



## AVIATION RULEMAKING ADVISORY COMMITTEE (ARAC) MEETING

September 8, 2022\*\*\*1:00 PM – 4:00 PM

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- Welcome and Introductions
  - Federal Advisory Committee Act (FACA) Statement
  - Ratification of Minutes
  - Status Reports
    - ARAC
      - Airman Certification System Working Group – Mr. David Oord
        - ❖ Expanded tasks of Sport Pilot and Recreational Pilot certificates and all additional remaining category and class pilot certificates and ratings (Present Recommendation Report to ARAC: 12/2022)
      - Part 145 Working Group – Ms. Sarah McLeod
        - ❖ Final Report (Present Recommendation Report to ARAC: 12/2022)
      - Training Standardization Working Group – Mr. Brian Koester
      - Part 65.101 Repairman Certificate Portability Working Group – Mr. Ric Peri
    - Transport Airplane and Engine (TAE) Subcommittee – Mr. Keith Morgan
      - Flight Test Harmonization Working Group – Mr. Brian P. Lee
        - ❖ Phase 4/Topic 21 – Narrow Runway Operations (Present Recommendation Report to ARAC:12/2022)
        - ❖ Phase 4/Topic 16 – Failure Assessment Methodology & Evaluation (FAME) (HQRM) (Present Recommendation Report to ARAC:12/2022)
        - ❖ Phase 4/Topic 33 – Landing Distance on Dry Runway (Present Recommendation Report to ARAC: 12/2022)
      - Transport Airplane Metallic and Composite Structures Working Group – Mr. Doug Jury
        - ❖ Repeat Inspections and Crack Interaction (Present Recommendation Report to ARAC: 12/2022)
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- Ice Crystals Icing Working Group (Present Recommendation Report to ARAC: 12/2022 – Ms. Melissa Bravin and Mr. Allan van de Wall
- Avionics System Harmonization Working Group – Mr. Clark Badie
  - ❖ Alerts for New Airplane Designs (Present Recommendation Report to ARAC: 12/2022)
- Recommendation Reports
  - Training Standardization Working Group – Mr. Brian Koester
    - ❖ G-V standardized curriculum package
  - Flight Test Harmonization Working Group – Mr. Brian P. Lee
    - ❖ Phase 4/Topic 32 – TALPA
- Any Other Business
- FAA update on regulatory activities
- Fiscal Year 2023 Meeting Dates
  - Thursday, December 8, 2022
  - Thursday, March 16, 2023

ARAC agendas, meeting minutes, and reports are available on the FAA's committee website at [https://www.faa.gov/regulations\\_policies/rulemaking/committees/documents/index.cfm/committee/browse/committeeID/1](https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/committee/browse/committeeID/1)

**AVIATION RULEMAKING ADVISORY COMMITTEE  
DRAFT RECORD OF MEETING**

**MEETING DATE:** June 16, 2022

**MEETING TIME:** 2:00 p.m. ET

**LOCATION:** The Aviation Rulemaking Advisory Committee (ARAC) held a hybrid meeting in person at the Capitol Hilton in Washington, DC, and online virtually using Zoom.

**PUBLIC ANNOUNCEMENT:** The Federal Aviation Administration (FAA) provided notice to the public of this ARAC meeting in a *Federal Register* notice published on June 7, 2022 (87 FR 34746).

**ATTENDEES:** **Committee Members**

David Oord (In-person)	Wisk <i>ARAC Chair</i>
Justin Barkowski (In-person)	American Association of Airport Executives (AAAE)
Doug Carr (In-person)	National Business Aviation Association (NBAA)
Tom Charpentier	Experimental Aircraft Association (EAA)
Chris Cooper (In-person)	Aircraft Owners and Pilots Association (AOPA)
Walter Desrosier (In-person)	General Aviation Manufacturers Association (GAMA)
Gail Dunham	National Air Disaster Alliance Foundation (NADAF)
Stéphane Flori (In-person)	Aerospace & Defense Industries Association of Europe (ASD)
Daniel Friedenzohn	Embry-Riddle Aeronautical University
Paul Hudson	FlyersRights
Randy Kenagy	Air Line Pilots Association (ALPA)
Sarah MacLeod (In-person)	Aeronautical Repair Station Association (ARSA)
Justin Madden (In-person)	Aircraft Mechanics Fraternal Association (AMFA)
Chris Martino	Helicopter Association International (HAI)
Keith Morgan (In-person)	Pratt & Whitney <i>Chair, Transport Aircraft and Engine (TAE) Subcommittee</i>

Ric Peri (In-person)	Aircraft Electronics Association (AEA)
Larry Rooney	Coalition of Airline Pilots Association (CAPA)
Yvette A. Rose (In-person)	Cargo Airline Association (CAA)
Bill Whyte	Regional Airline Association (RAA)
Christopher Witkowski	Association of Flight Attendants (AFA)
<b>Attendees</b>	
Dave Carew	Sikorsky Aircraft
Antonio Chiesa	TCCA
Maryann DeMarco (In-Person)	Coalition of Airline Pilots Association
Theseas Efthymiou	Eckert Seamans Cherin & Mellott, LLC
Katie Edwards (In-person)	Boeing
Doug Jury	Delta Airlines <i>Chair, Transport Aircraft Metallic and Composite Structures Working Group</i>
Alexey Khvostov	Boeing
Brian Koester (In-person)	NBAA
Chris Moore	International Brotherhood of Teamsters
Madison Nortz	EAA
Carrie Smith	Kaman Aerospace Corporation
Jackie Spanitz	Aviation Supplies & Academics
<b>FAA</b>	
Timothy Adams (In-person)	ARM, <i>Acting Designated Federal Officer (DFO)</i>
Angela Anderson	Office of Rulemaking (ARM)
Chris Bailey	ARM
Kathleen Bradshaw	Aircraft Certification Service (AIR)
Paul Cloutier	Flight Standards Service (AFS)
Thuy Cooper	ARM
Jim Crotty	ARM

Bryan Davis	AFS
Colleen Donovan	AIR
Aliah Duckett (In-person)	ARM
Svyatoslav (Slava) Guznov	AIR
Johann Hadian (In-person)	ARM
Gabriel Henkel	AFS
Daniel Leach	Office of Aviation Office and Plans (APO)
Nellie Lew	APO
Daron Malmborg	AFS
Suzanne Masterson	AIR
Trey McClure	AFS
Michael McKinley	Office of the Chief Counsel
Natalie Mitchell-Funderburk	ARM
Minh Nguyen	Office of Commercial Space Transportation
Kieran O'Farrell	AFS
Lakisha Pearson (In-person)	ARM
Robert Reckert	AFS
Monico Robles	AFS
Puja Sardana	FAA Contractor
Walter Sippel	AIR
Alan Strom	AIR
Joshua Tarkington	AFS
Lauren Thomas	AIR
Lisa Thomas	AIR
Phan Tran	APO
George Thurston	APO
Christopher Yanni	AFS

### ***Welcome and Introduction***

Mr. Timothy Adams, acting Designated Federal Officer (DFO), called the meeting to order at 2:04 pm. He introduced himself and reviewed logistics for the hybrid meeting, offering information to those attending in person and on Zoom.

Mr. Adams read the required FACA statement (Title 5, United States Code (5 U.S.C.); Appendix 2 (2007)). He stated that members of the public may address the ARAC with permission of the Chair, Mr. David Oord.

Mr. Oord asked ARAC members attending in person to introduce themselves and stated that virtual attendance would be recorded using Zoom.

### ***Ratification of Minutes***

Mr. Oord asked for a motion to accept the minutes from the March 17, 2022<sup>1</sup>, ARAC meeting. Ms. Sarah MacLeod motioned to accept the minutes, and Ms. Yvette Rose seconded the motion. ARAC voted, with no objections, to ratify the minutes.

### ***Status Reports***

A copy of the June 16, 2022, meeting packet, which includes the presentations, can be found at:

[https://www.faa.gov/regulations\\_policies/rulemaking/committees/documents/media/061922\\_ARAC%20Meeting%20Packet.pdf](https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/061922_ARAC%20Meeting%20Packet.pdf)

### ***Airman Certification Systems Working Group (ACSWG)***

Mr. Oord, ACSWG Chair, provided the working group's status report. The update included an overview of membership, a summary of tasking, a review of the schedule, the status of tasking, and areas for ARAC consideration.

Mr. Oord noted that a comprehensive interim report was submitted in June 2018, with subsequent interim reports consistently submitted since then. He stated that the ACSWG final report was originally due on December 1, 2021; however, the working group was granted an extension until June 2022. He noted that a further extension would be required to compile all interim reports into one report, after receiving guidance from FAA on previously submitted recommendations.

Mr. Oord reviewed the meeting schedule and noted that the working group would like to formally request a six-month extension for their work, considering the previous standards that were submitted to the agency are still under review by the FAA. Mr. Larry Rooney

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<sup>1</sup> The March 17, 2022, meeting minutes can be found at:  
[https://www.faa.gov/regulations\\_policies/rulemaking/committees/documents/media/061922\\_ARAC%20Meeting%20Packet.pdf](https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/061922_ARAC%20Meeting%20Packet.pdf).

motioned to accept the request for extension (until December 2022), and Ms. MacLeod seconded the motion.

Mr. Ric Peri asked questions about the necessity of using incorporation-by-reference (IBR) for technician certification standards and further inquired if there will need to be a formal rulemaking process completed anytime there is a new technology for aircraft. Mr. Oord noted that clarity of the process is discussed in the group's recommendation report.

Mr. Randy Kenagy asked if the working group's extension is to complete recommendations specifically related to private, commercial, and Airline Transport Pilots. Mr. Oord stated that the extension is to be able to complete all taskings and compile all the interim reports (including ones already submitted to FAA and ones currently being worked) into one final recommendation report for the entire working group. Mr. Kenagy asked if there was a list of what is completed and what needs to be finished for the final product and for a status update on the Call-to-Action report. Mr. Oord noted that the Call-to-Action report does not need an extension and will be presented today.

Ms. MacLeod asked about options to move forward without waiting for agency approval of the interim reports, and Mr. Oord noted that approval is part of the standard process.

ARAC voted to approve the 6-month extension for the ACSWG, with no opposition.

Mr. Oord introduced Ms. Jackie Spanitz to present the Call-to-Action final recommendation report. She described the working group's Call-to-Action report, detailing the research projects that were analyzed as part of the tasking and the five recommendations contained in the final report. She stressed the importance of standardization in training and in testing.

Ms. MacLeod motioned to accept the Call-to-Action final recommendation report, and Mr. Chris Cooper seconded the motion.

ARAC members discussed the report, including parallels (and evolving standardized training) in other industries. They noted that the specific language listed in recommendation #1 of the report isn't clear, questioning why the recommendation is listed as exempt from the Administrative Procedure Act (APA) and whether any justification for that exemption is described in the report. Ms. Spanitz noted that APA does not need to apply to airmen certification standards for transparency.

Ms. MacLeod asked if IBR was necessary (or required by Congress), and Mr. Oord noted that IBR is the chosen pathway by the agency. Ms. Spanitz noted that part 147 was the first time IBR was connected to ACSs.

Mr. Peri and Ms. MacLeod stated that the language and intention of recommendation #1 should be clarified.

ARAC voted to accept the Call-to-Action final recommendation report with edits to the language of recommendation #1 (and approval of recommendations #2-5), with no objections. Mr. Peri abstained from voting.

### ***Part 145 Working Group***

Ms. MacLeod provided the Part 145 Working Group update, which included an overview of membership, a summary of taskings, the status of taskings, and areas for ARAC consideration.

Ms. MacLeod noted that membership would be reactivated and explained the status of taskings. She stated that the working group was previously granted a 6-month extension to submit the final report.

Ms. MacLeod introduced and described a special interim report regarding the ability of a repair station applicant or certificate holder to work from multiple locations under a single quality system that requires a vote that the working group submitted for ARAC consideration. She described acceptable means of compliance and other standardization for repair stations addressed in the report.

Members discussed the history and various interpretations of current rulemaking related to part 145. Mr. Peri described current options for repair stations and the need for updated regulatory mandates.

Ms. MacLeod clarified that no regulatory language is included in the special interim report and that recommendations only apply to repair stations in the United States. Mr. Peri noted that international stations would be outside of the scope of the working group's tasking. The administrative process of submitting the special interim report (as necessary to move forward with the tasking) was discussed among members.

Mr. Oord asked if there was a motion to accept the special interim report. Ms. Rose motioned to accept the report, and Mr. Keith Morgan seconded the motion. ARAC voted to accept the report with no objections. Mr. Paul Hudson and Mr. Chris Witkowski abstained from voting on the part 145 special interim report.

### ***Training Standardization Working Group (TSWG)***

Mr. Brian Koester provided the Training Standardization Working Group's status report. The update included an overview of membership, a summary of tasking, a review of the schedule, the status of tasking, and areas for ARAC consideration.

Mr. Koester summarized the group's tasking, which is to provide recommendations on the most effective ways to standardize curricula provided by training centers.

Mr. Koester described the progress of the group's work and stated that they have no areas for ARAC consideration at this time.

### ***Part 65.101 Repairman Certificate Portability Working Group***

Mr. Peri provided the Part 65.101 Repairman Certificate Portability Working Group status report update. Mr. Peri described the following taskings:

- to provide advice and recommendations to ARAC on the most effective ways to allow a repairman certificate issued under §65.101 to be more portable from one employing certificate holder to another.
- to review all relevant materials to assist in achieving their objective.

### ***Transport Airplane and Engine (TAE) Subcommittee***

Mr. Keith Morgan, the TAE Subcommittee Chair, provided the TAE Subcommittee status report update.

Mr. Morgan stated that there are currently four active TAE Subcommittee working groups: Flight Test Harmonization (FTH), Transport Airplane Metallic and Composite Structure (TAMCS), Ice Crystal Icing (ICI), and Avionic Systems Harmonization (ASH).

Mr. Morgan reviewed the schedule of meetings and deliverables, including:

- three reports delivered by the September ARAC meeting (EICIWG Interim report, FTHWG TALPA, and the TAMCSWG Crack Interaction) and
- two reports delivered by the December ARAC meeting (ASHWG Ground Spoiler Alerting and FTHWG Dry Runway)

He briefly described highlights of each subcommittee working group and stated that he could be contacted with questions.

### ***Other Business and FAA Updates***

Mr. Adams, in the interest of time, highlighted the following items and requested any follow up questions to be discussed in email or in a working group:

- The FAA received a request for a briefing on the Freedom of Information Act, and the agency will connect with that working group to set up a meeting and provide an update at a later ARAC meeting.
- The FAA will email a response to the Designated Pilot Examiner Reform Working Group recommendations (submitted to the FAA in June 2021), to ARAC members and post it on the FAA Committee website.

### **Regulatory Updates**

The following rules have published since the March meeting.

- Aviation Maintenance Technician Schools; Interim Final Rule published on May 4, 2022. The effective date is August 1, 2023.
- Airplane Fuel Efficiency Certification NPRM published, and the comment period closes August 15, 2022.

### **ARAC Update**

Mr. Adams noted that the current ARAC charter expires on September 14, 2022 and that the agency has initiated the process to renew the charter.

Mr. Adams stated the last ARAC meeting of FY 2022 is Thursday, September 8, 2022.

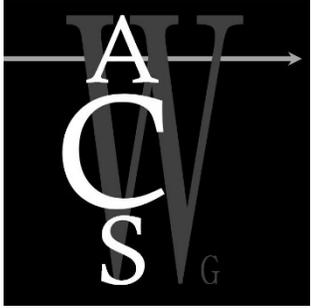
Mr. Oord thanked Mr. Adams and stated that the next meeting will also be hybrid, and he is looking forward to seeing as many people in person as possible in September.

In response to questions, Mr. Adams stated that:

- the Spring Unified Agenda should be released sometime soon;
- recommendations related to secondary barriers are currently with OIRA; and
- there are no updates on current emergency evacuation or mask mandate on airplane standards.

### ***Adjournment***

Mr. Oord adjourned the meeting at 4:05 pm.



# Airman Certification System Working Group Status Report to the Aviation Rulemaking Advisory Committee

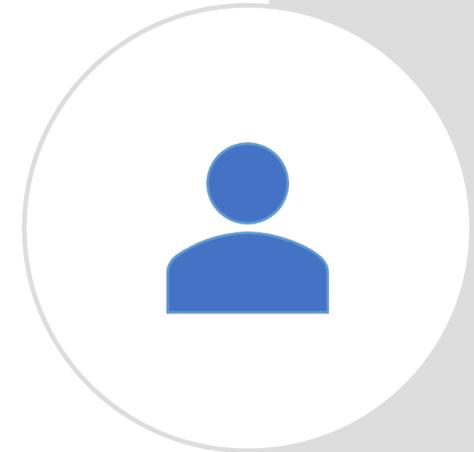
**David Oord**

Working Group Chair

September 8, 2022

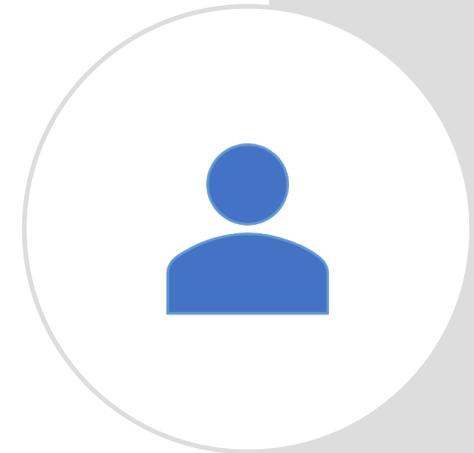
# MEMBERS of ACSWG - INDUSTRY

- David Oord, Wisk
- Paul Alp, Jenner & Block
- Cindy Brickner, SSA
- Paul Cairns, ERAU
- Kevin Comstock, ALPA
- Chris Cooper, AOPA
- Mariellen Couppee, Independent
- Eric Crump, Polk State College
- David Dagenais, FSCJ
- Maryanne DeMarco, CAPA
- Anna Dietrich, CAMI
- Rick Durden, Independent
- Megan Eisenstein, NATA
- David Earl, Flight Safety
- Tom Gunnarson, Wisk
- John Hazlet Jr., RACCA
- Jens Hennig, GAMA
- Chuck Horning, ERAU
- David Jones, Avotek
- John King, King Schools
- Janeen Kochan, ARTS Inc.
- Kent Lovelace, UND
- Justin Madden, AMFA
- John McGraw, NATA
- John McWhinney, King Schools
- Crystal Maguire, ATEC
- Nick Mayhew, L3
- Jimmy Rollison, Independent
- Mary Schu, Mary Schu Aviation
- Roger Sharp, Independent
- Jackie Spanitz, ASA
- Burt Stevens, CFI Care
- Robert Stewart, Independent
- Tim Tucker, Robinson
- Robert Wright, NBAA
- Donna Wilt, SAFE
- Roger Woods, Leonardo
- Philipp Wynands, Metro Aviation



# MEMBERS of ACSWG – FAA SMEs

- Susan Parson
- Barbara Adams
- Bill Anderson
- Dennis Byrne
- James Ciccone
- Bryan Davis
- Joel Dickinson
- Mike Duffy
- Troy Fields
- Ramona Fillmore
- Adam Giraldes
- Shawn Hayes
- Vanessa Jamison
- Laurin J. Kaasa
- Jeffrey Kerr
- Ricky Krietemeyer
- Mike Millard
- Anne Moore
- Kevin Morgan
- Margaret Morrison
- Kieran O’Farrell
- Richard Orentzel
- Katie Patrick
- Andrew Pierce
- Robert Reckert
- Jason Smith
- Shelly Waddell Smith
- Jeff Spangler
- Robert Terry
- Matt Waldrop
- Stephanie Williams
- Bill Witzig
- Jimmy Wynne
- Christopher Yanni



# SUMMARY OF TASKING

- Provide recommendations regarding standards, training guidance, test management, and reference materials for airman certification purposes.
- Continuation of Pilot, Instructor, and Aircraft Mechanic certificates.
- Revisions for Private, Commercial, Remote Pilot certificates and the Instrument Rating.
- Added Sport and Recreational Pilot certificates – airplane.
- Added Private, Commercial, ATP, and Instructor certificates and Instrument Rating in additional aircraft categories–
  - Rotorcraft, powered lift, lighter-than-air, glider, etc.

# SCHEDULE

- Interim reports
  - PVT, COM, ATP, Instructor, and AMT certificates and Instrument Rating – no later than June 2018 - complete
- Final recommendation reports no later than December 2022

# SCHEDULE

- 2021 Meetings – all virtual one-day meetings
- 2022 Meetings –
  - February 17 (virtual meeting)
  - September 6, industry check-in call
  - December in-person (To Be Scheduled)

# STATUS OF TASKING

- Progress on Standards, Guidance, and Test Management on hold
  - Publication of completed ACS documents waiting on Incorporation by Reference (IBR) rulemaking

**Part 145 Working Group  
Status Report to the  
Aviation Rulemaking Advisory Committee**

**Sarah MacLeod and Ric Peri**

Working Group Chairs

June 2022 Meeting

# Members of the Part 145 Working Group (Unchanged)

Paul Cloutier, Working Group Representative

Brent Hart, Analyst

Lakisha Pearson, Analyst

Justin Smith, Director of Operations

Craig Fabian, Regulatory Compliance Leader

Sarah MacLeod, Executive Director

Joe Sambiasi, Director Airworthiness & Maintenance

Jeff Cornell, Senior Director/Quality

Justin Madden, Legislative Affairs Director

Jeremy Bryck, Senior Director 145 Maintenance

John Fox, Accountable Manager  
Senior Manager, Quality Control

FAA—AFS, Repair Station Branch

FAA, ARM

FAA, ARM

Quality Aviation Instruments, Inc., D/B/A QAI

GE Engines

Aeronautical Repair Station Association

General Aviation Manufacturers Association

Aviation Technical Services

Aircraft Mechanics Fraternal Association (AFMA)

Air Methods Corporation

United Airlines, Inc.

# Members of the Part 145 Working Group (Unchanged)

Richard Macklosky, Manager, Regulatory Management  
Civil Aviation

Jeff Eagle, Senior Regulatory Compliance Specialist

Eric M. Monte., Principal Quality Assurance Engineer

David Stapes, Manager, Regulatory Compliance

Richard (Ric) Peri, Vice President Government & Industry  
Affairs

Stephanie Branscomb, Director of Operations  
Quality Manager

Stephen R. Wysong, President

Steven Brewer, Manager Structure Engineering

Bill Hanf, Owner

Samuel Edwards, Administrative Manager

Jeffrey Orth, Senior Regulatory & Compliance Specialist

United Technologies Corporation

United Technologies Corporation/Pratt &  
Whitney

Rockwell Collins

Delta TechOps

Aircraft Electronics Association

Wysong Enterprise

Wysong Enterprise

Kalitta Air

Green Mountain Avionics

Boeing Commercial Airplanes

Boeing Global Services

# Recognized Observers to the Part 145 Working Group (Unchanged)

Brian Koester, Manager, Flight  
Operations & Regulation

Carol Giles, Advisor

Ken Thompson

Art Smith, Vice President-Chief Quality  
Officer

Paul Hawthorne, Director Global  
Support Quality

Gary Daniels, FAA DAR-T DMS  
Designee

National Business Aircraft Association

Aeronautical Repair Station Association

National Air Transportation Association

AAR Corporation

Moog

Independent consultant



# SUMMARY OF TASKING

- ~~• Comprehensive review of internal and external guidance material — relate to laws and regulations — on certificating and overseeing all part 145 repair stations~~
  - ~~✓ Orders, notices, advisory circulars, job aids and safety assurance system (SAS) Data Collection Tools (DCTs)~~
  - ~~✓ Laws, executive orders~~
- The Final Report is in process. It will recommend improvements to guidance documents and will include an Acceptable Means of Compliance document which will—
  - ✓ Annotate the applicable regulations, laws or executive orders.
  - ✓ Be numbered to establish a relationship between the guidance and the underlying regulation.
  - ✓ Communicate agency expectation of compliance to the public and FAA workforce in a comprehensive and consistent manner, with tools to ensure application, evaluation, and oversight is performance-based
  - ✓ Account for oversight of repair stations vis-à-vis amount, type, scope and complexity of the certificate holders' work and its size.
  - ✓ Align with regulations, laws and executive orders.

# SCHEDULE

- Preliminary report was submitted, approved by ARAC in December 2020, and forwarded to the agency.
- Special Report submitted to ARAC June 2022.
- Final report is to be submitted December 2022.
- Task group of FAA representative, Co-Chairs, and interested industry representatives have *daily* meetings to—
  - ✓ Draft final report with recommendations, and
  - ✓ Work on AMC
  - ✓ Created Special Report

# STATUS OF TASKING

- ARAC Working Group is providing a Special Report for the ARAC to forward to the agency with the recommendation it be used to develop agency guidance on certification of repair stations with multiple locations. Part 145 provides the applicant the discretion to create—
  - A single certificate with managerial control of multiple locations.
  - A repair station certificate with managerial control over satellite locations.
- Excerpt from Acceptable Means of Compliance document on 14 CFR sections—
  - 145.51(a)
  - 145.5
- ARAC Working Group will begin weekly meetings starting Wednesday, July 6 through the first week in November.

# AREAS for ARAC CONSIDERATION

- None.

# Training Standardization Working Group Status Report to the Aviation Rulemaking Advisory Committee



September 8, 2022

# MEMBERS of Training Standardization Working Group

Thomas	Benvenuto	Solairus Aviation
Stephen	Bragg	Executive Jet Management
Greg	Brown	Helicopter Association International
Fabiano	Cypel	Embraer
Jon	Dodd	Coalition of Airline Pilots Associations
Steve	Hall	FlightSafety International
Aimee	Hein	CAE, Inc.
Jens	Hennig	General Aviation Manufacturers Association
Brian	Koester*	National Business Aviation Association
Doug	Carr	National Business Aviation Association
Todd	Lisak	Air Line Pilots Association
Steve	Maloney	Sun Air Jets
Allan	Mann	Wheels Up, LLC
John	McGraw	National Air Transportation Association
Brian	Neuhoff	Airbus Helicopters
Janine	Schwahn	Summit Aviation, Inc.
Anmarie	Stasi	Northwell
Daniel	Von Bargaen	Jet Aviation Flight Services, Inc.
Mike	Walton	Textron

## FAA Partners

Josh Tarkington

Paul Preidecker

Kevin Hancock

James Sapoznik

Kristin Tullius

\* Training Standardization Working Group Chair

# SUMMARY OF TASKING

The Training Standardization Working Group (TSWG) will provide advice and recommendations to the ARAC on the most effective ways to standardize curricula provided by training centers. The group is tasked with the following:

- ✓ Recommend a detailed master schedule for the development of part 135 standardized curricula for each aircraft or series of aircraft;
- ✓ Develop and recommend a standardized curriculum to qualify training center instructors and evaluators (check pilots) to provide part 135 training, testing, and checking;
- 3) Develop and recommend part 135 standardized curricula for each aircraft or series of aircraft, including the maneuvers, procedures, and functions to be performed during training and checking;
- 4) Recommend continuous improvements to each part 135 standardized curriculum for a specific aircraft or series of aircraft; and
- 5) Develop reports containing recommendations for standardized curricula and results of the tasks listed here. The group should review any relevant materials to assist in achieving their objective, including FAA Advisory Circular 142-1,2 Standardized Curricula Delivered by Part 142 Training Centers.

# SCHEDULE

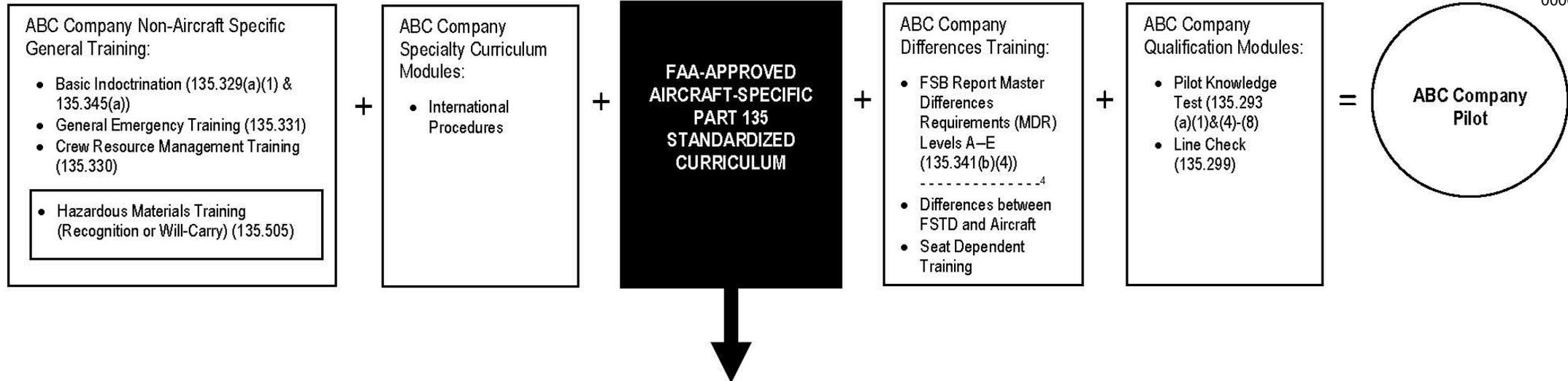
- ✓ June 2021 – Deadline for submitting initial recommendation report including the proposed master schedule for standardized curriculum development to ARAC. The deadline to submit the interim report to the FAA is June 30, 2021.
- ✓ December 2021 – Deadline for submitting the addendum recommendation report, including a standardized curriculum to qualify training center instructors and check pilots to provide part 135 training, testing, and checking to ARAC. The deadline to submit the interim report to the FAA is December 31, 2021.
- The Training Standardization Working Group may submit ad hoc recommendation reports, including continuous improvements, to standardized curricula, via ARAC to the FAA for review and consideration at any time.
- The voting members of the TSWG meet quarterly

# STATUS OF TASKING

- Tasking 1 (schedule) and 2 (instructor curriculum) are complete.
  - The FAA is making revisions to the instructor curriculum
- Anticipate additional recommendations on specialty curricula in December and adaptive recurrent in March.
- G-V Curriculum Recommendation Package:
  - Initial
  - Recurrent
  - Requal
  - Upgrade
  - Enhanced Recurrent
  - SOPs
  - Grading Criteria

# AREAS of ARAC CONSIDERATION

- G-V Action Team is now on standby
- New Action Teams:
  - Specialty curriculum (expected in December)
  - Remedial training policies (expected in December)
  - Adaptive recurrent (expected in March)
  - HS-125 Hawker Series Action Team
  - CE-560 Citation Excel Series Action Team



What does the Aircraft-Specific Part 135 Standardized Curriculum *portion* include (what's in the box—which curriculum segments are inside the box)?

**Aircraft-Specific Part 135 Standardized Curriculum:**

(Note: Aircraft Ground Training & Flight Training Segments under current Definitions.)<sup>1</sup>

- Aircraft-Specific Ground Training/Aircraft Systems (135.345(b))
- Flight Training (135.347)<sup>2</sup>
- SOPs
- Profiles (Maneuvers) (135.327(b)(3))
- Checklists (OEM or developed by SMEs)
- Aircraft-Specific Qualification Modules (Testing/Checking)<sup>3</sup>
  - Pilot Testing: 135.293(a)(2)&(3)
  - Proficiency Check: 135.293(b)
  - Instrument Proficiency Check: 135.297

- Instructors/Check Airman (Evaluators) qualified by the 142 Training Center in accordance with 135.337 through 135.340 to deliver training, testing & checking under Aircraft-Specific Part 135 Standardized Curriculum.

# TSWG G-V Action Team Tasks:



Action Team:	Team Lead	Participants:
G-V	Preidecker	Pahl, Neubert, Djordjevic, Mika, Emmert, Goldman, Emig, Pangalangan, Hancock, Wolfe, Maas

1. Conduct a review and analysis of the assigned tasks and any other related materials or documents.
  - ✓ Review TNA
  - ✓ Review FSBR
  - ✓ Review relevant OpSpecs/MELs
  - ✓ Review existing 142 training programs
2. Based on the templates and best practices established by the TSWG Develop and recommend the following curricula, including planned hours, for each aircraft fleet:
  - ✓ Initial New Hire,
  - ✓ Standard Recurrent,
  - ✓ Requalification,
  - ✓ Upgrade Recurrent, and
    - Scenario Enhanced Recurrent Training.
3. Each Type Specific Action Team will develop the following based on the templates and best practices established by the TSWG, to be used throughout the standardized training program and during normal operations:
  - ✓ SOPs
  - ✓ Call outs
4. Draft and submit the recommendation report based on the assigned tasks.
5. Present the recommendation report at the TSWG meeting.
6. Provide continuous improvement for the standardized curriculum based on recommendations from the TSWG.

# RECOMMENDATION(S)

## *6.1 Recommendation on Training Curricula*

*In accordance with the tasking, the Training Standardization Working Group recommends the curriculum in Appendices A through E for adoption and implementation as the standardized training program for pilots operating G-V aircraft under 14 CFR part 135.*

*Appendix A – G-V Curriculum Document*

*Appendix B – Standard Operating Procedures*

*Appendix C – Course 1, 2, and 3 Learning Objectives*

*Appendix D – Specialty Curriculum Learning Objectives (CPDLC)*

*Appendix E – Differences Course Learning Objectives*

# RECOMMENDATION(S)

## ***6.2 Recommendation on Performance Planning***

*The G-V action team recommends that each operator provide pilot training, in accordance with § 135.345(b), and checking, in accordance with § 135.293(a)(3), on the use of any third-party tools for calculating weight and balance or performance prior to beginning initial training at the contract training center.*

# RECOMMENDATION(S)

## ***6.3 Recommendation on Expanding Company Check Pilot Authority***

*The G-V Action Team recommends the FAA create new guidance to allow a company check pilot to conduct checks of § 135.293(a)(1) and (3) through (9).*

# RECOMMENDATION(S)

## ***6.4 Recommendation on Training Under Parts Other Than 135***

*The G-V Action Team recommends the FAA permit, as non-jeopardy events, training and checking elements for pilot classmates that will not operate under part 135.*

# RECOMMENDATION(S)

## ***6.5 Recommendation on Grading Criteria***

*The Training Standardization Working Group recommends that the standardized four-point grading system recommended in ACT ARC 16-1 Recommendation (g), Data Collection, should be implemented across all participating training providers and utilized for training and checking events. The deidentified information should be provided to the TSWG for review as part of the change management process for revising/updating and continuously improving the standardized curriculum.*

# RECOMMENDATION(S)

## ***6.6 Recommendation on Data Collection***

*The Training Standardization Working Group recommends that industry wide training and operational data be collected, aggregated, and deidentified by the FAA, then provided to the TSWG for continuous improvement of standardized curricula.*

# DISSENT(S)

- Air Line Pilots Association (ALPA)

All participants agree that it is best if all operators electing to use the standardized curriculum contribute voluntary safety data to ASIAs, which can then be fed back into the program. Section 4.2.4 suggests operators should be encouraged to participate in ASIAs. ALPA dissents due to the use of the word “encouraged” and believes operators should be required to participate in ASIAs.

The full dissent and reasoning for the majority opinion is included in the recommendation report.

Flight Test Harmonization Working Group  
Topic 32  
Codification of Part 25 Takeoff and Landing  
Performance Assessment (TALPA)  
Recommendation Report

Matt Muehlhausen  
FTHWG Topic 32 Co-Leader

26 July, 2022

# Executive Summary

Takeoff and Landing Performance Assessment (TALPA) was initiated in the early 2000's to following investigations of non-dry runway overrun excursions, most notably an overrun at Chicago Midway in 2005 that led to the creation of the FAA TALPA Aviation Rulemaking Committee (TALPA ARC).

- The TALPA ARC:
  - Created a cohesive set of recommendations that addressed reporting of runway condition, the creation of airplane performance data, and enabled implementation of flight operations on non-dry runways.
  - Defined consistent descriptions, assumptions, and language across all the stakeholders to deal with flight operations on non-dry runways.

TALPA information was published for voluntary implementation in Advisory Circular (AC) 25-31 and AC 25-32 in December of 2015 and become the de-facto global standard for the creation of aircraft performance data based on a consistent set of assumptions and reporting terminology.

This report recommends updates to the performance aspects of the airworthiness standards which will require information to be provided in the Airplane Flight Manual (AFM) for contaminated runway takeoff data and time-of-arrival landing data. Codifying these standards will promote harmonization in this area of aircraft operation.

# Summary of Tasking

Our task: Recommend rules and guidance to Codify the part 25 aspects recommended by the TALPA-ARC for computing landing distances for use at the time-of-arrival and computing takeoff distances on contaminated (non-dry, non-wet runways).

- The primary concern of this topic was the potential for diverging requirements exist as shown during the EASA RMT on the subject.
- The EASA implementation of the ICAO GRF recommendations in both CS 25, operating requirements and airport standards, and Transport Canada activity to implement similar GRF Reporting Format and TALPA ARC runway reporting requirements and recommendations presents the **risk of diverging requirements** that could be effectively harmonized across the industry.

## Major Activities of Working Group:

- 1) Determine if the FAA, TC, ANAC, etc. can accept the EASA implementation using CS 25.1591 and CS 25.1592 as a method to codify requirements.
- 2) Compare and harmonize FAA AC 25-31 and 25-32 with ICAO Airplane Performance Manual and EASA's CS 25 modifications.
- 3) Consider EASA's improved winter runway surface performance as proposed in EASA RMT.704/NPA 2018-14.

# Background

- What is TALPA and ICAO GRF? These programs, initiated in the early 2000's, addressed issues identified by investigation of non-dry runway overrun excursions.
- Specifically the concern was lack of timely airport and ATC reporting of runway conditions that could affect braking for operations of aircraft and inconsistencies caused by a lack of requirements in some countries for providing contaminated runway takeoff performance data and Time-Of-Arrival (TOA) landing distance data.
- Advisory Circular (AC) 25-31 and AC 25-32 in December of 2015 and become the de-facto global standard, yet the FAA has yet to codify the TALPA ARC recommendations, and instead has relied upon voluntary implementation to provide the performance information in order to reduce the number of runway overruns on non-dry runways as soon as possible and therefore contribute to aviation safety.
- While EASA did have a certification requirement for publication of takeoff and landing performance data for contaminated runways since 1988 with some evolution over time, the EASA material was not consistently applied across all manufacturers. Some of the performance assumptions were in need of updating to reflect the state of the industry knowledge and to align with recommendations of the TALPA ARC. Also, a mechanism for timely reporting of the aircraft stopping capability during changing conditions was needed.

# Summary of Method and Deliberations

The topic started with one day of face-to-face meetings in Feb of 2020 but reverted to 5 virtual dedicated telecons with another 30 scheduled weekly and supplementary telecons, and numerous informal conversations via e-mail.

## Progression

- The FTHWG spent the majority of the time and effort comparing and harmonizing FAA AC 25-31 (Takeoff) and 25-32 (Landing) with ICAO Airplane Performance Manual and EASA's CS 25 modifications.
- As can be seen in the report, there was considerable technical detail in the guidance that needed to be discussed, and details to be aligned which include:
- For takeoff (AC 25-31X and AC 25.1591)
  - Definitions: Dry, Wet, Slippery Wet, Ice, Compacted Snow, Dry Snow, Wet Snow, Slush, and Water
  - Contaminated Runway Takeoff Performance Data
  - Determination of Contaminated Runway Takeoff Performance Data
  - Accounting for the Drag of Loose Contaminants
  - Credit for Reverse Thrust

Including tables of:

- Runway Surface Condition—Descriptions and Contaminant Categories
- Tire-to-ground Braking Coefficients as a Function of Runway Surface Condition
- Loose Contaminant Specific Gravity

# Summary of Method and Deliberations cont'd

- For landing (AC 25-32X and AC 25.1592)
  - Definitions: Dry, Wet, Contaminated: Dry Snow, Wet Snow, Slush, Compacted Snow, Frost, Water, Ice, and Wet Ice
  - Time-of Arrival Performance Data
  - Determination of Landing Distance for Time-of-Arrival Landing Performance Assessments.
  - Accounting for the Drag of Loose Contaminants
  - Credit for Reverse ThrustIncluding tables of:
  - Runway Condition Reporting Surface Condition—Pilot-Reported Braking Action—Tire-to-ground Braking Coefficient Correlation Matrix
  - Loose Contaminant Specific Gravity
- The FTHWG included guidance, that at the option of the applicant, to provide data for specially prepared winter runway surfaces (e.g. icy surfaces that have been treated with sand or gravel).

## Summary of Method and Deliberations cont'd

- The deliberations of this working group were productive and did not encounter significant difficulty or dissent throughout the process, but the magnitude of the proposed guidance, even when working from generally accepted AC's was large, and leadership of the group and was amicably shifted between the FAA, Airbus, and Boeing as necessary to reach completion.
- The FTHWG accomplished most of this task virtually and the lack of face-to-face meetings did disrupt the flow and collaboration on the difficult subjects and caused delays, but ultimately we believe the final product is accurate and complete.

# Recommendation Summary

## New Recommended 14 CFR part 25 Regulations

§ 25.1591 [Takeoff Performance Information for Operations with Slippery Wet and Contaminated Runway Surface Conditions](#)

§ 25.1592 [Performance Information for Landing Distance Assessment at Time of Arrival](#)

## Recommended Updates to 14 CFR part 121 Operating Standards

§ 121.195 [Airplanes: Turbine engine powered: Landing limitations: Destination airports.](#)

§ 121.197 [Airplanes: Turbine engine powered: Landing limitations: Alternate airports.](#)

§ 121.647 [Factors for Computing Fuel Required](#)

## Recommendation Summary Cont'd

### Recommended Updates to Advisory Material for Existing Type Designs

AC 25-31X [Takeoff](#) Performance Information for Operations with Slippery Wet and Contaminated Runway Surface Conditions

AC 25-32X Performance Information for [Landing](#) Distance Assessment at Time of Arrival  
(and subsequent cancellation of AC 25-31 and AC 25-32)

### New Recommended Advisory Material for New Type Designs

AC 25.1591 [Takeoff](#) Performance Information for Operations with Slippery Wet and Contaminated Runway Surface Conditions

AC 25.1592 Performance Information for [Landing](#) Distance Assessment at Time of Arrival

AC 25-7X Section 42.4 Criteria for Approval of Steep Approach to Landing

## Consensus Summary

- The FTHWG was able to complete the technical discussions needed to define a consensus or majority position on all the identified issues.
- There is consensus that harmonized part 25 regulations to address the recommendations of TALPA ARC and EASA's implementation of the ICAO GRF are appropriate and needed.
- There is also consensus that the technical content of FAA AC 25-31 and FAA AC 25-32 are generally acceptable.
- The original AC 25-31 does not provide guidance for maximum contaminant depth, while EASA CS 25.1591 sets maximum depths for each contaminant type. It was decided to introduce these same limits in the basic guidance while allowing applicants to exceed these limits if shown to be safe.
- FAA AC 25-32 is to be revised to consider the publication of performance data for the Runway Condition Code reported in Field Condition (FICON) NOTAMS and therefore will be consistent with both the current FAA methods of reporting runway conditions as well as ICAO GRF standards of reporting runway condition.

## Consensus Summary Cont'd

- An update to the AC 25-7X is proposed to discuss the time-of-arrival distances for steep approach landing.
- It was discussed whether AC 25-32 should address wet grooved and wet PFC surfaces. There is a consensus to not include this as it was the object of a concurrent rewrite of AC 121.195(d)-1a.
- The FTHWG reached a consensus that there should be a 5% conservatism for landing distance time-of-arrival calculations applied to dry runway tire-to-ground braking coefficient (braking  $\mu$  used to comply with § 25.125) when that braking  $\mu$  was determined on a clean runway. The option also remains to use 100% of the tire-to-ground braking coefficient if the testing from which that braking coefficient was derived was conducted on portions of runways containing operationally representative amounts of rubber contamination and paint stripes.

## Consensus Summary Cont'd

- The FTHWG proposed the adoption of criteria to state that the failure of each individual thrust reverser to provide the expected level of thrust (without prior crew awareness) should be on the order of  $10^{-4}$  or less per landing or rejected takeoff (according to the flight phase in consideration). The FTHWG recommends this as reasonable criteria because it is closely aligned with the ACs 25-31 and 25-32 released 21 Dec 2015 and the TALPA ARC recommendations.

Note: The FAA indicated late in the process that this proposed criteria may not be satisfactory to some in their Propulsion Branch, and it was agreed that this reliability criteria would be further discussed in the currently active FTHWG Topic 33, Dry Runway Stopping Performance. These discussions could also affect the thrust reverser reliability criteria from the Topic 9, Wet Runway Landing report and Topic 10 Runway Excursion Hazard Assessment.

- The FTHWG also recommends that the FAA updates AC 25-22, *Certification of Transport Airplane Mechanical Systems*, § 48.d.(3) regarding the definition of safe and reliable. The group considers that a definition that impacts the performance capabilities of the airplane should rather reside in AC 25-7. Furthermore, this definition should be updated for consistency with current practices for compliance with § 25.109, and harmonized between FAA and EASA.

## Consensus Summary Cont'd

- Consensus was also reached for recommended revisions to the existing FAA AC 25-31 and AC 25-32.
- The FTHWG recognizes the FAA process to add recommended regulations can be a longer process than revisions to existing AC advisory material and there are significant reasons detailed in the report to implement a revision to these ACs as soon as practicable, likely in advance of the also-recommended new proposed rulemaking.
- The proposed ACs for revision prior to implementing the recommended rulemaking are referred to as AC 25-31X and AC 25-32X for the FTHWG/ARAC.
- Once the rule-making process has been completed, AC 25.1591 and AC 25.1592 are recommended be released to align with the new standards.

# Thank You !

Matt Muehlhausen (Boeing)  
Paul Giesman (FAA Retired)  
Lars Kornsteadt (Airbus)

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

**Keith R. Morgan**  
Subcommittee Chair

8 SEP 2022

# Members of the Transport Aircraft and Engines Subcommittee

Pratt & Whitney

ALPA

A4A

ASD

Airbus

Boeing

GAMA

AIA

NADA/F

Embraer

SRCA

# TAE Meeting Schedule

- 2022 Meetings
  - January 25, 2022
  - April 26, 2022
  - July 26, 2022
  - Oct. 25, 2022

# Active Working Groups

- Flight Test Harmonization
- Transport Aircraft Metallic and Composite Structures
- Engine Ice Crystal Icing
- Avionic Systems Harmonization

# Look Ahead Report Submittal Schedule to ARAC

- September 2022
  - FTHWG TALPA
- December 2022
  - ASHWG Ground Spoiler Alerting
  - FTHWG Dry Runway
  - TAMCSWG Crack Interaction
- March 2023
  - EICIWG Interim report

Flight Test Harmonization Working Group  
Status Report to the  
Transport Aircraft and Engines Subcommittee  
of the  
Aviation Rulemaking Advisory Committee

**Brian P. Lee, Boeing**  
**Laurent Capra, Airbus**  
Working Group Co-Chairs

26 July, 2022

# MEMBERS of Flight Test Harmonization Working Group Phase 4

Authorities	OEM's			Observers
FAA Bob Stoney Troy Brown (sponsor)	Airbus Philippe Genissel + SME's	Embraer Murilo Ribeiro + SME's	ATR Matthieu Ollivier Jean-Pierre Marre +SME's	JCAB (Japan) Shinsuke Yamauchi
				CAAI (Israel) Yshmael Bettoun
EASA Matthias Schmidt Lorenzo Prieto Saiz	Boeing Matt Muehlhausen + SME's	Gulfstream Mike Watson +SME's	Airbus Canada Joel Boudreault +SME's	Norwegian Airlines John Lande
				Operations SME David Anvid
Transport Canada Lee Fasken	Bombardier Tony Spinelli +SME's	Textron Kurt Laurie +SME's	DeHavilland Canada Eric Herrmann +SME's	Centre d'Essais en Vol (DGA) Matthieu Buisson
				Operators
ANAC (Brazil) Marcos Carvalho	Dassault Philippe Eichel +SME's			ALPA John Cinnamon Josh Larson

# STATUS OF TASKING

- Tasking for Phase 4 Received in December, 2020
- Planning for the 6 tasks is complete
- Work is under way on 4 topics:
  - TALPA (getting close)
  - Narrow Runway Certification
  - Dry Runway Braking (getting close)
  - FAME (how to deal with failures affecting Handling Qualities)
- ASHWG:
  - Low Energy Alerting
    - There will be fall-out from the ASHWG Recommendation
      - FTHWG Phase 2 recommended
        - Low Energy Alerting for all phases of flight only for neutral-stability configurations
      - ASHWG recommends
        - Low Energy Alerting only for close-to-ground for all configurations
    - We have put this on our calendar to be worked in Phase 4
  - Spoiler Not Armed Alert
    - FTHWG reviewed ASHWG recommendation Report (small suggestions; favorable agreement)

# Phase 4 FTHWG Topic Technical Status

- Topic #16 Failure Assessment Methodology & Evaluation (FAME)
  - Progress has been challenged by Covid and by the need to finish TALPA
  - Detailed topic planning is complete and agreed
  - Two days' discussions took place in SEA; subteams have been assigned and are running
- Topic # 21 Narrow runway operations
  - Team has converged on the definition a “baseline” runway, and the “regulatory hook” for declaration of runway width
  - Next moving on to what will be required for “narrower than baseline”
- Topic # 32 TALPA (time of arrival performance)
  - Recommendation Report to be briefed at this meeting
- Topic # 33 Landing Distance on Dry Runway (dispatch)
  - Most technical issues to define AFM landing distance to be more consistent with typical operations addressed.
  - Close to consensus on final recommendations for Part 25 certification standards as well as operational factors
  - In order to accommodate TALPA, and because some assumptions are common to TALPA, we agreed to bring this report to TAE in October for ARAC agenda in December
- Topic # 22 Landing in Abnormal Configurations Kickoff in September in Toulouse
- Topic # 26 Derate Thrust Procedures Kickoff at weekly telecom in September

# Coronavirus Accommodation

- Quarterly (face-to-face) meetings
  - Evaluated with decision gate at ~T-6 weeks
    - Have gone virtual since June, 2020
    - Replace 5-days of 8-hour face-to-face with 5 days of 3 hour virtual meetings
      - Not nearly as efficient
        - Less time
        - Communication is not as good (no body language, etc.)
- Last face-to-face occurred in Seattle, June, 2022 (Yea!)
  - ~25% of attendees contracted Covid; 1 was quarantined in hotel for 2 weeks
  - We hope that's the end of that!

# FTHWG Phase 4 Meeting Plan

000057

Delivery to TAE, Blue Stars

Delivery to ARAC in following quarter, Green Stars

	Dassault Bordeaux	Boeing Seattle Virtual	Easa Cologne Virtual	FAA Seattle Virtual	Airbus Toulouse Virtual	Boeing Seattle Virtual	EASA Cologne Virtual	Embraer Melbourne Virtual	EASA Cologne Virtual	Boeing Seattle Jttawa (TDC)	Airbus Toulouse	Textron Wichita	Dassault Paris	Boeing Seattle / Everett	ATR (TBC)	FAA (Location TBD)	Easa Cologne (TBC)	Airbus Canada (TBC)			
	March 2020 (2-6)	June 2020 (8-12)	Sept. 2020 (14-18)	Dec. 2020 (7-11)	March 2021 (1-5)	June 2021 (7-11)	Sept. 2021 (13-17)	Dec. 2021 (6-10)	March 2022 (7-11)	June 2022 (6-10)	Sept. 2022 (12-16)	Dec. 2022 (5-9)	March 2023 (6-10)	June 2023 (5-9)	Sept. 2023 (11-15)	Dec. 2023 (4-8)	March 2024 (4-8)	June 2024 (3-7)			
Topic #16 HQRM FAME																			★	★	
Topic # 32 TALPA (time of arrival performance)											★	★									
Topic # 33 Landing Distance on Dry Runway (dispatch)											★	★	★	★							
Topic # 21 Narrow runway operations													★	★							
Topic # 22 Derate thrust procedures																			★	★	
Topic # 26 Landing in abnormal configurations																			★	★	
ASHWG Low Speed Alert																★	★				

Buffer & Finalisation of Phase V preparation

Started work ahead of tasking

Formal Tasking Period

+ Single-topic telecom each week

- Mostly HQ Specialists
- Mostly Performance Specialists

# AREAS for ARAC CONSIDERATION

- None at this time, except lingering COVID restrictions on face-to-face meetings

# Transport Airplane Metallic and Composite Structures Working Group

*Recommendation Report, Extension Topics,  
Briefing to the TAE – July 2022 meeting*

**Doug Jury (Delta Air Lines)**

Working Group Chair

July 26, 2022

# Members of the Working Group

- Industry WG voting members:
  1. **William Browning** (Boeing)
  2. Chantal Fualdes (Airbus)
  3. Pascal Lortie (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. Ryan Higgins (British Airways)
  10. Doug Jury (Delta Air Lines) –Chairperson
  11. Mark Boudreau (FedEx)
  12. Eric Chesmar (United Airlines)
- NAAs: FAA (Walt Sippel, Larry Ilcewicz, Michael Gorelik, Patrick Safarian, Linda Jahner, Greg Schneider); EASA (Richard Minter, Simon Waite); ANAC (Pedro Caldeira, Marco Villaron, Fabiano Hernandes); TCCA (Jackie Yu, Natasa Mudrinic); JCAB (Hiroshi Komamura); Phil Ashwell (CAA)
- General public, non-voting participants: Allen Fawcett (retired, former SME participant), Mike Gruber (retired, former WG member & chair), **Kevin Davis (retired, former WG member)**

# 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 September, 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 (completed):
  - Develop requirements and guidance material for single load path (SLP) structure, which by definition has no SDC
  - ARAC approved this report on 12/10/2020
  - Minor revision required due to final recommendations in Structural Bond report – expect to have to TAE week of 10/25. Done. ARAC approved 12/11/2020 – completed and published, available to public.
2. Structural Bonding and “Weak Bonds” (completed):
  - FAA requests further clarification from the working group on how to address disbonds and weak bonds as a manufacturing defect
  - ARAC approved this report on 6/17/2020
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.

# Item 3: Crack Interaction

000063

- ARAC granted 3 month extension for report submission (Sept, 2022).
- Most technical matters settled (closed) – WG team is largely focused on report authoring/reviewing/editing phase.
- Rule change:
  - No – general consensus position
  - Currently two dissenting positions related to harmonization with EASA rule language
- Guidance changes:
  - WG agreement on need for some change, but no consensus on extent of clarification needed in guidance.
  - Since there is no clearly & widely accepted proposal considerable thought given to how to concisely and completely convey what the WG considered, and why various proposals were supported or opposed by WG members in recommendation report.

# Item 3: Crack Interaction (continued)

000064

Guidance changes (continued): WG is revising the draft report to improve the description of the WG positions and address a few new items

- Some WG members believe the current recommendation does not adequately address certain gaps in guidance
  - Report will summarize existing guidance where gaps may occur related to crack interaction and establishing repeat inspection intervals.
  - Report will identify those gaps that appear to cause confusion when addressing the following questions:
    - What is crack interaction?
    - Why does crack interaction need to be considered as DTE?
    - When does crack interaction need to be considered in a DTE?
    - How may crack interaction be considered in a DTE?
  - Report will identify all actions (e.g., guidance changes) the WG considered to address the gaps.
    - Report will summarize the supporting and objecting arguments for each action when consensus is not reached.
    - The FAA can form a position based on the WG's input on each action.
    - This is a slight shift in our approach to identify a recommendation to the FAA.
      - Originally, the WG tried to combine actions together to form recommendations.
      - The WG could not agree on which actions to combine.
- Discussions revealed AC 25.571-1D may need a new section to explicitly address repeat inspection intervals. (Input from full WG pending review of draft material)
- **Recently documenting further details in harmonization with other NAA guidance**
- **FAA posed specific questions to be addressed by WG**

# Item 3: Crack Interaction (continued)

In 2015, TAMCSWG established a standard for meeting quorum at 2/3 member participation. In absence of other guidance, we are considering that in whether we have that level of support for any proposal and in that case are those in minority willing to support the majority with just having their opposition noted

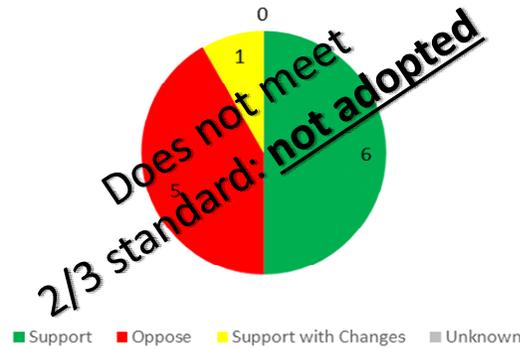
Potential Clarification 1: Add new statement to "extent of damage" 000065



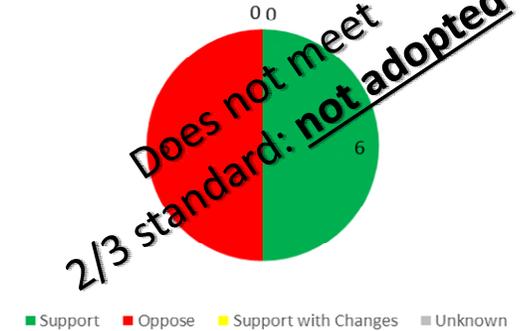
Potential Clarification 2: Add new definition



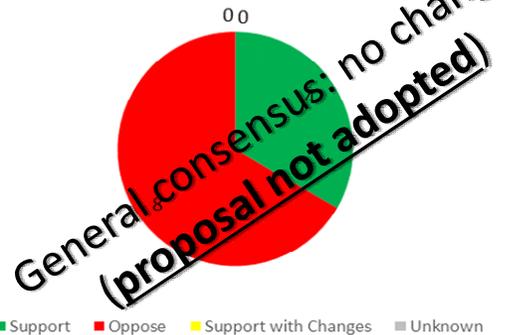
Potential Clarification 3: Add statement distinguishing between WFD and local detail for interaction



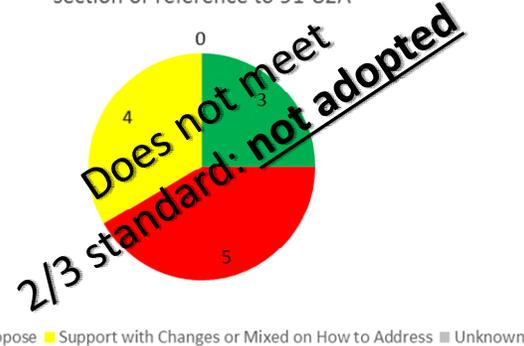
Potential Clarification 4: Establish "at some point" with respect to fatigue reliability



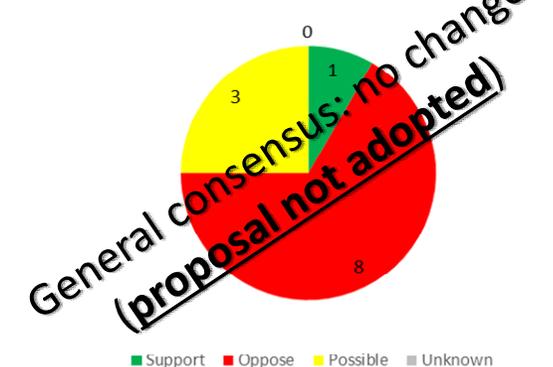
Potential Clarification 5: Provide guidance on how interaction may be considered



Potential Clarification 6: Repeat inspection interval section or reference to 91-82A



Separate Approach 7: Refer to SDO



# Item 3: Crack Interaction (continued)

000066

## Final Report – update

- Though final recommendations to FAA may appear minimal we took a long path to reach
- Report is drafted to capture all the various proposals considered by WG and their merits/challenges/objections
  - Because of various considerations we are intending to take care to ensure all relevant material is clearly and completely captured to provide value to subsequent unfamiliar readers
  - Draft presently ~150 pages
    - ~50 pages of main report content
    - ~100 pages of appendices, mainly supplemental for technical discussions
- Subteam (small team of ~7-9 members meeting weekly to collaboratively work through open items over past 6 months) is in process to review the draft report now. All basic elements of report are drafted.
  - Comments/edits collected and to be reconciled by subteam
  - Updated draft to be distributed to full WG upon completion by subteam
  - Notional positions shared with full WG all along way – some detailed report language already coordinated with WG members who share that position to help minimize review iteration process.

# Deliverable & Schedule

Deliverable: three reports 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
- ARAC agreeable to presenting this report at Sept 2022 meeting.
    - Core team has prepared a target report drafting & review milestone schedule to meet the next TAE scheduled meeting.
    - Targeting final week of June, 2022 to have draft ready for TAE review.
  - We thought report would be ready for submission to TAE in late June – in hindsight this was overly optimistic in consideration of effort to document notional discussions in a clearly written report with member concurrence given available resources.
  - We did not meet that objective, and the latest to have report submitted to TAE to in turn submit to ARAC would be first week of August – that too is overly aggressive relative to editing left to be done. Current projection with expected review process is ~mid October for everyone to review and report iteration.
  - WG is kindly requesting some patience as we finalize the draft report and allow us to submit to TAE at November meeting, so that TAE can present report to ARAC at December meeting.
  - WG is proposing to provide a supplemental presentation to summarize salient points of report to assist in TAE and ARAC member report review, similar to SLP and structural bonding reports.

*Meeting cadence:*

- Sub-teams (including NAA representatives) meeting weekly
- Full WG meetings (virtual) – monthly or as needed

# Ice Crystal Icing Working Group Status Report Transport Aircraft and Engines Subcommittee

**Melissa Bravin**

**Allan van de Wall**

Working Group Co-Chairs

01 September 2022

# MEMBERS of ICI WG

Member Name	Organization	Role
Alan Strom	(FAA-ANE Standards) <u>FAA Representative</u>	FAA Representative
Philip Haberen	(FAA-ANE Standards) <u>FAA Representative</u>	FAA Representative
Keith Morgan	Pratt & Whitney	ARAC 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
Josh Larson	Air Line Pilots Association	Other - P
Jon Saint-Jacques	A4A/Atlas Air	Other – P
David Dischinger	Honeywell	Engine – P
Keith Wegehaupt	Honeywell	Engine – P
Jim Loebig	Rolls-Royce	Engine – P
Roberto Marrano	Pratt & Whitney Canada	Engine – P
Shengfang Liao	Pratt & Whitney East Hartford	Engine – P
Roxanne Bochar	Pratt & Whitney	Engine – P
Aaron Cusher	Collins	Other - P

Member Name	Organization	Role
Philip Chow	FAA	Consultant
Jeanne Mason	FAA	Consultant
Walter Strapp	Met Analytics Inc.	Consultant
Dan Fuleki	National Research Council Canada	Consultant
Ashlie Flegel	NASA	Consultant
Tom Ratvasky	NASA	Consultant
Terry Tritz	Boeing	Consultant
Adam Malone	Boeing	Consultant
Bob Hettman	FAA	Non-voting role
Doug Bryant	FAA	Non-voting role
Eric Duvivier	EASA	Non-voting role
Julien Delanoy	EASA	Non-voting role
Fausto Enokibara	ANAC	Non-voting role
David Johns	TCCA-probes	Non-voting role
Eric Fleurent-Wilson	TCCA-engines	Non-voting role
<del>Masato Fukushi</del>	JCAB	<del>Non-voting role</del>
John Fisher	FAA	Non-voting role
Mauricio Caio Rosin	TCCA	Non-voting role

# 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 obtained from both government and industry to 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. Examine how compliance with §33.68(e) and §25.1093(b)(1) can be shown to demonstrate that at the airplane level, engine effects that could prevent the continued safe flight and landing of the airplane during encounters in ice crystal icing conditions would be extremely improbable ( $10^{-9}$ ). If that cannot be shown, recommend changes to the text of §33.68 or §25.1093 (or a combination of both) that would provide the level of safety described by §25.1309(b)(1).
  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. Determine whether engine or aircraft data probe responses warrant the use of a different environmental envelope from those proposed in Task 2, or to the existing Appendix D envelope.
  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 that may also include icing environments other than Appendix D as a secondary objective.
  6. Recommend changes to the Advisory Circular AC20-147a, *Turbojet, Turboprop, Turboshift and Turbofan Engine Induction System Icing and Ice Ingestion*, based on Task 1 through 5 results.
  7. Assist the FAA in determining the initial qualitative and quantitative costs, and benefits that may result from the working group's recommendations.
  8. 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.

# SCHEDULE

- Had F2F meeting in Cincinnati - 1-3 June 2022
- ~~October~~ November 30 2022: WG submits an interim report to FAA
  - Extension requested from ARAC WG; concurred by FAA rep
- July 2022: FAA high aerosol flight campaign complete
- September 2022: FAA Cabo Verde Saharan dust flight campaign underway
- 20 October 2022: FAA briefs ARAC WG on preliminary flight campaign results
- Q3-Q4 2022: FAA processes flight campaign data
- Summer 2023: WG reconvenes to assess flight campaign data
- December 2024 (?): WG submits a final report to FAA

# STATUS OF TASKING

Task #	Description	Status
1	Evaluate recent ICI environment data obtained from both government and industry to determine whether flight testing data supports the existing Appendix D envelope.	Complete
2	Evaluate the results carried out in Task 1 and recommend changes to the existing Appendix D envelope, as required. Examine how compliance with §33.68(e) and §25.1093(b)(1) can be shown to demonstrate that at the airplane level, engine effects that could prevent the continued safe flight and landing of the airplane during encounters in ice crystal icing conditions would be extremely improbable ( $10^{-9}$ ). If that cannot be shown, recommend changes to the text of §33.68 or §25.1093 (or a combination of both) that would provide the level of safety described by §25.1309(b)(1).	ALT-SAT Envelope Complete  Joint Probability study in work
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. Determine whether engine or aircraft data probe responses warrant the use of a different environmental envelope from those proposed in Task 2, or to the existing Appendix D envelope.	95% Complete (Boeing second review of probe events) – <u>not expected to change Task 4 status</u>
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.	Complete
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 that may also include icing environments other than Appendix D as a secondary objective.	In Work
6	Recommend changes to the Advisory Circular AC20-147a, Turbojet, Turboprop, Turboshaft and Turbofan Engine Induction System Icing and Ice Ingestion, based on Task 1 through 5 results.	In work
7	Assist the FAA in determining the initial qualitative and quantitative costs, and benefits that may result from the working group's recommendations.	TBC
8	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.	Interim report in work

# AREAS of ARAC CONSIDERATION

- None

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

**Clark Badie**

Working Group Chair

July 2022

# CURRENT ASHWG MEMBERS

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# SUMMARY OF TASKING

- Advise on the use of an alert when ground spoilers are not armed for landing in light of related incidents and accidents.
- Reference from the tasking statement:
  - There has been a history of landing incidents and accidents where the automatic ground spoilers were not armed, in addition to the subsequent reduction in wheel-braking effectiveness as well as drag reduction.
  - This has been a significant contribution to runway overruns. One example occurred on April 26, 2011, when a Southwest Airlines Boeing 737-700 went off the end of the runway at Chicago Midway International Airport. This task is also related to NTSB safety recommendations following the December 29, 2010, American Airlines Flight 2253 runway overrun accident at Jackson Hole Airport, Wyoming.

# SPECIFIC TASKING QUESTIONS

1. Are the existing industry standards or guidance material sufficient, or do you recommend any new or revised industry standards or guidance material to provide acceptable automatic ground spoiler alerts for the flightcrew in cases where the airplane is prepared to land (for example, when the airplane drops below an appropriate height above the runway), but the automatic ground spoilers are not armed? The recommendations should ensure there is enough flexibility to cope with potentially different aircraft designs.
2. Are the existing alerting standards in 14 CFR part 25 sufficient, or do you recommend changes to the existing alerting requirements?
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 landing without ground spoilers armed?
4. Is coordination necessary with other harmonization working groups? If yes, coordinate with that working group and report on that coordination.

# RECOMMENDED APPROACH

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Develop a 'Landing Alerting System' rule 25.704 and advisory material AC 25-704

- Include ground spoilers/speed brakes specifically, when required for landing
- Consistent with Ref: FTHWG Task 9 Wet Runway Stopping Performance Final Report, March 16, 2018. ASHWG to follow up with FTHWG in Q1.
- Allow for future considerations which may help reduce or eliminate the likelihood of runway overruns (e.g. unstable approaches, potential adverse runway conditions, potential long/late touchdowns, energy state issues).
- Document those other considerations in the report, and recommend a follow up task to improve in the future (addresses tasking question #3).

Recommend EASA CS 25.705 - Runway Overrun Awareness and Avoidance System (ROAAS) - for harmonization **(as-is)**.

- Ref: FTHWG Task 9 Wet Runway Stopping Performance Final Report, March 16, 2018

# SCHEDULE

- Initial meeting held February, 2021
- Monthly (virtual only) meetings have been conducted to work this task. Ad-hoc telecons and electronic correspondence have been used to the maximum extent possible.
- Current
  - Incorporated FTHWG feedback
  - Simplified the rule wording
  - Team review/vote of the final report nearly complete
- Planned completion: Q3 2022

# AREAS of ARAC CONSIDERATION

## Clarification (if possible) from the tasking statement:

QUESTION 1: ARE THE EXISTING **INDUSTRY STANDARDS** OR GUIDANCE MATERIAL SUFFICIENT, OR DO YOU RECOMMEND ANY NEW OR REVISED INDUSTRY STANDARDS OR GUIDANCE MATERIAL TO PROVIDE ACCEPTABLE AUTOMATIC GROUND SPOILER ALERTS FOR THE FLIGHTCREW IN CASES WHERE THE AIRPLANE IS PREPARED TO LAND (FOR EXAMPLE, WHEN THE AIRPLANE DROPS BELOW AN APPROPRIATE HEIGHT ABOVE THE RUNWAY), BUT THE AUTOMATIC GROUND SPOILERS ARE NOT ARMED? THE RECOMMENDATIONS SHOULD ENSURE THERE IS ENOUGH FLEXIBILITY TO COPE WITH POTENTIALLY DIFFERENT AIRCRAFT DESIGNS?

- Was the intention to write '*industry standards*' if they exist or to state 'are the existing *regulations* or guidance material sufficient...'
- Tasking was taken literally, but the working group did not find an *industry standard* related to ground spoiler alerting.

# AREAS of ARAC CONSIDERATION

None at the moment