

**Transport Aircraft and Engines
Committee
Status Report to the
Aviation Rulemaking Advisory Committee**

Keith R. Morgan
Committee Co-Chair

13 December 2018

MEMBERS of the Transport Aircraft and Engines Committee

Pratt & Whitney

ALPA

A4A

ASD

Airbus

Boeing

GAMA

AIA

Bombardier

NADA/F

Embraer

SCHEDULE

- Last Meetings:
 - May 10, 2018 Rosslyn, VA
 - Telecom July 25, 2018
 - Nov. 15, 2018 Seattle, WA

- Next meetings:
 - Telecom Feb. 6, 2019
 - Face-to-face week of May 13, 2019 (Washington D.C.)
 - Telecom July 24, 2019
 - Face-to-face week of Nov. 4 2019 (Seattle)

Flight Test Harmonization Working Group Status Report to the Aviation Rulemaking Advisory Committee

Brian P. Lee, Boeing
Christine Thibaudat, Airbus
Working Group Chairs

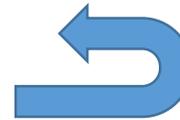
15 November, 2018

MEMBERS of Flight Test Harmonization Working Group

Authorities	OEM's		Operators	Observers
FAA Joe Jacobsen Bob Stoney Paul Giesman	Airbus Laurent Capra + SME's	Embraer Murilo Ribeiro + SME's	ALPA Rikki Gardonio Len Quiat	JCAB (Japan) Takahiro Suzuki Atsushi Fukui
EASA John Matthews Marco Locatelli	Boeing Darren Jens + SME's	Gulfstream Mike Watson +SME's		CAAI (Israel) Yshmael Bettoun
Transport Canada Lee Fasken	Bombardier Tony Spinelli +SME's	Textron Kurt Laurie +SME's		Norwegian Airlines John Lande
ANAC (Brazil) Pedro Donato	Dassault Philippe Eichel +SME's			

SUMMARY OF TASKING

- Transport Aircraft Performance and Handling Characteristics, Phase 3
- Long list of topics prioritized in Phase 1 (June, 2013 – June, 2014)
- Phase 2 Complete November, 2017; except
 - Wet Runway Stopping Performance: now complete
- Phase 3:
 - 15 . Pilot Induced Oscillation
 - 16. Handling Qualities Rating Method (+17)
 - 17. ~~Failure Assessment Methodology~~
 - 18. Go-Around Performance
 - 19. ~~Use of Amber Band on Airspeed Tape (Send to ASHWG with help from FTHWG)~~
 - 20. Return-to-Land
 - 30. Directional Control Below Vmc on Slippery Surfaces -
 - 31. Definitions of Vdf/Mdf (esp. for limited airplanes)
- Strategic Considerations
 - Considered to be aggressive
 - FTHWG began work ahead of formal tasking
- ASHWG: Low Energy Alerting
 - FTHWG is participating with ASHWG (B. Lee is Liaison)



PHASE 3 SCHEDULE

	1	2	3	4	5	6	7	8	9	10	11	12
	Wichita	Cologne	Seattle	Paris	Montreal	Toulouse	Melbourne	Cologne	Washington DC ?	Oslo	Savannah	Bordeaux/Istres?
	June 17	Sept 17	Dec 17	March 18	Jun-18	September 18	December 18	4-8 March 19	10-14 June 19	9-13 Sept 19	2-6 Dec 19	2-6 March 20
15 PIO					H			H	H	H*		
16 HQRM					H	H	H	H	H	H*		
18 GAR		P	P	*p		Report 1 November	Report 20 December					
20 Return to Land					P	P	P	*				
30 Yaw Control	H	H		H*	Report 1 June							
31 Vdf/Mdf	H		H	H		H	H	*	Report 30 June			

(*) means voting on requirements and guidance; final report will follow

P = Aircraft Performance
H = Handling Qualities



30 month clock starts 1 November, 2017
(so we've had a head-start)
FTHWG intends to stay on this schedule as best we can
(as opposed to stretching to 30 months from this date)
Buffer at end of schedule for contingencies



Tasking End Date
31 March, 2020
(We won't use it if we don't need it; we are anticipating Phase 4 to follow)

STATUS OF TASKING

- Topic from Phase 2: Wet Runway Stopping Performance
 - Scheduled Completion: March, 2018
 - Considered on-track / on-schedule: **Complete!**
- Phase 3: FTHWG considers activity on-track / on-schedule
 - Go-Around Performance (Topic 18)
 - OEI Requirements and Guidance complete by March Meeting
 - Desire to address EASA RMT 0647 activity (AEO, somatogravic illusion, etc.)
 - NPA and CRD released earlier this year
 - Based on release date of NPA and CRD, we target 20 December, 2018 report date.
 - OEI directional control on slippery surfaces (Topic 30) **Complete! To ARAC in December, 2018**
- ASHWG: Low Energy Alerting
 - FTHWG is participating (B. Lee is the liaison)
 - First Face-to-face meeting was concluded yesterday

STATUS OF TASKING

- →FTHWG-46 : 11-15 June 2018 Meeting Montreal (Bombardier)
 - 26 June (Go-Around OEI)
 - 3 July (HQRM)
 - 10 July (RTL)
 - 31 July (Vdf/Mdf)
 - 7 August (Go-Around AEO)
 - 21 August (RTL)
 - 28 August (Go-Around AEO)
 - 4 September (RTL)
- →FTHWG-47 : 17-21 September 2018 Meeting Toulouse (Airbus)
 - 2 October (Go-Around AEO)
 - 9 October (RTL)
 - 16 October (Go-Around AEO)
 - 23 October (PIO)
 - 30 October (HQRM)
 - 6 November (Vdf/Mdf)
 - 7 November (Go-Around)
 - 13 November (RTL)
 - 20 November (HQRM)
 - 21 November (Go-Around)
- →FTHWG-48 : 3-7 December 2018 Meeting Fort Lauderdale (Embraer)
- →FTHWG-49 : 4-8 March, 2019 Meeting Cologne (EASA)
- →FTHWG-50 : 10-14 June, 2019 Meeting Washington, DC (ALPA)
- →FTHWG-51 : 9-13 September, 2019 Meeting Oslo (Norwegian)
- →FTHWG-52 : 2-6 December, 2019 Meeting Savannah (Gulfstream)
- →FTHWG-53 : 2-6 March, 2020 Meeting Bordeaux / Istres (?) (Dassault)

Activity since
June, 2018

AREAS for ARAC CONSIDERATION

- No additional guidance needed from FAA or ARAC
- EASA's participation has improved (Thank you)

Transport Airplane Metallic and Composite Structures Working Group

Recommendation Report, Extension Topics, Briefing to the Aviation Rulemaking Advisory Committee

Doug Jury (Delta Air Lines)

Working Group Chair

November 15, 2018

Members of the Working Group

No membership changes from prior tasking

1. Michael Gruber (Boeing) – Outgoing Chairperson
2. Chantal Fualdes (Airbus)
3. Salamon Haravan (Bombardier)
4. Benoit Morlet (Dassault Aviation)
5. Antonio Fernando Barbosa (Embraer)
6. Kevin Jones (Gulfstream)
7. Toshiyasu Fukuoka (Mitsubishi Aircraft)
8. David Nelson (Textron Aviation)
9. Phil Ashwell (British Airways)
10. Doug Jury (Delta Air Lines) – Incoming Chairperson
11. Mark Boudreau (FedEx)
12. Eric Chesmar (United Airlines)

SUMMARY OF ORIGINAL TASKING

With the increased use of composite and hybrid structures recommendations regarding revision of the **fatigue and damage-tolerance requirements** & associated guidance material were previously provided in Final Report, dated 6/27/2018

Tasking was divided up into the following 12 focus areas:

1. Threat Assessment
2. Emerging material technology
3. Inspection Thresholds
4. Structural Damage Capability – Fail-safety
5. Aging, WFD & LOV (including ultimate strength & full-scale fatigue test evidence)
6. Testing (related to composite and hybrid materials including WFD test demonstration)
7. Repairs (bonding / bolting)
8. Modifications
9. EASA aging aircraft rulemaking and harmonization
10. Rotorburst
11. Disposition of cracking during full-scale fatigue testing
12. Accidental damage inspections included in the ALS conflicts w/ MSG-3 program

During final report submission and review by ARAC in July, 2018 three separate topics were raised as needing further evaluation and recommendation from this existing WG.

SUMMARY OF TASKING – extended topics

Three additional items for rule & guidance recommendation development

1. Structural Damage Capability (SDC) for Single Load Path (SLP) structure:

Develop requirements and guidance material for single load path (SLP) structure, which by definition has no SDC

2. Structural Bonding and “Weak Bonds”

FAA requests further clarification from the working group on how to address disbonds and weak bonds as a manufacturing defect

3. Repeat Inspections & Crack Interaction

Advisory Circular 91-82A provides evaluation considerations for establishing inspection thresholds and repeat intervals, including consideration of crack interaction with little guidance in AC. Based on this, the FAA is requesting information from the working group on how to address crack interaction when establishing inspection programs.

Each of these topics to be addressed by a smaller team, where each team has a designated leader to coordinate tasking activities among the smaller team – each leader has been identified, similar approach used in prior report development for the 12 separate items.

Deliverable & Schedule

Deliverable: report (either new report or amended existing report) containing:

- Recommendations on appropriate performance-based requirements
- Recommendations on any new guidance or changes to existing guidance
- Qualitative and quantitative costs and benefits of the recommendations

Milestones:

- | | |
|--|--------------|
| •TAE Status 1 | Nov 2018 |
| •Three targeted areas – define scope to be addressed in report - <i>Face to Face</i> | Jan/Feb 2018 |
| •TAE Status 2 | April 2019 |
| •Provide draft rule & guidance recommendations | Aug 2019 |
| •Provide cost and benefit analysis | Aug 2019 |
| •Draft report - <i>Face to Face</i> | Sept 2019 |
| •TAE Status 3 | Nov 2019 |
| •Approve Recommendation Report | Dec 2019 |

Objective is to complete the report within 13 months, with 5 months reserve in case of unexpected roadblocks

Meeting cadence:

- *Sub-teams (including NAA representatives) would meet more frequently*
- *Bi-weekly progress meetings (virtual) with FAA*
- *Full WG meetings (virtual) – monthly or as needed*

Ice Crystal Icing Working Group Status Report to the Aviation Rulemaking Advisory Committee

Melissa Bravin, Allan van de Wall

Working Group Chair

12/13/2018

MEMBERS of Ice Crystal Icing Working Group

Member Name	Organization	Role
Alan Strom	(FAA-ANE Standards) <u>FAA</u> Representative	FAA Representative
Melissa Bravin	Boeing Commercial Airplanes	WG Co-Chair – Airplane – P
Allan van de Wall	GE Aviation	WG Co-Chair – Engine – P
Tom Dwier	Textron Aviation	Airplane – P
Pierre-Emmanuel Arnaud	Airbus	Airplane – P
Bryan Lesko	Air Line Pilots Association	Other – P
Rikki Gardonio	Air Line Pilots Association	Other – B
Jon Saint-Jacques	A4A/Atlas Air	Other – P
David Dischinger	Honeywell	Engine – P
<u>Keith Wegehaupt</u>	Honeywell	Engine – P
<u>Jim Loebig</u>	Rolls-Royce	Engine – P
Roberto Marrano	Pratt & Whitney Canada	Engine – P
<u>Shengfang Liao</u>	Pratt & Whitney East Hartford	Engine – P
<u>Christopher Baczynski</u>	Mitsubishi MITAC	Airplane – P
<u>Kohei Ovabu</u>	Mitsubishi MITAC	Airplane – B
<u>Brian Matheis</u>	UTAS	Other (probe) – P

SUMMARY OF TASKING

The ICIWG will provide advice and recommendations to the ARAC through the TAE Subcommittee on Appendix D to Part 33, and harmonization of §33.68 Induction System Icing requirements as follows:

1. Evaluate recent ICI environment data - determine whether flight testing data supports the existing Appendix D envelope.
2. Evaluate the results carried out in Task 1 and recommend changes to the existing Appendix D envelope, as required.
3. Compare available service data on air data probes from both government and industry probes on Appendix D, including any changes proposed in Task 2.
4. Evaluate the results from Task 3 and recommend ICI boundaries relevant to aircraft and engine air data probes. If the working group proposes a different envelope for aircraft and engine air data probes, recommend if these should be included in the existing Appendix D, or create a new appendix to Part 33.
5. Identify non-harmonized FAA or EASA ICI regulations or guidance. If the working group finds significant differences that impact safety, propose changes to increase harmonization.
6. Recommend changes to the Advisory Circular AC20-147a based on Task 1 through 5 results.
7. Assist the FAA in determining the initial qualitative and quantitative costs, and benefits.
8. Develop a recommendations report containing the results of tasks 1 through 6.

SCHEDULE (Preliminary)

Kick-off meeting January 15-16 2019, Location: FAA, Burlington, MA

- Submit work plan to TAE January 30 2019

At Meeting #2 (March 2019), Location Recommendation: Rolls-Royce, Indianapolis, IN, USA

- Walter Strapp to debrief FAA report
- OEMs determine if any additional events need consideration

At Meeting #3 (June/July 2019), Location Recommendation: GE, Munich, Germany

- Airframer ICI encounter database statistics (request data if available)

At Meeting #4 (October/November 2019), Location Recommendation: Boeing, Seattle, WA, USA

- Discuss envelope recommendations

At Meeting #5 (January/February 2020), Location Recommendation: Honeywell, Phoenix, AZ, USA

- Discuss envelope recommendations
- Begin work on report

At Meeting #6 (April / May 2020), Location Recommendation: Boeing, Washington, DC, USA

- Review / work on AC20-147a recommendations
- Review draft report

At Meeting #7 (August 2020), Location Recommendation: Pratt & Whitney, East Hartford, CT, USA

- Finalize draft, deliver to TAE (how long does TAE take to provide comments?)

Via Webex

- Respond to TAE comments

At Meeting #8 if needed (October 2020), Location Recommendation: EASA, Cologne, Germany

- Final ARAC report to the FAA on or before TBD date

STATUS OF TASKING

- Working group has not started
- First milestone is the first meeting scheduled for January 15-16 at FAA offices in Burlington, MA

AREAS of ARAC CONSIDERATION

- None

Avionics Systems Harmonization Working Group

November, 2018

ASHWG Summary

New task:

Identify and develop recommendations on low energy alerting requirements to supplement previous work

Status:

Meeting held on 27/28 June, 2018 (webex) Meeting held on 5/6 September, 2018 (webex) Meeting held on 13/14 November, 2018 (in person)

ASHWG New Task

New task:

Identify and develop recommendations on low energy alerting requirements to supplement previous work

Background:

ASHWG previously tasked to develop standards and guidance material for low speed alerting systems, that may complement existing low speed alerting requirements.

Update:

As a result of the Asiana Flight 214 accident, NTSB recommended to the FAA to “develop design requirements for context-dependent low energy alerting systems for airplanes engaged in commercial operations” (NTSB Safety Recommendation A–14–043)

ASHWG New Task

- Task Deliverable: Provide advice and recommendations to the ARAC through the TAE Committee in a report that addresses the following questions relative to new airplane designs, along with rationale.
 1. Do you recommend any changes to the existing low speed alerting requirements to provide additional pilot reaction time in cases where the airplane is both slow and close to the ground?
 2. Do you recommend any new or revised guidance material to define an acceptable low energy alert?
 3. After reviewing airworthiness, safety, cost, and other relevant factors, including recent certification and fleet experience, are there any additional considerations that the FAA should take into account regarding avoidance of low energy conditions?
 4. Is coordination necessary with other harmonization working groups (e.g., Human Factors, FlighTest)? If yes, coordinate with that working group and report on that coordination.
 5. Develop a report containing recommendations on the findings and results of the tasks explained above.
 - a. The recommendation report should document both majority and dissenting positions on the findings and the rationale for each position.
 - b. Any disagreements should be documented, including the rationale for each position and the reasons for the disagreement.

November 2018 Meeting

Team converged on an initial recommendation

- Change to 14 CFR 25.1303(c), Flight and Navigation Instruments
 - Add sub paragraph (3), to provide low airspeed (energy) alerting to the flight crew during the approach phase of flight
- Change to AC 25-7D, paragraph 32.2 (Flight and Navigation Instruments—§ 25.1303.)
 - Guidance for compliance/design
 - Guidance for evaluation/procedures
- Identified a list of additional considerations to be considered

Next Steps

- ASHWG Internal draft report containing recommendations for the rule/AC
 - Include other options identified but not included - EX: update § 25.173 & 25.175 (positive stability airplanes), to be consistent with the FTHWG recommendation Topic 6 Phase2 report for neutral stability airplanes (§25.176 (c)).
 - Cover both automatic and manual Flight
 - Decouples longitudinal stability from the requirement for a low airspeed (energy) alert
 - Retains language consistent with the language from the FTHWG
 - Not be too prescriptive for the design and evaluation requirements/guidance
 - Writeup on each of the 'additional considerations' identified by the team
- Check point meeting in January 2019
 - Answers to the questions in the tasking statement for internal team circulation, and with the FTHWG
- Face to face meeting in April, 2019
 - Objective to have a proposal for TAE Review

Current Roster

Joe Jacobsen	FAA	Joe.Jacobsen@faa.gov
Bob Myers	Boeing	Robert.j.myers@boeing.com
Dave Leopold	Boeing	David.D.Leopold@boeing.com
Brian Lee	Boeing	brian.p.lee@boeing.com
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Chris Heck	ALPA	Chris.heck@alpa.org
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