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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee Meeting on Transport Airplane and Engine Issues

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

ACTION: Notice of public meeting.

SUMMARY: This notice announces a public meeting of the **FAA**'s Aviation Rulemaking Advisory Committee (ARAC) to discuss transport airplane and engine (TAE) issues.

DATES: The meeting is scheduled for February 10-11, 2004, starting at 8:30 a.m. on February 10. Arrange for oral presentations by February 6.

ADDRESS: Boeing Facility, 1200 Wilson Boulevard, Room 234, Arlington, VA.

FOR FURTHER INFORMATION CONTACT: Effie Upshaw, Office of Rulemaking, ARM-209, **FAA**, 800 Independence Avenue, SW., Washington, DC 20591, Telephone (202) 267-7626, FAX (202) 267-5075, or e-mail at effie.upshaw@**faa**.gov.

SUPPLEMENTARY INFORMATION: Pursuant to section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92-463; 5 U.S.C. app. III), notice is given of an ARAC meeting to be held February 10-11 in Arlington, Virginia.

The agenda will include:

[sbull] Opening remarks
[sbull] **FAA** Report
[sbull] European Aviation Safety Agency/Joint Aviation Authorities Report
[sbull] Transport Canada Report
[sbull] Executive Committee Report
[sbull] Harmonization Management Team Report
[sbull] Legal Expectations for ARAC Recommendations
[sbull] Human Factors Harmonization Working Group (HWG) Report
[sbull] Ice Protection HWG Report
[sbull] Avionics HWG Report and Approval
[sbull] General Structures HWG Report
[sbull] Written reports, as required, from the following harmonization working groups: Engine, Electromagnetic Effects, Flight Test, Seat Test, Flight Control, Flight Guidance, System Design and

Aviation Rulemaking Advisory Committee (ARAC)
Transport Airplane and Engine Issues Group (TAEIG)

Meeting Minutes

DATE: February 10, 2004

TIME: 8:30 a.m. – 4:00 p.m.

LOCATION: Boeing
1200 Wilson Boulevard
Conference Room 234
Arlington, VA 22209

Call to Order/Administrative Reporting

Craig Bolt, Assistant Chair, called the meeting to order. Mike Kaszycki, Assistant Executive Director, read the required statement for conducting the meeting, and attendees introduced themselves:

Members				NonMembers	
Keith Barnett	AIAC - Bombardier	Doug Lane	Boeing	Sebastiao Cavali	CTA
Craig Bolt *	Pratt & Whitney	Paulo Olenscki	Embraer	Sarah Knife	GE
Joe Bracken	ALPA	Tom Peters	Embraer	Trish Ververs	Honeywell
Aaron Gannon	Honeywell	Bob Robeson	AIA (Alternate)		
Rolf Greiner	Airbus	Mike Romanowski	AIA	Effie Upshaw	FAA
Mike Kaszycki **	FAA	Thaddee Sulocki	JAA	Alicia K. Douglas	FAA

For details, see attached attendance sheet

Mr. Bolt then reviewed: **Handout#**

- The Agenda **1**

  Mr. Kaszycki reported that Don Byrne, AGC, would not be able to attend the meeting because of a scheduling conflict. Mr. Kaszycki offered that Doug Anderson, ANM-7, might address at the June meeting in Seattle to present AGC position, 'Legal Expectations for ARAC Recommendations.'

- Items of Interest Since October 2003 TAEIG Meeting **2**
- Last Meeting Minutes

  Thaddee Sulocki requested clarification of item 10, CAA opinion on § 25.671. He stated the information was transmitted to the JAA Steering Group and there is dissenting opinion within the Steering Group on the matter. JAA is to submit the matter to EASA for consideration.

  NOTE: Effie Upshaw to make edits to the Meeting Minutes, as discussed, and send the document to Mr. Bolt for distribution.

- E-mail Update **3**
- Summary of Tasks in the Working Groups **4**
- Open/Completed Tasking Charts **5**
  Comments on the tasking charts are to be forwarded to Mr. Bolt.
- Action Items from the October 2003 TAEIG meeting (shown below) **6**

Item	Status
1.	Completed
2.	PPIHWG provided changes to Gerri Robinson – FAA Office of Rulemaking (ARM-20), however changes were not made to website. · Sarah Knife to send e-mail to Craig Bolt and Mike Kaszycki identifying problems and when first contact with ARM-20 was made. · All others, if there are problems with the WG website, send e-mail to ARM-20 and copy Mike and Craig.
3.	Completed
4.	Completed
5.	Completed
6.	Completed
Carryover from October 2002 meeting	
1.	Per Effie Upshaw, the letter is in coordination, currently with Ed Cleary, Airports.

FAA Report (Mike Kaszycki) **7**

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Mr. Kaszycki provided an overview of the status report. He also provided an update on rulemaking prioritization and on the HWG moratorium. Following are highlights of the presentation and resulting discussion (handout 10):

The FAA issued an extension to the comment period for the ETOPS NPRM on December 31, 2003. Comment period closed March 15, 2004. There are twelve Final Rules and 3 NPRMs in Headquarters coordination for issuance. Of these, four rules (fire protection of electrical systems; electronic equipment; battery installation and electric installation; and electrical cables) were removed from the EAPAS rulemaking project and are being coordinated as a Fast Track Category 1 bundled project. Also, five rules (revisions to powerplant installation requirements; public address system; powerplant controls; miscellaneous flight requirements; and trim systems and protective breathing equipment) are being worked as a bundled project.

There are six NPRMs in Headquarters for regulatory evaluation development. The Widespread Fatigue Damage NPRM has been removed from the listing, as the Tiger Team is working it. ANE has several rulemaking projects in Headquarters review, however they are not included in this report, as the rulemaking projects are not on the AVR Management Team's A-priority or feeder list. Two new taskings are under development.

The Airplane Security - Bulkhead Rule, previously noted in past status updates as a separate Part 25 NPRM. However, is now being bundled with other cockpit and airplane safety initiatives. The rule will be harmonized with JAA rules. It will be applicable to new bulkhead designs, such that any change made to the bulkhead could require other changes in accordance with principles of CPR in order to comply with the rule (handout 7).

Mr. Kaszycki stated that several rulemaking projects have been returned without AGC approval. He indicated that three primary reasons documents have been returned, as noted by AGC: Rulemaking by advisory circular; performance-based rules are not identified as such; and, documents are not clearly written in Plain Language.

A notice of policy on Digital Flight Data Recorder (DFDR) Systems was issued for comment. The FAA may reopen the comment period to ensure everyone has an opportunity to review the document and provide comment (handout 8).

Mr. Kaszycki noted that FAA Policy/Guidance material is available on the FAA website. Sarah Knife asked if it would be possible to have notification of when policy and guidance is published in the Federal Register.

* **Action 2**: Mr. Kaszycki to investigate if proposed policy statements could be made available on a subscription basis similar to NPRM's.

The Tiger Team recommendations on SFAR 88 (wiring), EAPAS, Aging Aircraft, Corrosion Protection, Widespread Fatigue Damage (WFD) will be published in a Federal Register Notice. The recommendations will affect some of TAEIG Working Groups efforts. The most significant impact is a proposed tasking to AAWG on Damage Tolerance. A draft of the tasking will be sent out to TAEIG members for review and comment.

* **Action 3**: TAEIG members to return comments on proposed tasking to AAWG within 2 weeks of receipt.

There are six Part 33 Policy/Guidance documents being worked by the Engine Directorate (ANE) Standards Staff. These are nonARAC projects. For information on these, contact Peter White at ANE.

The FAA is reviewing the Tiger Team recommendations and ARAC taskings. There are ARAC taskings that will not receive FAA rulemaking resources. These will be identified in a letter to ARAC, from either the FAA Office of Rulemaking (ARM) or EXCOM. These taskings will be accomplished by other means, though the alternate means have not yet been determined. The letter should address harmonization (that is, how the alternate methods will be recognized by foreign authorities). This shouldn't have much impact on Part 25 taskings, but there is a concern for the impact on Part 33 initiatives.

Mr. Bolt stated that he had not received a response to his letter to Tony Fazio on Part 33 initiatives, their status, and alternate rulemaking procedures.

* **Action 4**: FAA to respond to TAEIG letter regarding alternate rulemaking procedures.

Once the FAA and industry position on § 25.903(d) rotorburst task is finalized, the FAA plans to remove the HWG moratorium. The open issues should be resolved within the next couple of months.

The Complex STCs policy was released last week in the Federal Register. Comments received may not be in line with AAWG's tasking (handout 9).

* **Action 5**: TAEIG members to provide comments on FAA policy for Complex STCs.

In closing, Mr. Kaszycki reported on the recent changes in ANM senior management: Vi Lipski has moved to a new position, AQI-1, in FAA Headquarters, where she will manage integration of AFS, AIR, and ARM. It is expected the FAA will post the ANM-1 position for bid in spring/summer 2004. Meantime, Ali Bahrami is Acting Assistant Deputy, ANM-1.

* **Action 6**: Mr. Kaszycki to send out copy of presentation by end of week (handout 10).

EASA/JAA Report – JAA Transition to EASA (Thaddee Sulocki) **11**

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Mr. Sulocki reported the transition, JAA to EASA, is progressing smoothly. To date, appointments to EASA include: Mr. Patrick Goudou as Executive Director, Claude Probst as Rulemaking Director, Dr. Norbert Lohl as Certification Director, Markku Junkkari as Administrative Director (handout 11). Mr. Roger Hardy, previously with JAA, has accepted the position as Certification Manager, Rotorcraft (handout 12). Cologne, Germany, has been selected as the location for the EASA Headquarters offices.

To enable the smooth transition to EASA, there is a service contract in place, under which JAA will continue to do work for EASA. Coordination with JAA, EASA, and FAA is to continue through various forums (i.e., Harmonization Management Team). Also, it is expected the harmonization efforts through the TAEIG will continue. The JAA will continue as the authority over those states that are not part of EASA authority/oversight.

Both airworthiness and maintenance rulemaking inventory and activities are identified in EASA's Rulemaking Draft Program. For EASA's 2004 rulemaking program, the JAA has a series of NPA and final rules ready for adoption. As the JAA does not want to lose momentum on these, they will propose that EASA issue 6 week NPA on final rules, as opposed to the standard 3-month NPA, for adoption as EASA CS.

The rulemaking program for 2005-2007 will be discussed at EASA's first meeting, scheduled for February 23-25, 2004. Meantime, current rulemaking projects for harmonization are to continue. However, the JAA is no longer responsible to publish NPAs for airworthiness standards. In coming months, the JAA will adopt EASA CS by reference (i.e., "JAR-25 . . . see CS-25"), which should easily be accomplished, as the JARs and CS are similar, with little editorial differences.

Transport Canada Report (Maher Khouzam) **13**

Mr. Khouzam was unable to attend. He sent a summary report by e-mail (handout 13). The e-mail was read by Mr. Bolt:

CAR 521 will be submitted for discussion and acceptance at the May 2004 CARAC. With the structure of EC part 21, it will replace Canada's present 511 and 513. Canada is following the changes to 14 CFR Part 21 and will readjust 521, as needed.

Canada DG Civil Aviation countersigned the transitional arrangement with EASA last week. The official copy should reach EASA shortly. Canada is also working on a full agreement with EASA personnel. EASA will be seeking an official negotiating mandate to finalize the agreement.

CPR follow-up: TCCA joined the FAA Continuous Improvement Team (CIT), as one team, which includes the JAA/EASA, will be more effective.

* **Action 7**: Alicia Douglas to send e-mail to Mr. Bolt for distribution to TAEIG members.

Executive Committee (Craig Bolt)

At the last Excom meeting in November, 2003, Ron Priddy was elected as the new chairperson, and Craig Bolt as the vice chairperson. Nick Sabatini, AVR-1, provided a briefing to the group on the future of ARAC. He stated that ARAC will still be used, however the FAA will contain new ARAC taskings to safety-related issues and NTSB recommendations. Tony Fazio, ARM-1, briefed the group on 'alternate means', and a general discussion followed. The next meeting is scheduled for August 2004.

Harmonization Management Team (HMT)

Topics discussed at the HMT meeting in November 2003, included the current inventory of rulemaking projects, Terms of Reference (TORs), and EASA. Three TORs will move forward - tire burst, seat pitch, and air quality. The HMT has begun tasks on some issues that were a bit contentious. There has been an exchange of information with EASA. EASA needs to define harmonization effort. The HMT would like the exchange with EASA to continue.

The next HMT meeting is scheduled for March 16-18, 2004. Mr. Claude Probst or his representative will participate the first day of the meeting. Mr. Bolt asked TAEIG members to consider what they would like to see as agenda items for the next annual HMT meeting, as well as the format of the presentations.

* **Action 8**: TAEIG members to provide input on agenda items and format of the presentations for the next HMT Annual Meeting.

AGC (Legal) Expectations for ARAC Recommendations

Don Byrne was unable to attend due to a scheduling conflict.

General Structures HWG (Andy Kasowski) **14**

Mr. Kasowski, by telephone, reported there has been no meeting of GSHWG since their last report.

Section	Discussion/Action
§ 25.571	-- Clarification of issues with GE completed by teleconference on 1/29/04. For new designs, GE is concerned with the proposal for STC and inspections requirements. They do not agree with the proposal on existing designs. -- FAA representative, Rich Yarges, reviewed and reinitialized fail-safe structural damage into the rule. -- Comments received are to show up as comment to NPRM or during phase 4 review. -- Working group supports recommendation as submitted to TAEIG. -- Working group was instructed to document agreements and disagreements, and highlight unresolved issues in their report for the June TAEIG meeting.
25.365(d) and AC 25-20	-- JAA has changed their position – additional requirements for all altitudes. -- Working group recommends the effort be discontinued until they receive another tasking which would require the group to meet.

	-- Working group was instructed to document agreements and disagreements, providing each agency's position and logic for their position, and the pros/cons of their positions, and report these at the June TAEIG meeting. -- Report will be provided for FAA, JAA, and EASA for review and harmonization on the issue.

GSHWG to report agreements and disagreements, providing each agency's position and logic for their position, and the pros/cons of their positions at June TAEIG meeting. There are no future taskings for the GSHWG.

Human Factors HWG (HFHWG) (Curt Graeber) **15**

Kathy Abbott and Curt Graeber (by telephone) reported on the working group's progress and provided an overview of the draft rule and draft 14 of proposed AC/ACJ 25-HF. In drafting the documents, the working group developed an equipment-focused rule after identifying issues with the error-based rule approach. Two versions of the draft rule, § 25.1301and § 25.1302 were presented for consideration. Both versions have the same meaning, with JAR/§ 25.1302 written in plain language. Comments and draft minority reports on both documents are due February 2nd and February 15th, respectively.

Discussion items included FAA and industry comments on problems associated with leaving the language, "proficient and properly trained flight crew," in the rule language. The FAA is concerned the constraints on the scope of the rule in the AC could be seen as "rulemaking by AC". Industry stated concern about sharing proprietary information; cost and scheduling impacts; and that STC installations in the flight deck would require an analysis of the entire flight deck. EASA plans to issue NPA in September 2004, which would hinder the harmonization efforts of the group with UK CAA and EASA. The working group is working to address all comments and to develop solutions to FAA and industry concerns.

The working group's final meeting is scheduled for February 24-26, 2004, in Paris, France. Their final report will be available March 2004.

Ice Protection HWG (IPHWG) (Jim Hoppins) **16**

Jim Hoppins provided a status report. Bob Park also provided a status report. The following highlights were provided:

Task	Discussion/Action
1	--Working group reviewing SAE/EUROCAE Standards, comments to be submitted to TAEIG for forwarding to AIR-120 for consideration when drafting TSO.
2	--Bob Robeson questions if it is appropriate to address SLD in an AC, suggesting it could be perceived as rulemaking by AC. The WG responded that the AC provides methods for determining 'natural characteristics' for testing. The AC is drafted as a recommendation. It is not prescriptive. --The WG submitted that splitting the task (Part 25 and Part 33) might delay the process. As an alternate concept, the WG is considering separating the work on stratiform clouds and current Appendix X from cumulus clouds. -- Work in progress on recommendations: droplets physics

	relative to engines, mixed phase and cumulus clouds-meteorological support, and methods of compliance. --Flight Test HWG considering impact of Appendix X --Combined Engine & Engine Installation subgroup has been formed, meeting Feb. 24-25, 2004. --Keith Barnett asked if the WG will tackle exclusionary design features. The WG provides in their report that they have not come to consensus. The WG is to document the minority position(s) in their report to TAEIG. --The taskings are to remain together and the working group is to attempt to meet the deadline for completion of the taskings.
4	--Working group draft letter to close out task and submit to TAEIG.

IPHWG to provide report with minority positions identified (Task 2) and draft and submit letter to TAEIG to close out Task 4.

Flight Test HWG (FTHWG) **17**

Flight Test WG met on February 3-5. When working to draft the SLD modifications to Subpart B, they determined there are too many possibilities and combinations to consider. They request the FAA provide input on the starting point for SLD icing during takeoff and climbout. The WG is to submit a request to FAA and report to TAEIG at the next meeting.

Recommendations by the WG, relative to coordination of their work with the IPHWG: Separate Subpart B from §§ 25.1419 and 25.1420; relocate the airplane performance and handling qualities from the IPHWG Subpart B rules and AC for Appendix X into the updated Subpart B materials; and Define ice shapes by flight phase in Appendix X (as in Appendix C).

FTHWG to formally request the FAA provide input on the starting point for SLD icing during takeoff and climbout and report at TAEIG at the June 2004 meeting.

Avionics Systems HWG (AVSHWG) (Clark Badie) **18**

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Clark Badie provided a summary of the WG's latest updates to the draft rule § 25.1322 and draft AC/ACJ 25.1322, and submitted their report and draft documents to TAEIG.

The WG suggested that "Warning, Caution, and Advisory Lights" be changed to "Warning, Caution, and Advisory Alerts" in the draft rule and AC/ACJ. The TAEIG agreed the change should be made, as suggested.

Trish Ververs, of Honeywell, also representing the RTCA SC-195 group, expressed concern that RTCA SC-195 comments on the AC had not been addressed by the AVSHWG. Ms. Ververs indicated the following concerns still need to be addressed:

1) Definitions in the document are vague, issues with terminology used.
2) Limitation of use of green, amber, and red for issues other than alert.

The WG's response:

1) Definitions and Terminology – The group will provide feedback in disposition of each of the comments.

a. Advisories are included. The AC provides certain guidance for use of the term 'Advisory' vs. 'Advisory Alert'.
b. Applicability / Limitations – Clarification/intent may be needed to ensure appropriate future application.

2) Use of amber and red – Other than flight deck alerting, use of amber and red will remain in the document.
3) The AC may be a candidate for AGC non-approval. However, the AC is guidance material; it is not the mandate.

Sarah Knife expressed concern there may be a conflict with applicability to engines, where, in some cases, the use of red is mandated. Joe Bracken suggested the WG should work with the SC-195 group to resolve the issues. Mr. Badie opposed further delay in submitting the draft rule and AC for TAEIG vote.

Mr. Kaszycki stated that TAD is developing an Issue Paper to clarify the intent of the rule regarding use of red and amber in the cockpit for implementation in the field (ACOs) for use in certification of new products. He suggested the WG consider incorporating language from the draft issue paper into the AC. Mr. Badie suggested that drafting of the Issue Paper should be done with European participation.

* **Action 9**: Mr. Kaszycki to send Issue Paper, Use of Red and Amber (alerts) in the Cockpit, to the AVSHWG.

Vote on 25.1322: The TAEIG **abstained from voting** to accept the rule and associated AC because of concerns over the lack of guidance in the draft AC on the use of the colors red and amber on flight deck displays. However, Mike Romanowski put forward the motion for TAEIG members' vote, which was supported by Doug Lane, and unanimously approved by TAEIG members:

The TAEIG accept the WG Report and new rule 25.1322 and associated AC, but will hold them until the FAA's Issue Paper is available. The WG is to determine if the Issue Paper should be incorporated into an AC, either AC25.1322 or AC 25.11, whichever is more appropriate. In summary, TAEIG agreed to have an ad hoc meeting to vote on this recommendation after the WG addresses the outstanding 'red and amber' issue.

Loads and Dynamics HWG (LDHWG) (Larry Hanson, Todd Martin) **20**

Mr. Hanson, reporting by phone, provided a status report on the LDHWG efforts. To date, the WG has revised the report and draft AC. The FAA objects to revised paragraph 9.b wording and proposed use of minimal zonal temperature. GE, Airbus, and FAA proposed other alternatives. The WG plans to achieve a majority opinion, document dissenting opinions, and provide report to TAEIG at the next meeting.

Airworthiness Assurance HWG (AAHWG) (Amos Hoggard) **21**

Mr. Hoggard reported that the AAHWG has completed all assigned tasks and is waiting for direction and tasking on § 121.370a. The WG has put together an ad hoc team in preparation for the tasking.

§ 25.1529 & 25.1309 Plans (Mike Kaszycki) **22**

Mike Kaszycki's report included a recap from the last meeting, and provided a summary of FAA's plan of action relative to both §§ 25.1529 and 25.1309.

- § 25.1529 Mr. Kaszycki shared that the FAA agrees that SDA is not the right group to address Instructions for Continued Airworthiness (ICA). Safer Skies and the Certification Process Study (CPS) drive ICA activities. Recommendations from the CPS group are expected in the third quarter of 2004. The FAA will consult appropriate advisory groups, as needed.
- § 25.1309 Mr. Kaszycki reported that human factor considerations in hazard classifications is not covered by the HFHWG, and the FAA is still studying the issues. Regulatory authorities will discuss overarching regulatory issues. The authorities will provide their findings and guidance to industry. The FAA will consult with appropriate advisory groups on both issues, if they believe additional industry input is needed.

  The "no catastrophic single failure" rule has generated concern by JAA, and is being debated in several forums - SAE S18, EUROCAE W63, and FAA software/hardware conference. The FAA will monitor these activities and, when consensus is achieved, will determine if regulatory action is needed. This will be discussed at the 'Authorities Only' April meeting in Paris. The FAA will then determine what future action is needed, if any.

  NOTE: § 25.1309 to be added to the agenda for the June TAEIG meeting.

Wrap-up

Action Items: Mr. Bolt reviewed the Action Items, and indicated that the list would be sent to members electronically.

Item	Action	Status
	Carryover from October 2003 meeting	
1.	Sarah Knife to send e-mail to Craig Bolt and Mike Kaszycki identifying problems with ARAC website, and when first contact with ARM-20 was made.	Completed
	February 2004 Meeting	
2.	Mr. Kaszycki to investigate if proposed policy statements could be made available on a subscription basis similar to NPRM's.	
3.	TAEIG to provide comments to Mike Kaszycki on proposed new AAWG tasking by February 25.	Completed
4.	FAA to respond to C. Bolt letter on alternate rulemaking procedures.	
5.	TAEIG to provide comments to Mike Kaszycki on FAA Complex STCs policy.	
6.	Mike Kaszycki to distribute FAA report to TAEIG.	Completed
7.	Alicia Douglas to forward e-mail from Transport Canada to Craig for forwarding to TAEIG.	Completed
8.	TAEIG to provide input to Craig Bolt on HMT agenda items and format of the presentations for the next HMT Annual Meeting.	
9.	Mike Kaszycki to send Issue Paper on the use of red and amber in the cockpit to the AVSHWG.	

Next Meeting: June 15-16, 2004 in Seattle, Washington.

Public Notification **23**

The *Federal Register* published an announcement notice of this meeting on January 22, 2004.

Approval

I certify the minutes are accurate.

/s/ Craig R. Bolt

June 25, 2004

Transport Airplane and Engine Issues Group Meeting
Boeing
1200 Wilson Blvd, Conference Room 234
Arlington, VA 22209

DRESS: BUSINESS CASUAL

Tuesday, February 10, 2004 - ***866-442-8714 or 281-540-4931 Passcode: 14169163063***

8:30	Call to Order, Reading of the Procedures Statement, Review of Agenda, Meeting Logistics, Review of Action Items, Items of Interest, Review of Minutes from previous meeting	C. Bolt/M. Kaszycki
9:30	FAA Report	M. Kaszycki
9:45	EASA / JAA Report • JAA transition to EASA	T. Sulocki
10:15	***-- BREAK --***	C. Bolt
10:30	Transport Canada Report	M. Khouzam
10:45	Excom Report	C. Bolt
11:00	Harmonization Management Team Report	M. Kaszycki
11:15	General Structures HWG Report	A. Kasowski
11:30	***-- LUNCH --***	
12:15	Human Factors HWG Report	C. Graeber
12:45	Ice Protection HWG Report • Include discussion of EHWG / FTHWG / PPIHWG support as appropriate	J. Hoppins (J. McRoberts, Bob Park, A. Lewis-Smith)
1:15	Avionics HWG • Vote 25.1322	C. Badie
2:00	***-- BREAK --***	
2:15	AGC (Legal) Expectations for ARAC recommendations	D. Byrne
3:00	• Engine HWG • Electromagnetic Effects HWG • Flight Test HWG • Seat Test HWG • Flight Control HWG • Flight Guidance HWG • System Design and Analysis • Electrical Systems HWG • Loads and Dynamics HWG • Design for Security HWG • Powerplant Installation HWG • Mechanical Systems HWG • Airworthiness Assurance HWG	Written or verbal reports as required
3:15	25.1309 Phase II Task Discussion	FAA / TAEIG
4:15	Review Action Items / 2004 Meeting Schedule	C. Bolt
4:30	***-- ADJOURN --***	

Items of Interest Since October 2003 Meeting

1. TAEIG letter to FAA, Transmittal of MSHWG report, 25.841(a)(2,3), dated October 21, 2003.

2. TAEIG letter to FAA, Transmittal of MSHWG report, 25.831(g), dated October 21, 2003.

3. TAEIG letter to FAA, Widespread Fatigue Damage Bridging Task, dated October 22, 2003.

4. TAEIG letter to FAA, General Structures – 25.603 Materials, dated October 22, 2003.

5. TAEIG letter to FAA, General Structures – 25.631 Bird Strike, dated October 22, 2003.

6. TAEIG letter to FAA, General Structures – 25.571 Damage Tolerance, dated October 22, 2003.

E-MAIL UPDATE SEPTEMBER 2003 – JANUARY 2004

9/18/03	TAEIG: AVHWG Draft Rule 25.1322 and AC/AMJ Part 1 of 3
9/18/03	TAEIG: AVHWG Draft Rule 25.1322 and AC/AMJ Part 2 of 3
9/18/03	TAEIG: AVHWG Draft Rule 25.1322 and AC/AMJ Part 3 of 3
9/23/03	E-mail Update June to September
9/24/03	Revised October Meeting Agenda
9/29/03	TAEIG Updated Taskings Chart
9/30/03	TAEIG: PPIHWG report for October meeting of TAEIG
10/01/03	ATTENDANCE AT THE OCTOBER TAEIG MEETING
10/01/03	Revised Agenda for October TAEIG Meeting
10/02/03	10-2-03 Revised Agenda for Oct Meeting
10/07/03	Federal Register ARAC meeting announcement
10/07/03	FW: Federal Register ARAC meeting announcement
10/09/03	GSHWG Status Report October '03
10/09/03	Revised Agenda for the Oct TAEIG Meeting
10/09/03	MSWHG Presentation to TAEIG
10/09/03	Items of Interest/Tasks that are Active
10/14/03	TAEIG: FTHWG Status Report to TAEIG
10/14/03	TAEIG:HF Report
10/14/03	AAWG/TAEIG Report
10/14/03	L&D HWG Status Report for 15-16 Oct TAEIG meeting
10/21/03	TAEIG: FAA presentations from last week's TAEIG meeting
10/21/03	TAEIG: Link to Semi-Annual regulatory agenda

11/05/03	June mtg Min
11/12/03	FAA letter to the ARAC Executive Committee
11/25/03	TAEIG Action Items – October 15/16, 2003
12/01/03	TAEIG:Avionics HWG Report for 25.1322
12/16/03	Pat Waters Retirement
12/18/03	Updated ARAC charts
12/19/03	Correction for Aircraft Certification Policy Notice
01/07/04	February 2004 TAEIG Meeting
01/09/04	TAEIG: Draft Agenda for the February 10, 2004 ARAC meeting
01/12/04	Updated ARAC Draft Agenda for Feb Meeting
01/13/04	Updated Agenda for the February 10, 2004 ARAC meeting
01/16/04	Regulatory and Non-Regulatory Project Status Update
01/22/04	Federal Register ARAC meeting announcement

Tasks That Are Active Within WG's as of 2/10/04

A task is considered active if:

- There has not been a formal ARAC recommendation

or

- There has not been a submittal of a proposed NPRM or AC for formal economic or legal review.

- Airworthiness Assurance – None
  Avionics – 25.1322/AC25-11
  Braking Systems – None
  Continued Airworthiness Assessment Methodology – None
  Cargo Compartment – None
  Design for Security - None
  Direct View – None
  Electromagnetic Effects - None
  Electrical Systems - None
  Engine - None
  Flight Control - None
  Flight Guidance - None
  Flight Test – None

Tasks That Are Active Within WG's as of 10/15/03 (continued)

General Structures -	1) 25.365(d) High Altitude Flight – Moratorium planned
Human Factors -	1) Human Factors Task
Hydraulic –	None
Ice Protection -	Tasks 2 through 7
Loads and Dynamics -	None
Mechanical Systems -	None
Powerplant Installation -	1) 25.903(d) Rotor Burst – Moratorium planned 2) 25.975 Fuel Tank Vent Fire Protector – Moratorium planned
Systems Design & Analysis-	Phase II Pending
Seat Test -	None

Working Groups Under TAEIG - Open Taskings

Transport Airplane and Engine Issues Group

Legend:

Presently Tasked: | **To be Tasked:**

FAA Part 21, 25, 33, 35
JAR 21, 25, E, P, Subpart J

C. Badie - Honeywell

Avionics Systems Harmonization Working Group

25.1322
AC 25-11

F. Iannarelli - Aerospatiale
R. Park- Boeing

Flight Test Harmonization Working Group

25.1001
25.177
25.207
Min.Maneuver Speeds

A. Kasowski - Cessna

General Structures Harmonization Working Group

- 25.365(d)

R. Curtis Graeber - Boeing
D. Ronceray - Airbus

Human Factors Harmonization Working Group

25.HF

J. Hoppins - Cessna
C. Laburthe - Airbus

Ice Protection Harmonization Working Group

- 25.1419
- 25.773(b)(1)(ii)
- 25.1323(e)
- 25.1325(b)
- 25X1420

F.A. Lewis -Smith - Boeing
J. Nanche - Airbus

Powerplant Installation Harmonization Working Group

25.975
25.903(d)

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• *Indicates SRD items.*

Working Groups Under TAEIG - Completed Taskings

Transport Airplane and Engine Issues Group

Legend:

FAA Actions Pending | **FAA Actions Completed**

FAA Part 21, 25, 33, 35
JAR 21, 25, E, P, Subpart J

Airworthiness Assurance Harmonization Working Group

A. Carter - Delta
K. Gopinath - Boeing

- Repairs
- WFS Bridging
- WFD Report
- WFD Complex STC
- AC 91-56

Avionics Systems Harmonization Working Group

C. Badie - Honeywell

- 25.703(a)&(b) •
- 25.1333(b) •
- 25.1423
- 25.1331
- 25X1328

Brake Systems Harmonization Working Group

R. Amberg - Boeing

- 25.735 •
- 25.731

Cargo Class B & Comp. Harmonization Working Group

D. Klippert(Retired) - Boeing

- 25.857(b)

Continued Airworthiness Assessments Working Group

S. Knife - GE

- AC 39-8

Design for Security Harmonization Working Group

M. Allen- Boeing

- ICAO Annex 8
- Flight Deck Doors

Direct View Harmonization Working Group

D. Klippert- Boeing

- Flight Attendant Direct View AC

Electrical Systems Harmonization Working Group

B. Overhuls - Boeing
R. Bewsey - JAA

- 25.1351(b),(c)(d) •
- 25.1353(a),(c)(5), (c)(6),(d),(e)
- 25.1355(c)
- 25.1357
- 25X1360(a)(b)
- 25X1362
- 2,1431(d) •
- 25X.899 •
- 25.869(a)
- 25.1309
- 25.1310
- 25.1363 •

Electromagnetic Effects Harmonization Working Group

O. Spiller - Airbus
J. Cross - Raytheon

- 25.581 •
- 25.1316 •
- 25.1317 •

Engine Harmonization Working Group

J. McRoberts - Rolls-Royce
F. Fagegaltier - JAA

- 33.27
- FAR 35/JAR-P
- Bird Phase II
- Critical Parts
- 33.17 •
- 33.28
- 33.75 •
- 33.64 •
- APU •
- OEI
- Shafts
- 33.76 •

Flight Controls Harmonization Working Group

L. Schultz - Boeing
P. Traverse - Aerospatiale

- 25.671 •
- 25.671(c)/25.672 •

Flight Guidance Harmonization Working Group

J. Ackland - Boeing
J. Beale - BAE

- 25.1329 •
- 25.1335 •

Flight Test Harmonization Working Group

F. Iannarelli - Aerospatiale
R. Park- Boeing

- 25.101(c)(2)
- 25.107(e)
- 25.111(c)(4)
- 25.1419 •
- 25.147(c) •
- 25.161(c)(2)(e)
- 25.175(d)
- 25.177(a)(b)
- 25.177(c)
- 25.253(a)(3) •
- 25.253(a)(5) •
- 25.1583(k)
- 25X1591
- 25.1501
- 25.143(c)&(f)
- 25.149
- 25.201
- 25.203
- 25.145(c)
- 25.1527
- 25.1583(c)(f)
- 25.1585
- 25.1587
- 25x1516

General Structures Harmonization Working Group

A. Kasowski - Cessna

- 25.775(b)
- AC25.775(d)
- 25.1529 •
- Appendix H Part 25
- 25.307(a)
- 25.571 •
- 25.603
- 25.621
- 25.631 •
- 25.683
- 25.783
- 25.963(e)(g)
- AC25. 571
- 25.613

• *Indicates SRD items.*

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Working Groups Under TAEIG - Completed Taskings (continued)

Transport Airplane and Engine Issues Group

Legend:

FAA Actions Pending | **FAA Actions Completed**

FAA Part 21, 25, 33, 35
JAR 21, 25, E, P, Subpart J

J. Draxler - Boeing

Hydraulic Test Harmonization Working Group

25.1435

L. Hanson - Gulfstream

Loads & Dynamics Harmonization Working Group

25.1517
25.721
• 25.963(d)
25.994
25.471/ 25.519
25.865

25.301
25.302
25.305
25.331(c)
25.331(c)(1)
25.361/362
25.371
25.415

25.335(b)(2)
25.341
25.345
25.561
25.629
25.351(a)(1)
25.427
25.473
25.479
25.483
25.493
AC25.629-1A

25.493(d)
25.723(a)
AC25.491-1

K. (Pat) Waters - Boeing
H. Asshauer - Airbus

Mechanical Systems Harmonization Working Group

25X.1436
• 25.1438
25.1453
• 25.677(b)
• 25.729
• 25.773(b)(2)(b)(4)
• 25.1439
25.851(b)
25.831
25.841

F.A. Lewis-Smith - Boeing
J. Nanche - Airbus

Powerplant Installation Harmonization Working Group

• 25.901(c)(d)
25.903(d)(1)
25.903(e)
• 25.933(a)(1)
25.934
25.943/25 x1315
25.1091
• 25.1187/25.863
• 25.1193(e)
Notice 84-17A
25.973 (d)
25.1181(b)
25.1305(a)(7), d)(2)(i)
25.945 (b)(5)

• 25.1093 (b)(1)(ii)
25.1141
25.1189(a)
25.1155
FAR 1
APP I -(25.904)

AC20-128A
Phase I
• 25.905
• 25.929
25.1103
25.1183(c)

J.P. Deneuville - JAA/ DGAC

Seat Testing Harmonization Working Group

• 25.562
• 25.785(b) (c)&(e)

AC25.562-1A

D. Armstrong - Bombardier
J. Heckmann - Airbus

Systems Design & Analysis Harmonization Working Group

25.1301
• 25.1309
• 25.1310

• Indicates SRD items.

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TAEIG Action Items – October 15/16, 2003

1. Dionne Krebs to provide reference to most recent regulatory agenda that was published in Federal Register. – Done

2. TAEIG members should review ARAC website to be sure appropriate recommendations are on website. Gerri Robinson – Office of Rulemaking, should be contacted for corrections.

3. Mike Kaszycki to review acceptability of moving HFWG report from February 2004 to March 2004. – Done and agreed.

4. PPHWG sub group that is supporting IPHWG is to look at moving completion date of work to late '04 instead of June '05.

5. FAA to review course of action for 25.1309 phase II considering feedback provided at TAEIG meeting.

6. GE to review with GSHWG concerns on damage tolerance of engine mounts.
   - Done

Carryover from October 2002 Meeting

1. Effie Upshaw to check status of EHWG recommendation on airport bird control.

February 2004 TAEIG Meeting

Topics

- Rulemaking Project Status
- Non-Rulemaking Project Status
- Update on Rulemaking Prioritization
- Update on HWG Moratorium

February 2004 TAEIG Meeting

Rulemaking Project Status:

- Notices of Proposed Rulemaking (NPRMs) issued since October 2003:
  - Extended Operations (ETOPS) of Multi-engine Airplanes
    - NPRM issued November 7, 2003
    - Comment Period Extension to March 15, 2004 issued December 31, 2003

February 2004 TAEIG Meeting

Rulemaking Project Status: *continued*

- 12 Part 25 Final Rules (FRs) in Headquarters coordination for issuance
- 2 Part 25 NPRMs in Headquarters coordination for issuance
- 1 Part 33 NPRM in Headquarters coordination for issuance
- 3 Part 25 NPRMs in Headquarters for regulatory evaluation development
- 3 Part 33 NPRMs in Headquarters for regulatory evaluation development
- 2 New Taskings under development

February 2004 TAEIG Meeting

Non-Rulemaking Project Status:

- Policy/Advisory Material Status (since October 2003):
  - 1 Final Part 25 Policy Notice was issued:
    - Guidance for Determination of System, Hardware, and Software Development Assurance Levels on Transport Category Airplanes (1/15/04)
  - 1 Notice of Part 25 Policy was issued for comment:
    - Clarification of Policy and Advisory Material Associated with certification of Flight Data Recording Systems on 14 CFR Part 25 Airplanes (12/7/03)
      - Comment period closed 1/16/04

February 2004 TAEIG Meeting

Non-Rulemaking Project Status: *continued*

- Policy/Advisory Material Status (since October 2003):
  - 6 Part 33 policy/guidance documents in-work
    - Non-ARAC projects
    - 4 New Advisory Circulars (ACs)
      - AC 20-XX, Induction System Icing (engine/installation)
      - AC 33.27-1 Rotor Integrity Overspeed
      - AC 33.90-1 Initial Maintenance Inspection
      - AC 33.4-3, HIRF/Lightning FADEC Maintenance
    - 2 New Policy Memorandums
      - 33.87, Endurance Testing
      - 33.15, Titanium Inspections

February 2004 TAEIG Meeting

Update on FAA Rulemaking Prioritization

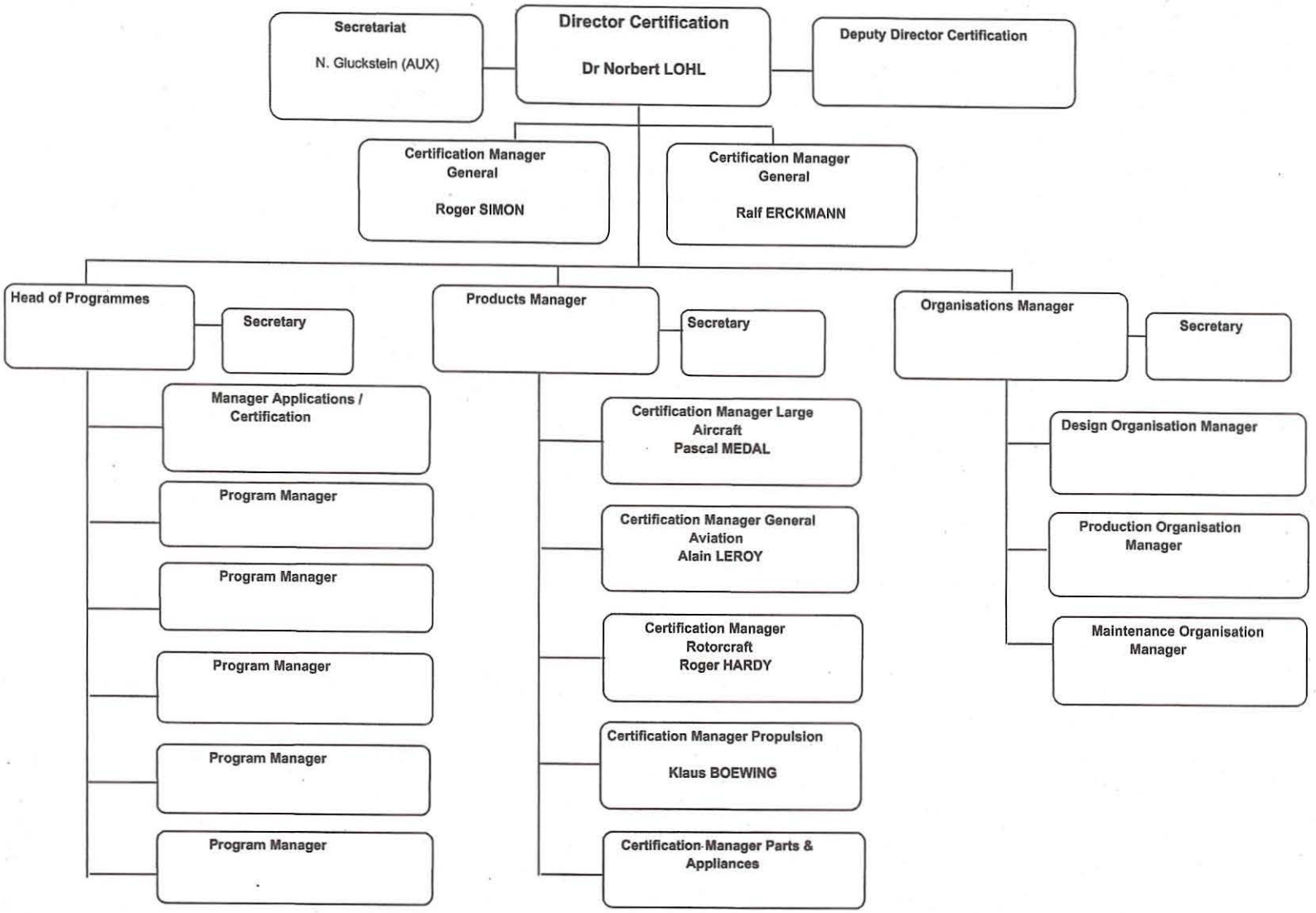
- The Transport Airplane Directorate and Flight Standards are reviewing internal rulemaking priorities to address Aging Airplane Tiger Team rulemaking recommendations.
- The FAA will send a letter to ARAC to identify those ARAC taskings that will not receive FAA rulemaking resources.
  - The FAA is identifying appropriate ways to use the results of the ARAC recommendations:
    - Policy, Equivalent Safety Finding/Exemptions, Special Conditions, acceptable means of compliance, etc.

February 2004 TAEIG Meeting

Update on HWG Moratorium:

- The FAA plans to remove the moratorium once the FAA and industry finalize their positions on the PPIHWG 25.903(d) Rotorbust task.
- The FAA will send a letter to TAEIG to:
  - Remove the moratorium
  - Request that the GSHWG submit their outstanding report for a vote at the next TAEIG meeting.
  - Inform TAEIG that the FAA will formally de-task the PPIHWG 25.975 Fuel Tank Vent Fire Protection.
  - Identify the FAA plan with respect to the PPIHWG 25.903(d) Rotorburst task.

EASA Organisational Chart (January 2004)


Secretariat
N. Gluckstein (AUX)
Director Certification
Dr Norbert LOHL
Deputy Director Certification
Certification Manager General
Roger SIMON
Certification Manager General
Ralf ERCKMANN
Head of Programmes
Secretary
Manager Applications / Certification
Program Manager
Program Manager
Program Manager
Program Manager
Program Manager
Products Manager
Secretary
Certification Manager Large Aircraft
Pascal MEDAL
Certification Manager General Aviation
Alain LEROY
Certification Manager Rotorcraft
Roger HARDY
Certification Manager Propulsion
Klaus BOEWING
Certification Manager Parts & Appliances
Organisations Manager
Secretary
Design Organisation Manager
Production Organisation Manager
Maintenance Organisation Manager

Effie
ARM-209
202 267-7626 (telephone)
202 267-5075 (fax)
----- Forwarded by Effie Upshaw/AWA/FAA on 02/09/2004 04:10 PM -----
"Khouzam, Maher" <KHOUZAM@tc.gc.ca>
02/09/2004 02:13 PM

To: Effie Upshaw/AWA/FAA@FAA
cc:
Subject: TCCA-Report

Hi Effie:
It was my pleasure to chat with you...

With my <<Mea culpa>> here is the TCCA report:

* CAR 521 will be submitted for discussion and acceptance at the May, 2004 CARAC. With the structure of EC part 21, it will replace our present 511 & 513. We are following the changes to FAR 21 and will re-adjust 521 where needed.
* The transitional arrangement with EASA was counter-signed last week by our DG Civil Aviation. The official copy should reach EASA shortly. We are also working with EASA personnel on a full Agreement. EASA will be seeking an official negotiating mandate, to finalize the agreement.
* CPR Follow-up: TCCA joined the FAA Continuous Improvement Team (CIT), as we believe that one team which includes the JAA/EASA will be more effective

I will try joining the group by phone sometime before lunch...

Regards to every one from the Bear from the north

Maher
613 990 2738

General Structures Harmonization Working Group Report to TAEIG

February 10, 2004

Andrew Kasowski
Cessna Aircraft Company

General Structures Harmonization Working Group - Current Activities

- No Meetings Since Last Report
- § 25.571 Damage Tolerance and Fatigue Evaluation of Structure
  - Clarification of Issues with GE 1-29-04 by Teleconference
  - FAA continues to review recommendations internally
- § 25.365(d)/AC25-20 Pressurized Compartment Loads - High Altitude Flight
  - Unresolved Issue
    - Cutoff altitude for high altitude requirement (altitude above which additional requirements are imposed)
    - Original positions were 41K or 45K
    - JAA revised position is that additional requirements must be considered at all altitudes
  - Coordination with group members by e-mail to reach resolution has been unsuccessful
  - Recommend to discontinue effort until additional taskings assigned to GSHWG which would require on purpose meeting

Human Factors HWG

Curt Graeber

Report to the TAEIG

February 10, 2004

Washington, DC

HF HWG Progress

- Draft rule
  - Issues were identified with error-based rule
  - HWG decided to adapt an equipment-focused rule
- Reviewing 14th draft of proposed AC/ACJ 25-HF
  - Have established ties to existing rules
  - Refined clarity of methods of compliance
  - Focusing on usability by industry and regulators
- Organization feedback on Draft 14 and rule draft
  - Comments due Feb 2, draft minority reports due Feb 15

Rule Approach

- Address design characteristics that lead to error rather than error itself
  - Information, controls and system logic required for flight crew tasks must be provided in accessible, usable, unambiguous form
- Narrowed the emphasis to certain aspects of design characteristics, enabling more focused discussions
- Explicit ties to flight crew tasks
- Potentially easier to tie to methods of compliance
- Addresses integration along with systems

Draft Rule – 25.1301

JAR/§ 25.1301 Function and Installation

Each item of installed equipment must -

(e) When intended for use by the flight crew from the normally seated position in the flight deck, individually and in combination with other such equipment,

1. Be of a kind and design such that the flight crew can safely perform their tasks associated with the intended function. Flight deck controls must be installed and information necessary to accomplish these flight crew tasks must be provided.

2. Be designed so that the controls and information in (e)(1) must:

    i. Be presented in a form that is clear and understandable, at a resolution and precision appropriate to the task,

    ii. Be accessible and usable by the flight crew in a manner consistent with the urgency, frequency, and duration of their tasks, and

    iii. Provide awareness to the flight crew, if required for safe operation, of the effects resulting from flight crew actions on the aircraft or systems.

Draft Rule (Con't)

3. Be designed so that installed equipment behavior that is operationally relevant to the flight crew tasks associated with intended function is:
    i. Predictable and understandable, and
    ii. Designed to enable the flight crew to intervene in a manner appropriate to the task.
4. Be designed to enable the flight crew to manage errors resulting from flight crew interaction with the installed equipment and that can be reasonably expected in service. *This does not apply to skill and proficiency issues associated with control of the airplane through the use of the primary flight control system.*

The provisions of this paragraph assume that the flight crew is proficient and properly trained.

Draft Rule – Separate Version

JAR/§ 25.1302 Installed Systems and Equipment for Use by the Flight Crew

Each item of installed equipment intended for the flight crew's use from their normally seated positions in the flight deck, individually and in combination with other such equipment, must:

Etc.

FAA Critical Comments

- "Proficient and Properly Trained Flight Crew“
  - Would bring training requirements into type certification process
  - Would establish a standard that could conflict with those established by AFS
  - Or, would force the FAA to drive the certification training assumptions into every FAA approved training program
- Rule Scope Constraints
  - Constraints set forth in several locations in the draft AC on the scope or applicability of the rule, or for the consideration of errors, constitute "rulemaking by AC" in that they reduce the apparent regulatory requirements.
- Methods of Compliance:
  - Draft AC has improved substantially but still many significant shortfalls, particularly with respect to the new rule.

Industry Critical Comments

- Include "Proficient and Properly Trained Flight Crew“ in the rule
  - This assumption is generally agreed, but not documented in part 25.
  - Without such documentation, the new rule, being powerful and fairly subjective, offers too much of an opportunity for excessively conservative interpretations.
- History of development is proprietary.
  - Applicant must be allowed to choose whether to share proof-of-concept activities, customer internal assessments with the regulator
- Potentially significant cost and schedule impact.
  - Requires considerable involvement from authorities before formal testing (vs. “delegation” via Partnership for Safety Program)
- A new "analysis" of entire flight deck is implied as a MoC for "changed" flight decks resulting from an STC installation
- Should categorize errors in relation to associated human behavior

HF HWG Issues

- Harmonization is a MUST
  - Significant progress with EASA with UK CAA
  - Sept ’04 issuance of NPA by EASA would significantly lead FAA and threaten harmonization
- Solutions being developed to main concerns
- Progress satisfactory, but significant challenges
  - All comments submitted and being addressed
  - Report being drafted
  - Will seek to resolve any minority report drafts at final meeting
- Final report will be available March 2004.

Future Meetings

Next (and final) meeting:

- Dates: Feb. 24-26, 2004
- Location: Paris, France (DGAC hosting)

Ice Protection HWG Status

Presentation to ARAC TAEIG
Feb - 2004

Task 1

IPHWG

"As a short-term project, consider the need for a regulation that requires installation of ice detectors, aerodynamic performance monitors, or another acceptable means to warn flight crews of ice accumulation on critical surfaces requiring crew action (regardless of whether the icing conditions are inside or outside of Appendix C of 14 CFR Part 25). Also consider the need for a Technical Standard Order for design and/or minimum performance specifications for an ice detector and aerodynamic performance monitors. Develop the appropriate regulation and applicable standards and advisory material if a consensus on the need for such devices is reached."

- ⇨ Proposed Part 121 rule submitted to TAEIG with FAA legal and economic analysis, September 2002
- ⇨ Proposed Part 25 certification rule "fast tracked" in Dec 2000, no further WG actions

Task 1 Ice Detector TSO

IPHWG

Proposed Operational and Certification rules address Task 1, except for TSO aspect

- ⇨ "Also consider the need for a Technical Standard Order for design and/or minimum performance specifications for an ice detector and aerodynamic performance monitors. Develop the appropriate regulation and applicable standards and advisory material if a consensus on the need for such devices is reached."

Per Oct 2003 TAEIG discussion:

- ⇨ IPHWG initiating reviewing of SAE/EUROCAE Standards
  - In-flight ice detector only, component level TSO
  - Identify any additional qualification requirements
  - Identify anything not appropriate for a TSO
- ⇨ IPHWG comments to be sent to TAEIG for forwarding to AIR-120 for consideration in drafting a TSO.
- ⇨ Priority after Task 2

Task 2

IPHWG

"Review National Transportation Safety Board recommendations A-96-54, A-96-56, and A-96-58, and advances in ice protection state-of-the-art. In light of this review, define an icing environment that includes supercooled large droplets (SLD), and devise requirements to assess the ability of aircraft to safely operate either for the period of time to exit or to operate without restriction in SLD aloft, in SLD at or near the surface, and in mixed phase conditions if such conditions are determined to be more hazardous than the liquid phase icing environment containing supercooled water droplets. Consider the effects of icing requirement changes on 14 CFR part 25 and revise the regulations if necessary. In addition, consider the need for a regulation that requires installation of a means to discriminate between conditions within and outside the certification envelope."

⇨ Removed reference to Part 23 per FAA letter 2/12/02

Status Task 2

Concept approved at March '02 TAEIG Meeting

- ⇨ Proposed rule §25.1420 would require unrestricted operation or exit from SLD
- ⇨ Includes definition of Appendix X (SLD envelopes)

Task 2 revision to add Part 33 to support EHWG sub-group efforts?

- ⇨ In process?
- ⇨ Complete?

Status Task 2 (continued)

IPHWG

November IPHWG Meeting Status

- ⇨ Draft AC Materials released to sub-groups for consideration
  - Received some comments (agenda items next IPHWG)
- ⇨ Draft Appendix X released to sub-groups for consideration
  - Small changes requested (agenda items next IPHWG)
- ⇨ Working group report for preamble considerations (~70%)
  - Last meeting focused on report
  - Determining economic factors
    - + FAA economist to attend next IPHWG meeting
    - + Some members have gathered data, but cannot release

FTHWG Support of IPHWG Task 2

IPHWG

- FTHWG considering impact of Appendix X on 25.21(g) proposals
  - ⇨ Some issues identified, to be discussed at next IPHWG
  - ⇨ Status to be provided by FTHWG

- FTHWG recommending IPHWG coordinate SLD issue with other disciplines
  - ⇨ Autopilot
  - ⇨ Structures (aeroelastic stability)
  - ⇨ Human factors

- No actions taken to date. Agenda item for next IPHWG Mtg

Engine HWG's Support of IPHWG Task 2

IPHWG

Combined Engine & Engine Installations sub-group formed

- Meeting planned for Feb. 24-25
- Telecon with IPHWG
- TAEIG request to speed up part 25 aspects
  - ⇨ Parts 25 and 33 are too closely linked to separate productively
  - ⇨ Tests for compliance of part 33 also used for part 25
  - ⇨ Alternate concept being explored
    - Separate the work on stratiform clouds and current Appendix X from cumulus clouds
- Detailed task list and time line in work
- Recommendations for technology and research in work
  - ⇨ Meteorological support (mixed phase and cumulus clouds)
  - ⇨ Methods of compliance
  - ⇨ Droplet physics relative to engines (breakup, inlet pressure effects, potential for glaciation)

Plan for Final Product

IPHWG

IPHWG to complete Task 2 systems aspects and environment definitions as much as possible with current information and moves on to other tasking

- ⇨ Release interim products to sub-groups to assist in tasking
- ⇨ Maintain coordination with other sub-groups as required
- ⇨ Start FAA preliminary technical writer and legal review of IPHWG products

When other working group products are received, a review & coordination period to consolidate the IPHWG/other sub-group products will likely be required

- ⇨ Telecons and/or meeting(s) as required
- ⇨ Other sub-group products are incorporated in IPHWG report as separate sections or appendices

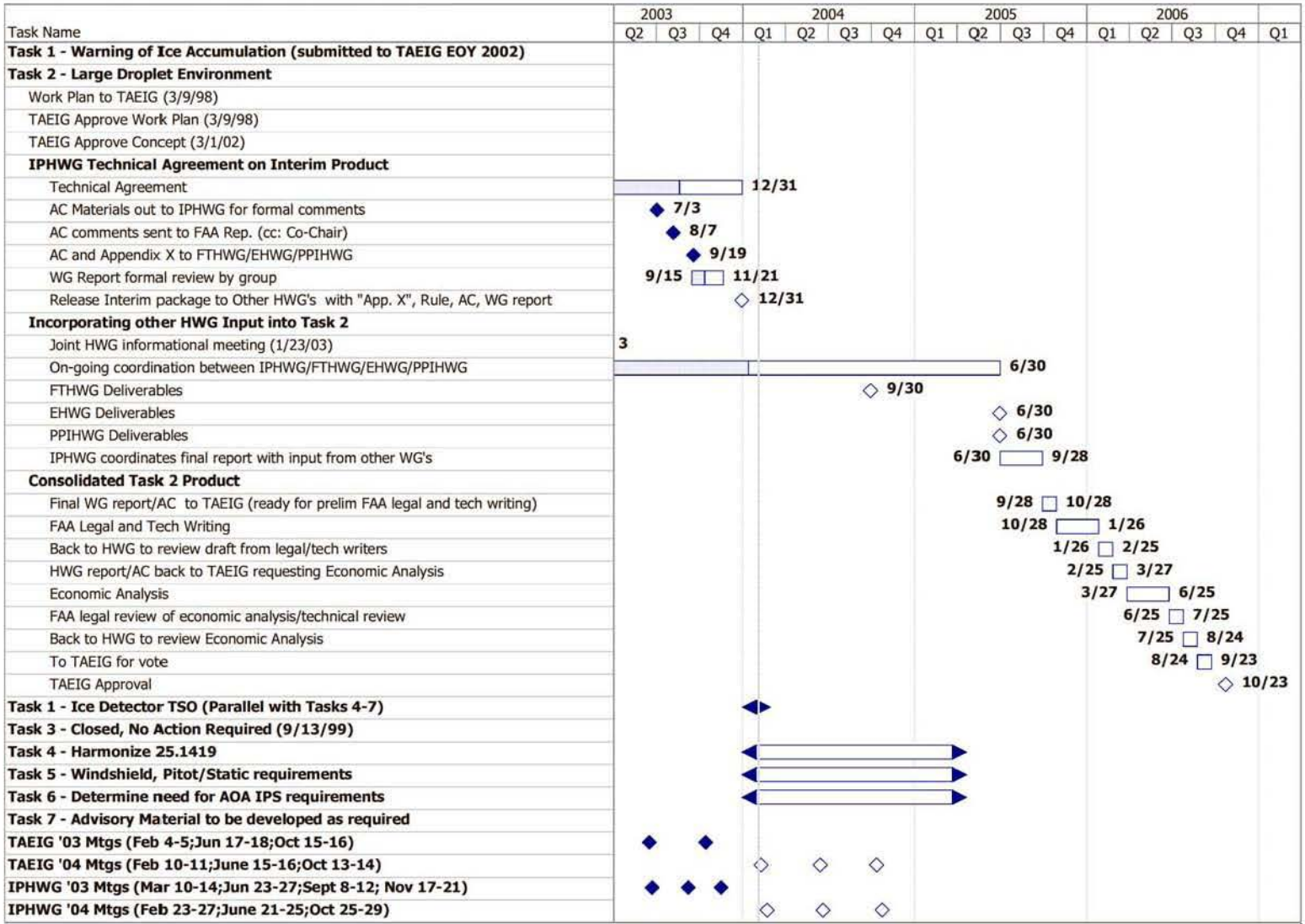
Consolidated package submitted to TAEIG for approval and final FAA economic and legal review

Task 2 Major Issues

- Need for a "means to discriminate between conditions within and outside the certification envelope"
- Requirements for flight testing in natural SLD
- Working group report completion

Schedule

IPHWG



WG Task Priorities & Schedule

IPHWG

Priorities

- Task 2 – Working Group Report
- TSO and Tasks 4-7 will not be addressed until technical agreement is reached on Task 2
- Task 4 to be considered complete
  - ⇨ AC 25.1419 was incorporated into a harmonized AC 25.1419/25.1420.
  - ⇨ WG action to draft closure letter

Schedule

- Mtg 23 - Feb. 23-27, 2004 Ft. Lauderdale (Embraer)
- Mtg 24 - Jun. 21-25, 2004 Vienna, Austria (Octagon)
- Mtg 25 – Oct. 25-29, 2004 Montreal (TC)

Remaining Tasking (reference)

IPHWG

Task 3 - "Propose changes to make FAR 23.1419 and 25.1419 the same"
- ⇨ Returned to FAA for further action (ref. FAA letter Sept 13, 1999)
- ⇨ No further IPHWG actions

Task 4 - "Harmonize 14 CFR 25.1419 and JAR 25.1419"
- ⇨ Revised per FAA letter of Nov. 10, 1999
- ⇨ Rule language harmonized, but advisory materials are not
- ⇨ AC materials for 25.1420 incorporated AC 25.1419 (harmonized)
- ⇨ Task 4 essentially complete, WG to draft proposed closure letter

Task 5 - "Consider the effects icing requirement changes may have on 14 CFR 25.773(b)(1)(ii), 25.1323(e), 25.1325(b) and JAR 25.773(b)(1)(ii), 25.1323(e), 25.1325(b). Revise and harmonize the regulations if necessary."
- ⇨ Revised per FAA letter of Nov. 10, 1999

Task 6 - "Consider the need for a regulation on ice protection of angle of attack probes"

Task 7 - "Develop or update advisory material pertinent to items 2 through 6 above."

FLIGHT TEST HWG STATUS

PRESENTATION TO ARAC TAEIG

February 10, 2004

Topics

- TAEIG Request of FTHWG
- Current Status
- FTHWG/IPHWG Coordination Issues
- Meeting Schedule

TAEIG Request of FTHWG

- The IPHWG through the TAEIG has requested coordination on this tasking relative to the flight test aspects of the proposed rulemaking. The specific aspects requiring coordination are the use of the proposed rules for § 25.21(g) relative to the unrestricted flight in SLD conditions. The present concept for unrestricted flight does not require identification or differentiation of the SLD environment from the current Appendix C icing environment. As such, it would appear appropriate to use the same set of airplane performance and handling characteristic standards as proposed under § 25.21(g) relative to Appendix C.
- The second part of the proposed IPHWG rulemaking would allow the optional certification in SLD conditions to be limited to the period required to identify and exit the conditions. The proposed performance and handling characteristic standard for this exit is the “safe return and landing” criterion commonly used in association with system failure conditions. This reduced handling criterion provides a standardized, widely accepted level of safety, yet provides greater certification flexibility for small-scale 14 CFR 25 aircraft.
- The specific action requested of the FTHWG is the consideration of the above-proposed performance and handling standards and to provide concurrence and/or comments.

Current Status

- The FTHWG met Feb. 3-5 in support of IPHWG Task 2.
  - A matrix of “certifiable” combinations of Appendix X “portions” and flight phases was developed.
  - Work was started on drafting “SLD” modifications to the Subpart B. This is complex and a number of issues have been identified, most involving coordination with the IPHWG.
  - FTHWG needs FAA support in determining the starting point for SLD icing during takeoff/climbout.
- Due to an increase in work requirement discovered during the detailed regulatory review an FTHWG meeting has been added in late 2004.

FTHWG/IPHWG Coord. Issues

- The FTHWG continues to believe adjustments to draft 25.1419 and 25.1420 are needed to make them more parallel and to separate out Subpart B aspects.
- In reviewing necessary changes to the Subpart B rules and AC for Appendix X the FTHWG determined that it is highly desirable that the requirements and advisory material developed by the IPHWG relating to airplane performance and handling qualities be relocated into the updated Subpart B materials.
- The FTHWG has determined that Appendix X should define ice shapes by flight phase as in Appendix C.
- Draft texts and justification for the above are in work.

FTHWG 2004 Meeting Schedule

• FTHWG-25	May 4-6	Long Beach
• FTHWG-26	Sept. 21-23	Europe, TBD
• FTHWG-27	Nov. 30 – Dec. 2	Ft. Lauderdale

ARAC WG Report
FAR/JAR 25.1322 & AC/ACJ 25.1322

1. What is underlying safety issue addressed by the FAR/JAR?
   The rule provides color requirements for warning, caution and advisory lights associated with alerting functions. However, the current rule only addresses "lights" and does not take into consideration the implementations, technology, and associated safety issues with the latest flight deck alerting systems.

   FAR/JAR 25.1322 describes standards for the color of warning, caution, advisory, and other message lights that are installed as annunciation displays in the flight deck. It addresses visual alerting cues only in the form of colored lights installed in the flight deck. The regulation became effective February 1, 1977 (Amendment No. 25-38, 41 FR 44567, December 20, 1976) and has never been amended. It does not consider the use of corresponding aural tones/voice and prioritization of multiple alerts that may occur at the same time. Nor does it consider new technologies, other than colored lights, that may be more effective in aiding the flight crew in decision making. Further, FAR/JAR 25.1322 is outdated, does not address safety concerns associated with today's display systems, and has resulted in additional work for applicants when showing compliance, and for the FAA when addressing new flight deck designs and the latest display technologies via special conditions and issue papers.

2. What are the current FAR and JAR standards?

   Current FAR text:
   If warning, caution, or advisory lights are installed in the cockpit, they must, unless otherwise approved by the Administrator, be--
   (a) Red, for warning lights (lights indicating a hazard which may require immediate corrective action);
   (b) Amber, for caution lights (lights indicating the possible need for future corrective action);
   (c) Green for safe operation lights; and
   (d) Any other color, including white, for lights not described in paragraphs (a) through (c) of this section, provided the color differs sufficiently from the colors prescribed in paragraphs (a) through (c) of this section to avoid possible confusion.

   Current JAR text:
   If warning, caution, or advisory lights are installed in the cockpit, they must, unless otherwise approved by the Authority, be -
   (a) Red, for warning lights (lights indicating a hazard which may require immediate corrective action);
   (b) Amber, for caution lights (lights indicating the possible need for future corrective action);
   (c) Green, for safe operation lights; and
   (d) Any other colour, including white, for lights not described in sub-paragraphs (a) to (c) of this paragraph, provided the colour differs sufficiently from the colours prescribed in sub-paragraphs (a) to (c) of this paragraph to avoid possible confusion.

3. What are the differences in the standards and what do these differences result in?:
   There are no differences in the standards. There is a related AMJ, but no AC.

4. What, if any, are the differences in the means of compliance?
   Specific means of compliance to JAR 25.1322 are provided in the associated AMJ.
   No specific means of compliance exists for FAR 25.1322.

5. What is the proposed action?
   The FAR 25 and JAR 25 and their associated guidance material have been identified as lacking content and guidance commensurate with the state-of-the-art. Therefore, a new FAR/JAR 25.1322 will be written to address current or future flight deck design and the technologies associated with flight crew alerting. The existing AMJ will be reviewed and harmonized advisory material will be generated.

6. What should the harmonized standard be?
   A new FAR/JAR 25.1322 and associated AC/AMJ 25.1322. (See Attachment and file Draft AC25.1322 DC Meeting 1003_rev a)

7. How does this proposed standard address the underlying safety issue (identified under #1)?
   The new standard will address the requirements for crew alerting systems and provide content and guidance that is commensurate with the state-of-the-art flight deck alerting systems.

8. Relative to the current FAR, does the proposed standard increase, decrease, or maintain the same level of safety?
   The level of safety will be increased by providing new standards and guidance material that is commensurate with the state-of-the-art and crew alerting, and by providing guidance for other Part 25 regulations that require the use of alerting.

9. Relative to current industry practice, does the proposed standard increase, decrease, or maintain the same level of safety?
   The new standards and guidance material supports current industry practice and will increase the level of safety.

10. What other options have been considered and why were they not selected?:
    The group initially thought of adopting the JAR and associated AMJ. However, this was still deemed insufficient for today's flight deck alerting systems. The level of effort to rewrite the rule was significant, and each sub-paragraph was reviewed and many options were considered. In addition, the Human Factors Harmonization Working Group provided additional options for consideration. The group has modified wording in the draft AC/ACJ to address the means of compliance to sub paragraph e) in the rule.

11. Who would be affected by the proposed change? The (Part 25) aviation industry in general including aircraft manufacturers, aircraft operators, avionics manufacturers, and regulators, if they are not already practicing the essence of these standards. There may be indirect effect to manufacturers that wish to develop products and systems that are intended to cross part 23/25/27/29 applications.

12. To ensure harmonization, what current advisory material (e.g., ACJ, AMJ, AC, policy letters) needs to be included in the rule text or preamble?
    AC/AMJ 25-11, and parts of the draft AC/AMJ 25-1322.

13. Is existing FAA advisory material adequate? No. There is no existing FAA advisory material. However, there is an existing AMJ 25.1322 and that document has been revised to incorporate this latest information.

14. How does the proposed standard compare to the current ICAO standard?
    There are no applicable ICAO standards.

15. Does the proposed standard affect other HWGs? Yes. We have coordinated with the working groups responsible for Human Factors (25.1301(e)), Propulsion and Safety (25.1309). We have also coordinated with other industry groups such as the RTCA SC-195 committee.

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

    For those manufacturers that are already in compliance / already practicing. Harmonization of 25.1322 and the associated guidance material will significantly reduce certification costs, thereby improving the allocation of limited resources.

    For those manufacturers that are not in compliance/not already practicing, there may be additional costs to comply with the new rule.

    There is a general potential problem with the change process, if this revised rule is used for new applications of existing products and systems, or if this revised rule is applied to any modifications to existing products and systems.

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

    Yes

18. 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?

    Yes, it is appropriate for the "Fast Track" process. The group identified an issue regarding sub paragraph (e) in the draft rule that caused controversy. The group resolved this to our satisfaction by revising both the regulation and advisory material, based on comments received from the RTCA SC-195 committee and from within group membership.

    The AVHWG will also update AC/AMJ 25-11 to cover the broad scope of the use of colors in the flight deck.

FAR/JAR 25.1322 Flight Crew Alerting

(a) When flight crew alerts are provided they must:

1) Provide timely attention-getting cues through at least two different senses by combination of aural, visual, or tactile indications, for crew alerts requiring immediate flight crew awareness.
2) Provide the flight crew with the information needed to identify the alert and determine correct action, if any.
3) Be readily and easily detectable and intelligible by the flight crew under all foreseeable operating conditions including conditions where multiple alerts are provided.

(b) Alerts must conform to the following prioritization hierarchy based upon urgency of flight crew awareness and urgency of flight crew response.

1) Warning: For conditions that require immediate flight crew awareness and immediate flight crew response. If warnings are time critical to maintain the immediate safe operation of the airplane, they must be prioritized higher than other warnings.
2) Caution: For conditions that require immediate flight crew awareness and subsequent flight crew response.
3) Advisory: For conditions that require flight crew awareness and may require subsequent flight crew response.

(c) Alert presentation means must be designed to minimize nuisance effects. In particular a crew alerting system must:

1) Permit each occurrence of attention getting cues, if provided, to be acknowledged and suppressed unless they are otherwise required to be continuous.
2) Prevent the presentation of an alert that is inappropriate or unnecessary for the particular phase of operation.
3) Remove the presentation of the alert when the condition no longer exists
4) Provide a means to suppress an attention getting component of an alert caused by a failure of the alerting system, and/or the sensors, which interfere with the flight crew's ability to safely operate the aircraft. This means must not be readily available to the flight crew such that it could be operated inadvertently, or by habitual reflexive action. In this case, there must be a clear and unmistakable annunciation to the flight crew that the alert has been suppressed.

(d) Alerts must conform to the following color convention for visual alert indications:

1) Red for Warning alert indications.
2) Amber/yellow for Caution alert indications.
3) Any color except red or green for Advisory alert indications.

(e) The colors red and amber/yellow are normally reserved for alerting functions. The use of these colors for functions other than crew alerting must be limited and must not adversely affect crew alerting.

Final Version AC/ACJ 25.1322 – **Updated October 2003 in Washington, D.C.**
Flight Crew Alerting

Table of Contents

1. PURPOSE

This advisory circular (AC) provides guidance for the design and approval of flight crew Alerting Functions installed in transport category airplanes.

2. SCOPE

This advisory circular applies to the installation, integration, and certification of flight deck alerting systems, whether they are integrated or not. That is, it applies to individual aircraft systems that provide alerts that may or may not be integrated with a central alerting system, as well as systems whose primary function is alerting, such as a central alerting system. The alerting system may be approved as part of a TC/STC/ATC/ASTC.

This AC provides guidance as to what is considered an alert. However, what should be alerted to the flight crew is dependent on the specific design and overall flight deck philosophy. For example, the failure of a single sensor in a multi-sensor system in some cases may not necessarily result in an alert condition that the pilot needs to be aware of. However, for a single sensor system such a failure would certainly result in alert. Thus, the applicant should discuss the overall flight deck design and alerting philosophy with the Authority when determining what should be alerted to the flight crew. Any system that provides an alert should follow the guidance in this AC.

Like all AC material, this AC is not mandatory and does not constitute a regulation. It is issued to provide guidance and to outline a method of compliance with rules and in particular 25.1322.

3. RELATED REGULATIONS

The following list of regulations describe requirements for flight crew alerting for which this advisory circular provides guidance.

CFR/JAR 25.207	Stall warning
CFR/JAR 25.253(a)(2)	High-speed characteristics
CFR/JAR 25.672(a)	Stability Augmentation…
CFR/JAR 25.679(a)	Control system gust locks
CFR/JAR 25.703	Takeoff warning system
CFR/JAR 25.729(e)	Retracting mechanism
CFR/JAR 25.783(e)	Doors
CFR/JAR 25.812(f)(2)	Emergency lighting
CFR/JAR 25.819(c)	Lower deck service compartments
CFR/JAR 25.841(b)(6)	Pressurized cabins
CFR/JAR 25.854(a)	Lavatory fire protection
CFR/JAR 25.857(b)(3)	Cargo compartment classification
CFR/JAR 25.857(c)(1)	Cargo compartment classification
CFR/JAR 25.857(e)(2)	Cargo compartment classification
CFR/JAR 25.859(e)(3)	Combustion heater fire protection
CFR/JAR 25.863(c)	Flammable fluid fire protection
CFR/JAR 25.1019(a)(5)	Oil strainer or filter
CFR/JAR 25.1165(g)	Engine ignition systems
CFR/JAR 25.1203(b)(2)	
CFR/JAR 25.1203(b)(3)	Fire-detector system
CFR/JAR 25.1203(f)(1)	Fire-detector system
CFR/JAR 25.1303(c)(1)	Flight and navigation instruments
CFR/JAR 25.1305(a)(1)	
CFR/JAR 25.1305(a)(5)	Powerplant instruments
CFR/JAR 25.1305(c)(7)	Powerplant instruments
CFR/JAR 25.1309(c)	Equipment, systems, and installations
CFR/JAR 25.1309(d)(4)	Equipment, systems, and installations
CFR/JAR 25.1322	Warning, caution, and advisory lights
CFR/JAR 25.1326	Pitot heat indication systems
CFR/JAR 25.1331(a)(3)	Instruments using a power supply
CFR/JAR 25.1353(c)(6)(ii)	Electrical equipment and installations
CFR/JAR 25.1419(c)	Ice protection
CFR/JAR 25.1517(3)	Rough air speed, V_{RA}
CFR/JAR 25, Appendix I Section 25.6	Installation of an Automatic Takeoff Thrust Control System (ATTCS) Powerplant Instruments
CFR/JAR 33.71(b)(6)	Lubrication system.
CFR/JAR 91.219	Altitude alerting system or device: Turbojet powered civil airplanes
CFR/JAR 91.221	Traffic alert and collision avoidance system equipment and use
CFR/JAR 91.223	Terrain awareness and warning system
CFR/JAR 91.603	Aural speed warning device
CFR/JAR 91, Appendix A Section 91.2(b)(1)	Required instruments and equipment
CFR/JAR, Appendix G Section 91.2(c)(3) Minimum (RVSM) Airspace - Aircraft approval	Operations in Reduced Vertical Separation
CFR/JAR 91, Appendix G Section 91.3(c)(6)	Instruments and Equipment Approval
CFR/JAR 121.221(c)(1)	Fire precautions
CFR/JAR 121.221(d)(1)	Fire precautions

14 CFR 121.221(f)(2)	Fire precautions
14 CFR 121.289	Landing gear: Aural warning device.
14 CFR 121.307(k)	Engine instruments
14 CFR 121.308(a)	Lavatory fire protection.
14 CFR 121.319(b)	Crewmember interphone system
14 CFR 121.354	Terrain awareness and warning system
14 CFR 121.356(b)	Traffic alert and collision avoidance system
CFR/JAR 121.358	Low-altitude windshear system equipment requirements
CFR/JAR 121.360(a)	
CFR/JAR 121.360(e)	
CFR/JAR 121.360(f)	Ground proximity warning-glide slope deviation alerting system
CFR/JAR 125.187	Landing gear: Aural warning device.
CFR/JAR 125.205(d)	Equipment requirements: Airplanes under IFR.
CFR/JAR 125.221(a)	Traffic alert and collision avoidance system
CFR/JAR 135.150(b)(7)	Public address and crewmember interphone system
14 CFR 135.153(a)	Ground proximity warning system.
14 CFR 135.154	Terrain awareness and warning system
14 CFR 135.163(d)	Equipment requirements: Aircraft carrying passengers under IFR.
14 CFR 135.180(a)	Traffic alert and collision avoidance system
14 CFR 135, Appendix A Section A135.1	Additional Airworthiness Standards for 10 or More Passenger Airplanes

4. RELATED DOCUMENTS

Only those sets of materials that were used as reference for this AC/AMJ are listed.

4.a Federal Aviation Administration Documents.

(1) 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 22166

(2) AC 25-11, Transport Category Airplane Electronic Display Systems 7/16/87

(3) Report DOT/FAA/CT-96/1 - GAMA Report No 10, "Recommended Guidelines for Part 23 Cockpit/Flight Deck Design" (September 2000), Section 4, Definitions, Primary Field of View.

(4) AC 25-23 TAWS Terrain Awareness and Warning Systems
(5) AC 25-1309-1A System Design and Analysis
(6) TSO C-151a, Terrain Awareness and Warning Systems
(7) AC 25.1523-1, Minimum Flight Crew & Workload

4.b JAA Documents.

(1) AMJ 25.1322, Alerting Systems, dated 12 April, 1991
(2) AMJ 25.1309 System Design and Analysis
(3) AMJ 25-11, Electronic Display Systems

(4) Patterson, R.D. (1982). *Guidelines for Auditory Warning Systems on Civil Aircraft.* Cheltenham, England: Civil Aviation Authority paper 82017.

4.c Industry Documents.

1. Edworthy, J. and Adams, A. (1996). Warning Design: A Research Perspective. Bristol, PA: Taylor & Francis.

2. Kuchar, J.K. (1996). Methodology for alerting-system performance evaluation. *Journal of Guidance, Control, and Dynamics. 19, 438-444.*

3. Parasuraman, R., & Riley, V. (1997). Human and Automation: use, misuse, disuse, abuse. *Human Factors, 39,* 216-229.

4. Satchell, P. (1993). *Cockpit monitoring and alerting systems.* Aldershot, England: Ashgate.

5. SAE ARP 4033 (Pilot-System Integration), August 1995

5. BACKGROUND

In the past airplanes have been designed with discrete lights for the alerting function. Now the alerting functions can be integrated with other systems, including electronic display systems, and aural warning or tone generation systems. This AC addresses the aspects of integration including prioritization, commonality between types of alerts, competing simultaneous aural and visual alerts, correlation of aural and visual alerts, potential inhibiting of alerts, and the increased possibility of false or nuisance alerts.

FAR/JAR Part 25 Regulations and advisory material often provide references to an alert, such as a warning, to provide awareness of a certain condition that is relevant to the applied rule. Many of these rules were written without recognition of a consistent flight deck alerting philosophy, and may use the term "warning" in a generic sense. This AC/ACJ does not intend to conflict with or replace the intent of those rules, but it is meant to provide standardization of crew alerting terminology that may be used in the development of consistent regulations and advisory material, and consistency to show compliance to existing rules.

6. DEFINITIONS

Definitions are written to support the content of this AC and its associated rule. Other regulations may use terms such as "warning" in a manner that is not necessarily consistent with the definitions below. However, the intent of this section is to facilitate standardization of these terms.

Advisory
The level of alert for conditions that require flight crew awareness and may require subsequent flight crew response

Alert
A generic term used to describe a flight deck indication meant to attract the attention of and identify to the flight crew a non-normal operational or airplane system condition. Warnings, Cautions, and Advisories are considered to be alerts.

Alert Inhibit
Application of specific logic to prevent the presentation of the alert.

Alert Message
A visual alert comprised of text, usually presented on a flight deck display.

Alerting Function
The aircraft function that provides alerts to the flight crew for non-normal operational or airplane system conditions. This includes Warning, Caution and Advisory information.

Alerting Philosophy
The principles, guidance and rules for implementing alerting functions within a flight deck. These typically consider:

- The reason for implementing an alert
- The level of alert required for a given condition
- The characteristics of each specific alert
- Integration of multiple alerts

Attention Getting Cues
Perceptual signals (visual, auditory or tactile/haptic) designed to attract the flight crew's attention in order to obtain the immediate awareness that an alert condition exists.

Caution
The level of alert for conditions that require immediate flight crew awareness and subsequent flight crew response.

Collector Message
An alert message that replaces two or more related alert messages that do not share a common cause or effect. Example: A Doors alert collector message is displayed when more than one entry, cargo, or service access door is open at the same time.

Communication message
A type of message whose initiating conditions are caused by incoming communications, primarily data link conditions. This type of message is not a crew alert.

(1) **Comm High**: A communication message which requires immediate flight crew awareness and immediate flight crew response. (Note: At this time there are no communication messages defined that require immediate flight crew response.)

(2) **Comm Medium**: An incoming communication message which requires immediate flight crew awareness and subsequent flight crew response.

(3) **Comm Low**: An incoming communication message which requires flight crew awareness and future flight crew response.

False Alert
An incorrect or spurious alert caused by a failure of the alerting system including the sensor.

Failure Flag
One local means of indicating the failure of a displayed parameter.

Flashing
Short term flashing symbols approximately 10 seconds or flash until acknowledge.

Flight Crew Response
The activity accomplished due to the presentation of an alert such as an action, decision, prioritization, search for additional information.

Master Aural Alert
An aural indication used to attract the flight crew's attention that is specific to an alert urgency level (e.g. Warning, Caution)

Master Visual Alert
A visual indication used to attract the flight crew's attention that is specific to an alert urgency level (e.g. Warning, Caution).

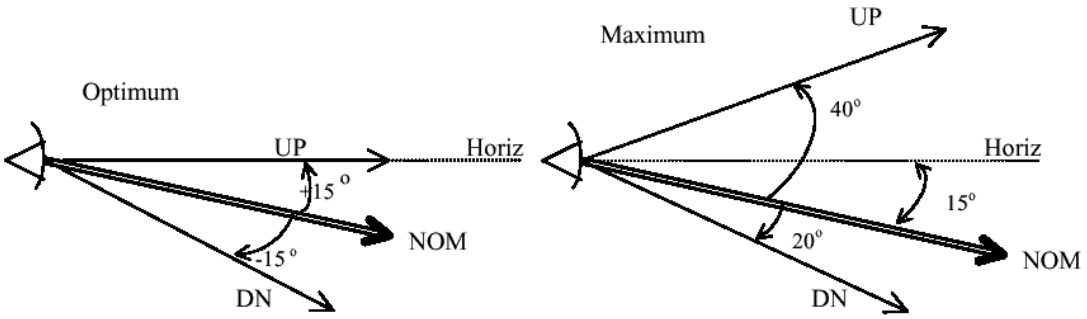
Normal Condition
Any fault-free condition typically experienced in normal flight operations. Operations typically well within the aircraft flight envelope and with routine atmospheric and environmental condition.

Nuisance Alert
An alert generated by a system that is functioning as designed but which is inappropriate or unnecessary for the particular condition.

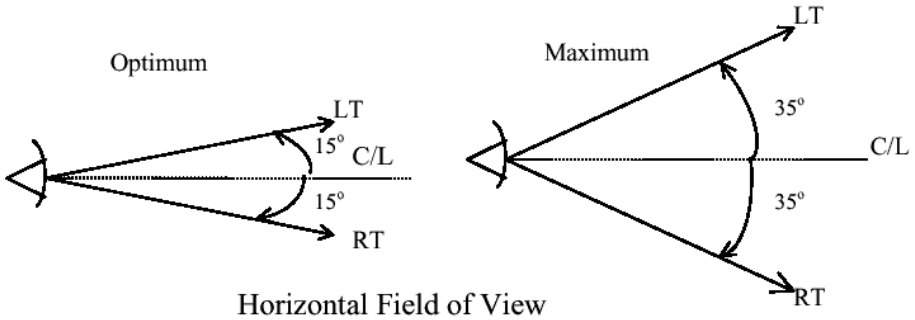
Primary field of view
Primary Field-of-View is based upon the optimum vertical and horizontal visual fields from the design eye reference point that can be accommodated with eye rotation only. The description below provides an example of how this may apply to head-down displays.

With the normal line-of-sight established at 15 degrees below the horizontal plane, the values for the vertical (relative to normal line-of-sight forward of the aircraft) are +/-15 degrees optimum, with +40 degrees up and -20 degrees down maximum.

For the horizontal visual field (relative to normal line-of-sight forward of the aircraft), the values are +/-15 degrees optimum, and +/-35 degrees maximum. .



Vertical Field of View



Horizontal Field of View

Status
A specific aircraft system condition that is recognized using a visual indication, but does not require an alert and does not require flight crew response. These types of messages are sometimes used to determine airplane dispatch capability for subsequent flights.

Tactile/haptic Information
Indication means where the stimulus is via physical touch, force feedback or vibration (e.g. stick shaker).

Time-Critical Warning
A subset of warning. The highest level of warning for conditions that require immediate flight crew response, to maintain the immediate safe operation of the airplane.Examples of Time-Critical warnings are:

- Predictive and Reactive Windshear Warnings
- Terrain Awareness Warnings (TAWS)
- TCAS Resolution Advisory
- Overspeed Warnings
- Low Energy Warnings

Umbrella Message
An alert message that is presented in lieu of two or more alert messages that share a common cause. Example: A single Engine Shutdown message in lieu of the multiple messages for electrical generator, generator drive, hydraulic pump and bleed air messages which would otherwise have been displayed.

Unique Tones (Unique Sounds)
An aural indication that is dedicated to specific alerts. (e.g. fire bell, overspeed)

Visual Alert Information
A visual indication that presents the flight crew with data on the exact nature of the alerting situation. For advisory level alerts, it also provides the awareness.

Voice Information
Means for informing the flight crew of the nature of a specific condition.

Warning
The level of alert for conditions that require immediate flight crew awareness and immediate flight crew response.

7. GENERAL

The purpose for alerting functions on airplanes is to get the attention of the flight crew, and inform the flight crew of specific airplane system conditions and certain operational events that require their awareness. The ability of the alerting function to accomplish its purpose is effected not only by the alert presentation itself, but also by the sensed condition and information processing for which the alert presentation was initiated. The alert presentation, condition sensing and information processing for the alert should all be designed to support the purpose of the alerting function.

Only airplane system conditions and operational events that require flight crew awareness to support a flight crew response should cause an alert. Conditions and events that do not require flight crew awareness should not cause an alert.

For all alerts which are presented to the flight crew, the action or accommodation for that alert must be either intuitive or a specific procedure must be provided to assist the flight crew in accomplishing corrective or compensatory action. Appropriate flight crew action for flight crew alerts are normally defined by airplane procedures (ex: in checklists), and are trained as part of a flight crew training curriculum or considered basic airmanship.

The presentation of all alerting signals should be accomplished using a consistent alerting philosophy.

7.a Alerting Presentation Elements

Alerting system presentation elements typically include:

- Master Visual Alerts
- Visual Alert Information
- Master Aural Alerts
- Voice Information
- Unique Tones (Unique Sounds)
- Tactile/haptic Information
- Failure Flag

Logic should be incorporated to ensure that the alerting system components are coordinated and provide the proper alert presentation format for each urgency level. For example, the onset of the master visual alert should occur simultaneously with the onset of the master aural alert.

When practical, the voice information message should be identical to the alphanumeric message presented on the visual information display, but at a minimum the voice and alphanumeric messages should be compatible and readily understandable.

Colors used for master caution and master warning should match colors for their respective caution and warning visual alerts.

To maintain the effectiveness of voice alerting, the use of voice should be minimized. To maintain the effectiveness of the visual alerting, consistent use of the colors red and amber/yellow must be implemented throughout the flight deck.

Failure flags and exceedances do not necessarily need to meet the requirements 25.1322(a)(1). For example, failure flags on primary flight displays have been shown to have sufficient attention getting characteristics and thus do not necessarily satisfy all of the requirements for crew alerts, such as providing attention-getting cues through at least two different senses.

7.b Functional Components for each type of Alert

(1) Warning:

The alerting system functional components used to accomplish the alerting and informing functions for warnings should include:

- Master Visual Alert, AND
- Visual Information, AND
- Master Aural Alert, or
  Voice Information or unique tone
  Note: Voice information may be preceded by a master aural alert

It is recognized that in a limited number of cases a master visual and master aural alert may not be required. For example, visual information presented in the pilot's primary forward field of view may be acceptable in place of a master visual alert if it provides sufficient attention-getting characteristics. Exceptions must be evaluated on a case by case basis.

The immediacy of pilot response required for some warning conditions may not be supported by use of the alerting system components described above. Examples of such warning conditions are reactive windshear warning and ground proximity warning. These are typically called "time-critical warnings."

The alerting system components used for indicating these kinds of conditions must support immediate pilot awareness of the specific condition without further reference to other indications in the flight deck.

The alerting system functional components used to accomplish the alerting and informing functions for time-critical warnings should include:

- Unique voice information and/or unique tone for each condition, AND
- Unique visual alert information in both pilots primary forward field of view for each condition.

Since, for time-critical warnings, it is expected that the unique visual alert information and the unique voice information or unique tone meets the attention-getting requirements for the condition, then the use of a master visual alert is not required. However, if the master visual alert is used, it should be used to aid in the overall attention-getting characteristics and to obtain the desired flight crew response and should not distract the flight crew from the time-critical condition.

2) Caution

The alerting system functional components used to accomplish the alerting and informing functions for cautions should include:

- Master Visual Alert, AND
- Visual Information, AND
- Master Aural Alert, or
  Voice Information or unique tone
  Note: Voice information may be preceded by a master aural alert

It is recognized that in a limited number of cases a master visual and master aural alert may not be required. For example, visual information presented in the pilot's primary forward field of view may be acceptable in place of a master visual alert if it

provides sufficient attention-getting characteristics. Exceptions must be evaluated on a case by case basis.

Some caution alerts are related to conditions that are precursors to potential time-critical warning conditions. In these cases, the alerting system components associated with the caution should be consistent with the components for related time-critical warning.

For example, a TCAS II Traffic condition, which can be a precursor to a TCAS II Resolution Advisory condition, may not have an associated Master Caution and is acceptable because the TCAS Traffic voice information alone provides the characteristic of a caution.

3) Advisory

The alerting system functional components used to accomplish the alerting and informing functions for advisories should include:

- Visual Information - Advisory information may be located in an area where the flight crew is expected to periodically scan for information

  Note: Advisory information does not require immediate flight crew awareness and therefore does not require an attention getting (master) visual or aural feature

Aural or visual information such as maintenance messages, information messages, and other status messages associated with conditions that do not require an alert may be presented to the flight crew, but the presentation of this information should not interfere with the alerting function or its use.

7.c Alerting System Reliability and Integrity

The alerting system should be designed to avoid false and nuisance alerts while providing reliable alerts to the flight crew when needed.

For establishing compliance of the alerting system with 25.1309, both the failure to operate when required and false operation should be considered.

When applying the 25.1309 process to a particular system or function that has an associated flight crew alert, both the failure of the system/function and a failure of its associated alert should be assessed. This should include assessing the effect of a single (common mode) failure that could cause the loss or failure of a system function and the loss of any associated alerting function.

When assessing crew alerting system compliance to 25.1309, particular attention should be paid to the following:

- Availability of the crew alerting function as a common point to several systems: although the individual assessment of not presenting an alert for a given system when required may lead to a specific consequence, the impact of a larger or a complete failure of the crew alerting function may lead to a more severe consequence, and should be assessed.
- Integrity of the alerting system driving the crew's confidence: since the individual assessment of a false or nuisance alert for a given system may lead to a specific consequence, the impact of frequent false or nuisance alerts increases the flight

crew's workload, reduces the flight crew's confidence in the alerting system, and affects their reaction in case of a real alert.

Existing implementations have shown that design of crew alerting systems as an essential system satisfy the two points above, but do not replace the need to show compliance with 25.1309.

8. MANAGEMENT OF ALERTS

8.a Prioritization

The objective of prioritization is to provide the most urgent alert to the flight crew.

(1) General Guidelines

A prioritization scheme should be established for all alerts presented throughout the flight deck. Prioritization within each category (Warning, Caution, Advisory) may also be necessary. For example, AC 25-23 (TAWS) identifies situations where prioritization within alert categories is necessary. The prioritization scheme, as well as the rationale for prioritization should be documented and evaluated.

Documentation should include the results of analysis that shows that any alerts that are delayed or inhibited as the result of the prioritization scheme do not adversely impact safety.

(2) Multiple Aural Alerts

Aural alerts should be prioritized so that only one aural alert is presented at a time. If more than one aural alert is presented at a time, each should be clearly distinguishable and intelligible to the flight crew.

Aural alerts must be prioritized based upon urgency of flight crew awareness and urgency of flight crew response. Normally this means Warnings are prioritized first, followed by Cautions and then Advisories. However, there may be a need to prioritize certain alerts of a lower urgency level over alerts of a higher urgency level depending on phase of flight.

When aural alerts are provided, an active alert should be completed before initiating another aural alert. However, active aural alerts may be interrupted by alerts from higher urgency levels if the delay to annunciate the higher priority alert would impact the timely response of the flight crew. If the interrupted alert condition is still active, it may be repeated once the higher urgency alert is completed.

(3) Multiple Visual Alerts

Since two or more visual alerts can occur at the same time, it should be shown that each alert is clearly recognizable to the flight crew.

Visual alert information should be prioritized between levels - Warnings have the highest priority, followed by Cautions and Advisories. When multiple alerts exist in a specific level (ie. multiple Warnings, multiple Cautions), a means for the flight crew to determine the most recent or most urgent alert should be provided. For example, the most recent or highest priority alert may be listed at the top of its own category. This also applies to time-critical alerts that share a dedicated display region.

8.b Alert Inhibits

Alert inhibits are used to prevent the presentation of an alert which is inappropriate or unnecessary for the particular phase of operation.

Alert inhibits are techniques that can be used to resolve prioritization of multiple alert conditions, alert information overload and display clutter. In many

circumstances, alert inhibits should be used to prevent additional hazard due to unnecessary flight crew distraction or response (i.e. during takeoff). Alerts may be inhibited automatically by the alerting system, or manually by the flight crew.

The presentation of alert indications should be inhibited under certain conditions where:

- The alert could cause a hazard if the flight crew was distracted by or responded to the alert.
- The alert contributes to display clutter
- The alert provides unnecessary information or awareness of airplane conditions

A number of consequential alerts may be combined into a single higher-level alert

For certain operational conditions not recognized by the alerting system, a means may be provided for the flight crew to inhibit a potential alert that would be expected to occur as the result of the specific operation (e.g. preventing a landing configuration alert for a different landing flap setting). There should be a clear and unmistakable indication that an alert has been manually inhibited by the flight crew, for as long as the inhibit exists.

8.c Clear/Recall of visual alert messages

Clearing visual alert messages from the current display allows the flight crew to remove a potential source of distraction. If a message can be cleared, the system should provide the ability to recall any cleared visual alert message that has been acknowledged where the condition still exists.

There should be a means to identify if alerts are stored (or otherwise not in view), either through a positive indication on the display or through normal flight crew procedures.

8.d Considerations for interface or integration with other systems (ex. Checklist, synoptics, switches, discrete lamps)

All annunciations and indications used to present an alert should be consistent with wording, color, position, or other attributes they may share. Other information displayed in the flight deck associated with the alert condition should facilitate the flight crew's ability to identify the alert condition and determine any correct action.

Information conveyed by the alerting system should lead the flight crew to the correct checklist procedure to facilitate the correct flight crew action. Some alerts may not have an associated checklist procedure because the correct flight crew action is covered by training or basic airmanship (e.g. autopilot disconnect, time critical warnings).

8.e Color standardization

The regulation 25.1322(e) requires that "The colors red and amber/yellow are normally reserved for alerting functions. The use of these colors for functions other than crew alerting must be limited and must not adversely affect crew alerting."

For discrete lights and indicators, the use of red and amber/yellow should be limited exclusively to flight crew alerting functions. The regulation applies to the use of these colors on both alerting systems and non-alerting systems including displays

and other indications. Note that a display is not necessarily a single piece of hardware but may include an appropriately partitioned and segregated section/function of a display used exclusively for non-alerting functions. The objective is to limit the use of red and amber/yellow within the flight deck so that these colors always provide an indication ~~of high level~~ of immediacy of response commensurate with the associated hazard.

The use of red and amber/yellow for non-alerting functions may also be appropriate in the flight deck. Authorization can be expected if any of the following guidelines are met:

A. Red may be used (on both alerting and non-alerting systems) for conditions that require immediate flight crew awareness and immediate flight crew response.

B. Amber/yellow may be used (on both alerting and non-alerting systems) for conditions that require immediate flight crew awareness and subsequent flight crew response.

C. If the colors red or amber/yellow are proposed to be used in any other way, the applicant should submit rationale to the authorities for their review and approval including the benefits and the following:

1. The use of red and amber/yellow is appropriate to the task and context of use;
2. The proposed use does not affect the attention getting qualities of the alerting functions across the flight deck.

Examples of acceptable uses of red and amber/yellow related to the paragraphs above typically include:

- Engine and airframe limit indications;
- Failure flags;
- ~~Selected~~ Eelectronic checklist elements that correlate to an alert;
- Indications that correlate to an associated alert;
- Weather radar;
- Proximate terrain that correlates to an onboard terrain alerting function.

It is appropriate to use red or amber/yellow failure flags and system indicators for failures/exceedances associated with hazard conditions requiring immediate flight crew awareness. In these cases, the color should be selected based on the immediacy of the flight crew response. For example, it is appropriate to have the EGT engine limit be red because in the event of an exceedance, this condition requires immediate flight crew awareness and immediate flight crew response. In other cases, the use of red and amber/yellow is not appropriate. However, it would not be appropriate to use red flag to indicate the loss of weather radar data, because immediate flight crew response is not required.

8.f Suppression of False Alerts

Pulling circuit breakers should not be the means for the flight crew to suppress an alert.

9. CERTIFICATION TEST AND EVALUATION CONSIDERATIONS

Because alerting systems or systems with alerting functions vary in complexity, level of integration, number of alerts, and types of alerts, these systems may raise unique certification issues. Thus it is recommended that applicants develop a plan to establish and document how issues will be identified, tracked, and resolved throughout the life cycle of the program. Applicants typically use the Certification Plan for this purpose. For addressing human factors/pilot interface issues applicants may use FAA Policy Memo ANM-99-2, *Guidance for Reviewing Certification Plans to Address Human Factors for Certification of Transport Airplane Flight Decks*. Additionally, the JAA *INT/POL/*25/14 "human factors aspects of flight deck design" provides guidance to evaluate this type of issues, particularly with new or novel systems or functions. A new harmonized AC/ACJ is also being developed.

It is recommended that the applicant document means of compliance with the appropriate regulations, as well as document compliance to and/or divergence from the recommendations in this AC/ACJ. Additionally, rationale should be provided for decisions regarding new or novel features in the design of the alerting system. This will facilitate the certification evaluation in that it enables the Authorities to focus on evaluating areas where the proposed system diverges from the recommended guidance and new or novel features. Thus, areas where the applicant has demonstrated compliance with this AC would typically receive less scrutiny.

The type of certification evaluation will vary depending upon the complexity, degree of integration, and specifics of the alerting system or function proposed. The evaluation should include evaluations of acceptable performance of the intended functions, including the human-machine interface, and acceptability of failure scenarios of the alerting system. The scenarios should reflect the expected operational use of the system. The validation of the performance and integrity aspects will typically be accomplished by a combination of the following methods:

- Analysis
- Laboratory Test
- Simulation
- Flight Test

The certification program should include evaluations of the alerts in isolation and combination throughout appropriate phases of flight and maneuvers, as well as representative environmental and operational conditions. The alerting function as a whole needs to be evaluated in a representative flight deck environment. Representative simulators can be used to accomplish the evaluation of some human factors and workload studies. The level and fidelity of the simulator used should be commensurate with the certification credit being sought and its use should be agreed with the regulatory authority. The assessment of the alerts may be conducted in a lab, simulator or in the actual aircraft. Certain elements of the alerting system may have to be validated in the actual aircraft. The evaluation should be conducted by a representative population of pilots of various background and expertise.

Some specific aspects that should be considered during the evaluation(s):

- Visual, aural, and tactile/haptic aspects of the alert(s)
- Effectiveness of meeting intended function from the human/machine integration, including workload, the potential for flight crew errors and confusion
- Normal and emergency cancellation logic and accessibility of related controls
- Proper integration with other systems, including labelling

- Acceptability of operation during failure modes
- Compatibility with other displays and controls
- Ensure that the alerting system by itself does not issue excessive nuisance alerts nor interfere with other systems
- Inhibition of alerts for specific phases of flight (e.g., takeoff and landing) and for specific airplane configurations (e.g., abnormal flaps and gear)

Evaluations may also be useful to verify the chromaticity (e.g., red looks red, amber looks amber) and discriminability (i.e., colors can be distinguished reliably from each other) of the colors being used, under the expected lighting levels. These evaluations can be affected by the specific display technology being used, so final evaluation with flight quality hardware is sometimes needed

10. RETROFIT APPLICABILITY

10.a Purpose

This provides recommendations for the integration of flight crew alerting associated with new aircraft systems into aircraft that currently have a FAR/JAR Part 25 type certificate (legacy aircraft). Many of these systems provide flight deck alerting functionality – This material is provided to give the applicant a means to comply with FAR/JAR 25.1322 without major modification to the existing aircraft flight deck alerting system.

Systems upgrades for legacy aircraft should be compatible with the aircraft flight deck alerting philosophy.

10.b Visual Alerts

(1) Master Warning System. A determination should be made per section 6.3 of this AC/ACJ if the added system warnings will require activation of an aircraft master warning system.
(2) Master Caution System. A determination should be made per section 6.3 of this AC/ACJ if the added system caution will require activation of an aircraft master caution system.
(3) The existing aircraft alerting system may not be able to facilitate the integration of additional aircraft systems and associated alerts due to limitations in the system inputs, incompatible technologies between the aircraft and the system being added, or economic considerations.
    i. The incorporation of an additional master visual function is discouraged. If it is not feasible to interface to the existing master visual function, an additional master visual function may be installed, provided that it does not delay the flight crew's response time for recognizing and responding to the alert.
    ii. New alerts should be integrated into the existing aircraft crew alerting system where possible. If these alerts cannot be integrated, individual annunciators or an additional alerting display system may be added.
    iii. It is permissible for some failure flags not to be integrated in the central alerting system. Thus, a master visual or master aural may not be initiated. The need to
    iv. Conditions that generate failure flags are not necessarily generating an alert.

10.c Aural Alerts

(1) A determination should be made per the guidance of this AC/ACJ, if the added system will require activation of an aural alert.
(2) If possible this new aural alert should be incorporated into the existing aural alerting system, if this is not possible, a separate aural alerting system may be introduced provided that all of the following have been considered
    i. A means is provided to set a prioritization scheme in place between existing aural alerts and the new aural alerts such that each alert is recognized and can be acted upon in the time frame appropriate for the alerting situation.
    ii. Each individual alert can be understood and acted upon. This may require a demonstration of any likely combination of simultaneous alerts.
    iii. The material provided in this AC/ACJ should be utilized in determining the prioritization for the integration of new aural alerts with existing aural alerts

10.d Special Considerations for Head-Up Displays (HUDs)

Although HUDs , when used as Primary Flight Displays (PFDs), are not intended to be classified as integrated caution and warning systems, they may display alerts such as time-critical warnings.

HUDs, when used as PFDs, should provide the equivalent alerting functionality as current head down display (HDD) PFDs. Time critical warnings that require continued flight crew awareness on the PFD should be presented on the HUD (e.g., TCAS, Windshear, and Ground Proximity Warning annunciations). In addition if master alerting indications do not provide sufficient attention to the pilot while using the HUD, the HUD should provide annunciations that inform the pilot of caution and/or warning conditions.

Time-critical warning information that is presented on a Head Up Display may include attributes which are different than those presented on a Head Down Display. For example the use of red on a HUD may not be technically feasible and under certain conditions may detract from the attention-getting characteristics of the associated time-critical warning.

To the extent that current HUDs are single color devices, cautions and warnings should be emphasized with the appropriate use of attention-getting properties such as flashing, outline boxes, brightness, size, and/or location. Report No. DOT/FAA/RD-81/38, II stresses the importance of preserving the distinguishing characteristics of caution and warning cues. . Where multi-color HUD symbols are used for alerts, consideration should be given to ensure consistency between the HUD and the head down flight displays.

Single HUD installations can take credit for the copilot monitoring of head down instruments and alerting systems, for failures of systems, modes, and functions not associated with primary flight displays.

Dual HUD installations require special consideration for alerting systems, since it must be assumed that both pilots will be head up simultaneously. If master alerting indications do not provide sufficient attention to each pilot while using the HUD, then each HUD should provide annunciations that direct the pilot's attention to head down alerting displays. The types of information that should trigger the HUD master alerting display are any cautions or warnings not already duplicated on the HUD from head down primary displays.

Appendices

APPENDIX A EXAMPLES FOR THE INCLUSION OF VISUAL SYSTEM ELEMENTS IN AN ALERTING SYSTEM

Examples are included in this AC/ACJ to help the reader through the detailed design of an alerting system. They are based on experience of existing and recommended alerting systems that comply with the rule. The extent to which these examples are applied to a specific certification program will vary, depending on the types of alerts that are presented, and the level of integration associated with an alerting system.

The visual elements of an alerting system include:

- Master Visual
- Visual Information
- Time-Critical Warning Visual Information

A.1 Master Visual

(1) Number & Location
A warning master visual alert and caution master visual alert should be provided at each pilot's station. Master visual alerts for warnings (Master Warning) and for cautions (Master Caution) should be located directly in front of each pilot in their primary field of view.

(2) Onset/Duration/Cancellation

The onset of a master visual alert should occur in a timeframe appropriate for the alerting condition and the desired response.

The onset of a master visual alert should occur simultaneously with the onset of its related master aural alert or unique tone, and its related visual alert information. Any delays between the onset of the master visual alert and its related master aural alert or unique tone, and its visual alert information should not cause flight crew distraction or confusion.

The onset of master visual alerts for the same condition (warnings, cautions) should occur simultaneously at each pilot's station.

The master visual alert should remain on until it is cancelled either manually by the flight crew, or automatically when the alerting situation no longer exists.

Upon cancellation the alerting mechanisms should be reset to annunciate any subsequent fault condition.

(3) Attention-getting visual characteristics

In addition to color, steady state or flashing master visual alerts may be used, as long as the method employed provides positive attention-getting characteristics. If flashing is used, all master visual alerts should be synchronous to avoid any unnecessary distraction.

(4) Brightness

Master visual alerts should be bright enough to attract the attention of the flight crew in all ambient light conditions.

Manual dimming should not be provided unless the minimum setting retains adequate attention-getting qualities when flying under all ambient light conditions.

(5) Display/Indicator Size and Character Dimensions

Any character types, sizes and fonts should be designed so that the master visual alerts are legible and understandable at the pilot's station where they are installed and should provide suitable attention-getting characteristics.

Master visual alerts that subtend at least 1 degree of visual angle have been shown to be acceptable.

(6) Color
Standard color conventions should be followed for the master visual alerts:

- Red for warning
- Amber/yellow for caution

Master visual alerts for conditions other than warnings or cautions (for example, ATC Datalink alerts) must be in a color other than red or amber/yellow.

(7) Test function

To comply with the safety requirements of FAR/JAR 25.1309, provisions may need to be included to test/verify the operability of the master visual alerts.

A.2 Visual Information

(1) Number & Location

The number of displays that provide warning, caution, and advisory alerts should be determined by a combination of ergonomic, operational and reliability criteria, as well as any flight deck physical space constraints.

The visual information should be located so that both pilots are able to readily identify the alert condition.

All warning and caution visual information linked to a master visual should be grouped together on a single dedicated display area. There may be a separate area for each pilot. Advisory alerts may also be presented on the same display area. The intent is to provide an intuitive and consistent location for the display of information.

(2) Format

A consistent philosophy should be provided for the format of visual information to unambiguously indicate the alert condition. The objectives of the corresponding text message format are to direct the flight crew to the correct checklist procedure, and to minimize the risk of flight crew error.

The alerting philosophy should describe the format for visual information. A consistent format should be used.
A format philosophy should include the following three elements:

- The general heading of the alert, (e.g. HYD, FUEL)
- the specific subsystem or location (e.g. L-R, 1-2), and,
- the nature of the condition (e.g. FAIL, HOT, LOW)

For any given message, the available space on a single page should be able to present the entire text on a single defined area to encourage short and concise messages. Additional lines may be used provided the alert message is clear and unambiguous.

If alerts are presented on a limited display area, an overflow indication should be used to inform the flight crew that additional alerts may be called up for review. A memory indication should be used to indicate the number and urgency level of the alerts that have been stored.

A "collector message" is a technique that can be used to resolve problems of insufficient display space, prioritization of multiple alert conditions, alert information overload and display clutter.

Collector messages should be used where the procedure or action is different for the multiple fault condition than the procedure or action for the individual messages being collected. Example: Non-normal procedures for loss of a single hydraulic system on it's own is different than non-normal procedures for loss of two hydraulic systems. The messages that are "collected" should be inhibited.

An alphanumeric font should be of a sufficient thickness and size to be readable when users are seated at the normal viewing distance from the screen.

NOTE: Minimum character height of 1/200 of viewing distance has been shown to be acceptable (e.g a viewing distance of 36 inches requires a 0.18 inch character height on the screen)(DOD-CM-400-18-05, p 12-1)

NOTE: Arial and Sans serif fonts have been shown to be acceptable for visual alert text. The size of numbers and letters required to achieve acceptable readability may depend on the display technology used. Stroke width between 10 and 15% of character height appears to be best for word recognition on text displays and extensions of descending letters and ascending letters should be about 40% of letter height.

(3) Color

Standard color conventions should be followed for the visual information:

- Red for warning
- Amber/yellow for caution

Red should be used for indicating a non-normal operational or non-normal aircraft system condition that requires immediate flight crew awareness and immediate action or immediate flight crew decision.

Amber/yellow should be used for indicating a non-normal operational or non-normal aircraft system condition that requires immediate flight crew awareness and future action or future flight crew decision.

In addition to red (for warning) and amber/yellow (for caution), a third color may be used to indicate advisory level alerts, to provide a unique and easily distinguishable coding method for all alerting categories.

Advisories may be any color except red or green, and preferably not amber/yellow. If amber/yellow is used for both caution and advisory messages, the alerting system should provide a distinguishable coding method.

NOTE: Use of red, amber, or yellow not related to caution and warning functions must be minimized to prevent diminishing the attention-getting characteristics of true warnings and cautions
Consistent color conventions for alerts within the cockpit should be provided.

(4) Luminance

The visual alert information should be bright enough so that both pilots are able to readily identify the alert condition in all ambient light conditions.

The luminance of the visual alert information display may be adjusted automatically as ambient lighting conditions inside the flight station change. A manual override control may be provided to enable the pilots to adjust display luminance.

A.3 Time Critical Warning Visual Information

(1) Number & Location

Time-critical warning visual information should be provided directly in front of each pilot within their primary field of view.

Note: The Primary Flight Display (PFD) is used as a practical and preferred display to use as the time critical warning display. Integration of time critical information into the PFD may vary depending on the exact nature of the warning. For example, a dedicated location on the PFD may be used both as an attention-getting function and a Visual Information Display by displaying alerts such as “WINDSHEAR”, “SINK RATE”, “PULL UP”, “TERRAIN AHEAD”, “CLIMB, CLIMB” etc. In addition, graphic displays of target pitch attitudes for TCAS RAs and Terrain may also be included.

(2) Format

Time critical warning visual information must be consistent with the corresponding time critical warning aural information.

Time critical warning visual information may be presented as a text message (for example, “WINDSHEAR”). Certain time critical warning visual information, including guidance, may be presented graphically (for example, TCAS Resolution Advisory)

Text messages that are used for time-critical warning visual information should be red.

The time-critical warning visual information should be erased when corrective actions have been taken, or when the alerting situation no longer exists

(3) Size

An acceptable means of a time-critical display is to subtend at least two square degrees of visual angle, to immediately attract the attention of the flight crews and to modify their habit pattern for responding to non-time-critical alerts.

A.4 Failure Flags

The use of failure flags on flight deck instruments is a means of indicating failures of displayed parameters or it’s data source. In the sense that these flags indicate failures of airplane systems they have been displayed using colors that are the same as for crew

alerts. Failure flags are typically associated with only single instrument displays and as such don't necessarily satisfy all of the guidance material for flight crew alerts in general. However, in the integrated environment of the flight deck it is appropriate to display instrument failure flags in a color consistent with the alerting system, as part of the alerting function(see paragraph 8d) Conditions that set failure flags may also generate flight crew alerts and the subsequent flight deck indications should be consistent.

APPENDIX B EXAMPLES FOR INCLUSION OF AURAL SYSTEM ELEMENTS IN AN ALERTING SYSTEM

Examples are included in this AC/ACJ to help the reader through the detailed design of an alerting system. They are based on experience of existing and recommended alerting systems that should comply with the rule. The extent to which these examples are applied to a specific certification program will vary, depending on the types of alerts that are presented, and the level of integration associated with an alerting system.

The aural elements of an alerting system include:

- Unique tones, including master aural alerts
- voice information

Each sound should differ from other sounds in more than one dimension (e.g. frequency, sequence, intensity) so that each one is easily distinguishable from the others.

B.1 Master Aural Alert and Unique Tones

(1) Frequency

Aural signals using frequencies between 200 and 4500 Hz have been found to be acceptable.

Aural signals composed of at least two different frequencies or aural signals composed of only one frequency that contain different characteristics (e.g. spacing) have been found to be acceptable.

To minimize masking, frequencies different from those that dominate background noise should be used

(2) Intensity

The aural alerting must be audible to the flight crew in the worst-case (ambient noise) flight conditions whether or not the flight crew is wearing headsets (taking into account their noise attenuation characteristics). The aural alerting should not be so loud and intrusive as to interfere with the flight crew taking the required action.

The minimum volume achievable by any adjustment (manual or automatic) (if provided) of aural alerts should be adequate to ensure it can be heard by the flight crew if the level of flight deck noise subsequently increases.

Automatic volume control is recommended to maintain an acceptable signal-to-noise ratio

(3) Number of Sounds

The number of different master aural alerts and unique tones should be limited, based on the ability of the flight crew to readily obtain information from each alert and tone. While different studies have resulted in different answers, in general these studies conclude that the number of unique tones should be less than 10.

One unique tone for master warning and one unique tone for master caution should be provided. A master aural tone for advisories is not recommended.

(4) Onset/Duration

It is recommended that an onset and offset of any aural alert or unique tone be ramped to avoid startling the flight crew.

- A duration for onsets and offsets of 20-30 ms in the region above threshold has been shown to be acceptable.

- An onset level of 20-30 dB above the flight deck ambient threshold has been shown to be acceptable.

The onset of the master aural alert or unique tone should occur in a timeframe appropriate for the alerting condition and the desired response. Any delays between the onset of the master aural alert or unique tone and its related visual alert should not cause flight crew distraction or confusion.
If more than one source of the master aural alert or unique tone is provided, the master aural alert or unique tone for the same condition should occur simultaneously and synchronously at each pilot's station. Any timing differences should not be distracting nor should they interfere with identification of the aural alert or unique tone.

Signal duration of the master aural alert and unique tones should vary, depending on the alert urgency level and the type of response desired.

Unique tones associated with time-critical warnings should be repeated and non-cancellable until the alerting condition no longer exists (e.g. stall warning), unless it interferes with the flight crew's ability to respond to the alerting condition.

Unique tones associated with warnings should be repeated and non-cancellable if the flight crew needs continuous awareness that the condition still exists, to support the flight crew in taking corrective action (ref. 1303.c.(1), Flight and Navigation Instruments, and 25.729.e, Retracting Mechanism)

Unique tones associated with warnings should be repeated and cancellable if the flight crew does not need continuous aural indication that the condition still exists (e.g. Fire Bell, Abnormal Autopilot Disconnect).

Unique tones associated with warnings should be non-repeatable if the flight crew does not need continuous aural indication that the condition still exists.
Master warnings should be repeated and non-cancellable if the flight crew needs continuous awareness that the condition still exists, to support the flight crew in taking corrective action (e.g. FAR/JAR 25.729(e) 2).

Master aural warnings should be repeatable until the flight crew acknowledges the warning condition or when the warning condition no longer exists.

For master aural cautions and unique tones associated with a caution, the sound should be limited in duration or can be continuous until the flight crew manually cancels it, or when the caution condition no longer exists.

Unique tones that are neither associated with a warning nor a caution (e.g. certain advisories, altitude alert, SELCAL), should be limited in duration.

(5) Cancellation

For caution level alerts, the master aural and unique tone should continue through one presentation and cancel automatically.

If there is any tone associated with an advisory, it should be presented once and then cancelled automatically.

A means must be provided to reactivate the aurals when canceled.

When silenced, the aurals may be capable of re-arming automatically. However, if there is a clear and unmistakable annunciation in the pilot's forward field of view that the aurals are silenced, manual re-arming is acceptable.

B.2 Voice Information

NOTE: The purpose for using voice information is to indicate conditions that demand immediate flight crew awareness of a specific condition without further reference to other indications in the flight deck.

Effects of using voice information include:
- To limit the number of unique tones
- To transfer workload from the visual to the auditory channel
- To enhance the identification of an abnormal condition, and effectively augment the visual indication without replacing its usefulness
- To provide information to the flight crew where a voice message is preferable to other methods
- Where awareness of the alert must be assured no matter where the pilot's eyes are pointed

(1) Voice Characteristics

The voice characteristics should be distinctive and intelligible.

Voice characteristics should include attention-getting qualities appropriate for the level of the alert.

(2) Voice Inflection

Voice inflection has been used in the past to indicate a sense of urgency. However, an alarming tone indicating tension or panic is not recommended, since it may be inappropriately interpreted by flight crews of differing cultures. Depending on the alerting condition, advising and commanding inflections may be used to facilitate corrective action, but the content of the message itself should be sufficient.

(3) Intensity

The aural alerting must be audible to the flight crew in the worst-case (ambient noise) flight conditions whether or not the flight crew is wearing headsets (taking into account their noise attenuation characteristics). The aural alerting should not be so loud and intrusive as to interfere with the flight crew taking the required action. The minimum volume achievable by any adjustment (manual or automatic) (if provided) of aural alerts should be adequate to ensure it can be heard by the flight crew if the level of flight deck noise subsequently increases.

Automatic volume control is recommended to maintain an acceptable signal-to-noise ratio

(4) Onset/Duration

The onset of the voice information should occur in a timeframe appropriate for the alerting condition and the desired response.

The onset of the voice information should occur simultaneously with the onset of its related visual alert information. Any delays between the onset of the voice information and its related visual alert should not cause flight crew distraction or confusion.

If more than one source of the voice information is provided for the same condition, they should occur simultaneously and synchronously at each pilot's station so that intelligibility is not affected.

Voice information associated with time-critical warnings should be repeated and non-cancellable until the alerting condition no longer exists (e.g. terrain warning). However, voice information associated with time-critical warnings should *not* be repeated if they interfere with the flight crew's ability to respond to the alerting condition (e.g. windshear warning, TCAS resolution advisory).

Voice information associated with warnings should be repeated and non-cancellable if the flight crew needs continuous awareness that the condition still exists, to support the flight crew in taking corrective action.
However, voice information associated with warnings should be repeated and cancellable if the flight crew does not need continuous aural indication that the condition still exists (e.g. Cabin Altitude Warning, Autopilot Disconnect).

Upon cancellation the alerting mechanisms should be reset to annunciate any subsequent fault condition.

For voice alerts associated with a caution, the corresponding voice information should be limited in duration (e.g. TCAS Traffic Advisory, Windshear Caution) or can be continuous until the flight crew manually cancels it or the caution condition no longer exists.

(5) Voice information Content

The content of the voice information should consider the flight crew's ability to understand the English language.

It may be acceptable to consider the use of languages other than aviation English (either replaced entirely or alternating with a native language).

For time-critical warnings, the content and vocabulary of voice information should elicit the immediate (instinctive) corrective action. In order to elicit immediate (instinctive) corrective action, it should provide identification of the condition. In some cases, it may also be necessary to include guidance or instruction information.

For warnings and cautions the content of voice information should provide an indication of the nature of the condition.

The content should be consistent with any related visual information display.

Voice information that use more than one word should be structured to avoid incorrect or misleading information if one or more words are missed (e.g. the word "don't" at the beginning of a voice message should be avoided).

Voice information should be designed to minimize confusion with each other.

L&D HWG Status Report

Larry Hanson, Chairman
Todd Martin, FAA Focal

10 February 2004 TAEIG Meeting

Discussion Items

- 25.865 Task Completion Plan presented at Oct 2003 TAEIG Meeting
- Current Status

25.865 Task Completion Plan presented at Oct 2003 TAEIG Meeting

- No additional testing will be conducted
- Remove "fireproof rating" table from AC. Replace with a paragraph noting Inconel 718 as fireproof material.
- Improve AC (paragraphs 7 – 9) with regard to acceptable means of compliance, using past compliance findings as a basis.

Current Status

- Working group report and draft AC 25-865 have been revised.
- Text for AC paragraph 9.b was drafted as follows:

  Redundancy: …….The use of the standard AC 20-135 flame has been found to be an acceptable representation of a foreseeable fire condition for assessment of redundancy. The effect of this flame impinging on a target load path should be assessed on the alternate load paths.

- The FAA has since raised an objection to this wording, and has proposed going back to the idea of including a minimal zonal temperature. Several alternatives have been proposed by GE, Airbus and the FAA.

Current Status (cont'd)

- The HWG has not reached a majority opinion on the minimum zonal temperature issue.
- Whatever the majority decides there will be significant dissenting opinions
- Current plan is to achieve a majority opinion and to document the dissenting opinions
- The revised HWG report and AC for 25.865 will be presented to TAEIG at the June TAEIG meeting in Seattle

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration Aviation Rulemaking Advisory Committee; Transport Airplane and Engine Issues-New Task AGENCY: Federal Aviation Administration (FAA), DOT. ACTION: Notice of new task assignment for the Aviation Rulemaking Advisory Committee (ARAC).

SUMMARY: The FAA tasks Aviation Rulemaking Advisory Committee (ARAC) to develop instructions that will enable certificate holders under part 121 and operators of U.S. registered multi-engine airplanes under part 129 to assess the damage-tolerance and widespread fatigue damage (WFD) characteristics of structural repairs, alterations, and modifications. This tasking supports industry compliance to sections 121.370a and 129.16 of the Aging Airplane Safety interim final rule (AASIFR), which requires maintenance programs to include damage-tolerance-based inspections and procedures by December 5, 2007. This tasking also supports the recommendations provided by ARAC to address RAMs for WFD. This notice is to inform the public of this ARAC activity.

FOR INFORMATION CONTACT: Greg Schneider, 1601 Lind Ave., Renton, Washington 98055-4056, 426-227-2116, greg.schneider@faa.gov

SUPPLEMENTARY INFORMATION:

Background

Aging Airplane Safety Interim Final Rule

On December 6, 2002 the FAA issued the Aging Airplane Safety Interim Final Rule. Sections 121.370a and 129.16 require certificate holders under part 121 and operators of U.S. registered multi-engine airplanes under part 129 to have damage-tolerance-based inspections and procedures incorporated into their maintenance program by December 5, 2007.

These damage-tolerance-based inspections and procedures must address an airplane's baseline (original type design) primary structure as well as RAMs made to the baseline primary structure. The purpose of these inspections is to detect damage that may develop in an airplane's primary structure before it degrades the load carrying capability of the structure below the levels required by the applicable airworthiness standards. The primary focus of this tasking will be to establish repair assessment guidelines that support the development of a certificate holder's damage-tolerance-based inspections and procedures for RAMs made to the baseline primary structure.

Air Transport Association requests FAA to task ARAC

A public meeting on February 27, 2003 was held to discuss the FAA's plan to standardize Airworthiness Directive language for Supplemental Structural Inspection Programs (SSIP). During that meeting, the Air Transport Association (ATA) expressed concern that U.S. operators will have difficulty complying with section 121.370a of the AASIFR. The ATA used this forum to inform the FAA that the aviation industry does not have the

resources to perform individual damage-tolerance assessments (DTA) for the repairs that will be required for compliance to the AASIFR.

In order to comply with the AASIFR, it was estimated that over 140,000 repairs on Boeing aircraft alone would require a DTA prior to December 5, 2007. The ATA therefore requested that the FAA task ARAC to develop repair assessment guidelines that will provide certificate holders a streamlined approach for addressing the damage-tolerance characteristics of repairs.

The ATA noted that the Airworthiness Assurance Working Group (AAWG) developed repair assessment guidelines (RAG) for the fuselage pressure boundary for large transport airplanes certified prior to 14 CFR part 25, amendment 45. The ATA stated that RAGs developed for areas outside the fuselage pressure boundary would support compliance to the AASIFR.

FAA review of public comments to the Aging Airplane Safety Interim Final Rule

On May 5, 2003, the public comment period to the AASIFR closed. Upon reviewing the comments and ATA comments in the above noted public meeting, the FAA concurred with the ATA position that repair assessment guidelines would be necessary to support compliance with the AASIFR.

The comments infer that the aviation industry does not have the resources needed to perform DTAs on RAMs to comply with sections 121.370a and 129.16 of the AASIFR. The industry's current practice of assessing individual repairs, combined with the high volume of RAMs causes a high demand on resources. Additional resources will be required to include damage-tolerant repairs in structural repair manuals (SRM). Type Certificate (TC) and Supplemental Type Certificate (STC) holder alteration and modification instructions (e.g. service bulletins) must also be reviewed for damage-tolerance. Therefore compliance by December 5, 2007 may not be possible.

Previous FAA tasking of ARAC to develop RAG's

On April 19, 2000, the FAA issued operational rules §§ 91.410, 121.370, 125.248 and 129.32, entitled "Repair Assessment for Pressurized Fuselages." These rules apply to operators of eleven different airplane models, and require that repair assessment guidelines (RAGs) be incorporated into their maintenance or inspection programs. The eleven affected airplane models had a maximum take-off weight of greater than 75,000 pounds and were certificated prior to 14 CFR part 25, amendment 45. The RAGs would establish damage-tolerance-based inspections for repairs made to certain areas of the airplane's fuselage pressure boundary, namely the fuselage skin, door skin, and bulkhead webs.

To support compliance with these operational rules, the ARAC was tasked to develop RAGs. RAGs were developed for each of eleven airplane models and were approved by the FAA prior to incorporation into operators' maintenance or inspection programs. As part of this new tasking, the ARAC, through the AAWG, will assess the effectiveness of

those fuselage pressure boundary RAGs to support compliance with the AASIFR. It is anticipated that lessons learned from this assessment will support the development of the guidelines that will be established per this new tasking.

Widespread fatigue damage for RAMs

In 1997, the FAA tasked ARAC to examine whether or not regulatory action was required to prevent WFD in the commercial airplane fleet. In support of this tasking, the AAWG reviewed available service difficulty reports for the transport airplane fleet and evaluated the certification and design practices, including results of fatigue tests, applied to certificated transport airplanes. The review conducted by ARAC revealed that all large transport airplanes are susceptible to some level of WFD. Based on this review, the FAA finds that to ensure the continued airworthiness of large transport airplanes it is necessary to develop data and guidelines that will enable certificate holders under part 121 and operators of U.S. registered multi-engine airplanes under part 129 to assess the WFD characteristics of structural repairs, alterations, and modifications.

AAWG is the appropriate ARAC body to develop data and guidelines for assessing RAMs

In an effort to reduce the scope of DTA work required for compliance to the AASIFR, and the work necessary to assess RAMs for WFD, the FAA has determined that an effective process for assessing RAMs is necessary. The AAWG is familiar with the issues and has the industry experience and technical expertise required to develop damage-tolerance and WFD guidelines for assessing RAMs. Therefore, the AAWG is the appropriate ARAC body to develop a process and should be tasked to develop data and guidelines for assessing RAMs.

TASKING TO ARAC

Airplane Applicability of Tasking

The RAGs that were previously developed under the direction of the AAWG to support operator compliance with §§ 91.410, 121.370, 125.248 and 129.32, were limited to transport airplanes certificated prior to CFR 14 part 25, amendment 45 having a maximum gross take-off weight of greater than 75,000 pounds.

To assure that the damage-tolerance requirements of the Aging Aircraft Safety Rule are adequately addressed for all affected transport category airplane models, this new tasking includes transport category airplanes with a type-certificated passenger seating capacity of 30 or greater, or a maximum payload capacity of 7,500 pounds or greater, operated under part 121 or under part 129 (for U.S. registered airplanes).

Concerning the assessment of RAMs for WFD, this new tasking will be applicable to transport category airplanes having a maximum gross take-off weight of greater than 75,000 pounds operated under part 121 or under part 129 (for U.S. registered airplanes).

Scope of Tasking

The RAGs that were previously developed under the direction of the AAWG were limited to repairs made to the fuselage skin, door skin, and bulkhead webs of the airplane's fuselage pressure boundary. To support compliance with sections 121.370a and 129.16 of the AASIFR, and to ensure RAMs are adequately addressed for WFD, the scope of this new tasking will encompass RAMs made to primary structure, including repairs made to alterations and modifications.

Statement of Tasking

Repairs, Alterations, and modifications

The FAA tasks ARAC to develop instructions that will enable part 121 and 129 certificate holders to assess the damage-tolerance characteristics of structural repairs, alterations, and modifications. Two products shall result from this tasking. The first product from this tasking shall be an Advisory Circular (AC) containing guidelines and procedures necessary to develop a damage-tolerance-based assessment document for RAMs. The guidance provided in this AC will support the development of damage-tolerance-based inspections and procedures for part 121 and 129 certificate holder's compliance with the AASIFR. The AC shall be directed to airplane model type certificate and supplemental type certificate holders, and airframe modifiers.

The second product from this tasking shall be model specific FAA approved documents that enable part 121 and 129 certificate holders to establish the inspection methods, thresholds, and intervals necessary for continued airworthiness. These documents shall facilitate a significant reduction in the need for individual DTA of repairs that would otherwise be required for compliance to sections 121.370a and 129.16 of the AASIFR. The time and effort saved by using the model specific documents shall be at a level that supports industry compliance with the AASIFR.

The tasking shall be performed in two phases. In phase one the AAWG will write the Advisory Circular (AC) containing guidelines and procedures necessary to develop a damage-tolerance-based assessment document for RAMs. Phase one will be accomplished within 30 months of issuance of this tasking.

In phase 2 the Structures Task Groups (STGs) under the direction of the AAWG will produce the model specific RAM assessment documents using the guidelines and procedures of the AC produced in phase one. The AAWG will be responsible for coordinating and overseeing the STG's application of the AC. The phase 2 documents will be produced within 18 months after completion of phase one.

In support of this tasking, the following sub-tasks shall be accomplished:

a. Assess the effectiveness of the Repair Assessment Guideline (RAG) documents to provide damage-tolerance based inspections for repairs made to baseline primary structure. The assessment should identify the following:

- Areas of baseline primary structure that are not covered by these documents
- Any deficiencies in the process used to implement the requirements of these documents (lessons learned)
- Identify useful data from these documents that can be used to support this new tasking

b. Identify the issues/difficulties industry has encountered with establishing damage-tolerance based inspections and procedures for RAMs as required by the 727 and 737 Structural Supplemental Inspection Programs (SSIP) airworthiness directives (AD 98-11-03 R1, AD 98-11-04 R1). The assessment should identify the following:
    - Lessons learned
    - Useful data from these programs that can be used to support this new tasking

c. Assess the extent to which Structural Repair Manuals (SRM) provide damage-tolerance based inspections for repairs made to baseline primary structure. The assessment should identify the following:
    - Areas of baseline primary structure that are not covered by SRMs
    - For CFR 14 part 25 pre-amendment 54 airplane certificated models, provide a status of work required to obtain damage tolerant rated SRMs

d. Assess the need to include damage-tolerance-based inspections and procedures in Service Bulletins (SB) that alter or modify baseline primary structure. The assessment should identify the following:
    - Significant alterations and modifications that currently have no established damage-tolerance-based inspections.
    - For CFR 14 part 25 pre-amendment 54 airplane certificated models, provide a status of work required to obtain damage tolerant rated service bulletins for above identified alterations and modifications.

e. Assess the need to include damage-tolerance-based inspections and procedures for alterations and modifications performed under an STC. The assessment should identify the following:
    - Significant STC alterations and modifications that currently have no established damage-tolerance based inspections.
    - For CFR 14 part 25 pre-amendment 54 airplane certificated models, provide a status of work required to obtain damage-tolerance-based inspections and procedures for above identified alterations and modifications.

f. Assess the effectiveness of Advisory Circular 91-56B to provide guidance to airplane model type certificate and supplemental type certificate holders for developing damage-tolerance-based inspections and procedures for repairs,

alterations, and modifications to the baseline primary structure. The following shall be provided:

- Effectiveness of AC to support industry compliance with the AASIFR
- Document any inadequacies identified in the AC with respect to providing guidance to model type certificate and supplemental type certificate holders in their development of damage-tolerance-based inspections and procedures.
- Identify guidance that can be used to support the development of model specific documents as required by this new tasking.

Baseline Primary structure

The FAA tasks ARAC to assess the various programs developed by TC holders to provide damage-tolerance-based inspections and procedures for the baseline primary structure. The assessment shall determine the effectiveness of these inspection programs to detect damage which may develop in an airplane's primary structure before that damage degrades the load carrying capability of the structure below the levels required by the applicable airworthiness standards. The AAWG shall provide recommendations for addressing any inadequacies identified in these inspection programs.

In support of this tasking, the following sub-tasks shall be accomplished:

a. Assess the effectiveness of SSIPs to provide damage-tolerance-based inspections and procedures for the baseline primary structure. The assessment should apply to SSIPs developed for CFR 14 part 25 pre-amendment 45 transport airplane models having a maximum gross take-off weight of 75,000 lbs or greater. The following shall be identified:
    - Areas of baseline primary structure that are not covered by these documents
    - Inadequacies in the methodology and/or assumptions applied in developing the SSIP
    - Any deficiencies in the implementation of the requirements of these programs
    - Provide recommendations to address any deficiencies

b. Assess the effectiveness of supplemental structural inspections specified /required by an applicable airplane model's Airworthiness Limitations Section (ALS) to provide damage-tolerance based inspections for the baseline primary structure. This assessment should apply to SSIPs developed for CFR 14 part 25 amendment 45 or later transport airplane models having a maximum gross take-off weight of 75,000 lbs or greater. The following shall be identified:
    - Areas of baseline primary structure that are not covered by these documents
    - Inadequacies in the methodology and/or assumptions applied in developing the supplemental structural inspections specified in ALS

- Any deficiencies in the implementation of the requirements of these programs
- Provide recommendations to address any deficiencies

c. Assess the effectiveness of Advisory Circular 91-56B to provide guidance to airplane model type certificate and supplemental type certificate holders for developing damage-tolerance-based inspections and procedures for the baseline primary structure. The following shall be provided:
    - Effectiveness of AC to support industry compliance with the AASIFR
    - Document any inadequacies identified in the AC with respect to providing guidance to model type certificate and supplemental type certificate holders in their development of damage-tolerance-based inspections and procedures.
    - Make recommendations to address any inadequacies identified in the AC.

Widespread Fatigue Damage(WFD) of Repairs, Alterations, and Modifications:

As the AAWG will be addressing RAMs under this new tasking in support of the AASIFR, it would be appropriate that the AAWG be involved with addressing RAMs for WFD. The AAWG was previously tasked to provide recommendations and methodology to address WFD. Addressing RAMs as required by the AASIFR and for WFD under this tasking is a more efficient approach than addressing them individually under separate taskings. The AAWG will develop a schedule that will ensure completion of this task within 48 months after issuance of the tasking.

The FAA tasks ARAC to develop instructions that will enable part 121 and 129 certificate holders to assess the WFD characteristics of structural repairs, alterations, and modifications. The product from this tasking shall be an Advisory Circular (AC) containing guidelines and procedures necessary to develop a WFD assessment document for RAMs. The AC shall be directed to airplane model type certificate and supplemental type certificate holders, and airframe modifiers.

Schedule

This tasking shall be accomplished in two phases. Phase 1 being the development of the RAM assessment guidelines and procedures, and the assessment of current damage-tolerance based programs, shall be completed by January 2007. Phase two, the final product, consisting of a model specific user-friendly RAM assessment document, shall be completed by July 2008. With respect to the tasking to address RAMS for WFD, the AAWG will develop a schedule that will ensure completion of the task within 48 months after issuance of the tasking.

Working Group Activity

The 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, for FAA/JAA approval within four months of the publication of this notice. The work plan should include a provision for progress reports to the FAA/JAA at each work group meeting.

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

3. Draft the appropriate documents and required analyses and/or any other related materials or documents the working group determines to be appropriate.

4. Provide status report at each meeting of the ARAC held to consider transport airplane and engine issues. Participation in the Airworthiness Assurance Working Group will be composed of technical experts having an interest in the assigned task. A working group member need not be a representative or 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 task, and stating the expertise, he or she would bring to the working group. All requests to participate must be received no later than (insert date here). All requests will be reviewed by the assistant chair, the assistant executive director, and the working group chair. Individuals will be advised whether the request can be accommodated. Individuals chosen for membership on the working group will be expected to represent their aviation community segment and actively participate 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 support the working group in meeting any assigned deadlines. Members are expected to keep their management chain and those they may represent 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 approval.

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 determined that the formation and use of the ARAC is necessary and in the public interest in connection with the performance of duties imposed on the FAA by law.

Meetings of the ARAC will be open to the public. Meetings of the Airworthiness Assurance Working Group will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. The FAA will make no public announcement or working group meetings.

Issued in Washington DC, on

25.1529 and 25.1309 Plans

TAEIG Briefing

February 2004

25.1529 – Recap from last mtg

- FAA proposed SDAHWG to address 25.1529
- TAE commented that SDAHWG was not the right group to address 25.1529 issue

25.1529 – FAA plan

- FAA agrees SDA is not the appropriate forum due to limited expertise
- ICA activities driven by Safer Skies and CPS
  - CPS recommendations expected 3rd quarter 04
- If additional industry inputs are needed, FAA will consult with appropriate advisory group(s)

25.1309 – Recap from last mtg.

- FAA proposed activities based on Phase 1 recommendations (hazard classifications, design assurance level, specific risk)
- TAE comments:
  - Verify consistency with HFHWG's recommendations
  - 25.1309 is "95%" good, do we benefit from additional activities
  - Phase 1 recommendation was to have an independent group to review historical accident and incident data to determine the need for "specific risk"

25.1309 – FAA plans

- HF considerations in hazard classifications is strictly a 25.1309 issue, not covered by HFHWG. Some topics of interests:
  - Workload definition and effects
  - Crew-error contribution to a hazard
- FAA is studying the issues
- If additional industry inputs are needed, FAA will consult with appropriate advisory group(s)

25.1309 – FAA plans (cont.)

- Is design assurance level A enough to satisfy the ARAC recommended “no catastrophic single failure” rule?
  - Concern raised by JAA
  - Currently a hot debate in many forums such as SAE S18, EUROCAE W63, FAA software/hardware conference, as well several certification programs.
  - No apparent consensus in the near term
- FAA to monitor these forums and, when consensus is achieved, to determine if any regulatory action is needed.

25.1309 – FAA plans (cont.)

- Specific Risk:
  - No common definition for “specific risk”
    - Widely different recommendations to address the latency aspect in thrust reversers and flight controls systems
  - FAA position on SFAR 88 and Amendment 102 are yet another way
  - “Independent group” would have no criteria to determine if an accident/incident was related to specific risk –
  - unless that group also defines the term and its applications.

25.1309 – FAA plans (cont.)

- Authorities should have an integrated approach and a clear understanding of overarching regulatory targets
  - Benefits/drawbacks of having common guidance at airplane level and across systems
  - Characteristics of an acceptable risk level when the average risk criteria are exceeded
- Authorities to discuss overarching issues, and provide findings/guidance to industry
- If additional industry inputs are needed, FAA will consult with appropriate advisory group(s)

Non-Regulatory Project Report as of 1/13/04

Branch Airframe

AA-00-67 Materials Properties

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Yarges ***ARACWG*** GSHWG

Background

Work Statement

Output

Section 25.603

AA-93-10 Engine and APU Load Conditions

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin ***ARACWG*** LDHWG

Background Rules did not take into account all known failure loads

Work Statement AR-93-15, Draft new rules and advisory material

Output

Section 25.361(b), 25.362

AA-93-6 Bird Strike

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization, Presently FAA requires the 8# bird on tail structure

Work Statement AR-93-12, Review current FAA/JAA requirements and study bird threat levels, and develop harmonized regulations

Output

Section 25.571(e), 25.631, 25.775(b)

AA-94-17 Continuous Turbulence Loads

Priority FTA/Cat 2 ***Status*** On Hold

Engineer Martin Haynes ***ARACWG*** LDHWG

Background NTSB Recommendation to consider multi axis gusts

Work Statement AR-94-14 R,E&D conducted to define analysis method

Output

Section 25.341(b) alias 25.305(d)/25.1517

AA-95-2 Damage Tolerance and Fatigue

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background

Work Statement

Output

Section 25.571

AA-95-3 Proof of Structure

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background

Work Statement

Output

Section 25.307

AA-96-10 Fuselage Doors

Priority FTA/Cat 3 ***Status*** 5.4 Doc-Draft Rvw

Engineer Gardlin ***ARACWG*** GSHWG

Background

Work Statement

Output

Section 25.783

AA-98-34 Fuel Tank Access Covers

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background

Work Statement

Output

Section 25.963(e)(g)

AA-98-36 Flight Control System

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin Stimson ***ARACWG*** FCHWG

Background

Work Statement

Output

Section 25.671, 25.672

AA-98-37 Structural Integrity of Fuel Tanks

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin ***ARACWG*** LDHWG

Background

Work Statement

Output

Section 25.561, 25.721, 25.963(d), 25.994

AA-98-38 Fire Protection of Structure

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin Haynes ***ARACWG*** LDHWG

Background

Work Statement

Output

Section 25.865

AA-99-48a Ops Tests

Priority ***Status*** ARAC WG

Engineer Yarges ***ARACWG*** GSHWG

Background

Work Statement

Output

Section 25.683

Branch Cabin Safety

AA-93-8 Direct View (Flight Attendant)

Priority ***Status*** ENG II

Engineer Gardlin ***ARACWG*** DVHWG(Inactiv

Background ARAC recommendation on direct view of cabin by flight attendant

Work Statement Publish advisory material

Output

Section 25.785

AA-96-2 Modify Emergency Evac Procedures

Priority B ***Status*** On Hold

Engineer Gardlin ***ARACWG*** EEIG

Background

Work Statement

Output

Section 25.803, App J

AA-98-21 Pax Seat Dynamic Testing

Priority ***Status*** Legal II

Engineer Gardlin ***ARACWG*** STHWG

Background Harmonization

Work Statement Develop advisory material

Output

Section 25.562

AA-98-22 Seats, Berths, Safety Belt Harnesses

Priority FTA/Cat 3 ***Status*** 3.10 Doc-Draft Rvw

Engineer Gardlin ***ARACWG*** STHWG

Background

Work Statement

Output

Section 25.785 (b), (c), (e)

AA-99-10 Emergency Lighting/Slide Illumination

Priority ***Status*** ENG I

Engineer Sinclair ***ARACWG*** EEIG

Background

Work Statement

Output

Section 25.812

FA-03-01 Thermal/Acoustic Insulation Flame Propagation Test Method Details

Priority High ***Status*** Interdirect

Engineer Gardlin ***ARACWG***

Background

Work Statement

Output

Section 25.856

FA-03-02 Installation of Thermal/Acoustic Insulation for Burnthrough Protection

Priority High ***Status*** Interdirect

Engineer Gardlin ***ARACWG***

Background

Work Statement

Output

Section 25.856

FA-95-1 Crashworthiness Mega AC, AC 25-17A- rev

Priority ***Status*** ENG II

Engineer Claar ***ARACWG*** FAA

Background Need to centralize existing policy and guidance

Work Statement Collect and publish existing policy and guidance into one document.

Output

Section

FA-97-3 Accessibility to Excess Exits

Priority ***Status*** On Hold

Engineer Sinclair ***ARACWG*** OnHold

Background

Work Statement

Output

Section 121.310, 25.807

Branch Electrical Systems

AA-00-64 AC 25-11, Takeoff Warning Systems

Priority ***Status*** 3.0 In ARAC

Engineer K Baker ***ARACWG*** ASHWG

Background

Work Statement

Output

Section 25

FA-95-7 Electrical Systems Mega AC

Priority ***Status*** ENG II

Engineer Sadeghi ***ARACWG*** FAA

Background Need to centralize existing policy and guidance

Work Statement Collect and publish existing policy and guidance into one document

Output

Section

FA-95-8 Windshear

Priority ***Status*** On Hold

Engineer K Baker ***ARACWG*** FAA

Background No current drivers since all operators have complied

Work Statement Develop a TSO to incorporated info in draft AC ON HOLD

Output

Section

Branch **Flight Test**

AA-01-02 PIO

Priority ***Status*** TOR

Engineer ***ARACWG*** TAEIG-NEW

Background

Work Statement

Output

Section 25

AA-01-03 HQRM

Priority ***Status*** TOR

Engineer ***ARACWG*** TAEIG-NEW

Background

Work Statement

Output

Section 25

FA-00-93 AC 25-7X

Priority ***Status*** ENG Prelim

Engineer Rogers ***ARACWG*** FAA

Background

Work Statement

Output

Section 25

FA-99-17 Tailplane Icing

Priority ***Status*** On Hold

Engineer Fender ***ARACWG*** OnHold

Background Accidents resulting from ice-contaminated tailplane stall (ICTS)

Work Statement Develop guidance material related to design characteristics and flight procedures to prevent ICTS. DONE

Output

Section

Branch Mechanical Systems

AA-00-69 Retracting Mechanisms

Priority ***Status*** RPR 1

Engineer Wahi ***ARACWG*** TAEIG-NEW

Background

Work Statement

Output

Section 25.729

AA-03-1 Supercooled Large Droplet (SLD) Icing Conditions

Priority ***Status*** 3.0 In ARAC

Engineer Ishimaru ***ARACWG*** IPHWG

Background

Work Statement

Output

Section App X icing

AA-93-5 Class B/F Cargo Compartments

Priority B ***Status*** ARM

Engineer Wahi ***ARACWG*** CSHWG(Inactive)

Background

Work Statement

Output

Section 25.857(b)

FA-01-05 AC 25.1419-1 Clarification

Priority ***Status*** W/E II

Engineer Jones ***ARACWG***

Background

Work Statement

Output

Section 25.1419

Branch Power Plant

AA-02-01 Part 121 and 25 Ice Protection Systems

Priority B ***Status*** 3.9 Doc-Draft

Engineer Ishimaru Hill ***ARACWG*** IPHWG

Background

Work Statement

Output

Section 121, 25.1419

AA-98-42 Flammable Fluid Drainage/Ventilation

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer McRae Dostert ***ARACWG*** PPIHWG

Background Lack of standardization and harmonization highlight need for more complete compliance guidance

Work Statement Resolve significant policy differences and develop appropriate advisory material

Output

Section 25.1187/25.863

AA-98-43 Powerplant in-flight Restarting

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Dostert ***ARACWG*** PPIHWG

Background Harmonization. 40 events of inflight shutdown of all engines brought recognition to the need for a rapid restart capability. AIA developed a rule change and AC for an All Engines out Restart Demo.

Work Statement Associated with AR-98-25

Output

Section 25.903(e)

AA-98-7 Flammable Fluid Shut-Off Means

Priority FTA/Cat 3 ***Status*** On Hold

Engineer McRae ***ARACWG*** PPIHWG

Background Harmonization

Work Statement See AR-98-15

Output

Section 25.1189

AA-99-12a Engine Case Burnthrough

Priority FTA/Cat 3 ***Status*** 5.4 Doc-Draft Rvw

Engineer McRae Dostert ***ARACWG*** PPIHWG

Background Harmonization

Work Statement Develop advisory material

Output

Section 25.903(d)(1)

Section Part 20 series AC

FA-02-01 Rev. of AC 25.981-1B

Priority High ***Status*** ENG II

Engineer Dostert ***ARACWG***

Background

Work Statement

Output

Section 25.981

FA-91-2 Engine Fire Extinguishing Concentration Testing

Priority ***Status*** On Hold

Engineer Dostert ***ARACWG*** OnHold

Background Standardized guidance need for test procedures, designs differ between ACOs do to test procedures for same engine

Work Statement Develop guidance material ON HOLD

Output

Section

FA-92-2 Engine Vibration Monitoring Design Guidance for Turbojet/Turbine Engine Rotor Unbalance Indicating Systems

Priority ***Status*** On Hold

Engineer Kaszycki ***ARACWG*** OnHold

Background Standardized guidance need for test procedures. Designs differ between ACOs do to test procedures for same engine.

Work Statement Develop guidance material

Output

Section 25.1301, 25.1305, 25.1309, 25.901, 25.903, 33.29

FA-94-6 Propulsion Mega AC

Priority ***Status*** On Hold

Engineer Happenny ***ARACWG*** PPIHWG

Background Need to centralize existing policy and guidance.

Work Statement Collect and publish existing policy and guidance into one document.

Output

Section

Branch Standardization

AA-00-26 Significant Modifications/STCs on Transport Airplanes

Priority ***Status*** 3.3 WG Report to TW

Engineer Brenneman Bandley ***ARACWG*** AAWG

Background

Work Statement

Output

Section

Section

FA-99-10 AIR Rulemaking Procedures Guide, Special Project

Priority ***Status*** W/E I

Engineer ***ARACWG***

Background

Work Statement

Output

Section

Regulatory Project Report as of 1/13/04

Branch Airframe

AR-00-24 Ground Handling Conditions

Priority ***Status*** RPR 2

Engineer Martin Haynes ***ARACWG*** LDHWG

Background Present regulations do not cover multi main gear. Have to write Special Conditions for each large airplane project.

Work Statement Update regulations and harmonize

Output

Section 25.471-25.519, 25.473, 25.509

AR-00-57 Flight Loads Validation

Priority ***Status*** On Hold

Engineer Martin ***ARACWG*** LDHWG

Background Harmonization

Work Statement Harmonize advisory materials.

Output

Section 25.301

AR-93-12 Bird Strike

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background FAA proposed rulemaking to upgrade bird strike requirements in 1992. Became harmonization effort in 1993.

Work Statement Review current FAA/JAA requirements, study bird threat levels, and develop harmonized regulations.

Output

Section 25.571, 25.631, 25.775(b)

AR-93-15 Engine Failure Loads

Priority FTA/Cat 2 ***Status*** On Hold

Engineer Martin ***ARACWG*** LDHWG

Background Modernization: Current rule for "sudden engine stoppage" is inadequate for modern engine designs. Special conditions are required to address this issue on transport airplanes.

Work Statement Review FAR and JAR sections 25.361, and ACJ 25.361 and provide a criteria to handle the transient load time history resulting from engine

Output

Section 25.361(b), 25.362

AR-94-12 Checked Pitch Maneuver

Priority FTA/Cat 3 ***Status*** 3.4 RPR-Draft

Engineer Martin Haynes ***ARACWG*** LDHWG

Background Harmonization, Modernization. JAR and FAR have different methods that result in different loads for same condition. FAR and JAR not adequate for fly by wire airplanes. Equivalent safety findings are required on most transport airplanes.

Work Statement Review FAR and JAR sections 25.331(c)(2) and provide criteria to account for a checked pitching maneuver that is appropriate for conventional as well as fly-by-wire active controlled airplanes.

Output

Section 25.331(c)(2)

AR-94-13 Interaction of Systems and Structures

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin ***ARACWG*** LDHWG

Background Special conditions. Structural design safety factors need to account for the loads that are caused by system failures, especially for advanced fly-by-wire airplanes. Special conditions are needed on transport airplanes

Work Statement Review the existing special conditions on this issue and recommend a general rule for the safety factors associated with the interaction of systems and structures.

Output

Section 25.1329, 25.302, App New

AR-94-14 Continuous Turbulence Loads

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin Haynes ***ARACWG*** LDHWG

Background Modernization/Safety: The continuous turbulence loads need to be upgraded according to the modern operational environment. Also NTSB recommends a multi-axis gust condition for wing mounted nacelles.

Work Statement Review FAR and JAR sections 25.341(b) and provide a criteria to update the continuous gust intensities, methods, and also provide a response to the NTSB recommendation.

Output

Section 25.341(b) alias 25.305(d)

AR-95-5 Damage Tolerance and Fatigue

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization

Work Statement Harmonization FAR/JAR 25.307.

Output

Section 25.571

AR-95-6 Proof of Structure

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization

Work Statement Harmonize FAR/JAR 25.307 and advisory material.

Output

Section 25.307

AR-96-7 Fuselage Doors

Priority FTA/Cat 3 ***Status*** 6.11a FR-HQ coord

Engineer Gardlin ***ARACWG*** GSHWG

Background Safety: Two back-to-back catastrophic accidents in early 1989 from door failures led to four NTSB recommendations and a special ATA task force study which also provided a list of recommendations.

Work Statement Review FAR 25.783 and JAR 25.783 including advisory material and provide recommendations that respond to the NTSB and ATA recommendations.

Output NPRM 03-01 was published on 1/14/03.

Section 25.783

AR-98-20 Flight Control System

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin Stimson ***ARACWG*** FCHWG

Background Harmonization and NTSB recommendations

Work Statement Develop revised rule and advisory material.

Output

Section 25.671, 25.672

AR-98-23 Structural Integrity of Fuel Tanks

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin ***ARACWG*** LDHWG

Background Harmonization: Additional phase added to AR 94-14. Both 25.963(d) and 25.721 treat the protection of fuel tanks in a minor crash landing and 25.994 also has requirements for protections of fuel systems in nacelles.

Work Statement Review the results of the harmonization of FAR and JAR sections 25.963(d) in task AR 94-14 and provide a complete harmonization package for sections 25.963(d), 25.721, and 25.994.

Output

Section 25.561, 25.721, 25.963(d), 25.994

AR-98-24 Fire Protection of Structure

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Martin Haynes ***ARACWG*** LDHWG

Background Harmonization, FAR 1 definitions for fireproof are also undergoing changes and effects this effort.

Work Statement Review JAR/FAR 1 definitions, FAR/JAR 25.865 and FAA issue papers on this subject. Recommend harmonized changes to 25.865 and prepare appropriate advisory material.

Output

Section 25.865

AR-98-33 Casting Factors

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization

Work Statement Harmonize FAR/JAR 25.261 and advisory material.

Output

Section 25.621

AR-99-26 Fuel Tank Access Covers

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization, FAR has fire resistance requirements; JAR does not.

Work Statement Harmonize FAR/JAR 25.963 and AC 25.963-1.

Output

Section 25.963 (e) (g)

AR-99-48 Ops Tests

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization

Work Statement JAA have additional requirements for testing envelope. Adopt JAR as written.

Output

Section 25.683

AR-99-49 Pressurized Compt Loads (high alt)

Priority FTA/Cat 3 ***Status*** 3.0 In ARAC

Engineer Yarges ***ARACWG*** GSHWG

Background Harmonization

Work Statement Harmonize FAR/JAR factors for pressurization loads for operations above 45K and related advisory material.

Output

Section 25.365(d)(e)

AR-99-66 Design for Security - ICAO

Priority ***Status*** ARAC WG

Engineer Gardlin ***ARACWG*** DFSHWG

Background Implementation of the ICAO amendment 97 rules.

Work Statement Implement the proposed requirements into FAR 25 and FAR 121 as appropriate.

Output Amdt 25-106 was adopted on 1/15/02 to address flightdeck security.

Section 25.795

AR-99-67 Aging Aircraft Program: Widespread Fatigue Damage

Priority A ***Status*** 5.7a Doc-HQ

Engineer Schneider ***ARACWG*** AAWG

Background AAP Task 5 has produced regulatory and advisory material recommendations which require action.

Work Statement Develop new requirements for WFD in FAR 25.1529 & App H, FAR 91, 121, 125,129, and 135.

Output

Section 121, 129

AR-99-68 Ground Gust Conditions

Priority FTA/Cat 3 ***Status*** 3.4 RPR-Draft

Engineer Martin ***ARACWG*** LDHWG

Background Harmonization: The JAA has moved forward with an NPA that will require the accounting for dynamic loads for control surfaces. A harmonized approach is needed.

Work Statement Review FAR/JAR 25.415 and NPA 25C-284 and develop information necessary for a harmonized rule and AC.

Output

Section 25.415

Branch Cabin Safety

AR-00-73 Emergency Evac Exit Sill Height

Priority ***Status*** TOR

Engineer Gardlin ***ARACWG*** TAEIG-NEW

Background Response to NTSB rec A-00-079 and to a recommendation by OSIG for a proposed new task

Work Statement ON HOLD

Output

Section 25.810

AR-00-88 Remote Occupied Compartments

Priority ***Status*** On Hold

Engineer Claar ***ARACWG*** TAEIG-NEW

Background 25.819 only address lower lobe service areas.

Work Statement Develop requirements for all remote compartments occupied by passenger or crew. Previous programs have been certified using special conditions. ON HOLD.

Output

Section 25.819, 25.xx

AR-94-11 Modify Emergency Evac Procedures

Priority B ***Status*** 6.11a FR-HQ coord

Engineer Gardlin ***ARACWG*** EEIG

Background Incorporate ARAC recommendations from AR-92-1.

Work Statement Modify evaluation procedures.

Output

Section 25.803

AR-99-13 Emergency Lighting/Slide Illumination

Priority ***Status*** On Hold

Engineer Sinclair ***ARACWG*** EEIG

Background Harmonization: The current requirements are already in a TSO.

Work Statement Develop harmonized escape slide illumination requirements. ON HOLD.

Output

Section 25.812

AR-99-56 Stowage Compartments

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Claar ***ARACWG*** EEIG

Background Harmonization

Work Statement Harmonize FAR and JAR

Output

Section 25.787

AR-99-57 Pax Info Signs

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Claar ***ARACWG*** EEIG

Background Harmonization

Work Statement Develop additional requirements for passenger information signs.

Output

Section 25.791(a) to (d)

AR-99-58 Emergency Egress Assist Means

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Claar ***ARACWG*** EEIG

Background Harmonization

Work Statement Harmonize requirements for emergency egress assist means

Output

Section 25.810

AR-99-58a Emergency Egress Markings

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Claar ***ARACWG*** EEIG

Background Harmonization

Work Statement Harmonize requirements for emergency egress markings.

Output

Section 25.811

AR-99-60 Emergency Exit Access (Type III exits)

Priority FTA/Cat 3 ***Status*** 3.3 WG Report to TW

Engineer Claar ***ARACWG*** EEIG

Background Harmonization

Work Statement Develop new requirements for access to Type III exits.

Output

Section 25.813

FR-00-22 Standards for Private Use Jets TCA

Priority ***Status*** 5.1 Team Rvw

Engineer Sinclair ***ARACWG*** FAA

Background Continually writing exemptions for private use jets

Work Statement Write an SFAR to cover private use jets.

Output

Section 25

FR-90-1 Misc. cabin safety changes final rule

Priority B ***Status*** ARM

Engineer Gardlin ***ARACWG*** FAA

Background Address various NTSB recommendations and a number of cabin requirement upgrades.

Work Statement Revise Rules.

Output NPRM 96-09 was published 7/24/96

Section 25.855

Section 25.812

Section 25.813

Section 121.310

Section 25.1447

Section 25.809

Section 121.333

Branch Electrical Systems

AR-00-32 Power Supply/Essential Load

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Slotte ***ARACWG*** ESHWG

Background A fast track project. No technical change. Making new 25.1310 out of 25.1309 (e) & (f) to improve awareness of the requirement to define essential loads and the conditions under which those loads must be supplied.

Work Statement Harmonize and clarify requirements.

Output

Section 25.1310, 25.1351(b), (c), (d)

AR-93-14 Powerplant Equipment, Systems and Installations/ Safety Assessment (PPI Task 1)

Priority FTA/Cat 3 ***Status*** 3.9 Doc-Draft

Engineer Le ***ARACWG*** SDAHWG

Background Harmonization: Also anticipate NTSB rec on this subject.

Work Statement Develop rule revisions and advisory materials.

Output

Section 25.1309, 25.901(c), 25.1301

AR-97-2 Automatic Flight Control and Guidance Systems

Priority FTA/Cat 3 ***Status*** 5.3 Doc-Final

Engineer Bartley ***ARACWG*** FGSHWG

Background Harmonization and update rule for modern airplanes, also related to an NTSB recommendation

Work Statement Develop revised rule.

Output

Section 25.1329, 25.1335

AR-98-17a Electrical Bonding and Protection Against Lightning

Priority FTA/Cat 1 ***Status*** 3.3 WG Report to TW

Engineer AIR-130 Dimtroff ***ARACWG*** EEHWG

Background NOT ANM's

Work Statement

Output

Section 25.1316, 23, 27, 29

AR-98-17b HIRF

Priority FTA/Cat 2 ***Status*** 5.4 Doc-Draft Rvw

Engineer AIR130 Dimtroff ***ARACWG*** EEHWG

Background NOT ANM's

Work Statement

Output

Section 25.1317

AR-98-28 Takeoff Warning System

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer K Baker ***ARACWG*** ASHWG

Background Harmonization

Work Statement Harmonize JAA/FAA rule, 25.703 to incorporate the most stringent requirements.

Output

Section 25.703(a),(b),(c)

AR-99-16 Cockpit Instrument System

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer K Baker ***ARACWG*** ASHWG

Background Harmonization

Work Statement Harmonize and clarify requirements. Policy statement issued based on an FAA safety recommendation.

Output

Section 25.1333(b)

AR-99-22 Electrical Bonding and Protection Against Static Electricity

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Slotte ***ARACWG*** ESHWG

Background Harmonization: FAR does not have section 25.899.

Work Statement This is a Fast Track Project to adopt the JAR.

Output

Section 25X899, 25.581, 25.1353(e), 25.1360(a)

AR-99-23a Electrical supply for emergency service

Priority FTA/Cat 3 ***Status*** 3.4 RPR-Draft

Engineer Slotte/ Sadeghi ***ARACWG*** ESHWG

Background There is no FAR 25.1362. Intended to address power supply after an emergency landing and ditching.

Work Statement Revise rules and advisory material /adopt modified JAR 25.1362.

Output

Section 25X1362

AR-99-23b Electrical Equipment and Installation; Storage Battery Installation; Electronic Equipment; and Fire Protection of Electrical System Components

Priority FTA/Cat 1 ***Status*** 6.11a FR-HQ coord

Engineer Slotte ***ARACWG*** ESHWG

Background Harmonization

Work Statement Adopt more stringent JAR requirements.

Output

Section 25.1353(a), (c)(5), (c)(6), 25.1431(d), 25.869(a)

AR-99-23c Electrical Distribution System

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Slotte ***ARACWG*** ESHWG

Background Harmonization to clarify applicability.

Work Statement This is a Fast Track Project to revise the FAR/JAR.

Output

Section 25.1355(C)

AR-99-23d Circuit Protective Devices, Electrical System Tests, Electrical Appliances & Motors

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Slotte ***ARACWG*** ESHWG

Background Harmonization: FAR and JAR differ slightly.

Work Statement This is a Fast Track Project to adopt the JAR.

Output

Section 25.1357, 25.1363, 25.1365

AR-99-23h Electrical Shock and Burns

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Slotte ***ARACWG*** ESHWG

Background Harmonization: Add new 25.1360 - no current rule.

Work Statement This is a Fast Track Project to update and adopt the JAR.

Output

Section 25X1360(a)(b)

AR-99-30 Instruments Using Power Supply

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer K Baker ***ARACWG*** ASHWG

Background Harmonization

Work Statement Harmonize to most stringent requirement.

Output

Section 25.1331

AR-99-31 Direction Indicator

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer K Baker ***ARACWG*** ASHWG

Background Harmonization

Work Statement Harmonize and clarify rule.

Output

Section 25.1327, 25.1328

AR-99-32 Warning, caution, and advisory lights

Priority ***Status*** 3.0 In ARAC

Engineer K Baker ***ARACWG*** ASHWG

Background Modernization and Harmonization

Work Statement Develop rules and advisory material.

Output

Section 25.1322

Branch Flight Test

AR-00-23 Minimum Maneuver Speeds for Flight in Icing Conditions (SFAR)

Priority ***Status*** 3.8 RPR-RMC

Engineer Stimson ***ARACWG*** TAEIG-NEW

Background COMAIR EMB-120 accident occurred during decelerating turn in icing conditions. NTSB concern for operating speeds that provide maneuver capability in icing conditions.

Work Statement Draft new regulation.

Output

Section 121

AR-00-34 Mandatory Artificial Stall Warning

Priority ***Status*** On Hold

Engineer Stimson ***ARACWG*** TAEIG-NEW

Background CASA 212 accident attributed, in part, to inadequate aero buffet to provide clear and unmistakable stall warning.

Work Statement Develop new rule.

Output

Section 25.207

AR-00-68 Stability

Priority ***Status*** TOR

Engineer Stimson ***ARACWG*** TAEIG-NEW

Background Harmonization recommended by FTHWG.

Work Statement Update the static directional and lateral stability requirements to address issues that could not be addressed during fast track harmonization.

Output

Section 25.177(c)

AR-01-02 Fly By Wire, sidestick, flight envelope

Priority ***Status*** TOR

Engineer ***ARACWG*** TAEIG-NEW

Background

Work Statement

Output

Section 25

AR-94-2 Performance and handling qualities in icing (IP 4/FT Task 3)

Priority A ***Status*** ARM

Engineer Stimson ***ARACWG*** FTHWG

Background Review of regulations identified a need to define standardized requirements for flight in icing conditions.

Work Statement Develop harmonized regulations and policy material for flight in icing conditions.

Output

Section 25.1419, 25.21(g)

AR-99-25 Harmonization of Airworthiness Standards Flight Rules, Static Lateral-Directional Stability, and Speed Increase and Recovery Characteristics (FT Task 4)

Priority FTA/Cat 1 & Cat 3 ***Status*** 3.4 RPR-Draft

Engineer Stimson ***ARACWG*** FTHWG

Background Harmonization

Work Statement Harmonize requirements for roll control capability from a lateral upset condition at high speeds.

Output

Section 25.107, 25.177, 25.253(a)(3),(a)(4),(a)(5)

AR-99-33 Contaminated Runway (FT Task 7)

Priority FTA/Cat 3 ***Status*** TOR

Engineer Stimson ***ARACWG*** FTHWG

Background Harmonization

Work Statement Harmonize requirements for operations on contaminated runways.

Output

Section 25X1591

Section 25.1501

Section 25.1583(k)

AR-99-35 Miscellaneous Flight Requirements (FT Task 5) - Flight Test Pkg 1 ARM

Priority FTA/Cat 1 ***Status*** 6.11a FR-HQ coord

Engineer Stimson ***ARACWG*** FTHWG

Background Harmonization

Work Statement Harmonize requirements related to credit for propeller feathering during the determination of takeoff path.

Output

Section 25.111(c)(4), 147(c)(2), 161(c)(2), (e), 175(d)

AR-99-46 Fuel Jettisoning System

Priority ***Status*** On Hold

Engineer Stimson ***ARACWG*** TAEIG-NEW

Background Analysis of takeoff performance on recently certified aircraft indicated that an unsafe condition may result in the event of immediate return to landing.

Work Statement Update performance requirements that define when a fuel jettisoning system is needed.

Output

Section 25.1001

Branch Human Factors

AR-99-21 Flight Crew Error/Flight Crew Performance Considerations in the Flight Deck Certification Process

Priority B ***Status*** ARAC WG

Engineer Boyd ***ARACWG*** HFHWG

Background Harmonization: There is no human factors regulation at this time.

Work Statement Review existing regulatory materials and develop needed revisions.

Output

Section

Branch Mechanical Systems

AR-00-35 Oxygen Systems

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Ishimaru ***ARACWG*** MSHWG

Background Harmonization

Work Statement This is a Fast Track Cat. 1 (enveloping) project.

Output

Section 25.1453

AR-00-54 Cabin Air Quality Issues

Priority ***Status*** On Hold

Engineer Happenny ***ARACWG*** TAEIG-NEW

Background Harmonization

Work Statement Develop new requirements.

Output

Section 25.831(a) thru (d), 25.832

AR-00-56 Nose Wheel Steering

Priority ***Status*** TOR

Engineer Wahi ***ARACWG*** TAEIG-NEW

Background Harmonization

Work Statement Review current requirements and advisory material and recommend changes to harmonize FAR and JAR 25X745, and related advisory material.

Output

Section 25X745

AR-00-66 Wheel Well Fire Detection

Priority ***Status*** On Hold

Engineer ***ARACWG*** OnHold

Background Safety and Harmonization

Work Statement Develop a rule to specify design criteria that address hazards associated with an uncontrolled fire in a landing gear wheel well.

Output

Section 25.729

AR-93-11 Class B/F Cargo Compartments

Priority B ***Status*** ARM

Engineer Wahi ***ARACWG*** CSHWG(Inactiv

Background Harmonization

Work Statement Develop revised rule and AC.

Output

Section 25.857(b)

AR-98-13 Effects of Icing Requirements Changes (Task 5)

Priority ***Status*** ARAC WG

Engineer Ishimaru Hill ***ARACWG*** IPHWG

Background See AR-98-10

Work Statement Ensure consistency of SLD changes across FAR 25 Subparts.

Output

Section 25.1323(e), 25.1325(b), 25.773(b)(1)(ii)

AR-98-14 Ice Protection of Angle of Attack Probes (IP Task 6)

Priority ***Status*** ARAC WG

Engineer Ishimaru Hill ***ARACWG*** IPHWG

Background FAR 25 rules have specific requirements to provide ice protection for the pitot probes. JAA add ice protection for angle of attack indicators to IPHWG

Work Statement Define need for angle of attack probe ice protection. OPEN

Output

Section 25.1419

AR-98-27 Pressurization and Pneumatic Systems

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Frey ***ARACWG*** MSHWG

Background Harmonization

Work Statement This is a Fast Track Cat. 1 (enveloping) project.

Output

Section 25.1438, 25X1436

AR-99-61 Cargo Compartment Fire Extinguishing or Suppression Systems

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Happenny ***ARACWG*** MSHWG

Background Deficiencies in test method need to be addressed.

Work Statement Develop technically sound and consistent advisory material.

Output

Section 25.851(b), 25.855, 25.857

AR-99-62 Amdt 25-87 (high alt)/Pressurization and Humidity

Priority ***Status*** ARAC WG

Engineer Happenny ***ARACWG*** MSHWG

Background Harmonization

Work Statement Develop new rule and AC.

Output

Section 25.831, 25.841

AR-99-65 Landing Gear Retracting Mechanisms and Pilot Compartment View

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Wahi ***ARACWG*** MSHWG

Background Harmonization

Work Statement This is a Fast Track Cat. 1 (enveloping) project.

Output

Section 25.729, 25.773

Branch Power Plant

AR-00-51a Fuel Vent System Fire Protection

Priority ***Status*** 3.0 In ARAC

Engineer Dostert ***ARACWG*** PPIHWG

Background Safety and Harmonization.

Work Statement Develop rule and advisory material (related to NPRM 84-17A).

Output

Section 25.975

AR-00-52 Fuel Vent System Fire Protection

Priority ***Status*** 3.0 In ARAC

Engineer Dostert ***ARACWG*** PPIHWG

Background NPRM issued 1996, ARAC tasked to complete rules. Related to fuel tank explosion TWA, Thai 737 ground fire.

Work Statement Issue rule.

Output

Section 121, 125, 135

AR-00-55 Uncontained Engine Failures

Priority ***Status*** ARM

Engineer Dostert ***ARACWG*** PPIHWG

Background Follow on to Phase I harmonization effort

Work Statement Issue revised AC.

Output

Section 25.903(d)

AR-00-87 Interfaces Airworthiness/Maintenance

Priority ***Status*** On Hold

Engineer McRae ***ARACWG*** OnHold

Background Applies standards for instructions to all systems similar to structures and fuel tanks.

Work Statement Issue new rule and AC.

Output

Section 25.1529

AR-93-13 Thrust Reversing Systems

Priority FTA/Cat 3 ***Status*** On Hold

Engineer McRae ***ARACWG*** PPIHWG

Background Resulted from accident/NTSB recommendation

Work Statement Provides for regulatory option to exiting rule.

Output

Section 25.933(a)(1)

AR-96-6 APU installations (PPI Task 2)

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Kammers McRae ***ARACWG*** PPIHWG

Background The APU installation requirements are scattered among the engine installation requirements. This arrangement has caused significant standardization problems for years.

Work Statement Collect APU installation requirements into one central location and harmonize with JAA.

Output

Section 25.901(d)/App K

AR-98-12 Propeller Deicing and Induction System Ice Protection (IP 4), AC 25.1093

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer McRae ***ARACWG*** PPIHWG

Background Harmonization

Work Statement Harmonize policy differences.

Output

Section 25.1093(b)(1)(ii), 25.929

AR-98-16 Beta, Reverse Thrust and Propeller Ptich Settings Below the Flight Regime (PPI Task 6)

Priority FTA/Cat 3 ***Status*** 3.4 RPR-Draft

Engineer McRae ***ARACWG*** PPIHWG

Background Response to accident and NTSB recommendation.

Work Statement Develop rule and advisory material.

Output

Section 25.1155

AR-98-25 Powerplant in-flight Restarting

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Dostert ***ARACWG*** PPIHWG

Background Harmonization. Current regs require restart capability, but do not define flight envelope where it is required. FAA is using Issue Papers in certification projects to impose minimum restart requirements.

Work Statement Revise FAR/JAR to reflect minimum requirements and advisory material developed by an AIA Committee (associated with AA-98-43).

Output

Section 25.903(e)

AR-98-41 Fire Protection of Engine Cowling

Priority FTA/Cat 3 ***Status*** On Hold

Engineer McRae ***ARACWG*** PPIHWG

Background Traditional compliance has been in part via equivalent safety. Both JAR and FAR being revised to reflect best practices.

Work Statement Develop regulatory material amending 25.1193(e) and associated advisory material.

Output

Section 25.1193(e)

AR-99-44 Negative acceleration

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Dostert ***ARACWG*** PPIHWG

Background Harmonization

Work Statement Significant regulatory differences require identifying minimum standards and advisory materials on demonstration.

Output

Section 25.943/25X1315

AR-99-50 Water Ingestion

Priority FTA/Cat 1 ***Status*** 3.4 RPR-Draft

Engineer Kaszycki McRae ***ARACWG*** PPIHWG

Background Harmonization

Work Statement Develop regulation and advisory material.

Output

Section 25.1091

AR-99-52 ATTCS

Priority FTA/Cat 3 ***Status*** On Hold

Engineer Pinkstaff Stimson ***ARACWG*** PPIHWG

Background Harmonization and upgrade requirements to cover today's technology

Work Statement Revise regulations and advisory material

Output

Section App. I

AR-99-53 Thrust Reverser Testing

Priority FTA/Cat 1 ***Status*** 3.3 WG Report to TW

Engineer McRae ***ARACWG*** PPIHWG

Background Harmonization: FAR 25 and JAR 25 identical but refer to FAR 33 and JAR-E (difference is in FAR 33 and JAR-E).

Work Statement Recommend action by ANE.

Output

Section 25.933

AR-99-69 Definitions fireproof/fire resistant

Priority ***Status*** On Hold

Engineer McRae ***ARACWG*** PPIHWG

Background Harmonization and standardization of current practice

Work Statement Develop harmonized performance based definition instead of materials based definition.

Output

Section FAR1/JAR1

Branch Standardization

AR-00-86 Light Transport Cargo Conversions

Priority ***Status*** ENG II

Engineer Gordon ***ARACWG*** FAA

Background Safety

Work Statement Develop harmonized rule to address cargo conversions.

Output

Section 25.857

FR-99-8 BC-17X (formerly MD-17) SFAR

Priority B ***Status*** ARM

Engineer Edgar ***ARACWG*** FAA

Background To facilitate new, cost saving technology.

Work Statement Develop SFAR.

Output

Section

BRIEFING ON FEDERAL ADVISORY COMMITTEE ACT PROCEDURES

THIS MEETING IS BEING HELD PURSUANT TO A NOTICE PUBLISHED IN THE FEDERAL REGISTER ON ***January 22, 2004***. THE AGENDA FOR THE MEETING WILL BE AS ANNOUNCED IN THAT NOTICE WITH DETAILS AS SET OUT TODAY. I AM THE DESIGNATED FAA OFFICIAL RESPONSIBLE FOR COMPLIANCE WITH THE FEDERAL ADVISORY COMMITTEE ACT, UNDER WHICH THE MEETING IS CONDUCTED. IT IS MY RESPONSIBILITY TO SEE TO IT THAT THE AGENDA IS ADHERED TO AND THAT ACCURATE MINUTES ARE KEPT. I ALSO HAVE THE RESPONSIBILITY TO ADJOURN THE MEETING SHOULD I FIND IT NECESSARY TO DO SO IN THE PUBLIC INTEREST.

PLACARDS FOR THE MEMBER ORGANIZATIONS ARE SET OUT ON THE CONFERENCE TABLE. ONLY ONE REPRESENTATIVE FROM EACH ORGANIZATION MAY SIT AT THE TABLE, PARTICIPATE IN ANY DISCUSSIONS, AND VOTE ON MATTERS PUT TO A VOTE BY THE CHAIR. THIS WILL GREATLY FACILITATE KEEPING ACCURATE MINUTES.

THE MEETING IS OPEN TO THE PUBLIC, AND MEMBERS OF THE PUBLIC MAY ADDRESS THE COMMITTEE ONLY WITH THE PERMISSION OF THE CHAIR. THE SCOPE AND DURATION OF SUCH A PRESENTATION SHOULD BE ARRANGED BY GIVING ADVANCE NOTICE. THE CHAIR MAY ENTERTAIN PUBLIC COMMENT IF, IN HIS JUDGMENT, DOING SO WILL NOT DISRUPT THE ORDERLY PROGRESS OF THE MEETING AND WILL NOT BE UNFAIR TO ANY OTHER PERSON. MEMBERS OF THE PUBLIC ARE WELCOME TO PRESENT WRITTEN MATERIAL TO THE COMMITTEE AT ANY TIME.

January 21, 2004

To: GAMA and AIA Member Companies

From: Barry Valentine and Bob Robeson

Subject: **Industry Meeting with EASA: February 11, 2004 @ Washington, DC**

On February 11, 2004, AIA and GAMA will host a meeting with Patrick Goudou, Executive Director, European Aviation Safety Agency. Attending this meeting with Mr. Goudou will be Claude Probst, Rulemaking Director, and Dr. Norbert Lohl, Certification Director. Representatives of other U.S. aviation associations are also being invited to the meeting.

EASA-INDUSTRY MEETING

Date: **February 11, 2004**
Time: 9:00-Noon (Buffet lunch from noon-1:00pm, $15 per industry attendee)
Location: AIA Offices
1000 Wilson Boulevard, Suite 1700
Arlington, VA 22209

The purpose of this meeting is to get acquainted with Mr. Goudou and his senior staff. It will provide an opportunity to exchange opinions on issues such as the future direction of EASA, U.S. industry needs and concerns, etc.

Please respond by completing the attached form and returning it to Marianne Semeria via fax or e-mail no later than close of business Wednesday, January 28. An agenda will be developed based on your responses prior to the meeting. Please call me if you have any questions or comments.

Attachments:
- EASA-Indsutry Meeting RSVP Form

Aerospace Industries Association of America, Inc.
1000 Wilson Blvd., Suite 1700, Arlington, VA 22209
Tel (703) 358-1000 Fax (703) 358-1011
Internet: http://www.aia-aerospace.org

General Aviation Manufacturers Association
1400 K Street N.W., Suite 801, Washington, DC 20005
Tel (202) 393-1500 Fax (202) 842-4063
Internet: http://www.GAMA.aero

RSVP FORM

Industry Meeting with Patrick Goudou, Executive Director, EASA

Date: **February 11, 2004**
Time: 9:00 am - 1:00 pm
Buffet lunch from noon-1:00pm, $15 per industry attendee
Location: AIA Offices
1000 Wilson Boulevard, Suite 1700
Arlington, VA 22209

Please complete the following:

Name:	
Company:	

Attendance:		I Will		Will NOT	Attend the Meeting
		I Will		Will NOT	Attend the Lunch

I would like to see the following items discussed:

Please return to Marianne Semeria no later than c.o.b. Wednesday, January 28, 2004

e-mail: **semeria@aia-aerospace.org**

Fax: **703-358-1181**

[Federal Register: January 22, 2004 (Volume 69, Number 14)]
[Notices]
[Page **3190**-3191]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr22ja04-114]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee Meeting on Transport Airplane and Engine Issues

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

ACTION: Notice of public meeting.

SUMMARY: This notice announces a public meeting of the **FAA**'s Aviation Rulemaking Advisory Committee (ARAC) to discuss transport airplane and engine (TAE) issues.

DATES: The meeting is scheduled for February 10-11, 2004, starting at 8:30 a.m. on February 10. Arrange for oral presentations by February 6.

ADDRESS: Boeing Facility, 1200 Wilson Boulevard, Room 234, Arlington, VA.

FOR FURTHER INFORMATION CONTACT: Effie Upshaw, Office of Rulemaking, ARM-209, **FAA**, 800 Independence Avenue, SW., Washington, DC 20591, Telephone (202) 267-7626, FAX (202) 267-5075, or e-mail at effie.upshaw@**faa**.gov.

SUPPLEMENTARY INFORMATION: Pursuant to section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92-463; 5 U.S.C. app. III), notice is given of an ARAC meeting to be held February 10-11 in Arlington, Virginia.

The agenda will include:

[sbull] Opening remarks
[sbull] **FAA** Report
[sbull] European Aviation Safety Agency/Joint Aviation Authorities Report
[sbull] Transport Canada Report
[sbull] Executive Committee Report
[sbull] Harmonization Management Team Report
[sbull] Legal Expectations for ARAC Recommendations
[sbull] Human Factors Harmonization Working Group (HWG) Report
[sbull] Ice Protection HWG Report
[sbull] Avionics HWG Report and Approval
[sbull] General Structures HWG Report
[sbull] Written reports, as required, from the following harmonization working groups: Engine, Electromagnetic Effects, Flight Test, Seat Test, Flight Control, Flight Guidance, System Design and

Analysis, Electrical Systems, Loads and Dynamics, Design for Security, Powerplant Installation, and Mechanical Systems. The Airworthiness Assurance working group may also provide a report.

[[Page 3191]]

[sbull] Discussion of section 25.1309 phase 2 task
[sbull] Review of Action Items and 2004 Meeting Schedule

If all the agenda items are discussed on February 10, no meeting will be held on February 11.

Attendance is open to the public, but will be limited to the availability of meeting room space and telephone lines. Visitor badges are required to gain entrance to the Boeing building where the meeting is being held. For badging purposes, you will need to provide your name, company, and nationality by January 30 to Sharon Neuner, (703) 465-3680, sharon.c.neuner@boeing.com, or the person listed in the FOR FURTHER INFORMATION CONTACT section.

For persons participating domestically by telephone, the call-in number is (866) 442-8714; for persons participating internationally, the number is (281) 540-4931. The Passcode for both numbers is: 14169163063. Details are also available on the ARAC calendar at http://www.**faa**.gov/avr/arm/araccal/htm.

To insure that sufficient telephone

lines are available, please notify the person listed in the FOR FURTHER INFORMATION CONTACT section of your intent by February 6. Anyone participating by telephone will be responsible for paying long-distance charges.

The public must make arrangements by February 6 to present oral statements at the meeting. Written statements may be presented to the committee at any time by providing 25 copies to the person listed in the FOR FURTHER INFORMATION CONTACT section or by providing copies at the meeting. Copies of the documents to be presented to ARAC for decision or as recommendations to the **FAA** may be made available by contacting the person listed in the FOR FURTHER INFORMATION CONTACT section.

If you are in need of assistance or require a reasonable accommodation for the meeting or meeting documents, please contact the person listed in the FOR FURTHER INFORMATION CONTACT section. Sign and oral interpretation, as well as a listening device, can be made available if requested 10 calendar days before the meeting.

Issued in Washington, DC, on January 14 ,2004.
Tony F. Fazio,
Director, Office of Rulemaking.
[FR Doc. 04-1329 Filed 1-21-04; 8:45 am]
BILLING CODE 4910-13-P

Analysis, Electrical Systems, Loads and Dynamics, Design for Security, Powerplant Installation, and Mechanical Systems. The Airworthiness Assurance working group may also provide a report.

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