Requirement for Material Strength Properties and Design Values for Transport Airplanes; Final rule -- FAA-2002-11345 and Advisory Circular 25.613-1; Material Strength Properties and Material Design Values – Regulatory and Guidance Library

Federal Register

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August 5, 2003

Part VI

Department of Transportation

Federal Aviation Administration

14 CFR Part 25

Revised Requirement for Material Strength Properties and Design Values for Transport Airplanes; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2002–11345; Amdt. No. 25–112]

RIN 2120–AH36

Revised Requirement for Material Strength Properties and Design Values for Transport Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This rule amends the airworthiness standards for transport category airplanes concerning material strength properties and material design values. It incorporates changes developed in cooperation with the Joint Aviation Authorities of Europe and the U.S. and European aviation industry through the Aviation Rulemaking Advisory Committee (ARAC). This action is necessary because differences between the current U.S. and European requirements impose unnecessary costs on airplane manufacturers. Issuing this amendment eliminates regulatory differences between the airworthiness standards of the U.S. and the Joint Aviation Requirements of Europe, without affecting current industry design practices.

DATES: Effective September 4, 2003.

FOR FURTHER INFORMATION CONTACT: Rich Yarges, Airframe/Cabin Safety Branch, ANM–115, FAA Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, WA 98055–4056; telephone (425) 227–2143, facsimile (425) 227–1320, e-mail *rich.yarges@faa.gov.*

SUPPLEMENTARY INFORMATION:

How Can I Obtain a Copy of This Final Rule?

You can get an electronic copy using the Internet by:

(1) Searching the Department of Transportation's electronic Docket Management System (DMS) web page (*http://dms.dot.gov/search*).

(2) Visiting the Office of Rulemaking's web page at *http://www.faa.gov/avr/arm/nprm.cfm?nav=nprm;* or

(3) Accessing the Government Printing Office's web page at *http://www.access.gpo.gov/su_docs/aces/aces140.html.*

You can also get a copy 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. Make sure to identify the amendment number or docket number of this rulemaking.

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact its local FAA official, or the person listed under **FOR FURTHER INFORMATION CONTACT**. You can find out more about SBREFA on the Internet at *http://www.faa.gov/avr/arm/sbrefa.htm,* or by e-mailing us at *9-AWA-SBREFA@faa.gov.*

Background

What Are the Relevant Airworthiness Standards in the United States?

In the United States, Title 14, Code of Federal Regulations (CFR) part 25 contains the airworthiness standards for type certification of transport category airplanes. Manufacturers of transport category airplanes must show that each airplane they produce of a different type design complies with the appropriate part 25 standards. These standards apply to—

- Airplanes manufactured within the U.S. for use by U.S.-registered operators; and
- Airplanes manufactured in other countries and imported to the U.S. under a bilateral airworthiness agreement.

What Are the Relevant Airworthiness Standards in Europe?

In Europe, Joint Aviation Requirements (JAR)–25 contains the airworthiness standards for type certification of transport category airplanes. The Joint Aviation Authorities (JAA) of Europe developed these standards, based on part 25, to provide a common set of airworthiness standards within the European aviation community. Twenty-three European countries accept airplanes type certificated to the JAR–25 standards, including airplanes manufactured in the U.S. that are type certificated to JAR–25 standards for export to Europe.

What Is ''Harmonization'' and How Did It Start?

Although part 25 and JAR–25 are very similar, they are not identical in every respect. When airplanes are type certificated to both sets of standards, the differences between part 25 and JAR–25 can result in substantial added costs to manufacturers and operators. These added costs, however, often do not bring about an increase in safety. In many cases, part 25 and JAR–25 may contain different requirements to accomplish the same safety intent. Consequently, manufacturers are usually burdened with meeting the requirements of both sets of standards without a corresponding increase in the level of safety.

Recognizing that a common set of standards would not only benefit the aviation industry economically, but also maintain the necessary high level of safety, the FAA and the JAA began an effort in 1988 to ''harmonize'' their respective aviation standards. The goal of the harmonization effort is to ensure that—

- Where possible, standards do not require domestic and foreign parties to manufacture or operate to different standards for each country involved; and
- The standards adopted are mutually acceptable to the FAA and the foreign aviation authorities.

The FAA and JAA have identified a number of significant regulatory differences (SRD) between the wording of part 25 and JAR–25. Both the FAA and the JAA consider ''harmonization'' of the two sets of standards a high priority.

What Is ARAC and What Role Does It Play in Harmonization?

After initiating the first steps towards harmonization, the FAA and JAA soon realized that traditional methods of rulemaking and accommodating different administrative procedures was neither sufficient nor adequate to make noticeable progress towards fulfilling the harmonization goal. The FAA identified the Aviation Rulemaking Advisory Committee (ARAC) as an ideal vehicle for helping to resolve harmonization issues and, in 1992, the FAA tasked ARAC to undertake the entire harmonization effort.

The FAA had formally established ARAC in 1991 (56 FR 2190, January 22, 1991), to provide advice and recommendations on the full range of the FAA's safety-related rulemaking activity. The FAA sought this advice to develop better rules in less overall time and using fewer FAA resources than previously needed. The committee provides the FAA firsthand information and insight from interested parties regarding potential new rules or revisions of existing rules.

There are 74 member organizations on the committee, representing a wide range of interests within the aviation community. Meetings of the committee

are open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act.

The ARAC sets up working groups to develop recommendations for resolving specific airworthiness issues. Tasks assigned to working groups are published in the **Federal Register**. Although working group meetings are not generally open to the public, the FAA invites participation in working groups from interested members of the public who have knowledge or experience in the task areas. Working groups report directly to the ARAC, and the ARAC must accept a working group proposal before presenting it to the FAA as an advisory committee recommendation.

The activities of the ARAC will not, however, circumvent the public rulemaking procedures; nor is the FAA limited to the rule language ''recommended'' by ARAC. If the FAA accepts an ARAC recommendation, the agency proceeds with the normal public rulemaking procedures. Any ARAC participation in a rulemaking package is fully disclosed in the public docket.

This rulemaking has been identified as a ''fast track'' project. Further details on the Fast Track Program can be found in the tasking statement (64 FR 66522, November 26, 1999) and the first NPRM published under this program, Fire Protection Requirements for Powerplant Installations on Transport Category Airplanes (65 FR 36978, June 12, 2000).

What Is the Current Standard?

Section 25.613 of 14 CFR part 25 prescribes requirements for material static strength properties and design values. Metallic material strength properties for aircraft manufactured in the U.S. have traditionally been based on those specified in Military Handbook (MIL–HDBK)–5. For metallic materials not listed in that handbook, the statistical procedures in the handbook were normally used to determine material strength properties. Prior to Amendment 25–72 to part 25 (55 FR 29786, July 20, 1990), the ''A'' or ''B'' material strength properties listed in MIL–HDBK–5, or those listed in MIL–HDBK–17, and –23, or Army-Navy-Commerce (ANC)–18, were required to be used unless specific FAA approval was granted to use other properties. With Amendment 25–72, §§ 25.613 and 25.615 were combined into one requirement, § 25.613, and the references to MIL–HDBK–5, –17, –23, and ANC–18 were removed. As part of that amendment, the requirement to use ''A'' and ''B'' properties of the military handbook was replaced by a more general requirement specifying probabilities and confidence levels for material strength properties, with the test procedures and statistical methods unspecified. Those probability and confidence levels apply to metallic as well as non-metallic materials. In Europe, other standards have been used in showing compliance with JAR 25.613, such as the Euronorm, International Standard Organization, and Engineering Sciences Data Unit 00932 Metallic Data Handbook.

Because Amendment 25–72 removed the provision which permitted the Administrator to approve ''other design values,'' such an approval requires an equivalent safety finding, including those where the applicant uses MIL–HDBK–5. This finding results in additional administrative time for both the manufacturer and the FAA. To reduce this administrative burden and to permit applicants to again use MIL–HDBK–5 data, the FAA issued Notice of Proposed Rulemaking No. 02–05 on January 29, 2002 (67 FR 4318).

What Changes to the Current Standard Did the FAA Propose?

In Notice No. 02–05, we proposed to revise § 25.613 of part 25 to reinstate the pre-amendment 25–72 provision that permitted the Administrator to approve ''other design values.'' We also proposed the following changes:

- Revise the heading of § 25.613 to read, ''Material Strength Properties and Material Design Values.'' This change clarifies that the design values are material design values.
- Revise paragraph (b) to clarify that the design values are material design values. The ''A'' and ''B'' properties published in MIL–HDBK–5 and –17, or in equivalent handbooks, would be acceptable without further statistical analysis. The statistical methods specified in MIL–HDBK–5 and –17 would be acceptable for use in establishing material design values. Other statistical methods, amounts of data, and material property data might also be acceptable, including those specified in the European Standards previously noted.
- Revise paragraph (c) to require consideration of environmental conditions in general, such as temperature and moisture, on material design values used in an essential component or structure, where those effects are significant in the airplane operating envelope. Paragraph (c) currently requires consideration of the effects of temperature on allowable stresses used for design where thermal effects are significant under normal operating conditions. This change is made because environmental factors other than temperature may have a significant effect on allowable stresses, not only under normal operating conditions, but also at other conditions within the airplane operating envelope.
- Remove paragraph (d) as fatigue is now adequately addressed in § 25.571.
- Revise the premium selection process of paragraph (e) to clarify that the design values are material design values.
- Add a new paragraph (f), which permits the use of other design values if approved by the Administrator.

Is Existing FAA Advisory Material Adequate?

Draft Advisory Circular (AC) 25.613–1, Material Strength Properties and Material Design Values, which describes acceptable methods of compliance with this rule, was published concurrently with Notice No. 02–05 for public comment. We plan to issue the final AC upon publication of the final rule in the **Federal Register**.

What Comments Were Received in Response to the Proposal?

Only one commenter responded to the request for comments. The commenter thanked the FAA for the opportunity to comment.

What Analyses and Assessments Has the FAA Conducted?

Paperwork Reduction Act

There are no current or new requirements for information collection associated with this final rule.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that there are no ICAO Standards and Recommended Practices that correspond to these regulations.

Regulatory Evaluation Summary

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 impact of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. §§ 2531–2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the

United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, to be the basis of U.S. standards. 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, FAA has determined this rule: (1) Has benefits that justify its costs, is not a ''significant regulatory action'' as defined in section 3(f) of Executive Order 12866, and is not ''significant'' as defined in DOT's Regulatory Policies and Procedures; (2) will not have a significant economic impact on a substantial number of small entities; (3) will reduce barriers to international trade; and (4) does not impose an unfunded mandate on State, local, or tribal governments, or on the private sector. These analyses, available in the docket, are summarized below.

Costs and Benefits

The FAA determines that there will be no additional costs associated with the rule and the current level of safety will be maintained or improved. As discussed in the previous section, in addition to harmonizing § 25.613 and JAA requirements, the amendments will clarify the current rule, codify current practice, and reinstate the provision that permits the Administrator to approve other material design values. Consequently, manufacturers of transport category airplanes will not incur any additional costs. In fact, in certain cases, the manufacturer and the FAA will realize cost savings as a result of the revisions. These cost savings are examined in further detail in the following paragraphs.

Under the current rule, there are three potential options on which to base material strength properties and material design values. First, a manufacturer could conduct a material properties development program for each material, product form, and heat treatment. Second, a manufacturer could test each aircraft structural part (on a sampling basis) to verify strength characteristics. Third, a manufacturer could use another method for establishing material design values and then request FAA approval of an equivalent safety finding. The FAA estimates that the initial cost of the latter method, which is the least costly, is between $100,000 and $150,000.

There will be cost savings to the manufacturer and the FAA associated with the provision in the rule permitting the Administrator to approve other material design values (such as those listed in the draft AC). First, under certain conditions, manufacturers of transport category airplanes will no longer need to employ one of the options, described above. If the material design values can be found in the accepted military or industry handbooks, the manufacturer would avoid the initial or recurring cost of establishing material design values. Based on analysis of the available options described above, the FAA estimates that this cost saving (*i.e.*, benefits) will be at least $100,000 per initial aircraft certification (the lower estimate of the least costly option).

Second, the (new) provision will eliminate the need for an equivalent safety finding in the third option. The manufacturer will realize minimal cost savings through a reduction in paperwork. For the FAA, the rule will eliminate approximately 30 hours of paperwork per aircraft certificate for an FAA aerospace engineer (GS–14, step 5) to conduct an equivalent safety finding. This converts to a cost savings of approximately $1,577 in administrative costs per certificate.

Given the findings of no incremental costs, benefits of at least $100,000 (*i.e.*, cost-savings associated with rule-harmonization), and continuation of the necessary high level of safety, the FAA deems this final rule cost-beneficial.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes ''as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.'' To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide-range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis as described in the Act.

If, however, an agency determines that a final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 act provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

As stated in the initial regulatory flexibility determination, the proposed rule affected only manufacturers of transport category airplanes. And, since all United States transport category airplane manufacturers exceed the Small Business Administration (SBA) small-entity standard of 1,500 employees for aircraft manufacturers, the FAA determined that the proposal ''would not have a significant economic impact on a substantial number of small entities.'' There were no comments to the docket contesting this finding. Consequently, the FAA now certifies that the final rule ''will not have a significant economic impact on a substantial number of small entities.''

International Trade Impact Assessment

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

In accordance with the above statute, the FAA has assessed the potential effect of this rule and has determined that it complies with the Act since it harmonizes U.S. standards with similar European standards. In addition, the rule will impose no incremental costs on either domestic or international manufacturers.

Unfunded Mandates Assessment

The Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104–4 on March 22, 1995, is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments.

Title II of the Act requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in a $100 million or more expenditure (adjusted annually for inflation) in any one year by State, local, and tribal governments,

in the aggregate, or by the private sector; such a mandate is deemed to be a ''significant regulatory action.'' This rule does not contain such a mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Executive Order 13132, Federalism

The FAA has analyzed this final rule and the principles and criteria of Executive Order 13132, Federalism. We determined that this action will not have a substantial direct effect 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, and therefore does not have federalism implications.

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. We received no comments on this final rule as it affects intrastate aviation in Alaska, and we will apply the rule to Alaska in the same way we will apply it nationally.

Plain English

Executive Order 12866 (58 FR 51735, October 4, 1993) requires each agency to write regulations that are simple and easy to understand. We invite your comments on how to make these regulations easier to understand, including answers to questions such as the following:

- Are the requirements in the regulations clearly stated?
- Do the regulations contain unnecessary technical language or jargon that interferes with their clarity?
- Would the regulations be easier to understand if they were divided into more (but shorter) sections?
- Is the description in the preamble helpful in understanding the regulations?

Please send your comments to the address specified in the **ADDRESSES** section.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this final rule qualifies for a categorical exclusion.

Energy Impact

The energy impact of the final rule has been assessed in accordance with the Energy, Policy, and Conservation Act (EPCA), Public Law 94–163, as amended (42 U.S.C. 6362), and FAA Order 1053.1. We have determined that the final rule is not a major regulatory action under the provisions of the EPCA.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends part 25 of Title 14, Code of Federal Regulations, as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

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

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

■ 2. Amend § 25.613 as follows:

■ a. By revising the section heading and paragraphs (b) introductory text, (c), and (e);

■ b. By removing and reserving paragraph (d); and

■ c. By adding a new paragraph (f).

The revisions and addition read as follows:

§ 25.613 Material strength properties and material design values.

* * * * *

(b) Material design values must be chosen to minimize the probability of structural failures due to material variability. Except as provided in paragraphs (e) and (f) of this section, compliance must be shown by selecting material design values which assure material strength with the following probability:

* * * * *

(c) The effects of environmental conditions, such as temperature and moisture, on material design values used in an essential component or structure must be considered where these effects are significant within the airplane operating envelope.

(d) [Reserved]

(e) Greater material design values may be used if a ''premium selection'' of the material is made in which a specimen of each individual item is tested before use to determine that the actual strength properties of that particular item will equal or exceed those used in design.

(f) Other material design values may be used if approved by the Administrator.

Issued in Renton, Washington, on July 25, 2003.

K.C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 03–19748 Filed 8–4–03; 8:45 am]

BILLING CODE 4910–13–P