Federal Aviation Administration – Regulations and Policies
Aviation Rulemaking Advisory Committee

Transport Airplane and Engine Issue Area
Flight Test Harmonization Working Group

Task 6 – Harmonize 25.103, 25.109(a), 25.113, 25.121, 25.125 and 25.207

Task Assignment

exemption is necessary or appropriate in the public interest and consistent with the protection of investors and the purposes fairly intended by the policies and provisions of the Act. OLDE Management states that the requested relief satisfies this standard.

4. OLDE Management asserts that the Transaction arose out of business considerations unrelated to the Trust and OLDE Management. OLDE Management states that there is insufficient time to obtain shareholder approval of the New Agreements prior to the Closing Date.

5. OLDE Management represents that under the New Agreements, during the Interim Period, the scope and quality of services provided to the Funds will be at least equivalent to the scope and quality of the services it previously provided under the Existing Agreements. OLDE Management states that if any material change in its personnel occurs during the Interim Period, OLDE Management will apprise and consult with the Board to ensure that the Board, including a majority of the Independent Trustees, are satisfied that the scope and quality of the advisory services provided to the Funds will not be diminished. OLDE Management also states that the compensation payable to it under the New Agreements will be no greater than the compensation that would have been paid to OLDE Management under the Existing Agreements.

Applicant's Conditions

OLDE Management agrees as conditions to the issuance of the exemptive order requested by the application that:

1. The New Agreements will have the same terms and conditions as the Existing Agreements except for the dates of execution and termination.

2. Fees earned by OLDE Management in respect of the New Agreements during the Interim Period will be maintained in an interest-bearing escrow account, and amounts in the account (including interest earned on such fees) will be paid to (i) OLDE Management in accordance with the New Agreements, after the requisite shareholder approvals are obtained, or (ii) the respective Fund, in absence of such shareholder approval.

3. The Trust will convene a meeting of shareholders of each Fund to vote on approval of the respective New Agreements during the Interim Period (but in no event later than April 15, 2000).

4. OLDE Management or an affiliate, not the Funds, will bear the costs of preparing and filing the application and the costs relating to the solicitation of shareholder approval of the Funds necessitated by the Transaction.

5. OLDE Management will take all appropriate steps so that the scope and quality of advisory and other services provided to the Funds during the Interim Period will be at least equivalent, in the judgment of the Trust's Board, including a majority of the Independent Trustees, to the scope and quality of services previously provided under the Existing Agreements. If personnel providing material services during the Interim Period change materially, OLDE Management will apprise and consult with the Board to assure that the trustees, including a majority of the Independent Trustees, of the Trust are satisfied that the services provided will not be diminished in scope or quality.

For the SEC, by the Division of Investment Management, under delegated authority.

Margaret H. McFarland,

Deputy Secretary.

[FR Doc. 99–30709 Filed 11–24–99; 8:45 am]

BILLING CODE 8010–01–M

SECURITIES AND EXCHANGE COMMISSION

SUNSHINE ACT MEETING

AGENCY MEETING: Notice is hereby given, pursuant to the provisions of the Government in the Sunshine Act, Pub. L. 94–409, that the Securities and Exchange Commission will hold the following meeting during the week of November 29, 1999.

A closed meeting will be held on Wednesday, December 1, 1999, at 11:00 a.m.

Commissioners, Counsel to the Commissioners, the Secretary to the Commission, and recording secretaries will attend the closed meeting. Certain staff members who have an interest in the matters may also be present.

The General Counsel of the Commission, or his designee, has certified that, in his opinion, one or more of the exemptions set forth in 5 U.S.C. 552b(c) (4), (8), (9)(A) and (10) and 17 CFR 200.402(a) (4), (8), (9)(A) and (10), permit consideration for the scheduled matters at the closed meeting.

Commissioner Unger, as duty officer, voted to consider the items listed for the closed meeting in a closed session.

The subject matter of the closed meeting scheduled for Wednesday, December 1, 1999, will be:

Institution and settlement of injunctive actions

Institution and settlement of administrative proceedings of an enforcement nature

At times, changes in Commission priorities require alterations in the scheduling of meeting items. For further information and to ascertain what, if any, matters have been added, deleted or postponed, please contact:

The Office of the Secretary at (202) 942–7070.

Dated: November 23, 1999.

Jonathan G. Katz,

Secretary.

[FR Doc. 99–30918 Filed 11–23–99; 2:54 pm]

BILLING CODE 8010–01–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

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

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of new and revised task assignments for the Aviation Rulemaking Advisory Committee (ARAC).

SUMMARY: Notice is given of new tasks assigned to and accepted by the Aviation Rulemaking Advisory Committee (ARAC) and of revisions to a number of existing tasks. This notice informs the public of the activities of ARAC.

FOR FURTHER INFORMATION CONTACT: Dorenda Baker, Transport Airplane Directorate, Aircraft Certification Service (ANM–110), 1601 Lind Avenue, SW., Renton, WA 98055; phone (425) 227–2109; fax (425) 227–1320.

SUPPLEMENTARY INFORMATION:

Background

The FAA has established an Aviation Rulemaking Advisory Committee to provide advice and recommendations to the FAA Administrator, through the Associate Administrator for Regulation and Certification, on the full range of the FAA's rulemaking activities with respect to aviation-related issues. This includes obtaining advice and recommendations on the FAA's commitment to harmonize its Federal Aviation Regulations (FAR) and practices with its trading partners in Europe and Canada.

One area ARAC deals with is transport airplane and engine issues. These issues involve the airworthiness standards for transport category

airplanes and engines in 14 CFR parts 25, 33, and 35 and parallel provisions in 14 CFR parts 121 and 135. The corresponding Canadian standards are contained in Parts V, VI, and VII of the Canadian Aviation Regulations. The corresponding European standards are contained in Joint Aviation Requirements (JAR) 25, JAR–E, JAR–P, JAR–OPS–Part 1, and JAR–26.

As proposed by the U.S. and European aviation industry, and as agreed between the Federal Aviation Administration (FAA) and the European Joint Aviation Authorities (JAA), an accelerated process to reach harmonization has been adopted. This process is based on two procedures:

(1) Accepting the more stringent of the regulations in Title 14 of the Code of Federal Regulations (FAR), Part 25, and the Joint Airworthiness Requirements (JAR); and

(2) Assigning approximately 41 already-tasked significant regulatory differences (SRD), and certain additional part 25 regulatory differences, to one of three categories:

- Category 1—Envelope
- Category 2—Completed or near complete
- Category 3—Harmonize

The Revised Tasks

ARAC will review the rules identified in the "FAR/JAR 25 Differences List," dated June 30, 1999, and identify changes to the regulations necessary to harmonize part 25 and JAR 25. ARAC will submit a technical report on each rule. Each report will include the cost information that has been requested by the FAA. The tasks currently underway in ARAC to harmonize the listed rules are superseded by this tasking.

New Tasks

The FAA has submitted a number of new tasks for the Aviation Rulemaking Advisory Committee (ARAC), Transport Airplane and Engine Issues. As agreed by ARAC, these tasks will be accomplished by existing harmonization working groups. The tasks are regulatory differences identified in the above-referenced differences list as Rule type = P–SRD.

New Working Group

In addition to the above new tasks, a newly established Cabin Safety Harmonization Working Group will review several FAR/JAR paragraphs as follows:

ARAC will review the following rules and identify changes to the regulations necessary to harmonize part 25 and JAR:

(1) Section 25.787;
(2) Section 25.791(a) to (d);
(3) Section 25.810;
(4) Section 25.811;
(5) Section 25.819; and
(6) Section 25.813(c).

ARAC will submit a technical report on each rule. Each report will include the cost information that has been requested by the FAA.

The Cabin Safety Harmonization Working Group would be expected to complete its work for the first five items (identified as Category 1 or 2) before completing item 6 (identified as Category 3).

Schedule

Within 120 days of tasking/retasking:

- For Category 1 tasks, ARAC submits the Working Groups' technical reports to the FAA to initiate drafting of proposed rulemaking documents.
- For Category 2 tasks, ARAC submits technical reports, including already developed draft rules and/or advisory materials, to the FAA to complete legal review, economic analysis, coordination, and issuance.

June 2000: For Category 3 tasks, ARAC submits technical reports including draft rules and/or advisory materials to the FAA to complete legal review, economic analysis, coordination, and issuance.

ARAC Acceptance of Tasks

ARAC has accepted the new tasks and has chosen to assign all but one of them to existing harmonization working groups. A new Cabin Safety Harmonization Working Group will be formed to complete the remaining tasks. The working groups serve as staff to ARAC to assist ARAC in the analysis of the assigned tasks. Working group recommendations must be reviewed and approved by ARAC. If ARAC accepts a working group's recommendations, it forwards them to the FAA and ARAC recommendations.

Working Group Activity

All working groups are expected to comply with the procedures adopted by ARAC. As part of the procedures, the working groups are expected to accomplish the following:

1. Document their decisions and discuss areas of disagreement, including options, in a report. A report can be used both for the enveloping and for the harmonization processes.

2. If requested by the FAA, provide support for disposition of the comments received in response to the NPRM or review the FAA's prepared disposition of comments. If support is requested, the Working Group will review comments/disposition and prepare a report documenting their recommendations, agreement, or disagreement. This report will be submitted by ARAC back to the FAA.

3. Provide a status report at each meeting of ARAC held to consider Transport Airplane and Engine Issues.

Partcipation in the Working Groups

Membership on existing working groups will remain the same, with the formation of subtask groups, if appropriate. The Cabin Safety Harmonization Working Group will be composed of technical experts having an interest in the assigned task. A working group member need not be a representative of a member of the full committee.

An individual who has expertise in the subject matter and wishes to become a member of the Cabin Safety Harmonization Working Group should write to the person listed under the caption **FOR FURTHER INFORMATION CONTACT** expressing that desire, describing his or her interest in the tasks, and stating the expertise he or she would bring to the working group. All requests to participate must be received no later than December 30, 1999. The requests will be reviewed by the assistant chair, the assistant executive director, and the working group chair, and the individuals will be advised whether or not the request can be accommodated.

Individuals chosen for membership on the Cabin Safety Harmonization Working Group will be expected to represent their aviation community segment and participate actively in the working group (e.g., attend all meetings, provide written comments when requested to do so, etc.). They also will be expected to devote the resources necessary to ensure the ability of the working group to meet any assigned deadline(s). Members are expected to keep their management chain advised of working group activities and decisions to ensure that the agreed technical solutions do not conflict with their sponsoring organization's position when the subject being negotiated is presented to ARAC for a vote.

Once the working group has begun deliberations, members will not be added or substituted without the approval of the assistant chair, the assistant executive director, and the working group chair.

The Secretary of Transportation has determined that the formation and use of ARAC are necessary and in the public interest in connection with the performance of duties imposed on the FAA by law.

Meetings of ARAC will be open to the public. Meetings of the working groups 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 November 19, 1999.

Anthony F. Fazio,

Executive Director, Aviation Rulemaking Advisory Committee.

[FR Doc. 99–30774 Filed 11–24–99; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

RIN 2120–AA64

General Aviation Summit; Notice of Public Meeting

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of public meeting.

SUMMARY: This notice announces a public meeting on the subject of the continued airworthiness of the U.S. general aviation fleet of aircraft. The purpose of the meeting is to gather information and discuss technical issues related to problems associated with the increasing average age of the general aviation fleet. Particular emphasis will be given to continued field support, service difficulty experiences and reporting, and inspection issues.

DATES: The public meeting will be held January 11–12, 2000, starting at 8:00 a.m. each day, in Kansas City, Missouri. Registration will begin at 8:00 a.m. on the first day of the meeting.

ADDRESSES: The public meeting will be held at the following location: The Adam's Mark Hotel, Grand Ballroom, 9103 East 39th Street, Kansas City, Missouri 64133.

Persons who are unable to attend the meeting may mail their comments to: Federal Aviation Administration, (FAA), Central Region, Small Airplane Directorate, Attention: Mr. Bill Timberlake, 901 Locust, Room 301, Kansas City, Missouri 64106. Written comments regarding the subject of this meeting will receive the same consideration as statements made at the public meeting.

FOR FURTHER INFORMATION CONTACT: Requests to present a statement at the public meeting and questions regarding the logistics of the meeting should be directed to FAA, Central Region, Small Airplane Directorate, Attention: Mr. Bill Timberlake, 901 Locust, Room 301, Kansas City, Missouri 64106; telephone: (816) 329–4178; facsimile (816) 329–4091.

SUPPLEMENTARY INFORMATION:

Participation at the Public Meeting

Requests from persons who wish to present oral statements at the public meeting should be received by the FAA no later than 10 days prior to the meeting. Such requests should be submitted to Mr. Bill Timberlake as listed in the section titled **FOR FURTHER INFORMATION CONTACT** above, and should include a written summary of oral remarks to be presented, and an estimate of time needed for the presentation. Requests received after the date specified above will be scheduled if there is time available during the meeting; however, the names of those individuals may not appear on the written agenda. The FAA will prepare an agenda of speakers that will be available at the meeting. To accommodate as many speakers as possible, the amount of time allocated to each speaker may be less than the amount of time requested. Those persons desiring to have available audiovisual equipment should notify the FAA when requesting to be placed on the agenda.

Background

The average airplane in the general aviation fleet of the United States is approximately 34 years old. In the next 10 years, this average age is expected to rise to over 41 years old. By the year 2019, the average general aviation airplane will be almost 50 years old.

Certain type design airplanes may be subject to pending rulemaking, which would require the development of Structural Inspection Documents (SIDs), and a mandated structural inspection program. These actions, if adopted, would not commence for at least 5 years and may not be complete until the year 2010. This rulemaking would not affect airplanes utilized in accordance with Part 91 of the Federal Aviation Regulations (14 CFR part 91). The FAA has determined that as the general aviation fleet gets older, there is concern about ensuring the continued airworthiness of these airplanes.

In addition to these concerns, there are a large number of general aviation airplane manufacturers that have gone out of business or severely curtailed operations. The FAA is concerned about the less than optimum availability of resources to respond to any airworthiness problems on these airplanes. The FAA is aware that many of these "orphaned" airplanes are well supported by owner associations and spare parts manufacturers, but unfortunately, this support is not available in all cases.

The FAA has determined that it is in the public interest to hold a public meeting on this subject for the purpose of sharing information and gathering additional data. Accordingly, the FAA will conduct this public meeting in Kansas City, Missouri.

The FAA anticipates that the agency, industry, and the general public will use the public meeting as a forum to share information, resolve questions, and discuss potential solutions concerning the continued airworthiness of older general aviation airplanes.

Public Meeting Procedures

The following procedures have been established for this meeting:

1. Admission and participation in the public meeting is free. The meeting will be open to all persons who have requested in advance to present statements, or who register on the first day of the meeting (between 8:00 a.m. and 8:30 a.m.). Time availability for presentations and seating will be made according to the order of reservation.
2. Representatives from the FAA will conduct the public meeting. A technical panel of FAA personnel will discuss information presented by participants.
3. The public meeting is intended as a forum to share information and resolve questions concerning the continued airworthiness of older general aviation airplanes. Those sharing information will include industry, the general public, and operators of general aviation aircraft. Participants must limit their presentations to the issue.
4. All interested parties will have the opportunity to present any additional information not currently available to the FAA. The FAA will then have the opportunity to explain the methodology and technical assumptions supporting its current observations.
5. FAA personnel, industry, and public participants may engage in a full discussion of all technical material presented at the meeting. Anyone presenting conclusions will be expected to submit to the FAA data supporting those conclusions.
6. The FAA will try to accommodate all speakers. Time may be limited for each presentation.
7. Sign and oral interpretations will be made available at the meeting, including assistive listening devices, if requested 10 calendar days before the meeting.
8. The meeting (except for any breakout sessions) will be recorded by a court reporter. Any person who is interested in purchasing a copy of the

Recommendation

ARAC WG Report #1
Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25X1516

What is the underlying safety issue addressed by the FAR/JAR?:

There may be speeds above which it is unsafe to extend devices into the air stream, such as spoilers, speed brakes, ram air turbines, thrust reversers, and landing lights, or to open windows or doors. Limitations must be established and made available to the flightcrew to ensure safe operation.

What are the current FAR and JAR standards?: see below

Current FAR text:

None.

Current JAR text:

JAR 25X1516 Other speed limitations

Any other limitation associated with speed must be established. (See also ACJ 25X1516.)

What are the differences in the standards and what do these differences result in?:

The FAR does not have an explicit requirement to mandate that any other limitation associated with speed be established, while the JAR does. The FAR relies on § 25.1501(a), "Each operating limitation specified in §§25.1503 and 25.1533 **and other limitations and information necessary for safe operation must be established,**" to accomplish the same goal. There are no practical differences resulting from the difference in the standards.

What, if any, are the differences in the means of compliance?:

FAA AC 25.1581-1 Airplane Flight Manual

Paragraph 2b(7)(vi)

(vi) Any other limiting speeds for extendable devices other than the landing gear should be included as applicable (e.g., spoilers, thrust reversers, landing lights, ram air turbines (RAT), windows that may be opened in flight, etc.).

ACJ 25X1516

Speed limitations for devices such as spoilers, speed brakes, high lift devices, thrust reversers, landing lights and the opening of doors and direct vision windows, should be included.

What is the proposed action?:

Harmonize to the JAR standard.

What should the harmonized standard be?:

See below

Proposed text of harmonized standard:

FAR/JAR 25.1516:

Any other limitation associated with speed must be established.

How does this proposed standard address the underlying safety issue?:

It continues to address the underlying safety issue by requiring the airspeed limitations to be established for devices that can open into the air stream in flight.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain

What other options have been considered and why were they not selected?:

This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?:

Manufacturers and operators of transport category airplanes could be affected by the proposed change. However, since the proposed change does not result in any practical changes in requirements, there will not be any effect.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?:

None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?):

No additional advisory material is needed. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25. The JAA will delete ACJ 25X1516.

How does the proposed standard compare to the current ICAO standards?:

The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?:

No.

What is the cost impact of complying with the proposed standard?:

None.

Does the working group want to review the draft NPRM prior to publication in the *Federal Register*?:

Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain:

Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report #2
Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1527

What is the underlying safety issue addressed by the FAR/JAR?:

Operation outside the environmental envelope established for the airplane may be unsafe. Therefore, the boundaries of that envelope must be established to ensure safe operations.

What are the current FAR and JAR standards?: see below

Current FAR text:

Maximum operating altitude. The maximum altitude up to which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be established.

Current JAR text:

The **extremes of the ambient air temperature and operating altitude for** which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be established.

What are the differences in the standards and what do these differences result in?:

The FAR standard only requires the maximum altitude portion of the environmental envelope to be established. The JAR requires both the minimum and maximum altitudes and ambient temperatures to be established. FAA policy is consistent with the JAR standard (as shown in AC 25.1581-1), but must rely on the general provisions of § 25.1501(a) ("other limitations and information necessary for safe operation must be established") for its regulatory basis.

What, if any, are the differences in the means of compliance?:

Although the explicit standards are different, there are no differences in the means of compliance. The FAA relies on the general provisions of § 25.1501(a) and the following AC 25-7A advisory material to apply the same requirement. There is no current JAA advisory material; however, the JAA will be adopting AMJ 25.1581 with Change 15 to JAR-25. AMJ 25.1581 is harmonized with FAA AC 25.1581-1.

FAA AC 25.1581-1 (paragraph 2b(3)):

(3) Operating Limitations. The extremes of the operational variables, including any appropriate descriptions for which compliance with parts 25 and 36 has been shown and for which the AFM data have been approved, should be listed with respect to the following:

(i) Operations.

(A) Maximum takeoff, landing, and zero fuel weight limits.

(B) Minimum in-flight gross weight.

(C) ***Minimum and maximum pressure altitude for which operation is limited for each flight phase (takeoff, en route, and landing). Further altitude limitations caused by changes to structure, powerplant, equipment characteristics, or flight characteristics (e.g., due to failures) should be provided.***

(D) Ambient atmospheric temperature (maximum and minimum).

What is the proposed action?:

Codify current FAA policy by harmonizing to the JAR standard.

What should the harmonized standard be?:

See below

Proposed text of harmonized standard:

FAR/JAR 25.1527:

The extremes of the ambient air temperature and operating altitude for which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be established.

How does this proposed standard address the underlying safety issue?:

It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain.

What other options have been considered and why were they not selected?:

This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?:

Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?:

None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?):

Current advisory material is adequate. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?:

The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?:

No.

What is the cost impact of complying with the proposed standard?:

None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?:

Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain:

Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report #3
Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1583(c)

What is the underlying safety issue addressed by the FAR/JAR?:

Section/JAR 25.1583 is linked to §§/JAR 25.1501 through 25.1533 in that it requires the limitations established under those sections to be provided in the Airplane Flight Manual. To ensure safe operation, any limitations established for the airplane must be made known to the flightcrew. This is accomplished through instrument markings and placards, and the information provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?:

Current FAR text:

25.1583(c): *Weight and loading distribution.* The weight and center of gravity limits required by §§ 25.25 and 25.27 must be furnished in the Airplane Flight Manual. All of the following information must be presented either in the Airplane Flight Manual or in a separate weight and balance control and loading document which is incorporated by reference in the Airplane Flight Manual:

(1) The condition of the airplane and the items included in the empty weight as defined in accordance with § 25.29.

(2) Loading instructions necessary to ensure loading of the airplane within the weight and center of gravity limits, and to maintain the loading within these limits in flight.

(3) If certification for more than one center of gravity range is requested, the appropriate limitations, with regard to weight and loading procedures, for each separate center of gravity range.

Current JAR text:

25.1583(c): *Weight and loading distribution.* The weight and centre of gravity limitations established under JAR 25.1519 must be furnished in the aeroplane Flight Manual. All the following information including weight distribution limitations established under JAR 25.1519 must be presented either in the aeroplane Flight Manual or in a separate weight and balance control and loading document which is incorporated by reference in the aeroplane Flight Manual (see ACJ 25.1583(c));

(1) The condition of the aeroplane and the items included in the empty weight as defined in accordance with JAR 25.29.

(2) Loading instructions necessary to ensure loading of the aeroplane within the weight and centre of gravity limits, and to maintain the loading within these limits in flight.

(3) If certification for more than one centre of gravity range is requested, the appropriate limitations, with regard to weight and loading procedures, for each separate centre of gravity range.

What are the differences in the standards and what do these differences result in?:

There are no practical differences in application of the standards. However, the JAR standard is more correct by referring to the requirement that establishes the weight and loading distribution limits as

operating limitations. Section/JAR 25.1519 contains the requirement to establish the limitations determined under §/JAR 25.23 to 25.27 as operating limitations.

JAR 25.1583(c) requires the operating limitations established under JAR 25.1519 to be provided in the Airplane Flight Manual. Instead of referencing § 25.1519, § 25.1583(c) specifically refers to the weight and center of gravity limitations determined under §§ 25.25 and 25.27. This mistakenly excludes any operating limitations established as a result of § 25.23.

What, if any, are the differences in the means of compliance?:

Although the explicit standards are different, there are no differences in the means of compliance. The FAA relies on the general provisions of § 25.1501(a) and the following AC 25-1581-1 advisory material to apply the same requirement. The JAA have a current ACJ that is relevant; however, the JAA will be adopting harmonized advisory material with Change 15 to JAR-25.

FAA AC 25.1581-1 (paragraphs 2b(1) and 2e):

2(b)(1) *Weight Limitations*. A statement of the maximum certified takeoff and landing weights must be provided. The maximum taxi/ramp weight, maximum zero fuel weight, and any other fixed limit on weight should also be included. Any limitations on airplane loading associated with the stated weight limitations must be included in the AFM or addressed in a separate weight and balance document. Separate takeoff and landing weight limits may be listed corresponding to each applicable constraint (e.g., structural or noise requirements, customer option, etc.), if the instructions in the Limitations Section clearly state that the most restrictive of these takeoff and landing weight limitations represent the maximum certified weights.

(i) For those performance weight limits that vary with runway length, altitude, temperature, or other variables, the variation in weight limitations may be presented as graphs in the Performance Section of the AFM and included as limitations by specific reference in the Limitations Section.

(ii) Only one set of takeoff and landing gross weight limits may be established under part 36 for a specific airplane model (i.e., hardware build).

. . .

e. Loading Instructions. Section 25.1583 requires instructions necessary to ensure loading of the airplane within the established limits of weight and center-of-gravity, and to maintain the loading within such limits in flight to be presented either in the AFM or included in a separate weight and balance document referenced in the AFM Limitations Section. If applicable, the loading instructions must refer to the flight procedures that consider the change to the airplane's center of gravity as fuel is consumed.

(1) Loading Instructions Presented in a Separate Document. If the loading instructions are presented in a separate document, the AFM Limitations Section should contain at least the following:

(i) Maximum taxi gross weight limits.

(ii) Maximum takeoff gross weight limits.

(iii) Maximum landing gross weight limits.

(iv) Maximum zero fuel weight limits.

(v) Minimum in-flight gross weight.

(vi) Center-of-gravity limits.

(vii) Information required to maintain the airplane within the above limits.

(2) Weight and Balance Data. Documentation of the weight and balance material outlined below is normally adequate for airplanes with conventional loading and fuel management techniques. For airplanes that require fuel to be redistributed (other than through normal consumption) to maintain loading within prescribed limits, the loading instructions should be expanded as necessary.

(i) Weight Limits. A list and identification of all weight limitations should be included.

(ii) Center-of-Gravity Limits. The approved center-of-gravity range, or ranges, should be presented with due accounting for airplane configuration (i.e., landing gear position, passenger loading, cargo distribution, etc.) such that loading limits can be maintained.

(iii) Dimensions, Datum, and MAC. The dimensions and relative location of airplane features associated with weighing and loading of the airplane and with weight and balance computations should be described or illustrated.

(iv) Configuration Checklist or Equipment List. The airplane should be defined or described sufficiently to identify the presence or absence of optional systems, features, or installations that are not readily apparent. In addition, all other items of fixed or removable equipment included in the empty weight should be listed.

(v) Fuel and Other Liquids. All fuel and other liquids, including passenger-service liquids, that are included in the empty weight should be identified and listed, together with the information necessary to enable ready duplication of the particular condition.

(vi) Weighing Computations. Computation of the empty weight and the empty weight c.g. location should be included.

(vii) Loading Schedule. The loading schedule should be included, if appropriate.

(viii) Loading Instructions. Complete instructions relative to the loading procedure or to the use of the loading schedule should be included.

(ix) Compartment and floor load limits should be included.

JAA ACJ 25.1583(c):

1. Indication should be given in tabular or graphic form of the c.g. limits for take-off and landing and for any other practicably separable flight condition, as appropriate for the range of weights between the maximum take-off weight and the minimum landing weight presented in accordance with JAR 25.1583(c). The landing gear position appropriate to each condition should be shown, or, alternatively, data should be presented for landing-gear-extended position only and should include the moment change due to gear retraction. C.g. limits should be presented in terms of both distance-from-datum and percentage of the mean aerodynamic chord (MAC). The datum for the former should be defined and the length and location of the MAC should be stated.
2. For those weight limitations which vary with runway length, altitude, temperature and other variables the variation in weight limitation may be presented as graphs in the performance section of the Flight Manual, and included as limitations by specific reference, in the limitations section, to the appropriate graph or page.

What is the proposed action?:

Codify current FAA policy by harmonizing to the JAR standard.

What should the harmonized standard be?:

FAR/JAR 25.1583(c):

Weight and loading distribution. The weight and center of gravity limitations established under §/JAR 25.1519 must be furnished in the Airplane Flight Manual. All of the following information, including the weight distribution limitations established under §/JAR 25.1519, must be presented either in the Airplane Flight Manual or in a separate weight and balance control and loading document that is incorporated by reference in the Airplane Flight Manual;

(1) The condition of the airplane and the items included in the empty weight as defined in accordance with §/JAR 25.29.

(2) Loading instructions necessary to ensure loading of the airplane within the weight and center of gravity limits, and to maintain the loading within these limits in flight.

(3) If certification for more than one center of gravity range is requested, the appropriate limitations, with regard to weight and loading procedures, for each separate center of gravity range.

How does this proposed standard address the underlying safety issue?:

It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain.

What other options have been considered and why were they not selected?:

No other options were considered.

Who would be affected by the proposed change?:

Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?:

None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?):

Existing FAA advisory material is adequate. The JAA intend to delete their ACJ when the harmonized JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?:

The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?:

No.

What is the cost impact of complying with the proposed standard?:

None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?:

Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain:

Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report #4
Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1583(f)

What is the underlying safety issue addressed by the FAR/JAR?:

Section/JAR 25.1583 is linked to §§/JAR 25.1501 through 25.1533 in that it requires the limitations established under those sections to be provided in the Airplane Flight Manual. To ensure safe operation, any limitations established for the airplane must be made known to the flightcrew. This is accomplished through instrument markings and placards, and the information provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?:

Current FAR text:

Altitudes. The altitude established under § 25.1527.

Current JAR text:

Ambient air temperatures and operating altitudes. The extremes of the ambient air temperatures and operating altitudes established under JAR 25.1527 and an explanation of the limiting factors must be furnished.

What are the differences in the standards and what do these differences result in?:

Consistent with § 25.1527, the FAR standard only requires the maximum altitude portion of the environmental envelope to be provided in the Airplane Flight Manual. Consistent with JAR 25.1527, the JAR requires both the minimum and maximum altitudes and ambient temperatures to be established. FAA policy is consistent with the JAR standard (as shown in AC 25.1581-1), but must rely on the general provisions of § 25.1501(a) ("other limitations and information necessary for safe operation must be established") for its regulatory basis.

What, if any, are the differences in the means of compliance?:

Although the explicit standards are different, there are no differences in the means of compliance. The FAA relies on the general provisions of § 25.1501(a) and the following AC 25.1581-1 advisory material to apply the same requirement. There is no current JAA advisory material, but AMJ 25.1581 is harmonized with FAA AC 25.1581-1 and will be published as part of Change 15 to JAR-25.

FAA AC 25.1581-1 (paragraph 2b(3)):

(3) *Operating Limitations*. The extremes of the operational variables, including any appropriate descriptions for which compliance with parts 25 and 36 has been shown and for which the AFM data have been approved, should be listed with respect to the following:

(i) Operations.

(A) Maximum takeoff, landing, and zero fuel weight limits.

(B) Minimum in-flight gross weight.

(C) **Minimum and maximum pressure altitude for which operation is limited for each flight phase (takeoff, en route, and landing). Further altitude limitations caused by**

changes to structure, powerplant, equipment characteristics, or flight characteristics (e.g., due to failures) should be provided.

(D) **Ambient atmospheric temperature (maximum and minimum).**

What is the proposed action?:

Codify current FAA policy by harmonizing to the JAR standard. The requirement for an explanation of the limiting factors would be deleted; however, as this does not represent current practice and is unnecessary for safety.

What should the harmonized standard be?:

see below

Proposed text of harmonized standard:

FAR/JAR 25.1583(f):
Ambient air temperatures and operating altitudes. The extremes of the ambient air temperatures and operating altitudes established under §/JAR 25.1527 must be furnished.

How does this proposed standard address the underlying safety issue?:

It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain.

What other options have been considered and why were they not selected?:

This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?:

Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?:

None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?):

Existing FAA advisory material is adequate. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?:

The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?:

No.

What is the cost impact of complying with the proposed standard?:

None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?:

Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain:

Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report #5
Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1585

What is the underlying safety issue addressed by the FAR/JAR?:

The primary purpose of the Airplane Flight Manual is to provide an authoritative and approved source of information considered necessary for safely operating the airplane. Consistent with this purpose, operating procedures related to airworthiness and necessary for safe operation, including those procedures that may be unique to that type of airplane, must be provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?:

Current FAR text:

§ 25.1585 Operating procedures.

(a) Information and instructions regarding the peculiarities of normal operations (including starting and warming the engines, taxiing, operation of wing flaps, landing gear, and the automatic pilot) must be furnished, together with recommended procedures for--

(1) Engine failure (including minimum speeds, trim, operation of the remaining engines, and operation of flaps);

(2) Stopping the rotation of propellers in flight;

(3) Restarting turbine engines in flight (including the effects of altitude);

(4) Fire, decompression, and similar emergencies;

(5) Ditching (including the procedures based on the requirements of §§ 25.801, 25.807(d), 25.1411, and 25.1415(a) through (e));

(6) Use of ice protection equipment;

(7) Use of fuel jettisoning equipment, including any operating precautions relevant to the use of the system;

(8) Operation in turbulence for turbine powered airplanes (including recommended turbulence penetration airspeeds, flight peculiarities, and special control instructions);

(9) Restoring a deployed thrust reverser intended for ground operation only to the forward thrust position in flight or continuing flight and landing with the thrust reverser in any position except forward thrust; and

(10) Disconnecting the battery from its charging source, if compliance is shown with Sec. 25.1353(c)(6)(ii) or (c)(6)(iii).

(b) Information identifying each operating condition in which the fuel system independence prescribed in § 25.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.

(c) The buffet onset envelopes, determined under § 25.251 must be furnished. The buffet onset envelopes presented may reflect the center of gravity at which the airplane is normally loaded during cruise if corrections for the effect of different center of gravity locations are furnished.

(d) Information must be furnished which indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.

(e) Information on the total quantity of usable fuel for each fuel tank must be furnished.

Current JAR text:

JAR 25.1585 Operating procedures

(a) Information and instructions regarding operating procedures must be furnished (see ACJ 25.1585(a)) in substantial accord with the categories described below –

(1) Emergency procedures which are concerned with foreseeable but unusual situations in which immediate and precise action by the crew, as detailed in the recommended procedures, may be expected to reduce the risk of catastrophe.

(2) Other procedures peculiar to the particular type or model encountered in connection with routine operations including malfunction cases and failure conditions, involving the use of special systems and/or the alternative use of regular systems not considered as emergency procedures.

(b) Information or procedures not directly related to airworthiness or not under the control of the crew, must not be included, nor must any procedure which is accepted as basic airmanship.

(c) The buffet onset envelopes, determined under JAR 25.251 must be furnished. The buffet onset envelopes presented may reflect the centre of gravity at which the aeroplane is normally loaded during cruise if corrections for the effect of different centre of gravity locations are furnished. (See ACJ 25.1585(c).)

(d) Information must be furnished which indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.

(e) Information on the total quantity of usable fuel for each fuel tank must be furnished.

What are the differences in the standards and what do these differences result in?:

The JAR does not include § 25.1585(b), the requirement that information identifying each operating condition in which the fuel system independence prescribed in § 25.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section. Lack of such information may compromise the intent of the rules regarding fuel system independence.

JAR 25.1585(a) and (b) essentially update the § 25.1585(a) requirements to better reflect current policy, practices, and interpretations. These differences are not thought to cause any material differences in technical requirements for procedural information in the Airplane Flight Manual. Any differences in this area are thought to result more from means of compliance and interpretation differences, which have recently been addressed by harmonizing the advisory material for compliance, FAA AC 25.1581-1 and JAA AMJ 25.1581.

What, if any, are the differences in the means of compliance?:

The advisory material related to the operating procedures section of the Airplane Flight Manual are reprinted below. Although there are differences between the texts of the FAA AC and the JAA ACJ's, the JAA will be adopting harmonized advisory material with Change 15 to JAR-25.

FAA AC 25.1581 (paragraph 2c):

c. Operating Procedures Section. The Operating Procedures Section of the AFM should contain, as a minimum, the essential information, peculiar to the particular airplane type or model, that is needed for safe operation under normal and other than normal conditions. Procedures not directly related to airworthiness, or not under control of the flightcrew, should not be included in the AFM. A notation similar to the following should be placed at the beginning of the Operating Procedures Section:

The operating procedures contained in this manual have been developed and recommended by the manufacturer and approved by the FAA for use in operating this airplane. These procedures are provided as guidance and should not be construed as prohibiting the operator from developing equivalent procedures in accordance with the applicable operating rules.

(1) Procedures Categories. Information should be presented for normal and non-normal/emergency procedures and be distinctly separated. The non-normal/emergency procedures may either be placed in one section or in separate non-normal and emergency procedures sections of the AFM. In either case, procedural tasks that are considered recall or immediate action items that must be accomplished from memory should be clearly identified.

(2) Format. Procedures should be presented in either a narrative or a checklist format, depending upon the intended use of the AFM.

(i) Narrative. This format is acceptable if sources of procedures information other than the AFM are intended for flightcrew use (e.g., a Flightcrew Operating Manual (FCOM)). Procedures presented in this format should be drafted in a manner from which the needed sequence can be easily established.

(ii) Checklist. This format should be used if the AFM is intended to be used directly by the flightcrew for operating procedures.

(3) Procedures Development. Prior to initial type certification, it is essential to verify that the proposed procedures are technically valid and operationally practicable. It is recognized that such procedures may have had only limited operational exposure at the time of certification and may need to be revised based on service experience.

(4) Procedures Content. The content and level of detail for the normal and non-normal procedures provided in the AFM should be based on the intended use of the AFM. More information and detail should be provided in AFMs that are intended to be the flightcrew's primary source of operating procedures information than for AFMs that are not intended to be used directly by the flightcrew.

(i) General. Classifying an operating procedure as normal or non-normal should reflect whether the airplane's systems are operating normally. Procedures associated with failed or inoperative systems should be considered non-normal. Procedures associated with glideslope deviation, ground proximity warning, all-engines-operating go-around, turbulent air penetration, windshear alerts, traffic advisories or resolution alerts from the traffic alerting and collision avoidance system, etc., which do not occur routinely, should be placed in the normal procedures subsection, provided the airplane's systems are operating normally.

(ii) Other Sources of Procedures Information. The flightcrew of large transport category airplanes typically use sources of operating procedures information other than the AFM. Examples of other sources of operating procedures information include manufacturer- or operator-produced operating manuals, Quick Reference Handbooks (QRH's), System Pilot's Guides, and Emergency or Abnormal Checklists. For these airplanes, items such as cockpit checklists, systems descriptions, and the associated normal procedures should not be presented in the AFM if they are provided in other documents acceptable to the FAA. Normal procedures that are necessary for safe operation should be presented in the

AFM, but the remaining normal procedures should be placed in the manufacturer-produced FCOM (or other acceptable source of operating procedures information). The non-normal procedures section of the AFM for these types of airplanes should include, as a minimum, procedures dictated by the airplane's systems and failure modes, and may also include those emergency procedures listed in paragraph 2c(5) of this AC.

(A) The system description and procedures provided in the AFM should be limited to that which is uniquely related to airplane safety or airworthiness. The AFM should include a brief general description of the system and its intended use. The limitations section of the AFM should reference the operating manual in which the detailed system description and procedures can be found. This reference should include the document title, the document or part number, and the date of issue, and may allow the use of later appropriate revisions. An example wording would be: "The *Manufacturer Unit Model* System Pilot's Guide, P/N XXXX, dated XXXX (or later appropriate revision) must be immediately available to the flightcrew whenever XXXX [e.g., navigation] is predicated on the use of the system. The software version [if applicable] stated in the Pilot's Guide must match that displayed on the equipment."

(B) Information that restricts or defines the operation of a particular system (e.g., authorizing or prohibiting specific types of approaches) should be located in the limitations section of the AFM. Emergency or abnormal procedures should be located in the appropriate procedures section(s) of the AFM.

(C) Detailed system descriptions and normal procedures that represent one means, but not the only means, of operation should be located in appropriate operating manuals with a reference placed in the procedures section of the AFM. This reference should include the document title, the document or part number, and the date of issue. The reference may also allow the use of later appropriate revisions of that document. An example wording would be: "Normal operating procedures are contained in the *Manufacturer Unit Model* System Pilot's Guide, P/N XXXX, dated XXXX (or later appropriate revision)."

(iii) AFM Used Directly. For those manufacturers and operators that do not produce other sources of procedures information (generally manufacturers and operators of small transports), the AFM is the only source of this information. In this circumstance, the AFM operating procedures information must be comprehensive and include information such as cockpit checklists, systems descriptions, and associated procedures.

(5) Emergency Procedures. The emergency procedures can be included either in a dedicated section of the AFM or in the non-normal procedures section. In either case, this section should include the procedures for handling any situation that is in a category similar to the following:

(i) Engine failure with severe damage or separation.

(ii) Multiple engine failure.

(iii) Fire in flight.

(iv) Smoke control. At least the following should be clearly stated in the AFM:

After conducting the fire or smoke procedures, land at the nearest suitable airport, unless it is visually verified that the fire has been extinguished.

(v) Rapid decompression.

(vi) Emergency descent.

(vii) Uncommanded reverser deployment in flight.

(viii) Crash landing or ditching.

(ix) Emergency evacuation.

JAA ACJ 25.1585(a):

1 In furnishing information and instructions, consideration should be given to the following. The lists do not necessarily include all items to be considered for a given aeroplane. The categorisation of certain items may need to be modified because of design features or other considerations.

2 *Emergency Procedures*

a. Engine and APU fire/separation/severe damage

b. Smoke or fire in cockpit/cabin/cargo compartment

c. Rapid decompression/emergency descent

d. Landing or go-around with jammed stabiliser

e. Runaway stabiliser

f. Flight with all engines inoperative

g. Ditching

3 *Other Procedures*

a. Engine starting

b. APU operation

c. Fuel management. The effect on unusable fuel quantity due to fuel booster pump failure should be stated.

d. Reverse thrust system.

e. Navigation system

f. Rain repellent system

g. Automatic flight control systems

h. Cabin pressurisation system

i. Oxygen system

j. Hydraulic system

k. Electrical system

l. Anti-ice/de-ice system

m. Operation in turbulence

n. Equipment cooling

o. Flight controls

p. Stall warning/stall identification system

q. Braking system

r. Fuel dumping

s. Go-around with minimum fuel

t. Landing in abnormal configurations

u. Engine shut-down and relight in flight

v. Approach and landing with engine(s) inoperative

w. Go-around with engine(s) inoperative

x. Landing gear alternate operation

4 Certain items listed in 3 may also need to be considered under 2.

5 Observance of these procedures may not be mandatory and approval of such procedures is not intended to prohibit or discourage development and use of improved or equivalent procedures based on operational experience with the aeroplane.

6 The procedures to be followed by the flight crew in the event of an engine fire, severe damage or separation of the engine should be similar, and should include identification of the failed engine as the primary action as far as the powerplant is concerned.

ACJ 25.1585(c):

The buffet onset envelopes should be accompanied by information of the maximum altitude at which it is possible to achieve a positive normal acceleration increment of 0.3 g without exceeding the buffet onset boundary, at any given combination of weight, centre of gravity location and airspeed. (See also ACJ 25.251(e).)

ACJ 25.251(e):

2 *Range of Load Factor for Normal Operations*

2.1.1 JAR 25.251(e) requires that the envelopes of load factor, speed, altitude and weight must provide a sufficient range of speeds and load factors for normal operations.

2.1.2 An acceptable means of compliance with the requirement is to establish the maximum altitude at which it is possible to achieve a positive normal acceleration increment of 0.3 g without exceeding the buffet onset boundary. See also ACJ 25.1585(c).

What is the proposed action?:

Harmonize to a standard using the FAR text for 25.1585(b) (the more stringent standard), and the JAR text for the rest of the section (with some editorial changes to simplify the text and make it better reflect current practices as exemplified by the AC/AMJ 25.1581 advisory material). Although the FAR text for § 25.1585(a)/JAR 25.1585(a) and (b) could be considered to be more stringent by virtue of its being more specific as to the procedures that must be furnished in the Airplane Flight Manual, it is considered outdated and not completely consistent with current practices. Some of the mandated procedures are no longer appropriate and other important procedures are not included. The proposed standard is intended to provide a better description of what types of procedures are required to be in the Airplane Flight Manual, the specifics of which will depend on the particular design. Current advisory material lists specific procedures corresponding to the general requirement that may be appropriate to include, depending on the design.

What should the harmonized standard be?:

FAR/JAR 25.1585:

(a) Operating procedures must be furnished for –

(1) Normal procedures peculiar to the particular type or model encountered in connection with routine operations;

(2) Non-normal procedures for malfunction cases and failure conditions involving the use of special systems or the alternative use of regular systems; and

(3) Emergency procedures for foreseeable but unusual situations in which immediate and precise action by the crew may be expected to substantially reduce the risk of catastrophe.

(b) Information or procedures not directly related to airworthiness or not under the control of the crew, must not be included, nor must any procedure that is accepted as basic airmanship.

(c) Information identifying each operating condition in which the fuel system independence prescribed in §/JAR 25.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.

(d) The buffet onset envelopes, determined under §/JAR 25.251 must be furnished. The buffet onset envelopes presented may reflect the center of gravity at which the airplane is normally loaded during cruise if corrections for the effect of different center of gravity locations are furnished.

(e) Information must be furnished that indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.

(f) Information on the total quantity of usable fuel for each fuel tank must be furnished.

How does this proposed standard address the underlying safety issue?:

It continues to address the underlying safety issue in the same manner by requiring information and procedures necessary for airworthiness and operational safety to be furnished in the Airplane Flight Manual.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintains the same level of safety.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintains the same level of safety.

What other options have been considered and why were they not selected?:

This item was proposed as an enveloping item. Harmonizing to the most stringent standard could be interpreted as harmonizing to the FAR standard (see discussion of differences above), but the JAR standard for the proposed §§/JAR 25.1585(a) and 25.1585(b) is considered to be closer to current practices and the manner in which § 25.1585(a) is actually applied.

Who would be affected by the proposed change?:

Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it is consistent with current regulatory requirements, practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?:

None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?):

Existing FAA advisory material is adequate. The advisory material associated with §/JAR 25.1585 will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?:

The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?:

No.

What is the cost impact of complying with the proposed standard?:

None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?:

Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain:

Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report #6
Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1587

What is the underlying safety issue addressed by the FAR/JAR?:

The primary purpose of the Airplane Flight Manual is to provide an authoritative and approved source of information considered necessary for safely operating the airplane. Consistent with this purpose, performance information related to airworthiness and necessary for safe operation must be provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?:

Current FAR text:

§ 25.1587 Performance information.

(a) Each Airplane Flight Manual must contain information to permit conversion of the indicated temperature to free air temperature if other than a free air temperature indicator is used to comply with the requirements of § 25.1303(a)(1).

(b) Each Airplane Flight Manual must contain the performance information computed under the applicable provisions of this part for the weights, altitudes, temperatures, wind components, and runway gradients, as applicable within the operational limits of the airplane, and must contain the following:

(1) The conditions under which the performance information was obtained, including the speeds associated with the performance information.

(2) V_S determined in accordance with § 25.103.

(3) The following performance information (determined by extrapolation and computed for the range of weights between the maximum landing and maximum takeoff weights):

(i) Climb in the landing configuration.

(ii) Climb in the approach configuration.

(iii) Landing distance.

(4) Procedures established under § 25.101(f), (g) and (h) that are related to the limitations and information required by § 25.1533 and by this paragraph. These procedures must be in the form of guidance material, including any relevant limitations or information.

(5) An explanation of significant or unusual flight or ground handling characteristics of the airplane.

Current JAR text:

JAR 25.1587 Performance information

(a) Not required for JAR-25

(b) Each aeroplane Flight Manual must contain the performance information computed under the applicable provisions of this JAR-25 (including JAR 25.115, 25.123 and 25.125 for the weights, altitudes, temperatures, wind components, and runway gradients, as applicable) within the operational limits of the aeroplane, and must contain the following:

(1) The condition of power, configuration, speeds and the procedures for handling the aeroplane and any system having a significant effect on performance upon which the performance graphs are based must be stated in each case. (See ACJ 25.1587(b)(1).)

(2) Not required for JAR-25 as this sub-paragraph is covered by the opening sentence of sub-paragraph (b).

(3) The following gross performance information (determined by extrapolation and computed for the range of weights between the maximum landing weight and maximum takeoff weight) must be provided:

(i) Climb in the landing configuration.

(ii) Climb in the approach configuration.

(iii) Landing distance.

(4) Procedures established under § 25.101 (f) and (g) that are related to the limitations and information required by JAR 25.1533 and by this paragraph must be stated in the form of guidance material, including any relevant limitation or information.

(5) An explanation of significant or unusual flight or ground handling characteristics of the aeroplane.

(6) Corrections to indicated values of airspeed, altitude and outside air temperature.

(7) An explanation of operational landing runway length factors included in the presentation of the landing distance, if appropriate. (See ACJ 25.1587(b)(7).)

What are the differences in the standards and what do these differences result in?:

The JAR does not include § 25.1587(a) or § 25.1587(b)(2). The FAR does not include JAR 25.1587(b)(6) or 25.1587(b)(7). The JAR also contains some wording differences that primarily reflect an updating of the FAR wording to better reflect current interpretations and practices. These differences are not thought to cause any material differences in technical requirements for performance information in the Airplane Flight Manual. Any differences in this area are thought to result more from means of compliance and interpretation differences, which have recently been addressed by harmonizing the advisory material for compliance, FAA AC 25.1581-1 and JAA AMJ 25.1581.

What, if any, are the differences in the means of compliance?:

The advisory material related to the operating procedures section of the Airplane Flight Manual are reprinted below. Although there are differences between the texts of the FAA AC and the JAA ACJ's, the FAA AC represents a harmonized text. The JAA are in the process of publishing the JAA equivalent to the FAA AC as AMJ 25.1581. The ACJ's will be removed upon publication of this AMJ.

FAA AC 25.1581-1 (paragraph 2d):

d. Performance Section. This section of the AFM contains the performance limitations and other data required by parts 25 and 36, and any special conditions that may apply. Additional information may be provided to assist the operator in complying with the operating rules or for implementing unique operational needs. The performance information should cover the operating range of weights, altitudes, temperatures, airplane configurations, thrust ratings, and any other operational variables stated as operational performance limitations for the airplane. If additional performance information is presented for operation at a specific altitude, these performance data should cover a pressure altitude span of at least the specific altitude ±1,000 feet to allow an

operator to adequately account for pressure altitude variations. It is recommended that such data be included as a separate section or appendix to the AFM.

(1) **General**. Include all descriptive information necessary to identify the configuration and conditions for which the performance data are applicable. Such information should include the type or model designations of the airplane and its engines, the approved flap settings, a brief description of airplane systems and equipment that affect performance (e.g., anti-skid, automatic spoilers, etc.), and a statement indicating whether such systems and equipment are operative or inoperative. This section should also include definitions of terms used in the Performance Section (e.g., IAS, CAS, ISA, configuration, net flight path, icing conditions, etc.), plus calibration data for airspeed (flight and ground), Mach number, altimeter, air temperature, and other pertinent information. The airspeed, altitude, and air temperature calibration data should be presented for the following ranges:

(i) Takeoff configurations:

(A) Ground run, 0.8 V_{1MIN} to V_{2MAX}

(B) Inflight, V_{2MIN} to V_{FE}

(ii) Approach and landing configurations:

(A) Approach, 1.2 V_S to V_{FE}

(B) Landing, 1.3 V_S to V_{FE}

(iii) En route configuration:

(A) Airspeed and Altimeter: For the takeoff/takeoff path altitude range, 1.25 V_S to V_{MO}/M_{MO}.

(B) Airspeed and Altimeter: For higher altitudes, from 1.25 V_S or the speed for 1.2g buffet onset margin, whichever is lower, to V_{MO}/M_{MO}.

(C) Mach Number: From the lowest useful Mach number (generally in the range of 0.4 to 0.5) to M_{MO}.

(D) Total or Static Air Temperature: For Mach numbers corresponding to the speed ranges noted in paragraphs 2d(1)(iii)(A) and (B) of this AC.

(2) **Performance Procedures**. The procedures, techniques, and other conditions associated with the AFM performance data should be included. Performance procedures may be presented as a performance subsection or in connection with a particular performance graph. In the latter case, a comprehensive listing of the conditions associated with the particular performance data may serve as procedures if sufficiently complete. The AFM should also include adequate information to enable the operator to show compliance with § 25.1001 for each takeoff.

(3) **Thrust or Power Setting**. Thrust or power settings should be provided for at least takeoff, maximum continuous, and go-around thrust or power, along with the thrust or power setting procedures necessary to obtain the performance shown in the AFM. These data should be shown for each applicable thrust or power setting parameter. If backing the airplane by reverse thrust or power is proposed, thrust or power setting limits should be established considering contaminated runway, foreign object damage potential, environmental control system impact, airplane weight and c.g., cockpit visibility, effect of braking, etc.

(4) **Minimum Control Speeds**. Minimum control speed data may be located in the Performance Section with a reference in the Limitations Section as to its location.

(5) **Stall Speeds**. The stall speeds established in showing compliance with certification requirements should be presented, together with associated conditions. Data should be presented in terms of calibrated airspeed.

(6) **Takeoff Speeds**. The takeoff speeds, V_1, V_R, and V_2, must be presented in the AFM, together with the associated conditions. These speeds should be presented in units consistent with cockpit instrument indications. V_1 and V_R speeds should be based upon ground effect calibration data, while V_2 speeds should be based upon free air calibration data. The takeoff speeds associated with the minimum control speeds and the maximum energy absorption capability of the brakes should be included. At the option of the applicant, the AFM may also include the V_1 speeds associated with unbalanced field lengths. At all conditions and airplane configurations represented in the AFM (i.e., at all altitudes, temperatures, weights, winds, runway slopes, flap settings, etc.), the accuracy of the V_1 speed should either: 1) be within 1.5 knots of the V_1 speed used to calculate the takeoff and accelerate-stop distances, or 2) not cause an increase to these distances of more than the greater of 100 feet or the incremental increase resulting from a 1.5 knot variation in V_1 speed.

(7) **Takeoff and Accelerate-Stop Distances**. Takeoff and accelerate-stop distances, complying with §§ 25.105, 25.109 and 25.113, must be provided. At the option of the applicant, and with concurrence by the FAA, additional data may be provided for operations on other than smooth hard-surfaced runways.

(8) **Climb Limited Takeoff Weight**. The climb limited takeoff weight, which is the most limiting weight showing compliance with §§ 25.121(a), (b), and (c), must be provided.

(9) **Miscellaneous Takeoff Weight Limits**. Takeoff weight limits should be shown for any equipment or characteristic of the airplane that imposes an additional takeoff weight restriction (e.g., maximum tire speed, maximum brake energy, fuel jettison considerations, inoperative system(s), etc.).

(10) **Takeoff Climb Performance**. For the prescribed takeoff climb airplane configurations, the climb gradients must be presented, together with associated conditions. The scheduled climb speed(s) should be included.

(11) **Takeoff Flight Path Data**. Takeoff flight paths, or performance information necessary to construct such paths, together with the associated conditions (e.g., procedures and speeds), should be presented for each approved takeoff configuration. The presentation should include all flight path segments existing between the end of the takeoff distance and the end of the takeoff path, as defined in § 25.111(a). Such data must be based upon net performance, as prescribed in §§ 25.115(b) and (c).

(12) **En Route Flight Path Data**. The net flight path gradient data prescribed in § 25.123 must be presented, together with the associated conditions (e.g., procedures and speeds). Data must be presented for both one- and two-engines-inoperative cases, as applicable, throughout the approved operating altitude and temperature envelope.

(13) **Climb Limited Landing Weight**. The climb limited landing weight, which is the most limiting weight showing compliance with §§ 25.119 and 25.121(d), should be provided.

(14) **Miscellaneous Landing Weight Limits**. Landing weight limits for any equipment or characteristic of the airplane configuration that imposes an additional landing weight restriction should be shown.

(15) **Approach Climb Performance**. For the approach climb configuration(s), the climb gradients (§ 25.121(d)) and weights up to maximum takeoff weight (§ 25.1587(b)(3)) should be presented, together with associated conditions (e.g., procedures and speeds). The affects of ice accretion on unprotected portions of the airframe, and the effects of engine and wing ice protection systems should be provided.

(16) **Landing Climb Performance**. Data for the landing climb configuration(s) should be presented in a manner similar to that described for the approach configuration above.

(17) **Landing Approach Speeds**. The scheduled speeds associated with the approved landing distances and operational landing runway lengths (see paragraph 2d(18) of this AC) should be presented, together with associated conditions.

(18) **Landing Distance**. The landing distance from a height of 50 feet must be presented either directly or with the factors required by the operating regulations, together with associated conditions and weights up to the maximum takeoff weight. For all landplanes, landing distance data must be presented for level, smooth, dry, hard-surfaced runways for standard day temperatures. At the option of the applicant, and with concurrence by the FAA, additional data may be presented for other temperatures and runway slopes within the operational limits of the airplane, or for operations on other than smooth hard-surfaced runways. For Category III operations, additional landing performance data may be required.

(19) **Performance Limits and Information Variation with Center-of-Gravity**. If performance information (e.g., buffet boundary) is not presented for the most critical c.g. condition, the AFM should present the effect of variation with c.g.

(20) **Noise Data**. The noise levels achieved during type certification in accordance with the provisions of part 36 should be presented, together with associated conditions and with the note prescribed in § 36.1581(c). The noise levels achieved during type certification should be included in the AFM and consist of only one takeoff, one sideline, and one approach noise level for each airplane model (i.e., hardware build). The noise certification stage level should accompany the noise level information to indicate the compliance status. Supplementary information (labeled as such) may be added to the AFM concerning noise levels for other configurations or conditions.

(21) **Miscellaneous Performance Data**. Any performance information or data not covered in the previous items that are required for safe operation because of unusual design features or operating or handling characteristics should be furnished. For example, the maximum quick turnaround weight should be provided.

ACJ 25.1587(b)(1):

The bank angle used in showing compliance with JAR 25.121 should be scheduled in the Flight Manual. Where it is more practical to quote the degree of lateral control (e.g. control wheel level) instead of the bank angle, this would be acceptable.

ACJ 25.1587(b)(7):

1 The landing distance from a height of 50 ft determined in accordance with JAR 25.125 should be presented together with associated conditions for weights up to the maximum take-off weight, standard temperature and corrected for not more than 50% of nominal headwind component, and not less than 150% of nominal tailwind component.

2 Data should be presented for level, smooth, dry, hard-surfaced runways. At the option of the applicant, additional data may be presented to show the effect of runway slope and temperature, within the operational limits of the aeroplane.

3 To facilitate application of operating regulations, the landing distance may be presented in the form of the operational or "factored" runway length, using the appropriate factors prescribed by the operating regulations of the state of registry of the aeroplane. The factors applied should be stated together with associated conditions.

What is the proposed action?:

Harmonize to the most stringent standard. In general, where the standards are different, the JAR standard more properly reflects current practices and is proposed as the harmonized standard. In areas, where there is a requirement in one standard that does not appear in the other standard, that

requirement has been carried over into the proposed harmonized standard. Some minor non-substantive changes are also proposed for editorial reasons.

What should the harmonized standard be?:

FAR/JAR 25.1587 :

(a) Each Airplane Flight Manual must contain information to permit conversion of the indicated temperature to free air temperature if other than a free air temperature indicator is used to comply with the requirements of §/JAR 25.1303(a)(1).

(b) Each Airplane Flight Manual must contain the performance information computed under the applicable provisions of this part/JAR-25 (including §/JAR 25.115, 25.123 and 25.125 for the weights, altitudes, temperatures, wind components, and runway gradients, as applicable) within the operational limits of the airplane, and must contain the following:

(1) *In each case, the conditions of power, configuration, and speeds, and the procedures for handling the airplane and any system having a significant effect on the performance information.*

(2) V_S determined in accordance with §/JAR 25.103.

(3) The following performance information (determined by extrapolation and computed for the range of weights between the maximum landing weight and the maximum takeoff weight):

(i) Climb in the landing configuration.

(ii) Climb in the approach configuration.

(iii) Landing distance.

(4) *Procedures established under § 25.101 (f) and (g) that are related to the limitations and information required by §/JAR 25.1533 and by this paragraph in the form of guidance material, including any relevant limitations or information.*

(5) An explanation of significant or unusual flight or ground handling characteristics of the airplane.

(6) Corrections to indicated values of airspeed, altitude, and outside air temperature.

(7) An explanation of operational landing runway length factors included in the presentation of the landing distance, if appropriate.

How does this proposed standard address the underlying safety issue?:

It continues to address the underlying safety issue in the same manner by requiring performance information necessary for airworthiness and operational safety to be furnished in the Airplane Flight Manual

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?:

Although there are differences in wording between the proposed standard and the current FAR, these differences do not materially increase or decrease the level of safety.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?:

Maintain. The proposed standard is consistent with current practices.

What other options have been considered and why were they not selected?:

This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?:

Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there is not expected to be a material effect from this proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?:

None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?):

Existing advisory material is adequate. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?:

The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?:

No.

What is the cost impact of complying with the proposed standard?:

None

Does the working group want to review the draft NPRM prior to publication in the Federal Register?:

Yes

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain:

Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

#5

ARAC Working Group Report for FTHWG
Fast Track Harmonization Program Cat 1 Issues

Introduction

This document provides draft ARAC Working Group reports for twelve Post-SRD Category 1 (enveloping) issues for which the Flight Test Harmonization Working Group (FTHWG) has been identified as primary in the FAA Draft Rulemaking Project Record RPR #TBD, "Fast Track Harmonization Program", Revision 3, July 28, 1999.

Although the FAA had not completed formal tasking of this project as of the date of this report, the ARAC TAEIG had provided the Flight Test Harmonization Working Group (FTHWG) authorization to initiate work on this task at the June 30, 1999 TAEIG meeting. The specific rule sections for which reports are provided in this document are the following:

1. FAR/JAR 25.111(c)(4)
2. FAR/JAR 25.161(c)(2)
3. FAR/JAR 25.161(e)
4. FAR/JAR 25.175(d)
5. FAR/JAR 25.177(a) and (b)
6. FAR/JAR 25.1323(c)
7. FAR/JAR 25.1527
8. FAR/JAR 25.1583(c)
9. FAR/JAR 25.1583(f)
10. FAR/JAR 25.1585
11. FAR/JAR 25.1587
12. FAR/JAR 25X1516

Each of the above rule sections was to be enveloped, which calls for the most stringent rule and advisory material to be selected. In addition, the FTHWG was identified to support the PPIHWG in enveloping FAR/JAR 25, Appendix I. FTHWG comments relative to Appendix I are being supplied to TAEIG separately from this document.

The following reports identify the current FAA/JAA rules and advisory material for each issue, provide the proposed harmonized rule and recommendations regarding advisory material, provide the justification for the proposed changes, and provide answers to all questions contained in the ARAC Working Group Report format.

These reports are being provided to the TAEIG for review and approval at the December 1999 TAEIG meeting.

Robert G. Park, FTHWG Co-chair, U.S.

Franck Iannarelli, FTHWG Co-chair, Europe

November 12, 1999

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.111(c)(4)

What is the underlying safety issue addressed by the FAR/JAR?: This requirement sets forth the definition of the takeoff path, which is used to comply with certain airworthiness and operating limitations. Section/JAR 25.111(c)(4), which is the only paragraph that is different between the FAR and JAR, allows only certain routine crew actions to be made before the airplane reaches a height of 400 feet above the takeoff surface. Simulation studies and accident investigations have shown that during periods of high workload, as with an engine failure during takeoff, the crew might not take actions such as advancing the power levers on the operating engine(s), even if the crew knows that the operating engine(s) are not at their maximum power setting. Credit can be taken for retracting the landing gear, however, as this is accomplished routinely once a positive rate of climb is observed.

What are the current FAR and JAR standards?: see below

> Current FAR text: § 25.111(c)(4): Except for gear retraction and propeller feathering, the airplane configuration may not be changed, and no change in power or thrust that requires action by the pilot may be made, until the airplane is 400 feet above the takeoff surface.
>
> Current JAR text: JAR 25.111(c)(4): Except for gear retraction and automatic propeller feathering, the aeroplane configuration may not be changed, and no change in power or thrust that requires action by the pilot may be made, until the aeroplane is 400 feet above the takeoff surface.

What are the differences in the standards and what do these differences result in?: The standards are the same except for §/JAR 25.111(c)(4). Although both standards allow credit in §/JAR 25.111(c)(4) for propeller feathering before the airplane is 400 feet above the takeoff surface, the JAR standard explicitly limits this credit to **automatic** propeller feathering. The JAR standard does not allow credit for manual propeller feathering until the airplane is at least 400 feet above the takeoff surface.

FAA policy has been in accordance with the JAR standard. Only automatic propeller feathering has been accepted as complying with the intent of § 25.111(c)(4).

What, if any, are the differences in the means of compliance?:

The means of compliance are the same, except for the following 2 JAA ACJ's.

ACJ 25.111
The height references in JAR 25.111 should be interpreted as geometrical heights.

ACJ 25.111(b):

2 The time between lift-off and the initiation of gear retraction should be not less than 3 seconds and may need to be longer than 3 seconds if, on a particular aeroplane type, a longer delay is found to be appropriate.

There is no FAA equivalent to ACJ 25.111. The FAA equivalent to ACJ 25.111(b) No. 2 is paragraph 12e(2) of AC 25-7A:

(2) Procedures. The time between liftoff and initiation of gear retraction should not be less than that necessary to establish an indicated positive rate of climb plus one second.

What is the proposed action?: Codify current FAA policy by harmonizing to the JAR standard.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.111(c)(4): Except for gear retraction and automatic propeller feathering, the airplane configuration may not be changed, and no change in power or thrust that requires action by the pilot may be made, until the airplane is 400 feet above the takeoff surface.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain. In AC 25-7A, it is noted that propeller feathering before the airplane reaches a height of 400 feet must be automatic in order to receive credit for its effect on the flight path.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Revise AC 25-7A as follows:

Add a new paragraph 12a(1)(iii) to read as follows:

(iii) The height references in § 25.111 should be interpreted as geometrical heights.

Revise paragraph 12e(2) to read as follows:

(2) Procedures. The time between liftoff and the initiation of gear retraction during takeoff distance demonstrations should not be less than that necessary to establish an indicated positive rate of climb plus one second. For the purposes of flight manual expansion, the average demonstrated time delay between liftoff and initiation of gear retraction may be assumed; however, this value should not be less than 3 seconds.

How does the proposed standard compare to the current ICAO standards?: The proposed standard is consistent with the ICAO standards, which are not specific in this area.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.161(c)(2)

What is the underlying safety issue addressed by the FAR/JAR?: Section/JAR 25.161 requires that transport category airplanes maintain longitudinal, lateral, and directional trim under certain conditions of flight. The capability to trim out control forces is both a pilot workload and a flight path precision issue. An out-of-trim airplane can be fatiguing to fly and it is more difficult to maintain the desired flight path.

Section/JAR 25.161(c)(2) specifies conditions under which longitudinal trim must be maintained.

What are the current FAR and JAR standards?: see below

> Current FAR text: Section 25.161(c)(2): A glide with power off at a speed not more than 1.4 V_{S1}, with the landing gear extended, the wing flaps (i) retracted and (ii) extended, the most unfavorable center of gravity position approved for landing with the maximum landing weight, and with the most unfavorable center of gravity position approved for landing regardless of weight; and
>
> Current JAR text: JAR 25.161(c)(2): Either a glide with power off at a speed not more than 1.4 V_{S1}, or an approach within the normal range of approach speeds appropriate to the weight and configuration with power settings corresponding to a 3° glidepath, whichever is the most severe, with the landing gear extended, the wing flaps (i) retracted and (ii) extended, the most unfavourable centre of gravity position approved for landing with the maximum landing weight, and with the most unfavourable centre of gravity position approved for landing regardless of weight; and

What are the differences in the standards and what do these differences result in?: In addition to the power-off glide condition specified by the FAR, the JAR requires longitudinal trim to be maintained at speeds and power settings appropriate to an approach on a 3 degree glidepath. For airplanes where this condition is more stringent than the power-off glide condition, a design difference may result. Also, additional flight testing must be performed to demonstrate compliance.

What, if any, are the differences in the means of compliance?: Except for the means of compliance associated with the differences in the standards, the means of compliance are the same.

What is the proposed action?: Harmonize to the more stringent JAR standard. The phrase, "the most unfavourable centre of gravity position approved for landing with the

maximum landing weight" has been removed. This phrase is unnecessary because compliance must also be demonstrated at the "most unfavorable center of gravity position approved for landing regardless of weight." The original CAR 4b rule referenced "the most forward" center of gravity position in each instance, so it is conceivable that the first case could have been more critical at that time.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.161(c)(2): Either a glide with power off at a speed not more than 1.4 V_{S1}, or an approach within the normal range of approach speeds appropriate to the weight and configuration with power settings corresponding to a 3° glidepath, whichever is the most severe, with the landing gear extended, the wing flaps (i) retracted and (ii) extended, and with the most unfavorable center of gravity position approved for landing regardless of weight; and

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner, but adds a requirement to ensure that transport category airplanes maintain longitudinal trim in a power-on approach condition.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: It increases the level of safety for those transport category airplanes for which the power-on approach condition is more critical for maintaining longitudinal trim than the power-off glide condition.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: It maintains the current level of safety since industry practice is to comply with both the FAR and the JAR.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): There is no specific advisory material for either the JAR or the FAR, so there is not a harmonization issue. Developing new harmonized advisory material appears to be unnecessary and probably would not fit within the fast track schedule.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: The cost of complying is negligible for the following reasons. For applicants already conducting JAA certifications, there are no additional costs. For other applicants, additional costs of compliance are possible (less than ½ hour of flight testing and 20 hours of data analysis).

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.161(e)

What is the underlying safety issue addressed by the FAR/JAR?: Section/JAR 25.161 requires that transport category airplanes maintain longitudinal, lateral, and directional trim under certain conditions of flight. The capability to trim out control forces is an issue of both pilot workload and capability to maintain a desired flight path. An out-of-trim airplane can be fatiguing to fly and it is more difficult to maintain the desired flight path.

Section/JAR 25.161(e) specifies conditions under which longitudinal, directional, and lateral trim must be maintained.

What are the current FAR and JAR standards?: see below

Current FAR text: *Airplanes with four or more engines.* Each airplane with four or more engines must maintain trim in rectilinear flight--

(1) At the climb speed, configuration, and power required by § 25.123(a) for the purpose of establishing the rate of climb;
(2) With the most unfavorable center of gravity position; and
(3) At the weight at which the two-engine-inoperative climb is equal to at least 0.013 V_{S0}^2 at an altitude of 5,000 feet.

Current JAR text: (e) *Aeroplanes with four or more engines.* Each aeroplane with four or more engines must maintain trim in rectilinear flight--

(1) At the climb speed, configuration, and power required by JAR 25.123(a) for the purpose of establishing gradient of climb; and
(2) With the most unfavourable centre of gravity position.
(3) *Not required for JAR-25*

What are the differences in the standards and what do these differences result in?: The FAR standard specifies a single weight at which a transport category airplane with four or more engines must maintain trim in rectilinear flight. The JAR standard, which does not contain this provision, applies at all weights. Therefore, the JAR standard is more stringent. There is also a minor wording difference between the two standards relative to the purpose of §/JAR 25.123(a).

What, if any, are the differences in the means of compliance?: Except for the means of compliance associated with the differences in the standards, the means of compliance are the same.

What is the proposed action?: Harmonize to the JAR standard, but further clarify the wording in §/JAR 25.161(e)(1) referring to the purpose of §/JAR 25.123(a). The FAR wording originated in Civil Air Regulations (CAR) Part 4b. At that time, the equivalent requirement to § 25.123(a) for two-engine-inoperative climb performance specified a minimum rate of climb that an airplane must be capable of. In the current part/JAR 25 standards, §/JAR 25.123(a) requires the determination of the en route flight paths, rather than a minimum rate of climb or climb gradient. To be consistent with the current §/JAR 25.123(a), the proposed harmonized §/JAR 25.161(e)(1) should refer to en route flight paths rather than either rate of climb (as in current FAR) or gradient of climb (as in current JAR).

The weight requirement in the FAR goes back to Civil Air Regulations Part 4b, which specified climb rates proportional to the square of the stall speed. The basis for this manner of specifying climb rates was that it was assumed that the level of safety associated with an emergency landing would depend on the kinetic energy of the airplane, which in turn is proportional to the mass times the velocity squared. For equivalent safety, it was reasoned that excess power, expressed in terms of rate of climb, should be proportional to the stall speed squared. Since the climb requirements of part 25 are now expressed in terms of climb gradient rather than rates of climb, the manner in which the weight for compliance is defined in § 25.161(e)(3) is an historical artifact and out of step with the rest of part 25.

In addition, the word "also" has been added to the lead-in sentence of the proposed standard to clarify that this is an additional requirement for airplanes with four or more engines. The requirements of §/JAR 161(d) remain applicable for these airplanes.

What should the harmonized standard be?: see below:

Proposed text of harmonized standard:

FAR/JAR 25.161(e): (e) *Airplanes with four or more engines.* Each airplane with four or more engines must also maintain trim in rectilinear flight with the most unfavorable center of gravity and at the climb speed, configuration, and power required by §/JAR 25.123(a) for the purpose of establishing the en route flight paths with two engines inoperative.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner, but expands the conditions under which airplanes with four or more engines must be able to maintain longitudinal, lateral, and directional trim by making the current standard applicable at all relevant gross weight conditions.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Because it expands the conditions under which an airplane with four or more engines must be able to maintain longitudinal, lateral, and directional trim, the propose standard increases the level of safety relative to the current FAR.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: It maintains the current level of safety since industry practice is to comply with both the FAR and the JAR.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): There is no specific advisory material for either the JAR or the FAR, so there is not a harmonization issue. Developing new harmonized advisory material appears to be unnecessary and probably would not fit within the fast track schedule.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.175(d)

What is the underlying safety issue addressed by the FAR/JAR?: Section/JAR 25.175 contains the conditions under which static longitudinal stability must be demonstrated for transport category airplanes. Static longitudinal stability is required by part 25 for the following reasons:

- Provides additional speed change cues to the pilot through control force changes.
- Ensures that short periods of unattended operation do not result in any significant changes in attitude, airspeed, or load factor.
- Provides predictable pitch response.
- Provides acceptable level of pilot attention (workload) to attain and maintain trim speed and altitude.
- Provides gust stability.

What are the current FAR and JAR standards?: see below

Current FAR text: *Landing.* The stick force curve must have a stable slope, and the stick force may not exceed 80 pounds, at speeds between 1.1 V_{S0} and 1.8 V_{S0} with--

(1) Wing flaps in the landing position;
(2) Landing gear extended;
(3) Maximum landing weight;
(4) Power or thrust off on the engines; and
(5) The airplane trimmed at 1.4 V_{S0} with power or thrust off.

Current JAR text: *Landing.* The stick force curve must have a stable slope, and the stick force may not exceed 80 pounds, at speeds between 1.1 V_{S0} and 1.8 V_{S0} with--

(1) Wing flaps in the landing position;
(2) Landing gear extended;
(3) Maximum landing weight;
(4) The aeroplane trimmed at 1.4 V_{S0} with –
    (i) Power or thrust off, and
    (ii) Power or thrust for level flight.

What are the differences in the standards and what do these differences result in?: The JAR standard requires the stick force criteria to be met at the power or thrust for level flight in addition to the FAR condition of power or thrust off. This additional condition requires additional flight test demonstrations to show compliance and may have an

influence on the design of airplanes for which the application of power has a significant destabilizing effect.

What, if any, are the differences in the means of compliance?: Except for the additional power-on condition required by the JAR, there are no differences in the means of compliance.

What is the proposed action?: Harmonize to the more stringent JAR standard.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.175(d): *Landing.* The stick force curve must have a stable slope, and the stick force may not exceed 80 pounds, at speeds between 1.1 V_{S0} and 1.8 V_{S0} with--

(1) Wing flaps in the landing position;
(2) Landing gear extended;
(3) Maximum landing weight;
(4) The airplane trimmed at 1.4 V_{S0} with –
  (i) Power or thrust off, and
  (ii) Power or thrust for level flight.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner, but adds a requirement to ensure that transport category airplanes have adequate static longitudinal stability in a power-on approach condition.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: It increases the level of safety for those transport category airplanes for which the power-on condition is more critical in terms of static longitudinal stability than the power-off condition.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: It maintains the current level of safety since industry practice is to comply with both the FAR and the JAR.

What other options have been considered and why were they not selected?: Harmonizing to the FAR standard was considered; however, there are normally occurring situations for which level flight in the landing configuration may be relevant. These situations include stepdown fixes on nonprecision approaches and extending the flaps and landing gear to the landing configuration when the glide slope becomes active on a precision approach, but before the glide slope intercept point.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): The existing advisory material is adequate.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: The cost of complying is negligible for the following reasons. For applicants already conducting JAA certifications, there are no additional costs. For other applicants, additional costs of compliance are possible (less than ½ hour of flight testing and 20 hours of data analysis).

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.177(a) and (b)

What is the underlying safety issue addressed by the FAR/JAR?: Section/JAR 25.177 requires that the airplane naturally recover from a skid without pilot action to move the rudder and a slip without pilot action to move the ailerons. Basic static and directional stability required by part/JAR 25:

- Provides additional cues of inadvertent slips and skids through control force changes.
- Ensures that short periods of unattended operation do not result in any significant changes in yaw or bank angle.
- Provides predictable roll and yaw response.
- Provides acceptable level of pilot attention (workload) to attain and maintain a coordinated turn.
- Provides gust stability.
- Enhances crosswind landing capability.

What are the current FAR and JAR standards?: see below

Current FAR text: (a) Reserved.

(b) Reserved

Current JAR text: (a) The static directional stability (as shown by the tendency to recover from a skid with the rudder free) must be positive for any landing gear and flap position and symmetrical power condition, at speeds from 1.2 V_{S1}, up to V_{FE}, V_{LE}, or V_{FC}/M_{FC} (as appropriate).

(b) The static lateral stability (as shown by the tendency to raise the low wing in a sideslip with the aileron controls free) for any landing gear and wing-flap position and symmetric power condition, may not be negative at any airspeed (except that speeds higher than V_{FE} need not be considered for wing-flap extended configurations nor speeds higher than V_{LE} for landing gear extended configurations) in the following airspeed ranges (see ACJ 25.177(b)):

(1) From 1.2 V_{S1} for wing-flap positions not more extended that the most extended takeoff wing-flap setting,

(2) From 1.2 V_{S1} to 1.3 V_{S1}, for wing-flap positions more extended than the most extended take-off wing-flap setting, except that negative stability may be accepted provided the divergence is—

(i) Gradual;

(ii) Easily recognisable by the pilot; and

(iii) Easily controllable by the pilot.

(3) From 1.3 V_{S1} to V_{MO}/M_{MO}.

(4) From V_{MO}/M_{MO} to V_{FC}/M_{FC}, except that negative stability may be accepted provided the divergence is—

(i) Gradual;

(ii) Easily recognisable by the pilot; and

(iii) Easily controllable by the pilot.

What are the differences in the standards and what do these differences result in?: The FAR equivalent to JAR 25.177(a) and (b) were removed by Amendment 25-72. Their removal was not meant to delete a requirement for satisfactory directional and lateral stability, but because the FAA considered it unnecessary to define the directional and lateral stability parameters as separate entities for determining whether an airplane has satisfactory directional and lateral stability. Instead, the directional and lateral stability characteristics could be determined by evaluating the force and deflection of the ailerons and rudder, and the bank and yaw angles required to maintain steady heading sideslips during the demonstration of compliance with § 25.177(c). In accordance with §§ 25.177(c) and (d), compliance with basic static and directional stability characteristics must be shown from 1.2 V_{S1} to V_{FE}, V_{LE}, or V_{FC}/M_{FC} as appropriate, except that negative stability may be acceptable between V_{MO}/M_{MO} and V_{FC}/M_{FC} if the divergence is gradual, easily recognized, and easily controlled by the pilot.

The JAR differs in that it allows negative stability (provided that the divergence is gradual, easily recognized, and easily controlled by the pilot) for flap positions more extended that the most extended takeoff flap position in the speed range from 1.2 V_{S1} to 1.3 V_{S1}.

What, if any, are the differences in the means of compliance?:

ACJ 25.177(b):

1 For speeds between 1.2 V_{S1} and 1.3 V_{S1} for wing-flap positions more extended than the most extended take-off wing flap setting, the symmetric power used during demonstrations need not exceed the power required for level flight in the conditions (speed and configuration) in which the demonstration is made.
2 Demonstration of compliance with JAR 25.177(b) should be made from sideslip angles appropriate to the operation of the aeroplane. Sideslip angles corresponding to half rudder deflection would normally be considered appropriate for this purpose.
3 The requirement is concerned with the short-term response of the aeroplane, and long term effects, due to factors such as fuel movement, need not be taken into account. If the initial response of the aeroplane on releasing the aileron control is neutral this will be acceptable, even though the response gradually becomes unstable in the longer term.

The first paragraph of the ACJ appears to be an alleviation of the requirement and is inappropriate as advisory material. The second paragraph is different from the FAA AC

25-7A guidance, which calls for an initial bank angle "not less than 10 degrees or that necessary to maintain the steady, sideslip with one-half rudder deflection, whichever comes first. The JAA Flight Test Guide is being harmonized with FAA AC 25-7A, and will be published for comment at a later date.) The third paragraph is included in the FAA AC 25-7A guidance material.

What is the proposed action?: Harmonize to the more stringent FAR standard that existed prior to Amendment 25-72 (with some minor editorial clarifications retained from the JAR standard) and the current FAA AC 25-7A material (again with minor editorial clarifications).

What should the harmonized standard be?: see below:

Proposed text of harmonized standard:

> FAR/JAR 25.177 : (a) The static directional stability (as shown by the tendency to recover from a skid with the rudder free) must be positive for any landing gear and flap position and symmetrical power condition, at speeds from 1.2 V_{S1}, up to V_{FE}, V_{LE}, or V_{FC}/M_{FC} (as appropriate).
>
> (b) The static lateral stability (as shown by the tendency to raise the low wing in a sideslip with the aileron controls free) for any landing gear and wing-flap position and symmetric power condition, may not be negative at any airspeed (except that speeds higher than V_{FE} need not be considered for flaps extended configurations nor speeds higher than V_{LE} for landing gear extended configurations) in the following airspeed ranges:
>
> (1) From 1.2 V_S to V_{MO} / M_{MO}.
>
> (2) From V_{MO}/M_{MO} to V_{FC}/M_{FC}, unless the divergence is –
>
> (i) Gradual;
>
> (ii) Easily recognizable by the pilot; and
>
> (iii) Easily controllable by the pilot.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner, but again includes explicit requirements for separate directional and lateral stability assessments.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: It maintains the same level of safety.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: It maintains the current level of safety since industry practice is to comply with both the FAR and the JAR.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Existing FAA advisory material is adequate. It needs updating to delete the references to the requirements that existed prior to Amendment 25-72, since these requirements would once again be in effect. The JAR ACJ will be deleted when the JAA Flight Test Guide is adopted.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: Negligible, since compliance is normally shown during the tests conducted to show compliance with § 25.177(c).

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1323(c)

What is the underlying safety issue addressed by the FAR/JAR?: The underlying safety issue is to prevent hazardously misleading airspeed information from being presented to the flightcrew. To this end, FAR/JAR 25.1323 specify the accuracy and calibration requirements and the speed ranges over which each airspeed system must be calibrated. In addition, each airspeed system must be designed and installed so as to minimize the possibility of malfunction by the entry of foreign material, by icing, or due to a collision with a bird.

What are the current FAR and JAR standards?: see below for 25.1323(c), which is the only part of 25.1323 where the standards are different:

> Current FAR text: The airspeed error of the installation, excluding the airspeed indicator instrument calibration error, may not exceed three percent or five knots, whichever is greater, throughout the speed range, from--
>
> (1) V_{MO} to 1.3 V_{S1} with flaps retracted; and
>
> (2) 1.3 V_{S0} to V_{FE} with flaps in the landing position.
>
> Current JAR text: (1) The airspeed error of the installation, excluding the airspeed indicator instrument calibration error, may not exceed three percent or five knots, whichever is greater, throughout the speed range, from--
>
> (i) V_{MO} to 1.3 V_{S1} with wing-flaps retracted; and
>
> (ii) 1.3 V_{S0} to V_{FE} with wing-flaps in the landing position.
>
> (2) From 1.3 V_S to stall warning speed the IAS must change perceptibly with CAS and in the same sense, and at speeds below stall warning speed the IAS must not change in an incorrect sense. (See ACJ 25.1323 (c)(2).)
>
> (3) From V_{MO} to V_{MO} + 2/3 (V_{DF} – V_{MO}) the IAS must change perceptibly with CAS and in the same sense, and at higher speeds up to V_{DF} the IAS must not change in an incorrect sense. (See ACJ 25.1323 (c)(3).)
>
> (4) There must be no indication of airspeed which would cause undue difficulty to the pilot during the take-off between the initiation of rotation and the achievement of a steady climbing condition.

What are the differences in the standards and what do these differences result in?: The JAR standard contains requirements, not in the FAR, for speeds greater than and less than the speed range for which accuracy requirements apply. At speeds up to 2/3 (V_{DF} – V_{MO}) and less than the stall warning speed, JAR 25.1323 requires the indicated speed to change perceptibly and in the same sense as the calibrated airspeed. At speeds up to V_{DF}, the

indicated airspeed must not change in an incorrect sense. Also, between the initiation of rotation and the achievement of a steady climbing condition during takeoff, there must not be an airspeed indication that would cause the pilot undue difficulty. An example of such an indication would be a significant pause or change in the rate of change in airspeed. Such effects could be caused by transiting through ground effect.

What, if any, are the differences in the means of compliance?:

The following JAR ACJ's and FAA AC 25-7A material are relevant:

ACJ 25.1323(c)(2): From 1.3 V_S to stall warning speed the rate of change of IAS with CAS should be not less than 0.75.

ACJ 25.1323(c)(3): From $V_{MO} + 2/3\ (V_{DF} - V_{MO})$ the rate of change of IAS with CAS should be not less than 0.5.

ACJ 25.1323(d): The design and installation of the pitot system should be such that positive drainage of moisture is provided, chafing of the tubing and excessive distortion at bends is avoided, and the lag and the possibility of moisture blockage in the tubing should be kept to an acceptable minimum.

ACJ 25.1323(e):

1. Tests should be conducted to the same standard as recommended for turbine engine air intakes (see ACJ 25.1093(b)(1)) unless it can be shown that the items are so designed and located as not to be susceptible to icing conditions. Ice crystal and mixed ice and water cloud will need to be considered where the system is likely to be susceptible to such conditions.
2. However, in conducting these test due regard should be given to the presence of the aeroplane and its effect on the local concentration of the cloud.

AC 25-7A

177. AIRSPEED INDICATING SYSTEM - § 25.1323.

a. Explanation.

(1) Methods. Unless a calibrated reference system is provided, the airspeed system should be calibrated throughout as wide a range as necessary to cover the intended flight tests. The procedures of this section are for the purpose of showing compliance with § 25.1323(b) and are not intended to cover the speed range of the flight tests. If an alternate airspeed indicating system is provided, it should be calibrated. The airspeed indicating system should be calibrated in accordance with the following methods:

(i) The tests should be conducted in stabilized flight at airspeeds throughout the speed range for the airplane configurations to be tested. The airplane's airspeed system should be calibrated against a reference airspeed system or a groundspeed course.

(ii) A reference airspeed system should consist of either of the following:

(A) An airspeed impact pressure and static pressure measurement device (or devices) that are free from error due to airplane angular changes relative to the direction of the free stream or due to slipstream variation resulting from changes in airplane configuration or power. In addition, the device or devices should have a known calibration error when located in the free stream; or

(B) Any other acceptable airspeed calibration method (e.g., the altimeter method of airspeed calibration).

(iii) When establishing the airplane's true airspeed by means of the groundspeed course, flight between the two reference points should be made at constant airspeed in two successive runs in opposite directions to eliminate the effect of wind. The runs should be made only in stable wind. The time to make the runs should be obtained by means of some calibrated device. The speed runs should not be made nearer the ground surface than a wing span's length.

(iv) If an alternate system is provided, it may be calibrated against either the reference system or the airplane's system.

(v) Airspeed Lag. With the advent of electronic instruments in the cockpit, the pneumatic signals from the pitot and static sources are processed and digitized in the Air Data Computer (ADC) and then filtered and transported to the cockpit display. As a result of the data processing and filtering, the associated time lag, and, consequently, airspeed lag at the cockpit display, can be an important consideration in the airspeed indicating system calibration during ground acceleration. As stated in § 25.1323(b), the calibration for an accelerated takeoff ground run must determine the "system error," which is the relation between indicated and calibrated airspeeds. The system error is the sum of the pneumatic lag in the pressure lines, airspeed lag due to time lags in processing the data, and static source, position error.

(A) Airspeed lag must be measured during ground acceleration tests or determined by analysis. Increments should be developed for a range of airplane gross weights considering airspeed lag at V_1 and the associated increase in accelerate-stop and takeoff distances due to lag. The error due to lag in the airspeed indicating system during ground acceleration should not be greater than 3.0 knots throughout the takeoff operating envelope of the airplane. Furthermore, an increase in the takeoff distance or the accelerate-stop distance as a result of airspeed lag should not exceed 100 ft. The 3 knots limitation is intended to establish the maximum acceptable systematic error. Even though

the lag may be within the 3 knots limit, an airspeed correction may be required to stay within the 100 ft. of increased distance.

(B) Corrections may be applied directly in the ADC or they may be introduced via the ground airspeed calibration provided in the Airplane Flight Manual (AFM). If corrections are applied directly in the ADC, it is possible to display calibrated airspeed in the cockpit. Furthermore, if acceleration data are input, the airspeed error can be computed and accounted for in real time, assuming the time lag is known. The alternative would be to use an airspeed lag increment derived from calibration tests that would represent a range of conditions within the takeoff envelope. After correction, an increase in distance due to lag should be less than 100 ft throughout the takeoff envelope, whether applied in the ADC or AFM. Consideration should be given to short field, lighter weight takeoffs (higher acceleration), as well as maximum weight and higher V_1 speeds, in deriving the increment.

(2) Configuration. Airspeed calibration tests should be conducted in the following configurations:

(i) Weight - between maximum takeoff and maximum landing.

(ii) C. G. position - optional.

(iii) Takeoff configuration(s) - ground roll.

(iv) Wing flaps and landing gear - all combinations of positions used to show compliance with the takeoff, climb, and landing requirements of 14 CFR part 25.

(v) Thrust - as required.

b. Procedures.

(1) Any one or any desired combination of the procedures in subparagraphs (2) through (4) of this paragraph may be used for calibrating the airspeed indicating system. The airspeed should be measured or determined simultaneously from the airplane's system and the reference system during stabilized runs for at least five speeds spaced throughout the speed range, the lowest not to exceed 1.3 V_S. The highest speed should not exceed V_{MO}/M_{MO}. The speed spread between the test speeds should be limited to 10 knots from V_S to 1.6 V_S or placard speed, and 20 knots from 1.6 V_S to V_{MO}.

(2) Speed course: The airspeed, power, and altitude should be stabilized before entering the speed course. Constant airspeed should be maintained during each run. The runs should be made in both directions on reciprocal headings for each speed over the speed course. The following data should be recorded:

(i) Time of day at beginning of run.

(ii) Time to make run.

(iii) Pressure altitude.

(iv) Ambient air temperature.

(v) Airspeed at several intervals during run.

(vi) Wing flap position.

(vii) Landing gear position.

(viii) Course distance.

(3) Reference airspeed system: Stabilized runs at the test speeds listed in this paragraph should be made. The airspeed from the airplane's airspeed system and the reference airspeed system should be read simultaneously. The following data should be recorded:

(i) Time of day.

(ii) Airplane's indicated airspeed.

(iii) Reference indicated airspeed.

(iv) Pressure altitude.

(v) Ambient air temperature.

(vi) Wing flap position.

(vii) Landing gear position.

(4) Other acceptable airspeed calibration methods. Stabilized flight runs at the test speeds should be made, and the necessary data recorded, to establish the airplane's airspeed system error and the configuration of the airplane. Calibration methods may also include airspeed boom, static trailing cone, and radar range.

(5) The procedures presented in this paragraph pertain to the calibration of the airspeed indicating system during takeoff ground acceleration. In particular, airplanes with electronic instruments in the cockpit must account for the airspeed lag at the cockpit display associated with data processing and filtering. The airspeed indicating system should not have a lag in excess of 3 knots at the V_1 speed during any takeoff condition. Furthermore, if airspeed lag causes an increase of more than 100 ft. in takeoff or

accelerate-stop distances, a lag correction must be applied to the airspeed indicating system. Airspeed lag should be determined by one of the following methods:

(i) Conduct ground acceleration tests for a range of airplane gross weights to calibrate Indicated Airspeed (IAS) at the cockpit display against the reference Calibrated Airspeed. Determine airspeed lag from the calibration data by comparing the cockpit displayed airspeed with the reference calibration speed for a given gross weight and V_1 speed.

(ii) Determine airspeed lag by analysis using a computer program suitable for AFM development. Compute takeoffs for a range of gross weights to determine the acceleration at V_1. Calculate airspeed lag at V_1 for a corresponding acceleration and a known time lag due to data processing and filtering. The analysis should also consider other sources of airspeed lag as appropriate, such as the pneumatic lag in the pressure lines for the pitot and static sources.

(6) Having established the calibration data, one acceptable method of adjusting for airspeed lag is to apply corrections directly in the ADC data processing to result in a lag-corrected airspeed at the cockpit display. Another would be to include an airspeed lag correction in the takeoff ground speed calibration of Indicated vs. Calibrated Airspeeds in the AFM. A single airspeed lag increment can be developed as the correction for the range of gross weights and corresponding accelerations at V_1. This increment, when applied to the calibration, must result in no more than a 100 ft. increase in takeoff or accelerate-stop distances due to airspeed lag for any takeoff condition. A more accurate correction would result from presenting airspeed lag as a function of airplane acceleration based on the calibration data. If acceleration data are available in the ADC, a real time correction for lag during the takeoff can be applied in the data processing.

<u>What is the proposed action?</u>: Harmonize to the more stringent JAR standard, and add the "requirements" contained in the FAA advisory material.

<u>What should the harmonized standard be?</u>: see below

<u>Proposed text of harmonized standard:</u>

<u>Replace the current FAR/JAR 25.1323(c) with the following, and renumber the remaining paragraphs accordingly</u>:

(c) The airspeed error of the installation, excluding the airspeed indicator instrument calibration error, may not exceed three percent or five knots, whichever is greater, throughout the speed range from--

(1) V_{MO} to 1.3 V_{S1} with flaps retracted; and

(2) 1.3 V_{S0} to V_{FE} with flaps in the landing position.

(d) From 1.3 V_S to the speed at which stall warning begins, the IAS must change perceptibly with CAS and in the same sense, and at speeds below stall warning speed the IAS must not change in an incorrect sense.
(e) From V_{MO} to $V_{MO} + 2/3\ (V_{DF} - V_{MO})$, the IAS must change perceptibly with CAS and in the same sense, and at higher speeds up to V_{DF} the IAS must not change in an incorrect sense.
(f) There must be no indication of airspeed that would cause undue difficulty to the pilot during the takeoff between the initiation of rotation and the achievement of a steady climbing condition.
(g) The effects of airspeed lag may not introduce significant takeoff indicated airspeed bias, or significant errors in takeoff or accelerate-stop distances.

How does this proposed standard address the underlying safety issue?: The proposed standard continues to address the underlying safety issue in the same manner. JAR standards have been added for the purpose of harmonization.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: The proposed standard increases the level of safety by incorporating the additional JAR requirements. The additional requirement regarding airspeed lag codifies current FAA policy.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: It maintains the current level of safety since industry practice is to comply with both the FAR and the JAR.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. Various options regarding the split between rule and advisory material were discussed to achieve the safety objective while ensuring flexibility in the means of compliance.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: The FAA policy regarding airspeed lag has been included in the proposed rule text.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Add the following to AC 25-7A:

An acceptable means of compliance when demonstrating a perceptible speed change between 1.3 V_S to stall warning speed is for the rate of change of IAS with CAS to be not less than 0.75.

An acceptable means of compliance when demonstrating a perceptible speed change between V_{MO} to $V_{MO} + 2/3\ (V_{DF} - V_{MO})$ is for the rate of change of IAS with CAS to be not less than 0.50.

The JAA will revise the relevant ACJ's to be consistent with the above text and will add the AC 25-7A text regarding airspeed lag to the JAA Flight Test Guide.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: Yes, this proposal has been coordinated with and approved by the Avionics Systems Harmonization Working Group.

What is the cost impact of complying with the proposed standard?: The Avionics HWG was asked to answer this question. Their response is: "In general the [Avionics HWG] commenters agreed that there will not be any large additional cost (if any) over the present day testing."

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1527

What is the underlying safety issue addressed by the FAR/JAR?: Operation outside the environmental envelope established for the airplane may be unsafe. Therefore, the boundaries of that envelope must be established to ensure safe operations.

What are the current FAR and JAR standards?: see below

> Current FAR text: **Maximum operating altitude**. The maximum altitude up to which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be established.
>
> Current JAR text: The extremes of the ambient air temperature and operating altitude for which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be established.

What are the differences in the standards and what do these differences result in?: The FAR standard only requires the maximum altitude portion of the environmental envelope to be established. The JAR requires both the minimum and maximum altitudes and ambient temperatures to be established. FAA policy is consistent with the JAR standard (as shown in AC 25.1581-1), but must rely on the general provisions of § 25.1501(a) ("other limitations and information necessary for safe operation must be established") for its regulatory basis.

What, if any, are the differences in the means of compliance?:

Although the explicit standards are different, there are no differences in the means of compliance. The FAA relies on the general provisions of § 25.1501(a) and the following AC 25-7A advisory material to apply the same requirement. There is no current JAA advisory material; however, the JAA will be adopting AMJ 25.1581 with Change 15 to JAR-25. AMJ 25.1581 is harmonized with FAA AC 25.1581-1.

FAA AC 25.1581-1 (paragraph 2b(3)):

(3) Operating Limitations. The extremes of the operational variables, including any appropriate descriptions for which compliance with parts 25 and 36 has been shown and for which the AFM data have been approved, should be listed with respect to the following:

(i) Operations.

(A) Maximum takeoff, landing, and zero fuel weight limits.

(B) Minimum in-flight gross weight.

(C) Minimum and maximum pressure altitude for which operation is limited for each flight phase (takeoff, en route, and landing). Further altitude limitations caused by changes to structure, powerplant, equipment characteristics, or flight characteristics (e.g., due to failures) should be provided.

(D) Ambient atmospheric temperature (maximum and minimum).

What is the proposed action?: Codify current FAA policy by harmonizing to the JAR standard.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.1527:

The extremes of the ambient air temperature and operating altitude for which operation is allowed, as limited by flight, structural, powerplant, functional, or equipment characteristics, must be established.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Current advisory material is adequate. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1583(c)

What is the underlying safety issue addressed by the FAR/JAR?: Section/JAR 25.1583 is linked to §§/JAR 25.1501 through 25.1533 in that it requires the limitations established under those sections to be provided in the Airplane Flight Manual. To ensure safe operation, any limitations established for the airplane must be made known to the flightcrew. This is accomplished through instrument markings and placards, and the information provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?: see below

Current FAR text: 25.1583(c): *Weight and loading distribution.* The weight and center of gravity limits required by §§ 25.25 and 25.27 must be furnished in the Airplane Flight Manual. All of the following information must be presented either in the Airplane Flight Manual or in a separate weight and balance control and loading document which is incorporated by reference in the Airplane Flight Manual:

(1) The condition of the airplane and the items included in the empty weight as defined in accordance with § 25.29.

(2) Loading instructions necessary to ensure loading of the airplane within the weight and center of gravity limits, and to maintain the loading within these limits in flight.

(3) If certification for more than one center of gravity range is requested, the appropriate limitations, with regard to weight and loading procedures, for each separate center of gravity range.

Current JAR text: 25.1583(c): *Weight and loading distribution.* The weight and centre of gravity limitations established under JAR 25.1519 must be furnished in the aeroplane Flight Manual. All the following information including weight distribution limitations established under JAR 25.1519 must be presented either in the aeroplane Flight Manual or in a separate weight and balance control and loading document which is incorporated by reference in the aeroplane Flight Manual (see ACJ 25.1583(c)):

(1) The condition of the aeroplane and the items included in the empty weight as defined in accordance with JAR 25.29.

(2) Loading instructions necessary to ensure loading of the aeroplane within the weight and centre of gravity limits, and to maintain the loading within these limits in flight.

(3) If certification for more than one centre of gravity range is requested, the appropriate limitations, with regard to weight and loading procedures, for each separate centre of gravity range.

What are the differences in the standards and what do these differences result in?: There are no practical differences in application of the standards. However, the JAR standard is more correct by referring to the requirement that establishes the weight and loading distribution limits as operating limitations. Section/JAR 25.1519 contains the requirement to establish the limitations determined under §/JAR 25.23 to 25.27 as operating limitations.

JAR 25.1583(c) requires the operating limitations established under JAR 25.1519 to be provided in the Airplane Flight Manual. Instead of referencing § 25.1519, § 25.1583(c) specifically refers to the weight and center of gravity limitations determined under §§ 25.25 and 25.27. This mistakenly excludes any operating limitations established as a result of § 25.23.

What, if any, are the differences in the means of compliance?: Although the explicit standards are different, there are no differences in the means of compliance. The FAA relies on the general provisions of § 25.1501(a) and the following AC 25-1581-1 advisory material to apply the same requirement. The JAA have a current ACJ that is relevant; however, the JAA will be adopting harmonized advisory material with Change 15 to JAR-25.

FAA AC 25.1581-1 (paragraphs 2b(1) and 2e):

2(b)(1) Weight Limitations. A statement of the maximum certified takeoff and landing weights must be provided. The maximum taxi/ramp weight, maximum zero fuel weight, and any other fixed limit on weight should also be included. Any limitations on airplane loading associated with the stated weight limitations must be included in the AFM or addressed in a separate weight and balance document. Separate takeoff and landing weight limits may be listed corresponding to each applicable constraint (e.g., structural or noise requirements, customer option, etc.), if the instructions in the Limitations Section clearly state that the most restrictive of these takeoff and landing weight limitations represent the maximum certified weights.

(i) For those performance weight limits that vary with runway length, altitude, temperature, or other variables, the variation in weight limitations may be presented as graphs in the Performance Section of the AFM and included as limitations by specific reference in the Limitations Section.

(ii) Only one set of takeoff and landing gross weight limits may be established under part 36 for a specific airplane model (i.e., hardware build).

e. Loading Instructions. Section 25.1583 requires instructions necessary to ensure loading of the airplane within the established limits of weight and center-of-gravity, and to maintain the loading within such limits in flight to be presented either in the AFM or included in a separate weight and balance document referenced in the AFM Limitations

Section. If applicable, the loading instructions must refer to the flight procedures that consider the change to the airplane's center of gravity as fuel is consumed.

(1) Loading Instructions Presented in a Separate Document. If the loading instructions are presented in a separate document, the AFM Limitations Section should contain at least the following:

(i) Maximum taxi gross weight limits.
(ii) Maximum takeoff gross weight limits.
(iii) Maximum landing gross weight limits.
(iv) Maximum zero fuel weight limits.
(v) Minimum in-flight gross weight.
(vi) Center-of-gravity limits.
(vii) Information required to maintain the airplane within the above limits.

(2) Weight and Balance Data. Documentation of the weight and balance material outlined below is normally adequate for airplanes with conventional loading and fuel management techniques. For airplanes that require fuel to be redistributed (other than through normal consumption) to maintain loading within prescribed limits, the loading instructions should be expanded as necessary.

(i) Weight Limits. A list and identification of all weight limitations should be included.

(ii) Center-of-Gravity Limits. The approved center-of-gravity range, or ranges, should be presented with due accounting for airplane configuration (i.e., landing gear position, passenger loading, cargo distribution, etc.) such that loading limits can be maintained.

(iii) Dimensions, Datum, and MAC. The dimensions and relative location of airplane features associated with weighing and loading of the airplane and with weight and balance computations should be described or illustrated.

(iv) Configuration Checklist or Equipment List. The airplane should be defined or described sufficiently to identify the presence or absence of optional systems, features, or installations that are not readily apparent. In addition, all other items of fixed or removable equipment included in the empty weight should be listed.

(v) Fuel and Other Liquids. All fuel and other liquids, including passenger service liquids, that are included in the empty weight should be identified and listed, together with the information necessary to enable ready duplication of the particular condition.

(vi) Weighing Computations. Computation of the empty weight and the empty weight c.g. location should be included.

(vii) Loading Schedule. The loading schedule should be included, if appropriate.

(viii) Loading Instructions. Complete instructions relative to the loading procedure or to the use of the loading schedule should be included.

(ix) Compartment and floor load limits should be included.

<u>JAA ACJ 25.1583(c)</u>:

1. Indication should be given in tabular or graphic form of the c.g. limits for take-off and landing and for any other practicably separable flight condition, as appropriate for the range of weights between the maximum take-off weight and the minimum landing weight presented in accordance with JAR 25.1583(c). The landing gear position appropriate to each condition should be shown, or, alternatively, data should be presented for landing-gear-extended position only and should include the moment change due to gear retraction. C.g. limits should be presented in terms of both distance-from-datum and percentage of the mean aerodynamic chord (MAC). The datum for the former should be defined and the length and location of the MAC should be stated.
2. For those weight limitations which vary with runway length, altitude, temperature and other variables the variation in weight limitation may be presented as graphs in the performance section of the Flight Manual, and included as limitations by specific reference, in the limitations section, to the appropriate graph or page.

What is the proposed action?: Codify current FAA policy by harmonizing to the JAR standard.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.1583(c):

Weight and loading distribution. The weight and center of gravity limitations established under §/JAR 25.1519 must be furnished in the Airplane Flight Manual. All of the following information, including the weight distribution limitations established under §/JAR 25.1519, must be presented either in the Airplane Flight Manual or in a separate weight and balance control and loading document that is incorporated by reference in the Airplane Flight Manual;

(1) The condition of the airplane and the items included in the empty weight as defined in accordance with §/JAR 25.29.

(2) Loading instructions necessary to ensure loading of the airplane within the weight and center of gravity limits, and to maintain the loading within these limits in flight.

(3) If certification for more than one center of gravity range is requested, the appropriate limitations, with regard to weight and loading procedures, for each separate center of gravity range.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

What other options have been considered and why were they not selected?: No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Existing FAA advisory material is adequate. The JAA intend to delete their ACJ when the harmonized JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1583(f)

What is the underlying safety issue addressed by the FAR/JAR?: Section/JAR 25.1583 is linked to §§/JAR 25.1501 through 25.1533 in that it requires the limitations established under those sections to be provided in the Airplane Flight Manual. To ensure safe operation, any limitations established for the airplane must be made known to the flightcrew. This is accomplished through instrument markings and placards, and the information provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?: see below

Current FAR text: *Altitudes*. The altitude established under § 25.1527.

Current JAR text: *Ambient air temperatures and operating altitudes.* The extremes of the ambient air temperatures and operating altitudes established under JAR 25.1527 and an explanation of the limiting factors must be furnished.

What are the differences in the standards and what do these differences result in?: Consistent with § 25.1527, the FAR standard only requires the maximum altitude portion of the environmental envelope to be provided in the Airplane Flight Manual. Consistent with JAR 25.1527, the JAR requires both the minimum and maximum altitudes and ambient temperatures to be established. FAA policy is consistent with the JAR standard (as shown in AC 25.1581-1), but must rely on the general provisions of § 25.1501(a) ("other limitations and information necessary for safe operation must be established") for its regulatory basis.

What, if any, are the differences in the means of compliance?: Although the explicit standards are different, there are no differences in the means of compliance. The FAA relies on the general provisions of § 25.1501(a) and the following AC 25.1581-1 advisory material to apply the same requirement. There is no current JAA advisory material, but AMJ 25.1581 is harmonized with FAA AC 25.1581-1 and will be published as part of Change 15 to JAR-25.

FAA AC 25.1581-1 (paragraph 2b(3)):

(3) Operating Limitations. The extremes of the operational variables, including any appropriate descriptions for which compliance with parts 25 and 36 has been shown and for which the AFM data have been approved, should be listed with respect to the following:

(i) Operations.

(A) Maximum takeoff, landing, and zero fuel weight limits.

(B) Minimum in-flight gross weight.

(C) **Minimum and maximum pressure altitude for which operation is limited for each flight phase (takeoff, en route, and landing). Further altitude limitations caused by changes to structure, powerplant, equipment characteristics, or flight characteristics (e.g., due to failures) should be provided.**

(D) **Ambient atmospheric temperature (maximum and minimum).**

What is the proposed action?: Codify current FAA policy by harmonizing to the JAR standard. The requirement for an explanation of the limiting factors would be deleted; however, as this does not represent current practice and is unnecessary for safety.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.1583(f):

Ambient air temperatures and operating altitudes. The extremes of the ambient air temperatures and operating altitudes established under §/JAR 25.1527 must be furnished.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner by codifying current FAA policy to harmonize with the JAR.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it codifies current practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Existing FAA advisory material is adequate. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1585

What is the underlying safety issue addressed by the FAR/JAR?: The primary purpose of the Airplane Flight Manual is to provide an authoritative and approved source of information considered necessary for safely operating the airplane. Consistent with this purpose, operating procedures related to airworthiness and necessary for safe operation, including those procedures that may be unique to that type of airplane, must be provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?: see below

Current FAR text:

§ 25.1585 Operating procedures.

(a) Information and instructions regarding the peculiarities of normal operations (including starting and warming the engines, taxiing, operation of wing flaps, landing gear, and the automatic pilot) must be furnished, together with recommended procedures for--

(1) Engine failure (including minimum speeds, trim, operation of the remaining engines, and operation of flaps);

(2) Stopping the rotation of propellers in flight;

(3) Restarting turbine engines in flight (including the effects of altitude);

(4) Fire, decompression, and similar emergencies;

(5) Ditching (including the procedures based on the requirements of §§ 25.801, 25.807(d), 25.1411, and 25.1415(a) through (e));

(6) Use of ice protection equipment;

(7) Use of fuel jettisoning equipment, including any operating precautions relevant to the use of the system;

(8) Operation in turbulence for turbine powered airplanes (including recommended turbulence penetration airspeeds, flight peculiarities, and special control instructions);

(9) Restoring a deployed thrust reverser intended for ground operation only to the forward thrust position in flight or continuing flight and landing with the thrust reverser in any position except forward thrust; and

(10) Disconnecting the battery from its charging source, if compliance is shown with Sec. 25.1353(c)(6)(ii) or (c)(6)(iii).

(b) Information identifying each operating condition in which the fuel system independence prescribed in § 25.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.

(c) The buffet onset envelopes, determined under § 25.251 must be furnished. The buffet onset envelopes presented may reflect the center of gravity at which the airplane is normally loaded during cruise if corrections for the effect of different center of gravity locations are furnished.
(d) Information must be furnished which indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.
(e) Information on the total quantity of usable fuel for each fuel tank must be furnished.

Current JAR text:

JAR 25.1585 Operating procedures

(a) Information and instructions regarding operating procedures must be furnished (see ACJ 25.1585(a)) in substantial accord with the categories described below –

(1) Emergency procedures which are concerned with foreseeable but unusual situations in which immediate and precise action by the crew, as detailed in the recommended procedures, may be expected to reduce the risk of catastrophe.

(2) Other procedures peculiar to the particular type or model encountered in connection with routine operations including malfunction cases and failure conditions, involving the use of special systems and/or the alternative use of regular systems not considered as emergency procedures.

(b) Information or procedures not directly related to airworthiness or not under the control of the crew, must not be included, nor must any procedure which is accepted as basic airmanship.
(c) The buffet onset envelopes, determined under JAR 25.251 must be furnished. The buffet onset envelopes presented may reflect the centre of gravity at which the aeroplane is normally loaded during cruise if corrections for the effect of different centre of gravity locations are furnished. (See ACJ 25.1585(c).)
(d) Information must be furnished which indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.
(e) Information on the total quantity of usable fuel for each fuel tank must be furnished.

What are the differences in the standards and what do these differences result in?: The JAR does not include § 25.1585(b), the requirement that information identifying each operating condition in which the fuel system independence prescribed in § 25.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section. Lack of such information may compromise the intent of the rules regarding fuel system independence.

JAR 25.1585(a) and (b) essentially update the § 25.1585(a) requirements to better reflect current policy, practices, and interpretations. These differences are not thought to cause

any material differences in technical requirements for procedural information in the Airplane Flight Manual. Any differences in this area are thought to result more from means of compliance and interpretation differences, which have recently been addressed by harmonizing the advisory material for compliance, FAA AC 25.1581-1 and JAA AMJ 25.1581.

What, if any, are the differences in the means of compliance?:

The advisory material related to the operating procedures section of the Airplane Flight Manual are reprinted below. Although there are differences between the texts of the FAA AC and the JAA ACJ's, the JAA will be adopting harmonized advisory material with Change 15 to JAR-25.

FAA AC 25.1581 (paragraph 2c):

c. Operating Procedures Section. The Operating Procedures Section of the AFM should contain, as a minimum, the essential information, peculiar to the particular airplane type or model, that is needed for safe operation under normal and other than normal conditions. Procedures not directly related to airworthiness, or not under control of the flightcrew, should not be included in the AFM. A notation similar to the following should be placed at the beginning of the Operating Procedures Section:

> The operating procedures contained in this manual have been developed and recommended by the manufacturer and approved by the FAA for use in operating this airplane. These procedures are provided as guidance and should not be construed as prohibiting the operator from developing equivalent procedures in accordance with the applicable operating rules.

(1) Procedures Categories. Information should be presented for normal and non-normal/emergency procedures and be distinctly separated. The non-normal/emergency procedures may either be placed in one section or in separate non-normal and emergency procedures sections of the AFM. In either case, procedural tasks that are considered recall or immediate action items that must be accomplished from memory should be clearly identified.

(2) Format. Procedures should be presented in either a narrative or a checklist format, depending upon the intended use of the AFM.

(i) Narrative. This format is acceptable if sources of procedures information other than the AFM are intended for flightcrew use (e.g., a Flightcrew Operating Manual (FCOM)). Procedures presented in this format should be drafted in a manner from which the needed sequence can be easily established.

(ii) Checklist. This format should be used if the AFM is intended to be used directly by the flightcrew for operating procedures.

(3) Procedures Development. Prior to initial type certification, it is essential to verify that the proposed procedures are technically valid and operationally practicable. It

is recognized that such procedures may have had only limited operational exposure at the time of certification and may need to be revised based on service experience.

(4) Procedures Content. The content and level of detail for the normal and non-normal procedures provided in the AFM should be based on the intended use of the AFM. More information and detail should be provided in AFMs that are intended to be the flightcrew's primary source of operating procedures information than for AFMs that are not intended to be used directly by the flightcrew.

(i) General. Classifying an operating procedure as normal or non-normal should reflect whether the airplane's systems are operating normally. Procedures associated with failed or inoperative systems should be considered non-normal. Procedures associated with glideslope deviation, ground proximity warning, all-engines-operating go-around, turbulent air penetration, windshear alerts, traffic advisories or resolution alerts from the traffic alerting and collision avoidance system, etc., which do not occur routinely, should be placed in the normal procedures subsection, provided the airplane's systems are operating normally.

(ii) Other Sources of Procedures Information. The flightcrew of large transport category airplanes typically use sources of operating procedures information other than the AFM. Examples of other sources of operating procedures information include manufacturer- or operator-produced operating manuals, Quick Reference Handbooks (QRH's), System Pilot's Guides, and Emergency or Abnormal Checklists. For these airplanes, items such as cockpit checklists, systems descriptions, and the associated normal procedures should not be presented in the AFM if they are provided in other documents acceptable to the FAA. Normal procedures that are necessary for safe operation should be presented in the AFM, but the remaining normal procedures should be placed in the manufacturer-produced FCOM (or other acceptable source of operating procedures information). The non-normal procedures section of the AFM for these types of airplanes should include, as a minimum, procedures dictated by the airplane's systems and failure modes, and may also include those emergency procedures listed in paragraph 2c(5) of this AC.

(A) The system description and procedures provided in the AFM should be limited to that which is uniquely related to airplane safety or airworthiness. The AFM should include a brief general description of the system and its intended use. The limitations section of the AFM should reference the operating manual in which the detailed system description and procedures can be found. This reference should include the document title, the document or part number, and the date of issue, and may allow the use of later appropriate revisions. An example wording would be: "The *Manufacturer Unit Model* System Pilot's Guide, P/N XXXX, dated XXXX (or later appropriate revision) must be immediately available to the flightcrew whenever XXXX [e.g., navigation] is predicated on the use of the system. The software version [if applicable] stated in the Pilot's Guide must match that displayed on the equipment."

(B) Information that restricts or defines the operation of a particular system (e.g., authorizing or prohibiting specific types of approaches) should be located in the limitations section of the AFM. Emergency or abnormal procedures should be located in the appropriate procedures section(s) of the AFM.

(C) Detailed system descriptions and normal procedures that represent one means, but not the only means, of operation should be located in appropriate operating manuals with a reference placed in the procedures section of the AFM. This reference should include the document title, the document or part number, and the date of issue. The reference may also allow the use of later appropriate revisions of that document. An example wording would be: "Normal operating procedures are contained in the *Manufacturer Unit Model* System Pilot's Guide, P/N XXXX, dated XXXX (or later appropriate revision)."

(iii) AFM Used Directly. For those manufacturers and operators that do not produce other sources of procedures information (generally manufacturers and operators of small transports), the AFM is the only source of this information. In this circumstance, the AFM operating procedures information must be comprehensive and include information such as cockpit checklists, systems descriptions, and associated procedures.

(5) Emergency Procedures. The emergency procedures can be included either in a dedicated section of the AFM or in the non-normal procedures section. In either case, this section should include the procedures for handling any situation that is in a category similar to the following:

(i) Engine failure with severe damage or separation.
(ii) Multiple engine failure.
(iii) Fire in flight.
(iv) Smoke control. At least the following should be clearly stated in the AFM:

After conducting the fire or smoke procedures, land at the nearest suitable airport, unless it is visually verified that the fire has been extinguished.

(v) Rapid decompression.
(vi) Emergency descent.
(vii) Uncommanded reverser deployment in flight.
(viii) Crash landing or ditching.
(ix) Emergency evacuation.

<u>JAA ACJ 25.1585(a)</u>:

1 In furnishing information and instructions, consideration should be given to the following. The lists do not necessarily include all items to be considered for a given aeroplane. The categorisation of certain items may need to be modified because of design features or other considerations.
2 *Emergency Procedures*
a. Engine and APU fire/separation/severe damage
b. Smoke or fire in cockpit/cabin/cargo compartment
c. Rapid decompression/emergency descent
d. Landing or go-around with jammed stabiliser
e. Runaway stabiliser
f. Flight with all engines inoperative
g. Ditching

3 *Other Procedures*

a. Engine starting

b. APU operation

c. Fuel management. The effect on unusable fuel quantity due to fuel booster pump failure should be stated.

d. Reverse thrust system.

e. Navigation system

f. Rain repellent system

g. Automatic flight control systems

h. Cabin pressurisation system

i. Oxygen system

j. Hydraulic system

k. Electrical system

l. Anti-ice/de-ice system

m. Operation in turbulence

n. Equipment cooling

o. Flight controls

p. Stall warning/stall identification system

q. Braking system

r. Fuel dumping

s. Go-around with minimum fuel

t. Landing in abnormal configurations

u. Engine shut-down and relight in flight

v. Approach and landing with engine(s) inoperative

w. Go-around with engine(s) inoperative

x. Landing gear alternate operation

4 Certain items listed in 3 may also need to be considered under 2.

5 Observance of these procedures may not be mandatory and approval of such procedures is not intended to prohibit or discourage development and use of improved or equivalent procedures based on operational experience with the aeroplane.

6 The procedures to be followed by the flight crew in the event of an engine fire, severe damage or separation of the engine should be similar, and should include identification of the failed engine as the primary action as far as the powerplant is concerned.

<u>ACJ 25.1585(c)</u>:

The buffet onset envelopes should be accompanied by information of the maximum altitude at which it is possible to achieve a positive normal acceleration increment of 0.3 g without exceeding the buffet onset boundary, at any given combination of weight, centre of gravity location and airspeed. (See also ACJ 25.251(e).)

<u>ACJ 25.251(e)</u>:

2 *Range of Load Factor for Normal Operations*

2.1 JAR 25.251(e) requires that the envelopes of load factor, speed, altitude and weight must provide a sufficient range of speeds and load factors for normal operations.
2.2 An acceptable means of compliance with the requirement is to establish the maximum altitude at which it is possible to achieve a positive normal acceleration increment of 0.3 g without exceeding the buffet onset boundary. See also ACJ 25.1585(c).

What is the proposed action?: Harmonize to a standard using the FAR text for 25.1585(b) (the more stringent standard), and the JAR text for the rest of the section (with some editorial changes to simplify the text and make it better reflect current practices as exemplified by the AC/AMJ 25.1581 advisory material). Although the FAR text for § 25.1585(a)/JAR 25.1585(a) and (b) could be considered to be more stringent by virtue of its being more specific as to the procedures that must be furnished in the Airplane Flight Manual, it is considered outdated and not completely consistent with current practices. Some of the mandated procedures are no longer appropriate and other important procedures are not included. The proposed standard is intended to provide a better description of what types of procedures are required to be in the Airplane Flight Manual, the specifics of which will depend on the particular design. Current advisory material lists specific procedures corresponding to the general requirement that may be appropriate to include, depending on the design.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.1585:

(a) Operating procedures must be furnished for –
(1) Normal procedures peculiar to the particular type or model encountered in connection with routine operations;
(2) Non-normal procedures for malfunction cases and failure conditions involving the use of special systems or the alternative use of regular systems; and
(3) Emergency procedures for foreseeable but unusual situations in which immediate and precise action by the crew may be expected to substantially reduce the risk of catastrophe.
(b) Information or procedures not directly related to airworthiness or not under the control of the crew, must not be included, nor must any procedure that is accepted as basic airmanship.
(c) Information identifying each operating condition in which the fuel system independence prescribed in §/JAR 25.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.

(d) The buffet onset envelopes, determined under §/JAR 25.251 must be furnished. The buffet onset envelopes presented may reflect the center of gravity at which the airplane is normally loaded during cruise if corrections for the effect of different center of gravity locations are furnished.
(e) Information must be furnished that indicates that when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.
(f) Information on the total quantity of usable fuel for each fuel tank must be furnished.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner by requiring information and procedures necessary for airworthiness and operational safety to be furnished in the Airplane Flight Manual.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintains the same level of safety.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintains the same level of safety.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. Harmonizing to the most stringent standard could be interpreted as harmonizing to the FAR standard (see discussion of differences above), but the JAR standard for the proposed §§/JAR 25.1585(a) and 25.1585(b) is considered to be closer to current practices and the manner in which § 25.1585(a) is actually applied.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there will be no effect as it is consistent with current regulatory requirements, practices and policy.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Existing FAA advisory material is adequate. The advisory material associated with §/JAR 25.1585 will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25.1587

What is the underlying safety issue addressed by the FAR/JAR?: The primary purpose of the Airplane Flight Manual is to provide an authoritative and approved source of information considered necessary for safely operating the airplane. Consistent with this purpose, performance information related to airworthiness and necessary for safe operation must be provided in the Airplane Flight Manual.

What are the current FAR and JAR standards?: see below

Current FAR text:

§ 25.1587 Performance information.

(a) Each Airplane Flight Manual must contain information to permit conversion of the indicated temperature to free air temperature if other than a free air temperature indicator is used to comply with the requirements of § 25.1303(a)(1).
(b) Each Airplane Flight Manual must contain the performance information computed under the applicable provisions of this part for the weights, altitudes, temperatures, wind components, and runway gradients, as applicable within the operational limits of the airplane, and must contain the following:
(1) The conditions under which the performance information was obtained, including the speeds associated with the performance information.
(2) V_S determined in accordance with § 25.103.
(3) The following performance information (determined by extrapolation and computed for the range of weights between the maximum landing and maximum takeoff weights):
(i) Climb in the landing configuration.
(ii) Climb in the approach configuration.
(iii) Landing distance.
(4) Procedures established under § 25.101(f), (g) and (h) that are related to the limitations and information required by § 25.1533 and by this paragraph. These procedures must be in the form of guidance material, including any relevant limitations or information.
(5) An explanation of significant or unusual flight or ground handling characteristics of the airplane.

Current JAR text:

JAR 25.1587 Performance information

(a) *Not required for JAR-25*
(b) Each aeroplane Flight Manual must contain the performance information computed under the applicable provisions of this JAR-25 (including JAR 25.115, 25.123 and 25.125 for the weights, altitudes, temperatures, wind components, and runway gradients, as applicable) within the operational limits of the aeroplane, and must contain the following:

(1) The condition of power, configuration, speeds and the procedures for handling the aeroplane and any system having a significant effect on performance upon which the performance graphs are based must be stated in each case. (See ACJ 25.1587(b)(1).)

(2) *Not required for JAR-25 as this sub-paragraph is covered by the opening sentence of sub-paragraph (b).*

(3) The following gross performance information (determined by extrapolation and computed for the range of weights between the maximum landing weight and maximum takeoff weight) must be provided:

(i) Climb in the landing configuration.
(ii) Climb in the approach configuration.
(iii) Landing distance.

(4) Procedures established under § 25.101 (f) and (g) that are related to the limitations and information required by JAR 25.1533 and by this paragraph must be stated in the form of guidance material, including any relevant limitation or information.

(5) An explanation of significant or unusual flight or ground handling characteristics of the aeroplane.

(6) Corrections to indicated values of airspeed, altitude and outside air temperature.

(7) An explanation of operational landing runway length factors included in the presentation of the landing distance, if appropriate. (See ACJ 25.1587(b)(7).)

What are the differences in the standards and what do these differences result in?: The JAR does not include § 25.1587(a) or § 25.1587(b)(2). The FAR does not include JAR 25.1587(b)(6) or 25.1587(b)(7). The JAR also contains some wording differences that primarily reflect an updating of the FAR wording to better reflect current interpretations and practices. These differences are not thought to cause any material differences in technical requirements for performance information in the Airplane Flight Manual. Any differences in this area are thought to result more from means of compliance and interpretation differences, which have recently been addressed by harmonizing the advisory material for compliance, FAA AC 25.1581-1 and JAA AMJ 25.1581.

What, if any, are the differences in the means of compliance?:

The advisory material related to the operating procedures section of the Airplane Flight Manual are reprinted below. Although there are differences between the texts of the FAA

AC and the JAA ACJ's, the FAA AC represents a harmonized text. The JAA are in the process of publishing the JAA equivalent to the FAA AC as AMJ 25.1581. The ACJ's will be removed upon publication of this AMJ.

FAA AC 25.1581-1 (paragraph 2d):

d. Performance Section. This section of the AFM contains the performance limitations and other data required by parts 25 and 36, and any special conditions that may apply. Additional information may be provided to assist the operator in complying with the operating rules or for implementing unique operational needs. The performance information should cover the operating range of weights, altitudes, temperatures, airplane configurations, thrust ratings, and any other operational variables stated as operational performance limitations for the airplane. If additional performance information is presented for operation at a specific altitude, these performance data should cover a pressure altitude span of at least the specific altitude ±1,000 feet to allow an operator to adequately account for pressure altitude variations. It is recommended that such data be included as a separate section or appendix to the AFM.

(1) General. Include all descriptive information necessary to identify the configuration and conditions for which the performance data are applicable. Such information should include the type or model designations of the airplane and its engines, the approved flap settings, a brief description of airplane systems and equipment that affect performance (e.g., anti-skid, automatic spoilers, etc.), and a statement indicating whether such systems and equipment are operative or inoperative. This section should also include definitions of terms used in the Performance Section (e.g., IAS, CAS, ISA, configuration, net flight path, icing conditions, etc.), plus calibration data for airspeed (flight and ground), Mach number, altimeter, air temperature, and other pertinent information. The airspeed, altitude, and air temperature calibration data should be presented for the following ranges:

(i) Takeoff configurations:

(A) Ground run, 0.8 V_{1MIN} to V_{2MAX}

(B) Inflight, V_{2MIN} to V_{FE}

(ii) Approach and landing configurations:

(A) Approach, 1.2 V_S to V_{FE}

(B) Landing, 1.3 V_S to V_{FE}

(iii) En route configuration:

(A) Airspeed and Altimeter: For the takeoff/takeoff path altitude range, 1.25 V_S to V_{MO}/M_{MO}.

(B) Airspeed and Altimeter: For higher altitudes, from 1.25 V_S or the speed for 1.2g buffet onset margin, whichever is lower, to V_{MO}/M_{MO}.

(C) Mach Number: From the lowest useful Mach number (generally in the range of 0.4 to 0.5) to M_{MO}.

(D) Total or Static Air Temperature: For Mach numbers corresponding to the speed ranges noted in paragraphs 2d(1)(iii)(A) and (B) of this AC.

(2) Performance Procedures. The procedures, techniques, and other conditions associated with the AFM performance data should be included. Performance procedures

may be presented as a performance subsection or in connection with a particular performance graph. In the latter case, a comprehensive listing of the conditions associated with the particular performance data may serve as procedures if sufficiently complete. The AFM should also include adequate information to enable the operator to show compliance with § 25.1001 for each takeoff.

(3) Thrust or Power Setting. Thrust or power settings should be provided for at least takeoff, maximum continuous, and go-around thrust or power, along with the thrust or power setting procedures necessary to obtain the performance shown in the AFM. These data should be shown for each applicable thrust or power setting parameter. If backing the airplane by reverse thrust or power is proposed, thrust or power setting limits should be established considering contaminated runway, foreign object damage potential, environmental control system impact, airplane weight and c.g., cockpit visibility, effect of braking, etc.

(4) Minimum Control Speeds. Minimum control speed data may be located in the Performance Section with a reference in the Limitations Section as to its location.

(5) Stall Speeds. The stall speeds established in showing compliance with certification requirements should be presented, together with associated conditions. Data should be presented in terms of calibrated airspeed.

(6) Takeoff Speeds. The takeoff speeds, V_1, V_R, and V_2, must be presented in the AFM, together with the associated conditions. These speeds should be presented in units consistent with cockpit instrument indications. V_1 and V_R speeds should be based upon ground effect calibration data, while V_2 speeds should be based upon free air calibration data. The takeoff speeds associated with the minimum control speeds and the maximum energy absorption capability of the brakes should be included. At the option of the applicant, the AFM may also include the V_1 speeds associated with unbalanced field lengths. At all conditions and airplane configurations represented in the AFM (i.e., at all altitudes, temperatures, weights, winds, runway slopes, flap settings, etc.), the accuracy of the V_1 speed should either: 1) be within 1.5 knots of the V_1 speed used to calculate the takeoff and accelerate-stop distances, or 2) not cause an increase to these distances of more than the greater of 100 feet or the incremental increase resulting from a 1.5 knot variation in V_1 speed.

(7) Takeoff and Accelerate-Stop Distances. Takeoff and accelerate-stop distances, complying with §§ 25.105, 25.109 and 25.113, must be provided. At the option of the applicant, and with concurrence by the FAA, additional data may be provided for operations on other than smooth hard-surfaced runways.

(8) Climb Limited Takeoff Weight. The climb limited takeoff weight, which is the most limiting weight showing compliance with §§ 25.121(a), (b), and (c), must be provided.

(9) Miscellaneous Takeoff Weight Limits. Takeoff weight limits should be shown for any equipment or characteristic of the airplane that imposes an additional takeoff weight restriction (e.g., maximum tire speed, maximum brake energy, fuel jettison considerations, inoperative system(s), etc.).

(10) Takeoff Climb Performance. For the prescribed takeoff climb airplane configurations, the climb gradients must be presented, together with associated conditions. The scheduled climb speed(s) should be included.

(11) Takeoff Flight Path Data. Takeoff flight paths, or performance information necessary to construct such paths, together with the associated conditions (e.g., procedures and speeds), should be presented for each approved takeoff configuration. The presentation should include all flight path segments existing between the end of the takeoff distance and the end of the takeoff path, as defined in § 25.111(a). Such data must be based upon net performance, as prescribed in §§ 25.115(b) and (c).

(12) En Route Flight Path Data. The net flight path gradient data prescribed in § 25.123 must be presented, together with the associated conditions (e.g., procedures and speeds). Data must be presented for both one- and two-engines-inoperative cases, as applicable, throughout the approved operating altitude and temperature envelope.

(13) Climb Limited Landing Weight. The climb limited landing weight, which is the most limiting weight showing compliance with §§ 25.119 and 25.121(d), should be provided.

(14) Miscellaneous Landing Weight Limits. Landing weight limits for any equipment or characteristic of the airplane configuration that imposes an additional landing weight restriction should be shown.

(15) Approach Climb Performance. For the approach climb configuration(s), the climb gradients (§ 25.121(d)) and weights up to maximum takeoff weight (§ 25.1587(b)(3)) should be presented, together with associated conditions (e.g., procedures and speeds). The affects of ice accretion on unprotected portions of the airframe, and the effects of engine and wing ice protection systems should be provided.

(16) Landing Climb Performance. Data for the landing climb configuration(s) should be presented in a manner similar to that described for the approach configuration above.

(17) Landing Approach Speeds. The scheduled speeds associated with the approved landing distances and operational landing runway lengths (see paragraph 2d(18) of this AC) should be presented, together with associated conditions.

(18) Landing Distance. The landing distance from a height of 50 feet must be presented either directly or with the factors required by the operating regulations, together with associated conditions and weights up to the maximum takeoff weight. For all landplanes, landing distance data must be presented for level, smooth, dry, hard-surfaced runways for standard day temperatures. At the option of the applicant, and with concurrence by the FAA, additional data may be presented for other temperatures and runway slopes within the operational limits of the airplane, or for operations on other than smooth hard-surfaced runways. For Category III operations, additional landing performance data may be required.

(19) Performance Limits and Information Variation with Center-of-Gravity. If performance information (e.g., buffet boundary) is not presented for the most critical c.g. condition, the AFM should present the effect of variation with c.g.

(20) Noise Data. The noise levels achieved during type certification in accordance with the provisions of part 36 should be presented, together with associated conditions and with the note prescribed in § 36.1581(c). The noise levels achieved during type certification should be included in the AFM and consist of only one takeoff, one sideline, and one approach noise level for each airplane model (i.e., hardware build). The noise certification stage level should accompany the noise level information to indicate the

compliance status. Supplementary information (labeled as such) may be added to the AFM concerning noise levels for other configurations or conditions.

(21) Miscellaneous Performance Data. Any performance information or data not covered in the previous items that are required for safe operation because of unusual design features or operating or handling characteristics should be furnished. For example, the maximum quick turnaround weight should be provided.

ACJ 25.1587(b)(1):

The bank angle used in showing compliance with JAR 25.121 should be scheduled in the Flight Manual. Where it is more practical to quote the degree of lateral control (e.g. control wheel level) instead of the bank angle, this would be acceptable.

ACJ 25.1587(b)(7):

1 The landing distance from a height of 50 ft determined in accordance with JAR 25.125 should be presented together with associated conditions for weights up to the maximum take-off weight, standard temperature and corrected for not more than 50% of nominal headwind component, and not less than 150% of nominal tailwind component.
2 Data should be presented for level, smooth, dry, hard-surfaced runways. At the option of the applicant, additional data may be presented to show the effect of runway slope and temperature, within the operational limits of the aeroplane.
3 To facilitate application of operating regulations, the landing distance may be presented in the form of the operational or "factored" runway length, using the appropriate factors prescribed by the operating regulations of the state of registry of the aeroplane. The factors applied should be stated together with associated conditions.

What is the proposed action?: Harmonize to the most stringent standard. In general, where the standards are different, the JAR standard more properly reflects current practices and is proposed as the harmonized standard. In areas, where there is a requirement in one standard that does not appear in the other standard, that requirement has been carried over into the proposed harmonized standard. Some minor non-substantive changes are also proposed for editorial reasons.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.1587 :

(a) Each Airplane Flight Manual must contain information to permit conversion of the indicated temperature to free air temperature if other than a free air temperature indicator is used to comply with the requirements of §/JAR 25.1303(a)(1).

(b) Each Airplane Flight Manual must contain the performance information computed under the applicable provisions of this part/JAR-25 (including §/JAR 25.115, 25.123 and 25.125 for the weights, altitudes, temperatures, wind components, and runway gradients, as applicable) within the operational limits of the airplane, and must contain the following:

(1) In each case, the conditions of power, configuration, and speeds, and the procedures for handling the airplane and any system having a significant effect on the performance information.

(2) V_S determined in accordance with §/JAR 25.103.

(3) The following performance information (determined by extrapolation and computed for the range of weights between the maximum landing weight and the maximum takeoff weight):

(i) Climb in the landing configuration.

(ii) Climb in the approach configuration.

(iii) Landing distance.

(4) Procedures established under § 25.101 (f) and (g) that are related to the limitations and information required by §/JAR 25.1533 and by this paragraph in the form of guidance material, including any relevant limitations or information.

(5) An explanation of significant or unusual flight or ground handling characteristics of the airplane.

(6) Corrections to indicated values of airspeed, altitude, and outside air temperature.

(7) An explanation of operational landing runway length factors included in the presentation of the landing distance, if appropriate.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue in the same manner by requiring performance information necessary for airworthiness and operational safety to be furnished in the Airplane Flight Manual

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Although there are differences in wording between the proposed standard and the current FAR, these differences do not materially increase or decrease the level of safety.

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain. The proposed standard is consistent with current practices.

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change; however, there is not expected to be a material effect from this proposed change.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): Existing advisory material is adequate. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

ARAC WG Report

Report from the Flight Test Harmonization Working Group

Rule Section: FAR/JAR 25X1516

What is the underlying safety issue addressed by the FAR/JAR?: There may be speeds above which it is unsafe to extend devices into the air stream, such as spoilers, speed brakes, ram air turbines, thrust reversers, and landing lights, or to open windows or doors. Limitations must be established and made available to the flightcrew to ensure safe operation.

What are the current FAR and JAR standards?: see below

Current FAR text: None.

Current JAR text:

JAR 25X1516 Other speed limitations

Any other limitation associated with speed must be established. (See also ACJ 25X1516.)

What are the differences in the standards and what do these differences result in?: The FAR does not have an explicit requirement to mandate that any other limitation associated with speed be established, while the JAR does. The FAR relies on § 25.1501(a), "Each operating limitation specified in §§25.1503 and 25.1533 **and other limitations and information necessary for safe operation must be established**," to accomplish the same goal. There are no practical differences resulting from the difference in the standards.

What, if any, are the differences in the means of compliance?:

FAA AC 25.1581-1 Airplane Flight Manual

Paragraph 2b(7)(vi)

(vi) Any other limiting speeds for extendable devices other than the landing gear should be included as applicable (e.g., spoilers, thrust reversers, landing lights, ram air turbines (RAT), windows that may be opened in flight, etc.).

ACJ 25X1516

Speed limitations for devices such as spoilers, speed brakes, high lift devices, thrust reversers, landing lights and the opening of doors and direct vision windows, should be included.

What is the proposed action?: Harmonize to the JAR standard.

What should the harmonized standard be?: see below

Proposed text of harmonized standard:

FAR/JAR 25.1516:

Any other limitation associated with speed must be established.

How does this proposed standard address the underlying safety issue?: It continues to address the underlying safety issue by requiring the airspeed limitations to be established for devices that can open into the air stream in flight.

Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain

Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?: Maintain

What other options have been considered and why were they not selected?: This item was proposed as an enveloping item. No other options were considered.

Who would be affected by the proposed change?: Manufacturers and operators of transport category airplanes could be affected by the proposed change. However, since the proposed change does not result in any practical changes in requirements, there will not be any effect.

To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?: None.

Is existing FAA advisory material adequate? (If not, what advisory material should be adopted?): No additional advisory material is needed. The advisory material will be fully harmonized when JAA AMJ 25.1581-1 is published as part of Change 15 to JAR-25. The JAA will delete ACJ 25X1516.

How does the proposed standard compare to the current ICAO standards?: The proposed standards are consistent with, but more detailed than the ICAO standards.

Does the proposed standard affect other harmonization working groups?: No.

What is the cost impact of complying with the proposed standard?: None.

Does the working group want to review the draft NPRM prior to publication in the Federal Register?: Yes.

In light of the information provided in this report, does the HWG consider that the "Fast Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the Fast Track Process. Explain: Yes, the "Fast Track" process is appropriate for this project. The project is neither too complex nor too controversial to use the "Fast Track" process.

FAA Action: 1-g Stall Speed as the Basis for Compliance with Part 25 of the Federal Aviation Regulations; FAA-2002-13982