

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

Keith R. Morgan
Working Group Chair

15 March 2018

MEMBERS of the Transport Aircraft and Engines Working Group

Pratt & Whitney

ALPA

A4A

ASD

Airbus

Boeing

GAMA

AIA

Bombardier

NADA/F

Embraer

SCHEDULE

- Last Meeting – November 1, 2017
- Next meetings:
 - May 10, 2018 in Washington, DC
 - November 2018 Seattle area

150 Hour Endurance Test Working Group Status Report to the Aviation Rulemaking Advisory Committee

Peter G Thompson
Working Group Chair

15 March 2018

SUMMARY OF TASKING

1. Develop an alternate endurance test that would allow an engine to be tested in the configuration representative of its type design, and
 - a. Maintain compliance with the intent, as well as the basic elements currently in 14CFR33.87, including the ratings, operating limitations, and engine configuration.
 - b. The alternate test is to be equivalent to the test currently in 14CFR33.87 with regards to demonstrating engine operability and durability, and is validated with engine data. The engine data must include experience, certification, and additional component and engine tests.
2. Develop and document recommended:
 - a. Methods of compliance, and
 - b. Rule changes, if considered necessary.
3. Review the current foreign requirements for engine endurance test and determine the need for harmonizing any new methodologies.
4. Provide initial qualitative and quantitative estimates of costs and benefits for any new methodologies.
5. Develop a report containing the recommendations for rulemaking or guidance material, or both, and explain the rationale and safety benefits for each proposed change.

STATUS OF TASKING

- Accepted by ARAC Dec 14th 2017
- Waiting FAA decision on way to move forward with rule making

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

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

15 March 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: Report will be presented to TAE in May
- 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

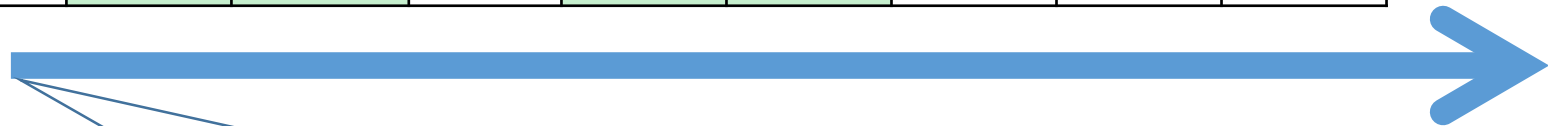


PHASE 3 SCHEDULE

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

(*) 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

STATUS OF TASKING

- Topic from Phase 2: Wet Runway Stopping Performance
 - Scheduled Completion: March, 2018
 - Considered on-track / on-schedule
- 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.)
 - Anticipating NPA and CRD “early in 2018”, but have not seen indication of publication
 - Based on “early 2018” promise of NPA and CRD, we target 1 November, 2018 report date (subject to revision based on actual publication of NPA and CRD).
 - OEI directional control on slippery surfaces (Topic 30)
 - Requirements and Guidance for OEI conditions complete by March meeting

STATUS OF TASKING

- →FTHWG-44 : 4-8 December 2017 Meeting Seattle (Boeing)
 - 12 December (WET)
 - 19 December (WET)
 - 9 January, 2018 (WET)
 - 16 January (Topic 30 - OEI Directional Control on Slippery Runways)
 - 23 January (WET)
 - 30 January (Go-Around)
 - 6 February (WET)
 - 13 February (Topic 30)
 - 20 February (Go Around)
 - 26 February (WET)
 - 27 February (Topic 30)
- →FTHWG-45 : 5-9 March 2018 Meeting Paris ? (Dassault)
 - ...plan weekly telecons (Tuesdays, 09:00 Eastern Time)
- →FTHWG-46 : 11-15 June 2018 Meeting Montreal (Bombardier)
 - ...plan weekly telecons (Tuesdays, 09:00 Eastern Time)
- →FTHWG-47 : 17-21 September 2018 Meeting Toulouse (Airbus)
 - ...plan weekly telecons (Tuesdays, 09:00 Eastern Time)
- →FTHWG-48 : 3-7 December 2018 Meeting Melbourne (Embraer)

Activity since
December,
2017

AREAS of ARAC CONSIDERATION

- No additional guidance needed from FAA or ARAC
- Continued concern about inconsistent participation from EASA

Metallic and Composite Structures Working Group Status Report to the Aviation Rulemaking Advisory Committee

Mike Gruber (Boeing)
Working Group Chair

15 March 2018

MEMBERS of Metallic and Composite Structures WG

1. Michael Gruber (Boeing) – 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)
11. Mark Boudreau (FedEx)
12. Eric Chesmar (United Airlines)

SUMMARY OF TASKING

With the increased use of composite and hybrid structures provide recommendations regarding revision of the fatigue and damage-tolerance requirements & associated guidance material

Working group will provide recommendations on the following:

1. Threat Assessment
2. Emerging material technology
3. Inspection Thresholds
4. Large damage capability (SDC, Structural Damage Capability) - **AAWG**
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 – **AAWG**
11. Disposition of cracking during full-scale fatigue testing
12. Accidental damage inspections included in the ALS conflicts w/ MSG-3 program

SCHEDULE

#	Major Tasks/Deliverables	Date	Status	Comments
1	ARAC Tasking Published in Federal Register	1/26/15	Complete	
2	ARAC Working Group (WG) Chair and member selected & notified	5/5/15	Complete	
3	WG Plan accepted by TAE	11/4/15	Complete	
4	Face to Face WG Meetings	6/16/15 9/14/15 3/16/16 12/6/16 6/27/17	Complete Complete Complete Complete Complete	Kick-off meeting Everett, Wa . Montreal Canada Everett, Wa. (leverage AAWG mtg) Melbourne, Florida Everett, Wa.
5	Planned Date to submit Final Report to TAE	10/2017 4/10/2018		Delay resultant from controversial topics: - Structural Damage Capability (SDC) - Aging/Hybrid Additional time required to finish report
6	Final Report provided to FAA	1/2018 7/21/2018		

STATUS OF TASKING

Final report is delayed due to significant effort associated with developing recommendations for controversial topics:

- Re-introduction of fail-safety back into regulation

Past efforts spanning over 20 years have been unsuccessful

General consensus finally reached by WG on Oct. 11

- Will not recommend global re-introduction of fail-safety into regulation

- Recommend future effort to focus on the primary are of concern – single load path structure

- Aging & Hybrid topics

General consensus accomplished late November

12 Sub team reports now being drafted and consolidated into parent report

- Cost & benefit analysis to follow draft report

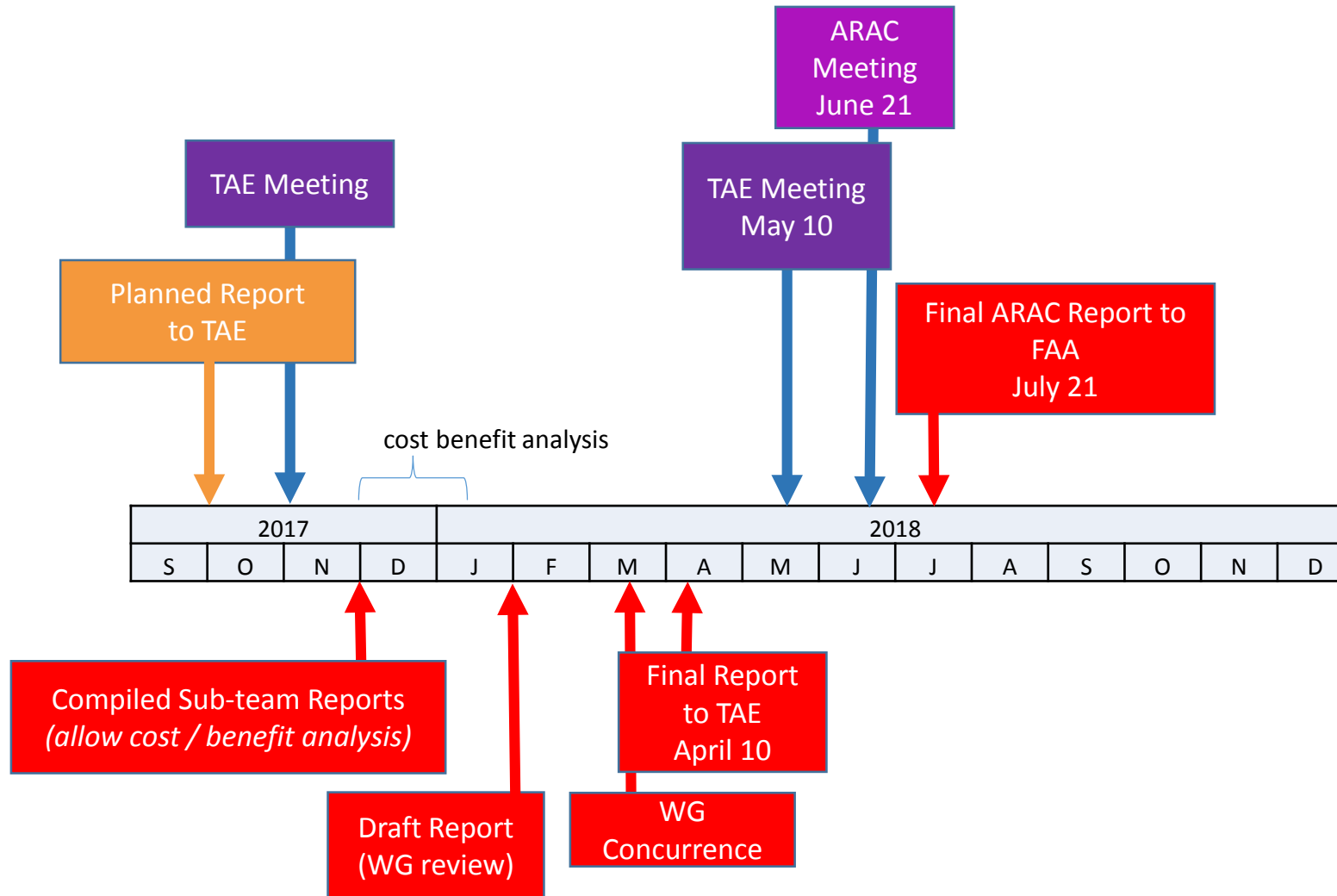
- Technical discussions are complete

AREAS of ARAC CONSIDERATION

Extension necessary to compile a comprehensive report

- Technical discussions are complete
- Recommendations are capturing industry practice and thus not immediately urgent
- Following schedule shows alignment with TAE and ARAC meetings

Document Completion Timeline



**Transport Aircraft Crashworthiness and
Ditching Working Group (TACDWG)
Status Report to the
Aviation Rulemaking Advisory Committee**

Kevin Davis

Working Group Chair

15 March 2018

Transport Aircraft Crashworthiness and Ditching Working Group MEMBERS

Working group voting members

Kevin Davis	(Boeing Commercial) – Chairperson
John van Doeselaar	(Airbus)
Akif Bolukbasi	(Boeing Military Vertical Airlift)
Milenko Milekic	(Bombardier)
Clóvis Augusto Eça Ferreira	(Embraer)
Olena Zagoskina	(Cascade Aerospace)
Matthias Waimer	(German Aerospace Center (DLR))
Toru Sakagawa	(Mitsubishi Aircraft Corporation)
Vincent Jacques	(Dassault Aviation)
Dinkar Mokadam	(Association of Flight Attendants)
Heidi R. Moore	(Naval Air Systems Command)
Justin Littell	(NASA)
Jack Caughron	(Gulfstream Aerospace Corporation)
Gerardo Olivares Ph.D.	(National Institute of Aviation Research)
Dan Hoverson	(Textron Aviation)

SUMMARY OF TASKING

- Provide recommendations regarding the incorporation of airframe-level crashworthiness and ditching standards into Title 14, Code of Federal Regulations (14 CFR) part 25 and development of associated advisory material.

SCHEDULE

#	Major Tasks/Deliverables	Date	Status	Metric	Comments
1	ARAC Tasking Published in Federal Register	4 June '15	Complete	Completed	
2	ARAC Working Group (WG) Chair and members selected & notified	October '15	Complete	Industry Representation	
3	WG Plan submitted to TAE	April '16	Complete	Plan Approved	
4	Face to Face WG Meetings	Dec. '15 April '16 October '16 March '17 Sept '17	Complete Complete Complete Complete Complete		
5	Planned Date to submit Final Report to TAE	12/2017	Complete	Submitted 12-15-2017	
6	Final Report Due to FAA	03/2018			Reflected in approved plan

STATUS OF TASKING

- FAA recommendation report approved by team and submitted to TAE December 2017
- TAE review at May 2018 meeting
- Submittal to ARAC for June 2018 meeting
- Team is prepared to address questions and comments as needed.

AREAS of ARAC CONSIDERATION

- None

**Avionics Systems Harmonization
Working Group (ASHWG)
Status Report to the
Aviation Rulemaking Advisory Committee**

Clark Badie
Working Group Chair

15 March 2018

MEMBERS of Avionics Systems Harmonization Working Group

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 |
| • Karl Minter | ALPA | Karl.minter@alpa.org |
| • Chris Heck | ALPA | Chris.heck@alpa.org |
| • Christine Thibaudat | Airbus | christine.thibaudat@airbus.com |
| • Thierry Bourret | Airbus | thierry.bourret@airbus.com |
| • Tim Buker | Gulfstream | Timothy.Buker@gulfstream.com |
| • Janiece Lorey | Gulfstream | janiece.lorey@gulfstream.com |
| • Robin Brulotte | Transport Canada | Robin.brulotte@tc.gc.ca |
| • Marcelo de Lima Camargo | Embraer | macamargo@embraer.com.br |
| • Clark Badie | Honeywell | Clark.badie@Honeywell.com |

SUMMARY OF TASKING

- 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)

SUMMARY OF TASKING

Task Deliverable: Provide advice and recommendations to the ARAC through the TAE Subcommittee in a report that addresses the following questions relative to new airplane designs, along with rationale.

- 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?
- Do you recommend any new or revised guidance material to define an acceptable low energy alert?
- 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?
- Is coordination necessary with other harmonization working groups (e.g., Human Factors, Flight Test)? If yes, coordinate with that working group and report on that coordination.
- 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.

STATUS OF TASKING

- Prior to first meeting (required homework....) – send out nlt 1 March
 - Each member to review the task and develop list of questions/clarifications
- First meeting (held by telecom) – End March 2018
 - Review task
 - Collect/discuss list of questions/clarifications needed
 - Identify/ request materials
 - Team member expectations
 - Assign roles /actions
 - E.G. Ownership to each major question 1-4
 - Working group MOS including timeline
 - Coordination required with other HWG
 - Quarterly progress review
 - Quarterly report to TAEIG
 - Agree on recommended timeline
 - Internal draft report March 2019
 - Final report December 2019

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

Working Group Chair Not Yet Determined

15 March 2018

MEMBERS of Ice Crystal Icing WG

- Working Group co-chairs selected
- FAA Representative and working group co-chairs determining make-up of working group membership

SUMMARY OF TASKING

- Evaluate recent ICI environment data to determine whether flight testing data supports the existing appendix D envelope. Recommend changes to the existing appendix D envelope, as applicable.
- Compare available service data on air data probes with appendix D, including any changes proposed in task 2. Determine whether engine or aircraft air data probe responses warrant the use of a different environmental envelope from those proposed in task 2, or to the existing appendix D envelope.
- 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.
- 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.
- Recommend changes to the advisory circular, AC 20-147A, *Turbojet, Turboprop, Turboshaft, and Turbofan Engine Induction System Icing and Ice Ingestion*, based on task 1 through 5 results.
- Assist the FAA in determining the initial qualitative and quantitative costs, and benefits that may result from the working group's recommendations.
- Develop a recommendations report containing the results of tasks 1 through 6. The report should document both majority and dissenting positions on the findings, the rationale for each position, and reasons for disagreement.

STATUS OF TASKING

- Received numerous requests to participate in the working group
- Recruitment period ended February 20th
- TAE Chairman and FAA Representative selected working group co-chairs
- First meeting to be scheduled once OST approves membership list

AREAS of ARAC CONSIDERATION

- None