Federal Aviation Administration – Regulations and Policies
Aviation Rulemaking Advisory Committee

Transport Airplane and Engine Issue Area
Avionics Systems Harmonization Working Group

Task 2 – Cockpit Instrument System

Task Assignment

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

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

AGENCY: Federal Aviation Administration (FAA), DOT.

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

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

FOR FURTHER INFORMATION CONTACT: Stewart R. Miller, Transport Standards Staff (ANM–110), Federal Aviation Administration, 1601 Lind Avenue, SW., Renton, WA 98055–4056; phone (425) 227–1255; 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 Tasks

This notice is to inform the public that the FAA has asked ARAC to provide advice and recommendation on the following harmonization tasks:

Avionics Systems

Task 1: Takeoff Warning System

JAR 25.703(a) is more specific in the requirements than the FAR. The JAR, requires parking brake input, while FAR is silent. Also, the JAR 25.703(b) references guidance material on manual warning deactivation and reset of the warning that needs to be examined, the FAA advisory material generated, and both advisories harmonized.

Task 2: Cockpit Instrument Systems

The wording of 25.1333(b) is different between FAR and JAR, which may lead to interpretation differences. In addition, the existing JAR guidance material needs to be examined and harmonized. Currently, no FAA guidance material exists, therefore, advisory circular will be written. AC/AMJ 25.11 paragraph 4 to be revisited.

The FAA expects ARAC to submit its recommendation(s) by March 31, 2001.

For each of the above tasks the working group is to review airworthiness, safety, cost, and other relevant factors related to the specified differences, including recent certification and fleet experience. Must reach consensus on harmonized Part 25/JAR 25 rule and guidance material.

The FAA also has asked that ARAC prepare the necessary documents, including notice of proposed rulemaking (NPRM) and economic analysis, to justify and carry out its recommendations. If the resulting recommendation is one or more NPRM's published by the FAA, the FAA may ask ARAC to recommend disposition of any substantive comments the FAA receives.

ARAC Acceptance of Tasks

ARAC has accepted the tasks and has chosen to establish a new Avionics Systems Harmonization Working Group. The working group will serve as staff to ARAC to assist ARAC in the analysis of the assigned task. Working group recommendations must be reviewed and approved by ARAC. If ARAC accepts the working group's recommendations, it forwards them to the FAA as ARAC recommendations.

Working Group Activity

The Avionics Systems Harmonization Working Group is expected to comply with the procedures adopted by ARAC. As part of the procedures, the working group is expected to:

1. Recommend a work plan for completion of the task, including the rationale supporting such a plan, for consideration at the meeting of ARAC to consider transport airplane and engine issues held following publication of this notice.

2. Give a detailed conceptual presentation of the proposed recommendations, prior to proceeding with the work stated in item 3 below.

3. Draft appropriate regulatory documents with supporting economic and other required analyses, and/or any other related guidance material or collateral documents the working group determines to be appropriate; or, if new or revised requirements or compliance methods are not recommended, a draft report stating the rationale for not making such recommendations. If the resulting recommendation is one or more notices of proposed rulemaking (NPRM) published by the FAA, the FAA may ask ARAC to recommend disposition of any substantive comments the FAA receives.

4. Provide a status report at each meeting of ARAC held to consider transport airplane and engine issues.

Participation in the Working Group

The Avionics Systems 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 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 November 20, 1998. The requests will be reviewed by the assistant chair and the assistant executive director, and the individuals will be advised whether or not the request can be accommodated.

Individuals chosen for membership on the 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 Avionics Systems Harmonization Working Group

will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of working group meetings will be made.

Issued in Washington, DC, on October 21, 1998.

Joseph A. Hawkins,

Executive Director, Aviation Rulemaking Advisory Committee.

[FR Doc. 98–28757 Filed 10–26–98; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Notice of Intent To Rule on Application To Impose and Use the Revenue From a Passenger Facility Charge (PFC) at Mobile Regional Airport, Mobile, AL

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of intent to rule of application.

SUMMARY: The FAA proposes to rule and invites public comment on the application to Impose And Use the revenue from a PFC at Mobile Regional Airport under the provisions of the Aviation Safety and Capacity Expansion Act of 1990 (Title IX of the Omnibus Budget Reconciliation Act of 1990) (Pub. L. 101–508) and Part 158 of the Federal Aviation Regulations (14 CFR Part 158).

DATES: Comments must be received on or before November 27, 1998.

ADDRESSES: Comments on this application may be mailed or delivered in triplicate to the FAA at the following address: FAA Airports District Office, 120 North Hangar Driver, Suite B, Jackson, MS 39208–2306.

In addition, one copy of any comments submitted to the FAA must be mailed or delivered to Mobile Regional Airport, Mr. Roger Engstrom, Director of Aviation, of the Mobile Airport Authority at the following address: Mobile Airport Authority, P.O. Box 88004, Mobile, Alabama 36608–0004.

Air carriers and foreign air carriers may submit copies of written comments previously provided to the Mobile Airport authority under section 158.23 of Part 158.

FOR FURTHER INFORMATION CONTACT: Keafur Grimes, Program Manager, Jackson, Airports District Office, 120 North Hangar Drive, Suite B, Jackson, Mississippi 39208–2306, telephone number 601–965–4628. The application may be reviewed in person at this same location.

SUPPLEMENTARY INFORMATION: The FAA proposes to rule and invites public comment on the application to impose and use the revenue from a PFC at Mobile Regional Airport under the provisions of the Aviation Safety and Capacity Expansion Act of 1990 (Title IX of the Omnibus budget Reconciliation Act of 1990) (Public Law 101–508) and part 158 of the Federal Aviation Regulations (14 CFR Part 158).

On September 29, 1998, the FAA determined that the application to Impose and Use the revenue from a PFC submitted by Mobile Airport Authority was substantially complete within the requirements of section 158.25 of Part 158. The FAA will approve or disapprove the application, in whole or in part, no later than January 21, 1988.

The following is a brief overview of the application. PFC Application No. 98–02–C–00–MOB.

Level of the proposed PFC: $3.00.

Proposed charge effective date: May 1, 1999.

Proposed charge expiration date: August 30, 1999.

Total estimated PFC revenue: $445,000.

Brief description of proposed project(s): Elevator; Baggage claim display; and Terminal seating.

Class or classes of air carriers which the public agency has requested not be required to collect PFCs: Air Taxi/Commercial operators (ATCO) filing FAA Form 1800–31.

Any person may inspect the application in person at the FAA office listed above under **FOR FURTHER INFORMATION CONTACT.** In addition, any person may, upon request, inspect the application, notice and other documents germane to the application in person at the Mobile Airport Authority.

Issued in Jackson, Mississippi on October 5, 1998.

Wayne Atkinson,

Manager, Jackson Airports District Office, Southern Region.

[FR Doc. 98–28752 Filed 10–26–98; 8:45 am]

BILLING CODE 4910–13–M

Recommendation Letter

ACTION: MKM

Pratt & Whitney
400 Main Street
East Hartford, CT 06108

Pratt & Whitney
A United Technologies Company

December 14, 1999

Department of Transportation
Federal Aviation Administration
800 Independence Ave, SW
Washington, D.C. 20591

Attention: Mr. Tom McSweeny, Associate Administrator for Regulation and Certification

Reference: ARAC Tasking, Federal Register, November 26, 1999

Dear Tom,

In accordance with the reference tasking statement, the ARAC Transport Airplane and Engine Issues Group is pleased to forward the attached technical reports which provide ARAC recommendations for FAR/JAR harmonization of the following rules:

25.703(a)(b)(c) – Takeoff Warning System – ANM-99-017-A -TASK #1
25.1333(b) – Instrument Systems – ANM-99-018-A -TASK #2
25.1423(b) – Public Address System – ANM-00-092-A
TRANS TO FLIGHT TEST HWG NOW ANM-00-208-A

These reports have been prepared by the Avionics System Harmonization Working Group of the TAEIG.

Sincerely,

Craig R. Bolt

C. R. Bolt
Assistant Chair, TAEIG
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Email: boltcr@pweh.com

cc: Dorenda Baker – FAA-NWR*
Tony Fazio – FAA. ARM-1*
Kristin Larson – FAA-NWR
Vid Variakojis, Boeing*
*(letter only)

Acknowledgement Letter

MAR 15 2000

Mr. Craig Bolt
Assistant Chair, Transport Airplanes
and Engines Issues Group
400 Main Street
East Hartford, CT 06108

Dear Mr. Bolt:

This letter acknowledges receipt of the following working group technical reports that you have submitted on behalf of the Aviation Rulemaking Advisory Committee (ARAC) on Transport Airplane and Engine Issues (TAE):

Date of Letter	Task No.	Description of Recommendation	Working Group
12/14/00	1, 2, 3	Fast track reports addressing §§ 25.703(a) thru (c) (takeoff warning system); 25.1333(b) (instrument systems; and 25.1423(b) (public address system)	ASHWG
12/17/00	5	Fast track reports addressing §§ 25.111(c)(4), 25.147, controllability in 1-engine inoperative condition; 25.161 (c) (2) and (4), and (e) (longitudinal trim and airplanes with 4 or more engines) 25.175(d) (static longitudinal stability; 25.177(a)(b) (static lateral-directional stability); 25.253(a)(3) (high speed characteristics); 25.1323(c) (airspeed indicating system); 25.1516 (landing gear speeds); 25.1527 (maximum operating altitude); 25.1583(c) and (f) operating limitations) 25.1585 (operating procedures); and 25.1587 (performance information)	FTHWG
12/17/00	7	Fast track report addressing § 25.903(e) (inflight engine failures)	PPIHWG

12/20/00	5	Fast track reports addressing §§ 25.1103 (auxiliary power units); 25.933(a) (thrust reverers); 25.1189 (shutoff means); 25.1141 (powerplant controls); 25.1093 (air intake/induction systems); 25.1091 (air intake system icing protection; 25.943 (thrust reverser system tests); 25.934 (negative acceleration); 25.905(d) (propeller blade debris); 25.903(d)(1) (engine case burn-through); 25.901(d) (auxiliary power unit installation; and 1.1 (general definitions)	PPIHWG
12/20/00	4	Fast track report, category 2 format--NRRM addressing § 25.302 and appendix K (interaction of systems and structures	LDHWG
12/20/00	2	Fast track report—(in NPRM/AC format) addressing §§ 25.361 and 25.362 (engine and auxiliary power unit load conditions)	LDHWG
12/20/00	1	Fast track report addressing § 25.1438 (pressurization and low pressure pneumatic systems)	MSHWG

The above listed reports will be forwarded to the Transport Airplane Directorate for review. The Federal Aviation Administration's (FAA) progress will be reported at the TAE meetings.

This letter also acknowledges receipt of your July 28, 1999, submittal which included proposed notices and advisory material addressing lightning protection. We apologize for the delay. Although the lightning protection task is not covered under the fast track proposal, the FAA recognizes that technical agreement has been reached and we will process the package accordingly. The package has been sent to Aircraft Certification for review; the working group will be kept informed of its progress through the FAA representative assigned to the group.

Lastly, at the December 8 - 9, 1999, TAE meeting, Mr. Phil Salee of the Powerplant Installation Harmonization Working Group indicated that the working group members agreed that § 25.1103 was sufficiently harmonized and that any further action was beyond the scope of task 8 assigned. We agreed with the TAE membership to close the task. This letter confirms the FAA's action to close the task to harmonize § 25.1103.

Recommendation

FAR/JAR 25.1423 Public Address System
(FINAL REPORT)

A. FAR 25.1423 (b)

1. What is the underlying safety issue addressed by FAR/JAR?
Assures system's operational availability within specified time for passenger announcements in the event of an emergency situation.

2. What are current FAR and JAR standards?
FAR 25.1423 (b):
Be capable of operation within 10 seconds by a flight attendant at those stations in the passenger compartment from which the system is accessible.

JAR 25.1423 (b):
The system must be capable of operation within 3 seconds from the time a microphone is removed from its stowage by a flight attendant at those stations in the passenger compartment from which its use is accessible.

3. What are the differences in the standards?
The JAR requirement is very specific in that the system must be operational within 3 seconds from the time the flight attendant removes the microphone from its stowage position. The FAR specifies that the system must be operational within 10 seconds. The FAR requirement does not specify the start of the 10-second time period.

4. What, if any, are the differences in required means of compliance?
Demonstration wise there is no difference. However, for a system to be approved under the JAR requirements it must operate within the 3 seconds from the time the microphone is removed from its stowed position. Conversely, the system can be approved under the FAR requirements if it is operational within 10 seconds by a flight attendant at those stations in the passenger compartment from which its use is accessible. Currently, the technology, which is used in the amplifiers for the public address system, is compliant with the 3 seconds delay requirement. The old vacuum tube technology needed heating and by consequence more time to operate. From now on, the 3 seconds delay is acceptable.

5. What is the proposed action?
The JAR requirement is more stringent, therefore, envelop on the JAR.

6. What should the harmonized standard be?
The system must be capable of operation within 3 seconds from the time a microphone is removed from its stowage by a flight attendant at those stations in the passenger compartment from which its use is accessible.

7. How does this proposed standard address the underlying safety issue (identified in #1)?

Same as Item #1 above.

8. **Relative to current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?**
The proposed standard maintains the level of safety. Clarifies the requirement.

9. **Relative to current industry practice, does the proposed standard increase, decrease, or maintains the same level of safety?**
For the systems that are designed to meet both the FAR/JAR requirements, the safety level remains the same. For the systems that were designed only to meet the FAR requirement, the safety level may be increased.

10. **What other options have been considered and why were they not selected?**
None.

11. **Who would be affected by the proposed change?**
Potentially some equipment manufacturers may be affected. For new equipment it is not a problem. Similar requirements exist in the FAR 121.318 and may need to be examined.

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

13. **Is existing FAA advisory material adequate?**
Not applicable

14. **If not, what advisory material should be adopted?**
Not applicable

15. **How does the proposed standard affect the current ICAO standard?**
The AVHWG is not aware of any existing ICAO standards.

16. **How does the proposed standard affect other HWG's?**
No effect.

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

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
No.

19. **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?**
The project can be worked under the "Fast Track" process.

FAR/JAR 25.703
(FINAL REPORT)

A. FAR 25.703(a)

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

This requirement ensures that an aural warning is given, during the initial portion of the takeoff, if the airplane is not in proper configuration to allow a safe takeoff. The intent of this rule is to require that the takeoff configuration warning system cover only those configurations that may be unsafe.

2. What are current FAR and JAR standards?

Current FAR text:

(a) The system must provide to the pilots an aural warning that is automatically activated during the initial portion of the takeoff roll if the airplane is in a configuration, including any of the following, that would not allow a safe takeoff:

(1) The wing flaps or leading edge devices are not within the approved range of takeoff positions

(2) Wing spoilers (except lateral control spoilers meeting the requirements of 25.671) speed brakes, or longitudinal trim devices are in a position that would not allow a safe takeoff.

Current JAR text:

(a) The system must provide to the pilots an aural warning that is automatically activated during the initial portion of the takeoff roll if the airplane is in a configuration, including any of the following, that would not allow a safe takeoff:

(1) The wing flaps or leading edge devices are not within the approved range of takeoff positions

(2) Wing spoilers (except lateral control spoilers meeting the requirements of 25.671) speed brakes, or longitudinal trim devices are in a position that would not allow a safe takeoff.

(3) The parking brake is unreleased

3. **What are the differences in the standards?**
The JAR requires one additional input into the warning system: the parking brake. This requirement will increase the margin for safe takeoff, under some runway conditions, if the parking brake remains on. The difference between the FAR and the JAR standards only affect airplanes that do not presently have the parking brake input. Examples of airplanes affected are Raytheon Aircraft models: Beachjet 400/400A, Hawker 800 (800/800XP).

4. **What, if any, are the differences in required means of compliance?**
None

5. **What is the proposed action?**
Envelope the JAR requirement

6. **What should the harmonized standard be?**
The FAR/JAR 25.703(a) should read as follows –

(a) The system must provide to the pilots an aural warning that is automatically activated during the initial portion of the takeoff roll if the airplane is in a configuration, including any of the following, that would not allow a safe takeoff:
   (1) The wing flaps or leading edge devices are not within the approved range of takeoff positions
   (2) Wing spoilers (except lateral control spoilers meeting the requirements of 25.671) speed brakes, or longitudinal trim devices are in a position that would not allow a safe takeoff.
   (3) The parking brake is unreleased

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
The proposed standard continues to address the underlying issue by requiring additional input into the takeoff warning system. If the parking brake is not released, the aircraft, under certain conditions, may not achieve takeoff speed for the runway length used.

8. **Relative to current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?**
The proposed standard increases the level of safety.

9. **Relative to current industry practice, does the proposed standard increase, decrease, or maintains the same level of safety?**
For FAA and JAA certifications the current industry practice for transport category airplanes is to comply with the proposed standard. Maintains the current safety level.

10. **What other options has been considered and why were they not selected?**
None in this case, current industry standard has the parking brake input.

11. **Who would be affected by the proposed change?**
Manufacturers of transport category airplanes and avionics manufacturers would be affected.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
The currently available advisory material does not need to be included in the rule text or the preamble.

13. **Is existing FAA advisory material adequate?**
The existing AC 25.703-1 Takeoff Configuration Warning Systems should be revised to include the reference to the parking brake requirement.

14. **If not, what advisory material should be adopted?**
None additional

15. **How does the proposed standard affect the current ICAO standard?**
The AVHWG is not aware of any ICAO standards in this specific area.

16. **How does the proposed standard affect other HWG's?**
No effect.

17. **What is the cost impact of complying with the proposed standard?**
The new airplanes comply with the proposed standard; therefore, there is no cost impact.

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
If accepted and published as proposed, NO.

19. **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?**
The project falls within the "Fast Track" concept for enveloping.

B. FAR 25.703(b)

1 **What is the underlying safety issue addressed by FAR/JAR?**
This requirement ensures that there is continuous aural warning during the initial portion of the takeoff when the airplane is not in the proper configuration to allow a safe takeoff.

2 **What are current FAR and JAR standards?**

Current FAR text:

b) The warning required by paragraph (a) of this section must continue until-
(1) The takeoff configuration is changed to allow a safe takeoff;
(2) Action is taken is taken by the pilot to terminate the takeoff roll;
(3) The airplane is rotated for takeoff; or
(4) The warning is manually deactivated by the pilot.

Current JAR text:

(b) The warning required by paragraph (a) of this section must continue until-
(1) The takeoff configuration is changed to allow a safe takeoff;
(2) Action is taken is taken by the pilot to terminate the takeoff roll;
(3) The airplane is rotated for takeoff; or
(4) The warning is manually deactivated by the pilot. (See ACJ 25.703 (b)(4).)

3 What are the differences in the standards?
The JAR references an ACJ 25.703 which has some additional information that can be interpreted as a requirement.

4. What, if any, are the differences in required means of compliance?
None.

5. What is the proposed action?
Harmonize on one standard by deleting the reference to ACJ 25.703(b)(4) in the JAR and by adding a new paragraph (c) incorporating the ACJ requirements. Existing paragraph (c) is changed to paragraph (d).

6. What should the harmonized standard be?
The FAR/JAR 25.703 (b) --

(b) The warning required by paragraph (a) of this section must continue until-
(1) The takeoff configuration is changed to allow a safe takeoff;
(2) Action is taken by the pilot to terminate the takeoff roll;
(3) The airplane is rotated for takeoff; or
(4) The warning is manually silenced by the pilot. The means to silence the warning must not be readily available to the flight crew such that it could be operated instinctively, inadvertently, or by habitual reflexive action. Before each takeoff, the warning must be rearmed automatically, or manually if the absence of automatic rearming is clear and unmistakable..

7. How does this proposed standard address the underlying safety issue (identified in #1)?
Same as before. (See item #1).

8. **Relative to current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?**
Increases the level of safety by requiring rearming features.

9. **Relative to current industry practice, does the proposed standard increase, decrease, or maintains the same level of safety?**
Same.

10. **What other options have been considered and why were they not selected?**
None in this case. Current industry practice has the rearming feature.

11. **Who would be affected by the proposed change?**
No one.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
The JAA ACJ 25.703(b)(4) needs to be included in the rule.

13. **Is existing FAA advisory material adequate?**
AC 25.703-1 should be revised to better define the "not readily available" requirement to the applicant and include flight evaluation for re-arming and silencing. See proposed AC revisions.

14. **If not, what advisory material should be adopted?**
See #13 above.

15. **How does the proposed standard affect the current ICAO standard?**
. The AVHWG is not aware of any ICAO standards in this specific area

16. **How does the proposed standard affect other HWG's?**
No effect.

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

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
If accepted and published as proposed, NO.

19. **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?**
The project falls within the "Fast Track" concept for enveloping.

C. FAR 25.703 (c)

1. **What is the underlying safety issue addressed by FAR/JAR?**
This requirement ensures that there is a warning for all takeoff configurations for which the airplane is certified.

2. **What are current FAR and JAR standards?**

Current FAR text:

(c) The means used to activate the system must function properly throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested

Current JAR text:

(c) The means used to activate the system must function properly for all authorised takeoff power settings and procedures, and throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested.

3. **What are the differences in the standards?**
The JAR includes in the requirement that the warning system must function at all power settings and takeoff procedures for which the certification is requested. The FAR is silent in those areas.

4. **What, if any, are the differences in required means of compliance?**
None. The applicant must show to the FAA that the system is operational at all power settings and procedures.

5. **What is the proposed action?**
Envelope on JAR

6. **What should the harmonized standard be?**

The FAR/JAR 25.703(c) should read as follows

(c) The means used to activate the system must function properly for all authorized takeoff power settings and procedures, and throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested.

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
   There is no change, since the requirements did not change, only clarification

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

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

10. **What other options have been considered and why were they not selected?**
    None.

11. **Who would be affected by the proposed change?**
    No one.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
    The currently available advisory material does not need to be included in the rule text or the preamble.

13. **Is existing FAA advisory material adequate?**
    The existing FAA advisory material is adequate.

14. **If not, what advisory material should be adopted?**
    None for this paragraph.

15. **How does the proposed standard affect the current ICAO standard?**
    The AVHWG is not aware of any ICAO standards in this specific area

16. **How does the proposed standard affect other HWG's?**

No other HWG's affected

17. **What is the cost impact of complying with the proposed standard?**
No change from present

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
If accepted and published as proposed, NO.

19. **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?**

The project falls within the "Fast Track" concept for enveloping.

FAR/JAR 25.1333 (b)

(Final Report)

A. FAR 25.1333(b)

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

The requirement ensures that there is sufficient information to the flight crew for safe control of the airplane in the event of a failure condition. It also ensures that the crew work load will not be increased by requiring that essential information to be present without additional crew action.

2. What are current FAR and JAR standards?

Current FAR 25,1333(b):

(b) The equipment, systems, and installations must be designed so that one display of the information essential to the safety of flight which is provided by the instruments, including attitude, direction, airspeed, and altitude will remain available to the pilots, without additional crew member action, after any single failure or combination of failures that is not shown to be extremely improbable; and

Current JAR 25.1333(b):

(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the aeroplane in speed, altitude, heading and attitude by one of the pilots without immediate crew action, after any single failure or combination of failures that is not assessed to be extremely improbable (see ACJ 25.1333(b)); and

3. What are the differences in the standards?

a. The FAR requires one display of the essential information required for safe flight (attitude, direction airspeed, and altitude) while the JAR asks for sufficient information to assure control of attitude, direction, airspeed, and altitude.

b. The JAR language replaces the word "additional" in phrase "without additional crew action" with the word "immediate" implying that some later crew member action is possible.

c. The FAR uses "direction" while the JAR uses "heading".

4. What, if any, are the differences in required means of compliance?

a. The JAA may require to demonstrate what is the sufficient information required to assure control of the airplane in attitude, direction, airspeed, and altitude.

b. The FAA requires an analysis to show compliance, while the JAA may accept a combination of analysis and/or demonstration.

FAR/JAR 25.1333 (b)

(Final Report)

A. FAR 25.1333(b)

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

The requirement ensures that there is sufficient information to the flight crew for safe control of the airplane in the event of a failure condition. It also ensures that the crew work load will not be increased by requiring that essential information to be present without additional crew action.

2. What are current FAR and JAR standards?

Current FAR 25,1333(b):

(b) The equipment, systems, and installations must be designed so that one display of the information essential to the safety of flight which is provided by the instruments, including attitude, direction, airspeed, and altitude will remain available to the pilots, without additional crew member action, after any single failure or combination of failures that is not shown to be extremely improbable; and

Current JAR 25.1333(b):

(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the aeroplane in speed, altitude, heading and attitude by one of the pilots without immediate crew action, after any single failure or combination of failures that is not assessed to be extremely improbable (see ACJ 25.1333(b)); and

3. What are the differences in the standards?

a. The FAR requires one display of the essential information required for safe flight (attitude, direction airspeed, and altitude) while the JAR asks for sufficient information to assure control of attitude, direction, airspeed, and altitude.

b. The JAR language replaces the word "additional" in phrase "without additional crew action" with the word "immediate" implying that some later crew member action is possible.

c. The FAR uses "direction" while the JAR uses "heading".

4. What, if any, are the differences in required means of compliance?

a. The JAA may require to demonstrate what is the sufficient information required to assure control of the airplane in attitude, direction, airspeed, and altitude.

b. The FAA requires an analysis to show compliance, while the JAA may accept a combination of analysis and/or demonstration.

5. **What is the proposed action?**
Envelope on the FAR/JAR; use the JAR words modified to include the FAR statement "without additional crew action". Also change "speed" to "airspeed".

6. **What should the harmonized standard be?**
(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the airplane airspeed, altitude, heading, and attitude by one of the pilots without additional crew member action, after any single failure or combination of failures that is not assessed to be extremely improbable;
and

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
Same as stated on #1 above.

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

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

10. **What other options have been considered and why were they not selected?**
The FAR words were considered. However, the proposed wording permits better flexibility in light of the new technologies while maintaining the same safety level.

11. **Who would be affected by the proposed change?**
Non FAA certificated systems.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
The AC/AMJ 25-11 and ACJ 25.1333 needs to be reviewed. A harmonized AC/ACJ needs to be developed.

13. **Is existing FAA advisory material adequate?**
See #12 above.

14. **If not, what advisory material should be adopted?**
See #12 above.

15. **How does the proposed standard affect the current ICAO standard?**
The AVHWG is not aware of any..

16. **How does the proposed standard affect other HWG's?**
    None affected.

17. **What is the cost impact of complying with the proposed standard?**
    None if the system complies with the FAA requirements.

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
    Yes.

19. **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?**
    This project is appropriate for the "Fast Track" process.

ANM-99-018-A

FAR/JAR 25.1333 (b)
Avionics Harmonization Working Group
Final Report / Issue 2

(as agreed in AVHWG Meeting #4 in Toulouse on January 13, 2000)

TAE
Avionics System
H WG

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

The requirement ensures that there is sufficient information to the flight crew for safe control of the airplane in the event of a failure condition. It also ensures that the crew work load will not be increased by requiring that essential information to be present without additional crew action.

2. What are current FAR and JAR standards?

Current FAR 25,1333(b):

(b) The equipment, systems, and installations must be designed so that one display of the information essential to the safety of flight which is provided by the instruments, including attitude, direction, airspeed, and altitude will remain available to the pilots, without additional crew member action, after any single failure or combination of failures that is not shown to be extremely improbable; and . . .

Current JAR 25.1333(b):

(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the aeroplane in speed, altitude, heading and attitude by one of the pilots without immediate crew action, after any single failure or combination of failures that is not assessed to be extremely improbable (see ACJ 25.1333(b)); and. . .

3. What are the differences in the standards?

The FAR requires one display of the essential information required for safe flight (attitude, direction airspeed, and altitude), while the JAR asks for sufficient information to assure control of attitude, direction, airspeed, and altitude.

The JAR language replaces the word "*additional*" in the phrase "without additional crew action" with the word "*immediate*," implying that some later crew member action is possible.

The FAR uses the term "*direction,*" while the JAR uses "*heading.*"

4. What, if any, are the differences in required means of compliance?

a. The JAA may require demonstration of the *sufficient information* necessary to assure control of the airplane in attitude, direction, airspeed, and altitude.

b. The FAA requires an analysis to show compliance, while the JAA may accept a combination of analysis and/or demonstration.

5. What is the proposed action?

Envelope on the FAR/JAR; use the JAR words modified to include the FAR statement "without additional crew action".

6. What should the harmonized standard be?

"(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the airplane in airspeed, altitude, direction, and attitude by one of the pilots without additional crew member action, after any single failure or combination of failures that is not assessed to be extremely improbable; and . . ."

7. How does this proposed standard address the underlying safety issue (identified in #1)?

Same as stated on #1, above.

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

Maintains the same level of safety.

9. Relative to current industry practice, does the proposed standard increase, decrease, or maintains the same level of safety?

Maintains the same level of safety.

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

The FAR words were considered. However, the proposed wording permits better flexibility in light of the new technologies while maintaining the same safety level.

The group considered both terms "direction" and "heading" for the harmonized FAR/JAR, taking into consideration both the conventional display methods and possible future display methods developed to control the aircraft.

As a starting point we reviewed the definition of direction – "The course by which something moves, lies, or points." This implies that heading is ONE FORM of direction, but not necessarily the only form. Graphical representation of aircraft direction is becoming more widespread, and may provide better situational awareness than today's conventional representation using heading as a primary or only direction source. Other information sources (position, database information, and inertial velocities) may provide more accurate and more integrated representations of aircraft direction, possibly resulting in more accurate control.

In addition, the word "direction indicator" is used in other FAR/JAR material, most notably 25.1303 which identifies required instruments. The existing FAR 25.1333(b) includes the word "direction." Admittedly, many parenthetical and other comments within the FAR/JAR, as well as historical applications, imply a gyroscopically stabilized (or heading) indicator, but the sole use of "heading" becomes more restrictive, possibly preventing the implementation of novel and improved design features intended for safer operation of the aircraft. Therefore, the group's position is to maintain the existing FAR wording of "direction."

11. Who would be affected by the proposed change?

Airplane and airplane systems manufacturers. Non-FAA-certificated systems.

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

The AC/AMJ 25-11 and ACJ 25.1333 needs to be reviewed. A harmonized AC/ACJ needs to be developed. *[PER 1/00 TAE MEETING: Working Group is developing AC material – expected Spring 2000.]*

13. Is existing FAA advisory material adequate?

See #12 above.

14. If not, what advisory material should be adopted?

See #12 above.

15. How does the proposed standard affect the current ICAO standard?

The AVHWG is not aware of any..

16. How does the proposed standard affect other HWG's?

None affected.

17. What is the cost impact of complying with the proposed standard?

None, if the system complies with the FAA requirements.

18. Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?

Yes.

19. 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?

This project is appropriate for the "Fast Track" process.

■

Recommendation Letter

Action ARM

400 Main Street
East Hartford, Connecticut 06108

Pratt & Whitney
A United Technologies Company

April 4, 2000

Rec for #2

Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Attention: Mr. Thomas McSweeny, Associate Administrator for Regulation and Certification

Subject: ARAC Recommendations

Reference: 1) ARAC Tasking, Federal Register, November 19, 1999
2) TAEIG letter to FAA, Transmittal of ARAC Recommendations for 25.703 and 25.1333b, dated December 14, 1999

Dear Tom,

The Transport Airplane and Engine Issues Group is pleased to submit the following "Fast Track" reports as recommendations in accordance with the Reference 1 tasking. These reports have been prepared by the Avionics Harmonization Working Group.

Task 1 Takeoff Warning System ANM-99-067-A

- FAR 25.703 - Note report previously submitted per Reference 2 but has been modified to include recommended advisory material.

Task 2 Cockpit instrument systems

- FAR 25.1333(b) - Note report previously submitted per Reference 2 but has been modified to clarify terminology.

Task 3

- FAR 25.1331 (a)(2) and (a)(3). ANM-00-092-A instruments using a power supply

Sincerely yours,

Craig R. Bolt

Craig R. Bolt
Assistant Chair, TAEIG

Attachments

Copy: Kris Carpenter, FAA-NWR
*Clark Badie, Honeywell
*Effie Upshaw, FAA Washington, DC

*letter only

CRB06_040400

Recommendation

FAR/JAR 25.703

(FINAL REPORT) issue 2

(as agreed in AVHWG meeting#4 in Toulouse on jan.13th 2000)

A. FAR 25.703(a)

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

This requirement ensures that an aural warning is given, during the initial portion of the takeoff, if the airplane is not in proper configuration to allow a safe takeoff. The intent of this rule is to require that the takeoff configuration warning system cover only those configurations that may be unsafe.

2. What are current FAR and JAR standards?

Current FAR text:

(a) The system must provide to the pilots an aural warning that is automatically activated during the initial portion of the takeoff roll if the airplane is in a configuration, including any of the following, that would not allow a safe takeoff:

(1) The wing flaps or leading edge devices are not within the approved range of takeoff positions.

(2) Wing spoilers (except lateral control spoilers meeting the requirements of 25.671) speed brakes, or longitudinal trim devices are in a position that would not allow a safe takeoff.

Current JAR text:

(a) The system must provide to the pilots an aural warning that is automatically activated during the initial portion of the takeoff roll if the airplane is in a configuration, including any of the following, that would not allow a safe takeoff:

(1) The wing flaps or leading edge devices are not within the approved range of takeoff positions.

(2) Wing spoilers (except lateral control spoilers meeting the requirements of 25.671) speed brakes, or longitudinal trim devices are in a position that would not allow a safe takeoff.

(3) The parking brake is unreleased

3. **What are the differences in the standards?**
The JAR requires one additional input into the warning system: the parking brake. This requirement will increase the margin for safe takeoff, under some runway conditions, if the parking brake remains on. The difference between the FAR and the JAR standards only affect airplanes that do not presently have the parking brake input. Examples of airplanes affected are Raytheon Aircraft models: Beeachjet 400/400A, Hawker 800 (800/800XP).

4. **What, if any, are the differences in required means of compliance?**
None

5. **What is the proposed action?**
Envelope the JAR requirement

6. **What should the harmonized standard be?**
The FAR/JAR 25.703(a) should read as follows –

(a) The system must provide to the pilots an aural warning that is automatically activated during the initial portion of the takeoff roll if the airplane is in a configuration, including any of the following, that would not allow a safe takeoff:
   (1) The wing flaps or leading edge devices are not within the approved range of takeoff positions
   (2) Wing spoilers (except lateral control spoilers meeting the requirements of 25.671) speed brakes, or longitudinal trim devices are in a position that would not allow a safe takeoff.
   (3) The parking brake is unreleased

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
The proposed standard continues to address the underlying issue by requiring additional input into the takeoff warning system. If the parking brake is not released, the aircraft, under certain conditions, may not achieve takeoff speed for the runway length used.

8. **Relative to current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?**
The proposed standard increases the level of safety.

9. **Relative to current industry practice, does the proposed standard increase, decrease, or maintains the same level of safety?**
For FAA and JAA certifications the current industry practice for transport category airplanes is to comply with the proposed standard. Maintains the current safety level.

10. **What other options has been considered and why were they not selected?**
None in this case, current industry standard has the parking brake input.

11. **Who would be affected by the proposed change?**
Manufacturers of transport category airplanes and avionics manufacturers would be affected.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
The currently available advisory material does not need to be included in the rule text or the preamble.

13. **Is existing FAA advisory material adequate?**
The existing AC 25.703-1 Takeoff Configuration Warning Systems should be revised to include the reference to the parking brake requirement.(see attached document: AC 25.703 revised by AVHWG on Jjanuary 12th 2000)

14. **If not, what advisory material should be adopted?**
None additional

15. **How does the proposed standard affect the current ICAO standard?**
The AVHWG is not aware of any ICAO standards in this specific area.

16. **How does the proposed standard affect other HWG's?**
No effect.

17. **What is the cost impact of complying with the proposed standard?**
The new airplanes comply with the proposed standard; therefore, there is no cost impact.

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
If accepted and published as proposed, NO.

19. **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?**
The project falls within the "Fast Track" concept for enveloping.

B. FAR 25.703(b)

1 **What is the underlying safety issue addressed by FAR/JAR?**
This requirement ensures that there is continuous aural warning during the initial portion of the takeoff when the airplane is not in the proper configuration to allow a safe takeoff.

2 **What are current FAR and JAR standards?**

Current FAR text:

b) The warning required by paragraph (a) of this section must continue until-
(1) The takeoff configuration is changed to allow a safe takeoff;
(2) Action is taken is taken by the pilot to terminate the takeoff roll;
(3) The airplane is rotated for takeoff; or
(4) The warning is manually deactivated by the pilot.

Current JAR text:

(b) The warning required by paragraph (a) of this section must continue until-

(1) The takeoff configuration is changed to allow a safe takeoff;
(2) Action is taken is taken by the pilot to terminate the takeoff roll;
(3) The airplane is rotated for takeoff; or
(4) The warning is manually deactivated by the pilot. (See ACJ 25.703 (b)(4).)

3 What are the differences in the standards?

The JAR references an ACJ 25.703 which has some additional information that can be interpreted as a requirement.

4. What, if any, are the differences in required means of compliance?

None.

5. What is the proposed action?

Harmonize on one standard by deleting the reference to ACJ 25.703(b)(4) in the JAR and by ~~adding a new paragraph (c) incorporating the ACJ requirements. Existing paragraph (c) is changed to paragraph (d).~~rewording (b)(4) to incorporate the ACJ requirements. The word "aural" is added before "warning" to avoid the interpretation that a continuous visual warning is sufficient.

6. What should the harmonized standard be?

The FAR/JAR 25.703 (b) --

(b) The aural warning required by paragraph (a) of this section must continue until-

(1) The takeoff configuration is changed to allow a safe takeoff;
(2) Action is taken by the pilot to terminate the takeoff roll;
(3) The airplane is rotated for takeoff; or
(4) The warning is manually silenced by the pilot. The means to silence the warning must not be readily available to the flight crew such that it could be operated instinctively, inadvertently, or by habitual reflexive action. Before each takeoff, the warning must be rearmed automatically, or manually if the absence of automatic rearming is clear and unmistakable..

7. How does this proposed standard address the underlying safety issue (identified in #1)?

Same as before. (See item #1).

8. **Relative to current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?**
Increases the level of safety by requiring rearming features.

9. **Relative to current industry practice, does the proposed standard increase, decrease, or maintains the same level of safety?**
Same.

10. **What other options have been considered and why were they not selected?**
None in this case. Current industry practice has the rearming feature.

11. **Who would be affected by the proposed change?**
No one.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
The JAA ACJ 25.703(b)(4) needs to be included in the rule.

13. **Is existing FAA advisory material adequate?**
AC 25.703-1 should be revised to better define the "not readily available" requirement to the applicant and include flight evaluation for re-arming and silencing. See proposed AC revisions.

14. **If not, what advisory material should be adopted?**
See #13 above.

15. **How does the proposed standard affect the current ICAO standard?**
. The AVHWG is not aware of any ICAO standards in this specific area

16. **How does the proposed standard affect other HWG's?**
No effect.

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

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**

If accepted and published as proposed, NO.

19. **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?**
The project falls within the "Fast Track" concept for enveloping.

C. FAR 25.703 (c)

1. **What is the underlying safety issue addressed by FAR/JAR?**
This requirement ensures that there is a warning for all takeoff configurations for which the airplane is certified.

2. **What are current FAR and JAR standards?**

Current FAR text:

(c) The means used to activate the system must function properly throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested

Current JAR text:

(c) The means used to activate the system must function properly for all authorizsed takeoff power settings and procedures, and throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested.

3. **What are the differences in the standards?**
The JAR includes in the requirement that the warning system must function at all power settings and takeoff procedures for which the certification is requested. The FAR is silent in those areas.

4. **What, if any, are the differences in required means of compliance?**
None. The applicant must show to the FAA that the system is operational at all power settings and procedures.

5. **What is the proposed action?**
Envelope on JAR

6. **What should the harmonized standard be?**
   The FAR/JAR 25.703(c) should read as follows

   (c) The means used to activate the system must function properly for all authorized takeoff power settings and procedures, and throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested.

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
   There is no change, since the requirements did not change, only clarification

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

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

10. **What other options have been considered and why were they not selected?**
    None.

11. **Who would be affected by the proposed change?**
    No one.

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
    The currently available advisory material does not need to be included in the rule text or the preamble.

13. **Is existing FAA advisory material adequate?**
    The existing FAA advisory material is adequate.

14. **If not, what advisory material should be adopted?**
    None for this paragraph.

15. **How does the proposed standard affect the current ICAO standard?**
    The AVHWG is not aware of any ICAO standards in this specific area

16. **How does the proposed standard affect other HWG's?**
    No other HWG's affected

17. **What is the cost impact of complying with the proposed standard?**
    No change from present

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
    If accepted and published as proposed, NO.

19. **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?**

    The project falls within the "Fast Track" concept for enveloping.

(as agreed in AVHWG meeting#4 in Toulouse on jan,13th 2000)

~~As agreed in AVHWG Meeting #3, 9/29/99, Phoenix~~
AC/AMJ 25.703: TAKEOFF CONFIGURATION WARNING SYSTEMS

~~Initiated by: ANM-110~~
~~Date: 3/17/93~~

1. PURPOSE. This ~~advisory circular (~~AC/AMJ~~)~~ provides guidance for the certification of takeoff configuration warning systems installed in transport category airplanes. Like all AC/AMJ material, this AC/AMJ is not mandatory and does not constitute a regulation. It is issued to provide guidance and to outline a method of compliance with the rules.

2. RELATED REGULATIONS. Sections 25.703, .1301, .1309, 1322, .1357, .1431, and .1529 of the Federal Aviation Regulations (FAR) and ~~Joint Airworthiness Authorities regulations~~Joint Aviation Requirements ~~(~~JAR~~).~~

3. RELATED READING MATERIAL.

a. Federal Aviation Administration and Joint Aviation Authorities Documents.

(1) Advisory Circular ~~25.1309-1A~~25.1309-( ), System Design and Analysis and AC 25-11 Transport Category Airplane Electronic Display Systems. Advisory circulars can be obtained from the U.S. Department of Transportation, M-443.2, Subsequent Distribution Unit, Washington, D.C. 20590.

(2) Report DOT/FAA/RD-81/38, II, Aircraft Alerting Systems Standardization Study, Volume II, Aircraft Alerting Systems Design Guidelines. This document can be obtained from the National Technical Information Service, Springfield, Virginia 22161.

(3) FAA report, Review of Takeoff Configuration Warning Systems on Large Jet Transports, dated April 29, 1988. This document can be obtained from the Federal Aviation Administration, Transport Airplane Directorate, 1601 Lind Avenue, S.W., Renton, Washington, 98055-4056.

(4) AMJ 25.1322 (Alerting Systems)

(5) AMJ 25-11 (Electronic Display Systems)

(6) AMJ 25.1309-1A (System Design and Analysis)

b. Industry Documents.

(1) Aerospace Recommended Practice (ARP) 450D, Flight Deck Visual, Audible and Tactile Signals; ARP 4012/4, Flight Deck Alerting Systems (FAS). These documents can be obtained from the Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

(2) ~~Radio Technical Commission for Aeronautics (~~RTCA~~)~~ document DO~~-160C~~160D or latest version, Environmental Conditions and Test Procedures for Airborne Equipment; RTCA document DO~~-178A~~178B or latest version, Software Considerations in Airborne Systems and Equipment Certification. These documents can be obtained from the RTCA, One McPherson Square, Suite 500, 1425 K Street Northwest, Washington, D.C. 20005.

(3) ~~Aeronautical Radio, Inc. (~~ARINC~~)~~ 726, Flight Warning Computer System. This document can be obtained from the ARINC, 2551 Riva Road, Annapolis, Maryland 21401.

4. BACKGROUND. A number of airplane accidents have occurred because the airplane was not properly configured for takeoff and a warning was not provided to the ~~flightcrew~~flight crew by the takeoff configuration warning system. Investigations of these accidents have indicated a need for guidance material for design and approval of takeoff configuration warning systems.

5. DISCUSSION.

a. Regulatory Basis.

(1) Section 25.703 of the FAR, "Takeoff warning system," makes it mandatory for a takeoff configuration warning system to be installed in transport airplanes. This rule was added to Part 25 by Amendment 25-42 effective on March 1, 1978. Section 25.703 requires that a takeoff warning system be installed and provide an aural warning to the ~~flightcrew~~flight crew during the initial portion of the take off roll, whenever the airplane is not in a configuration which would allow a safe takeoff. The intent of this rule is to require that the takeoff configuration warning system cover (a) only those configurations of the required systems which would be unsafe, and (b) the effects of system failures resulting in wrong surface or system functions if there is not a separate and adequate warning already provided. According to the preamble of Amendment 25-42, the takeoff warning system should serve as "back-up for the checklist, particularly in unusual situations, e.g., where the checklist is interrupted or the takeoff delayed." Conditions for which warnings are required include wing flaps or leading edge devices not within the approved range of takeoff positions, and wing spoilers (except lateral control spoilers meeting the requirements of § 25.671), speed brakes, parking brakes, or longitudinal trim devices in a position that would not allow a safe takeoff. Consideration should also be given to adding rudder trim and aileron (roll) trim if these devices can be placed in a position that would not allow a safe takeoff.

(2) Prior to Amendment 25-42, there was no requirement for a takeoff configuration warning system to be installed in transport airplanes. Since this amendment is not retroactive, some transport airplane models in service. today may not have takeoff configuration warning systems; however, all large turbojet transports currently in service, even those with a certification basis established prior to 1978, include a takeoff configuration warning system in the basic design. These include the majority of jet transport category airplanes.

(3) Other general rules such as §§ 25.1301, 25.1309, 25.1322, 25.1357 and 25.1431 for electronic system installations also apply to takeoff configuration warning systems.

b. System Criticality.

(1) It has been ~~Federal~~ Aviation Authorities~~Administration~~ policy to categorize systems designed to alert the ~~flightcrew~~flight crew of potentially hazardous operating conditions as being at a level of criticality associated with a probable failure condition. (For a definition of this terminology together with discussions and guidelines on the classification of failure conditions and the probability of failures, see AC/AMJ ~~25.1309-1A~~25.1309-( ).) This is because failures of these systems, in themselves, are not considered to create an unsafe condition, reduce the capability of the airplane, or reduce the ability of the crew to cope with adverse operating conditions. Other systems which fall into this category include stall warning systems, overspeed warning systems, ground proximity warning systems, and windshear warning systems.

(2) Even though AC/AMJ ~~25.1309-1A~~25.1309-( ) does not define an upper probability limit for probable failure conditions, generally, it can be shown by analysis that such systems have a probability of failure (of the ability to adequately give a warning) which is approximately 1.0 x 10E-3 or less per flight hour. This probability does not take into account the likelihood that a warning will be needed. Systems which are

designed to meet this requirement are usually single channel systems with limited built-in monitoring. Maintenance or preflight checks are relied on to limit the exposure time to undetected failures which would prevent the system from operating adequately.

(3) Applying the practice given in Paragraphs b(1) and b(2) above to takeoff configuration warning systems is not considered to result in an adequate level of safety when the consequence of the combination of failure of the system and a potentially unsafe takeoff configuration could result in a major/catastrophic failure condition. Therefore, these systems should be shown to meet the criteria of AC/AMJ ~~25.1309-1A~~25.1309-( ) pertaining to a major failure condition, including design criteria and in-service maintenance at specified intervals. This will ensure that the risk of the takeoff configuration warning system being unavailable when required to give a warning, if a particular unsafe configuration occurs, will be minimized.

(4) If such systems use digital electronic technology, a software level should be used, in accordance with the applicable version of RTCA document DO-178~~8AB~~, which is compatible with the system integrity determined by the AC/AMJ ~~25.1309-1A~~25.1309-( ) analysis.

(5) Since a false warning during the takeoff run at speeds near V 1 may result in an unnecessary rejected takeoff (RTO), which could lead to a mishap, the occurrence of a false warning during the takeoff should be ~~improbable~~ remote in accordance with AC/AMJ ~~25.1309-1A~~25.1309-( ).

(6) If the takeoff configuration warning system is integrated with other systems that provide crew alerting functions, the level of criticality of common elements should be commensurate with that of the takeoff configuration warning system unless a higher level is dictated by one or more of the other systems.

c. Design Considerations.

(1) A review of existing takeoff configuration warning systems has shown a trend towards increased sophistication of design, partly due to the transition towards digital electronic technology which is amenable to self-monitoring and simple testing. The net result has been an improvement in reliability, fewer unwanted warnings and enhanced safety.

(2) With the objective of continuing this trend, new systems should be designed using the objectives and criteria of AC/AMJ ~~25.1309-1A~~25.1309-( ). Analysis should include all the remote sensors, transducers and the elements they depend on, as well as any takeoff configuration warning system line replaceable unit (LRU) and the actual visual and aural warning output devices.

(3) Unwanted warnings may be reduced by inhibiting~~suppressing~~ the takeoff configuration warning system where it is ~~safe~~ saferto do so, e.g., between V 1 and VR, so that a hazardous rejected takeoff is not attempted~~ if, for example, a sensor fails due to vibration during the takeoff run~~. Inhibition ~~Suppression~~ of the takeoff configuration warning system at high speeds will also avoid any confusion from the occurrence of a warning during a touch-and-go landing. This is because the basic message of an alert is to stop because it is unsafe to take off. It ~~does~~ may or may not tell the ~~flightcrew~~flight crew which surface or system is wrong. An unwanted warning may be more hazardous than reliance~~depending~~ on the ~~flightcrew~~flight crew's skill and training to cope with the situation.

(4) Even though § 25.703 specifies those inputs common to most transport category airplanes that must be included in the design, each airplane model should be carefully reviewed to ascertain that any configuration or trim setting that could jeopardize a safe takeoff has an input to the takeoff ~~warninq~~ warning system unless a separate and adequate warning is already provided by another system. There may be airplane configurations or electronically positioned lateral or longitudinal trim unique to a particular model that constitute this hazard. In the event that it is necessary to ~~suppress~~ inhibit the warning from a particular system during the entire takeoff roll, an equivalent level of safety finding would be required.

(5) Automatic volume adjustment should be provided to maintain the aural warning volume at an appropriate level relative to cockpit ambient sound. According to Report No. DOT/FAA/RD-81/38, II entitled "Aircraft Alerting Systems Standardization Study, Volume II - Aircraft Alerting System Design Guidelines," aural signals should exceed masked threshold by 8 ± 3 dB.

(6) Of particular importance in the design of takeoff configuration warning systems is the elimination of nuisance warnings. These are warnings generated by a system which is functioning as designed but which are inappropriate or unnecessary for the particular phase of operation. Attempting to eliminate nuisance warnings cannot be overemphasized because any indication which could cause the ~~flighterew~~flight crew to perform a high speed ~~refused~~ rejected takeoff, or which distracts or adversely affects the ~~flighterew~~flight crew's performance of the takeoff maneuver, creates a hazard which could lead to an accident. In addition, any time there are ~~n~~nuisance warnings generated, there is a possibility that the ~~flighterew~~flight crew will be tempted to eliminate them through system deactivation, and by continually doing this, the ~~flighterew~~flight crew may be conditioned to ignore a valid warning.

(7) ~~(7)~~ There are a number of operations that could produce nuisance warnings. Specifically, single engine taxi for twin engine airplanes, or in the case of 3 and 4 engine airplanes, taxi with fewer than all engines operating is a procedure used by some operators for the purpose of saving fuel. Nuisance warnings have also been caused by trim changes and speed brake handle adjustments.

(8) The m~~M~~eans for silencing the aural warning shall not be located such that it can be operated instinctively, inadvertently, or by habitual reflexive action. Silencing is defined as the interruption of the aural warning. When silenced, it is preferred that the system will be capable of- re-arming itself automatically prior to takeoff ~~.or,~~ However, ~~i~~if there is a clear and unmistakable annunciation that the system is silenced, manual re-arming is acceptable.

(9)~~(8)~~ Each airplane model has a different means of arming the takeoff configuration warning system, therefore the potential for nuisance warnings varies accordingly. Some existing systems use only a single throttle position, some use position from multiple throttles, some use EPR or N1, and some use a combination of these. When logic from a single operating engine was used, nuisance warnings were common during less than all engine taxi operations because of the higher power settings required to move the airplane. These systems were not designed for that type of operation. Because this procedure is used, inputs that arm the system should be judiciously selected taking into account any likely combination of operating and shut-down engines so that nuisance warnings will not occur if the airplane is not in takeoff configuration.

(10) FAR/JAR 25.703 requires only an aural alert for the takeoff warning system. FAR/JAR 25.1322 currently specify requirements for visual alerts while related reading material reference 3a(2), 3a(4) and 3b(1) provide guidance for integrated visual and aural annunciations for warnings, cautions and advisory alerting conditions. It has been common industry practice to incorporate the above mentioned references in their airplane designs. FAR/JAR 25.1322 are planned for revision to incorporate the guidance of these references to reflect current industry practices. Manufacturers may wish to incorporate these alerting concepts to the Takeoff warning system. If such is the case , the following guidance is offered.
a) A master warning (red) attention getting alert may be provided in the pilot's primary field of view simultaneously with the aural attention getting alert.
b) In addition to or instead of the aural attention getting alert (tone), voice may be used to specify the general problem (Configuration), or the exact problem(slats, flaps, trim, parking brake, etc...).
c) The visual alert may also specify the general problem (Configuration), or the exact problem(slats, flaps, trim, parking brake, etc...).
d) A visual cautionary alert associated with the failure of the Takeoff warning system may be provided e.g. "T/O WARN FAIL".

(11~~09~~) The FAA/JAA approved Master Minimum Equipment List (MMEL) includes those items of equipment related to airworthiness and operating regulations and other items of equipment which the Administrator finds may be inoperative and yet maintain an acceptable level of safety by appropriate conditions and limitations. No MMEL relief is provided for an inoperative takeoff configuration warning ~~system~~. Therefore, design of these systems should include proper system monitoring including immediate annunciation to the ~~flightcrew~~flight crew should a failure be identified or if power to the system is interrupted.

d. System Tests and Test Intervals.

(1) When manual tests or checks are required to show compliance with § 25.1309~~(b?) and (d?)~~, by detecting the presence of and limiting the exposure time to a latent failure that would render the warning inoperative, they should be adequate, simple and straight forward in function and interval to allow a quick and proper check by the ~~flightcrew~~flight crew and maintenance personnel. ~~Flightcrew~~Flight crew checks may be specified in the approved Airplane Flight Manual (AFM) and, depending on the complexity of the takeoff configuration warning system and the airplane, maintenance tasks may be conventional Maintenance Review Board (MRB) designed tasks or listed as Certification Check Requirements (CCR) where appropriate, as defined in AC/AMJ ~~25.1309-1A~~25.1309-( ), and determined as part of the approval process between the manufacturer and the certification office.

(2) The specified tests/checks established in accordance with Paragraph 5d(1) above should be demonstrated as part of the approval process and should show that each input sensor as well as the control and logic system and its emitters, including the indication system, are individually verified as required to meet Paragraph 5b(3). It should also be demonstrated that the warning self cancels when required to do so, for example by retarding the throttles or correcting the wrong configuration~~.~~

e. ~~Flight~~ Test Considerations.

(1) ~~(1)~~ During ~~the flight~~flight testing it should be shown that the takeoff configuration warning system does not issue nuisance alerts or interfere with other systems. Specific testing~~, including airplane or simulator tests,~~ should be conducted to ensure that the takeoff configuration warning system works satisfactorily ~~in all modes of operation~~ for all sensor inputs to the system. Flight testing should include reconfiguration of the airplane during touch and go maneuvers.

(2) ~~(2)~~ It should be shown by test or analysis that for all requested power settings, feasible weights, taxiway slopes, temperatures and altitudes, there will be no nuisance warnings, ~~or~~ nor failure to give a warning when necessary (e.g., cold conditions, derated takeoff), for any reasonable configuration of engines operating or shut down. This is to test or simulate all expected operational configurations. Reasonable pilot technique for applying power should be presumed.

~~(3) It should be demonstrated that the takeoff configuration warning system aural warning can be silenced by closing the throttles, bringing the airplane into the proper takeoff configuration, or by pulling the system circuit breaker~~

(3) ~~.~~ . The ~~M~~means for silencing the aural warning by the flight crew will be evaluated to assure that the device is not accessible instinctively and it is properly protected from inadvertent activation. Automatic or manual re-arming of the warning system will be evaluated.

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FAR/JAR 25.1333 (b)

(Final Report / issue 2)
(as agreed in AVHWG meeting#4 in Toulouse on jan,13th 2000)

A. FAR 25.1333(b)

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

The requirement ensures that there is sufficient information to the flight crew for safe control of the airplane in the event of a failure condition. It also ensures that the crew work load will not be increased by requiring essential information to be present without additional crew action.

2. What are current FAR and JAR standards?

Current FAR 25.1333(b):

(b) The equipment, systems, and installations must be designed so that one display of the information essential to the safety of flight which is provided by the instruments, including attitude, direction, airspeed, and altitude will remain available to the pilots, without additional crew member action, after any single failure or combination of failures that is not shown to be extremely improbable; and

Current JAR 25.1333(b):

(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the aeroplane in speed, altitude, heading and attitude by one of the pilots without immediate crew action, after any single failure or combination of failures that is not assessed to be extremely improbable (see ACJ 25.1333(b)); and

3. What are the differences in the standards?

a. The FAR requires one display of the essential information required for safe flight (attitude, direction, airspeed, and altitude) while the JAR asks for sufficient information to assure control of attitude, direction, airspeed, and altitude.
b. The JAR language replaces the word "additional" in phrase "without additional crew action" with the word "immediate" implying that some later crew member action is possible.
c. The FAR uses "direction" while the JAR uses "heading".

4. What, if any, are the differences in required means of compliance?

a. The JAA may require demonstration of the "sufficient information" necessary to assure control of the airplane in attitude, direction, airspeed, and altitude.
b. The FAA requires an analysis to show compliance, while the JAA may accept a combination of analysis and/or demonstration.

5. **What is the proposed action?**
Envelope on the FAR/JAR; use the JAR words modified to include the FAR statement "without additional crew action". Also change "speed" to "airspeed".

6. **What should the harmonized standard be?**
(b) The equipment, systems, and installations must be designed so that sufficient information is available to assure control of the airplane in airspeed, altitude, ~~heading~~ direction, and attitude by one of the pilots without additional crew member action, after any single failure or combination of failures that is not assessed to be extremely improbable;
and

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
Same as stated on #1 above.

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

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

10. What other options have been considered and why were they not selected?
The FAR words were considered. However, the proposed wording permits better flexibility in light of the new technologies while maintaining the same safety level.

The group considered both terms "direction" and "heading" for the harmonized FAR/JAR, taking into consideration both the conventional display methods and possible future display methods developed to control the aircraft.

As a starting point we reviewed the definition of direction – "The course by which something moves, lies, or points." This implies that heading is ONE FORM of direction, but not necessarily the only form. Graphical representation of aircraft direction is becoming more widespread, and may provide better situational awareness than today's conventional representation using heading as a primary or only direction source. Other information sources (position, database information, and inertial velocities) may provide more accurate and more integrated representations of aircraft direction, possibly resulting in more accurate control.

In addition, the word "direction indicator" is used in other FAR/JAR material, most notably 25.1303 which identifies required instruments. The existing FAR 25.1333(b) includes the word "direction." Admittedly, many parenthetical and other comments within the FAR/JAR, as well as historical applications, imply a gyroscopically stabilized (or heading) indicator, but the sole use of "heading" becomes more restrictive, possibly preventing the implementation of novel and improved design features intended for safer operation of the aircraft. Therefore, the group's position is to maintain the existing FAR wording of "direction."

11. Who would be affected by the proposed change?
Non FAA certificated systems.

12. To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?
No advisory material will be included.

13. Is existing FAA advisory material adequate?
See #12 above.

14. If not, what advisory material should be adopted?
A harmonized AC/AMJ will be submitted with this report.

15. How does the proposed standard affect the current ICAO standard?
The AVHWG is not aware of any.

16. How does the proposed standard affect other HWG's?
None affected.

17. What is the cost impact of complying with the proposed standard?

None if the system complies with the FAA requirements.

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
    Yes.

19. **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?**
    This project is appropriate for the "Fast Track" process.

FAR/JAR AC/ACJ 25.1333

(Harmonized Final Report proposal - Issue 1 date 29/03/2000)

1. **What is the underlying safety issue addressed by FAR/JAR?**
The requirement ensures that there is sufficient information to the flight crew for safe control of the airplane in the event of a failure condition. It also ensures that the crew work load will not be increased by requiring that essential information to be present without additional crew action.

2. **What are current FAR and JAR standards?**
Current FAR AC 25.1333(b):
No current FAR AC

Current JAR ACJ.25.1333(b):

(Instruments systems (interpretative Material and Acceptable means of Compliance)
1 In showing compliance with JAR 25.1333(b) account may be taken of the probability with which loss of information will lead to a catastrophe.
2 Attitude displays systems. One acceptable means of compliance with JAR 25.1333(b) is to provide three displays, the reliability and independence of which should be confirmed by a suitable assessment. Each display should have independent sensors and power supplies. The power supply to the standby display and its lighting should be such that the display is usable for not less than 30 minutes if a total failure of the generated electrical power causes the loss of both main instruments.
Note: The time for which the display remains usable will be stated in the flight manual

3. **What is the proposed action?**
Suppress the section 1 which is already covered by 25.1309
Envelope on the JAR ACJ for section 2 with minor modification in order to incorporate the existing requirement about pilot usability specified in FAR 121.305(j).

This FAR requirement ask for a third artificial horizon (bank and pitch indicators) installation on various types of aircraft... in accordance with paragraph (k) of this section (ie when required by paragraph (j) , a third gyroscopic bank-and-pitch indicator that:
(1) Is powered from a source independent of the electrical generating system;
(2) Continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system.
(3) Operates independently of any other attitude indicating system;
*(4) Is **operative without selection** after total failure of the electrical generating system;*
(5) Is located on the instrument panel in a position acceptable to the Administrator that will make it plainly visible to and usable by each pilot at his or her station; and
*(6) Is **appropriately lighted** during all phases of operation.*

4. What should the harmonized standard be?

Instruments systems (interpretative Material and Acceptable means of Compliance) Attitude displays systems. If three displays are used to show compliance with FAR/JAR 25.1333(b), the reliability and independence of those displays should be confirmed by a suitable assessment in accordance with FAR/JAR 25.1309. Each display should have independent sensors and power supplies. The power supply to the standby display and its appropriate lighting should be such that the display is usable from each pilot station for not less than 30 minutes if a total failure of the generated electrical power causes the loss of both main instruments.

Note: the time for which the display remains usable will be stated in the flight manual

FAR/JAR 25.1331
INSTRUMENT USING A POWER SUPPLY

(Final Report)
(as agreed in AVHWG meeting#4 in Toulouse on jan,13th 2000)

A. FAR 25.1331(a)(2)

1. What is the underlying safety issue addressed by FAR/JAR?
Assures that the instruments required under FAR/JAR 25.1303 are available to the flight crew in the event the power source that is supplied to each instrument is lost due to failure. In addition the JAR assures that a failure of one power source does not affect the same instrument on both pilot stations.

2. What are current FAR and JAR standards?
Current FAR 25.1331:
(a)(2) Each instrument must ,in the event of the failure of one power source, be supplied by another power source. This may be accomplished automatically or by manual means.

Current JAR 25.1331:
(a)(2) Each instrument must ,in the event of the failure of one power source, be supplied by another power source. This may be accomplished automatically or by manual means. The failure of one power source must not affect the instruments of both pilot stations

3. What are the differences in the standards?
(a)(2). The JAR requires in addition the failure of one power source must not affect the same instrument of both pilot stations.

4. What, if any, are the differences in required means of compliance?
N/A for this paragraph

5. **What is the proposed action?**
   Envelope on the JAR but include clarification for the same instrument.

6. **What should the harmonized standard be?**
   (a)(2) Each instrument must ,in the event of the failure of one power source, be supplied by another power source. This may be accomplished automatically or by manual means. The failure of one power source must not affect the same instrument of both pilot stations.

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
   No change in addressing the safety issue, see #1 above.

8. **Relative to current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?**
   The proposed standard may increase the level of safety by clarifying the requirement that the same type of instrument can not be affected on both pilot stations.

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

10. **What other options have been considered and why were they not selected?**
    The FAR words were considered but not retained because the JAR supersedes FAR rule.

11. **Who would be affected by the proposed change?**
    None because compliance with 25.1309 and the current practices comply with the JAR.

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

13. **Is existing FAA advisory material adequate?**
    N/A.

14. **If not, what advisory material should be adopted?**
    None.

15. **How does the proposed standard affect the current ICAO standard?**
    The AVHWG is not aware of any..

16. **How does the proposed standard affect other HWG's?**
    None affected.

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

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
Yes.

19. **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?**
This project is appropriate for the "Fast Track" process.

B. FAR 25.1331(a)(3)

1 **What is the underlying safety issue addressed by FAR/JAR?**
Prevents the crew from using bad information by giving a visual warning when the data presented by an instrument to the crew becomes corrupted or lost.

2 **What are current FAR and JAR standards?**
Current FAR 25.1331:
(a)(3) If an instrument presenting navigation data receives information from sources external to that instrument and loss of that information would render the presented data unreliable, the instrument must incorporate a visual means to warn the crew, when such loss of information occurs, that the presented data should not be relied upon.

Current JAR 25.1331:
(a)(3) If an instrument presenting flight and/or navigation data receives information from sources external to that instrument and loss of that information would render the presented data unreliable, a clear and unambiguous visual warning must be given to the crew when such loss of information occurs that the presented data should not be relied upon.(see ACJ 25.1331 (a)(3).

3 **What are the differences in the standards?**
(a)(3) The JAR deals also with flight data and The FAR requires the instrument must incorporate a visual means while the JAR requires a clear and unambiguous warning .

4 **What, if any, are the differences in required means of compliance?**
There is not an AC but it shall be noted that the corresponding ACJ 25.1331(a)(3) allows, where practicable, incorporation of the warning in the instrument.

5 **What is the proposed action?**
Envelope on the FAR and the JAR:
- consider Flight data in addition to navigation data as stated by the JAR
- take into account the need for incorporation in the instrument of a visual means to warn the crew as stated by the FAR and make it clear and unambiguous as stated by the JAR.

6 **What should the harmonized standard be?**
(a)(3) If an instrument presenting flight and/or navigation data receives information from sources external to that instrument and loss of that information would render the presented data unreliable, a clear and unambiguous visual warning must be given to the crew, when such loss of information occurs, that the presented data should not be relied upon. The warning shall be incorporated in the instrument.

7. **How does this proposed standard address the underlying safety issue (identified in #1)?**
Same as stated on #1 above.

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

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

10. **What other options have been considered and why were they not selected?**
None

11. **Who would be affected by the proposed change?**
None

12. **To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?**
None because the new harmonized code itself includes the ACJ 25 1331(a)(3) which recommended incorporation of a visual means in the instrument to warn the crew.

13. **Is existing FAA advisory material adequate?**
N/A - there is no FAA advisory material.

14. **If not, what advisory material should be adopted?**
N/A

15. **How does the proposed standard affect the current ICAO standard?**
The AVHWG is not aware of any.

16. **How does the proposed standard affect other HWG's?**
None affected.

17. **What is the cost impact of complying with the proposed standard?**
None if the system complies with the current requirements.

18. **Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?**
Yes.

19. **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?**
This project is appropriate for the "Fast Track" process.

FAA Action – Not Available