

AVIATION RULEMAKING ADVISORY COMMITTEE (ARAC) MEETING

September 16, 2021***1:00 PM - 4:00 PM

- Welcome and Introductions
- Federal Advisory Committee Act (FACA) Statement
- Ratification of Minutes
- Status Reports
 - ARAC
 - Airman Certification System Working Group Mr. David Oord
 - ♦ Call to Action (CtA) Subgroup (SG) Interim Recommendation Report
 - 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: 6/2022)
 - Part 145 Working Group Ms. Sarah McLeod
 - Final Report (Present Recommendation Report to ARAC: 12/2021)
 - Training Standardization Working Group Mr. Brian Koester
 - ✤ Addendum Recommendation Report (Present to ARAC: 12/2021)
 - Transport Airplane and Engine (TAE) Subcommittee Mr. Keith Morgan
 - Flight Test Harmonization Working Group Mr. Brian P. Lee
 - Topic 16 Handling Qualities Rating Method (HQRM) (Present Recommendation Report to ARAC: TBD)
 - Phase 4 (Present Recommendation Report to ARAC: TBD)
 - Transport Airplane Metallic and Composite Structures Working Group Mr. Doug Jury
 - Repeat Inspections and Crack Interaction (Present Recommendation Report to ARAC: 12/2021)
 - Ice Crystals Icing Working Group (Present Recommendation Report to ARAC: 6/2022 – 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: 6/2022)
- Recommendation Report
 - Transport Airplane and Engine (TAE) Subcommittee
 - Transport Airplane Metallic and Composite Structures Working Group Mr. Doug Jury
 - Structural Bonding
- Any Other Business
 - FAA update on regulatory activities
 - Fiscal Year 2022 Meeting Dates
 - Thursday, December 9, 2021
 - o Thursday, March 17, 2022
 - Thursday, June 16, 2022
 - o Thursday, September 15, 2022

ARAC agendas, meeting minutes, and reports are available on the FAA's committee website at <a href="https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/com

AVIATION RULEMAKING ADVISORY COMMITTEE

RECORD OF MEETING

MEETING DATE:	June 17, 2021
MEETING TIME:	1:00 PM EDT
LOCATION:	The Aviation Rulemaking Advisory Committee (ARAC) held a "virtual" meeting via Zoom.
PUBLIC ANNOUNCEMENT:	The Federal Aviation Administration (FAA) provided notice to the public of this ARAC meeting in a <i>Federal Register</i> notice published on May 3, 2021 86 FR 23487).

ATTENDEES:		Committee Members	
	Yvette A. Rose	Cargo Airline Association (CAA) ARAC Chair	
	David Oord	Lilium, ARAC Vice Chair and Airman Certification Systems Working Group Chair	
	Justin Barkowski	American Association of Airport Executives (AAA	
	Michelle Betcher	Airline Dispatchers Federation (ADF)	

David Oord	Lilium, ARAC Vice Chair and Airman Certification Systems Working Group Chair
Justin Barkowski	American Association of Airport Executives (AAAE)
Michelle Betcher	Airline Dispatchers Federation (ADF)
Doug Carr	National Business Aviation Association (NBAA)
Tom Charpentier	Experimental Aircraft Association (EAA)
Ambrose Clay	National Organization to Insure a Sound Controlled Environment (N.O.I.S.E.)
Walter Desrosier	General Aviation Manufacturers Association (GAMA)
Gail Dunham	National Air Disaster Alliance Foundation (NADAF)
Stéphane Flori	Aerospace & Defense Industries Association of Europe (ASD)
Daniel Friedenzohn	Embry-Riddle Aeronautical University (ERAU)
Paul Hudson	FlyersRights
Randy Kenagy	Air Line Pilots Association (ALPA)
Sarah MacLeod	Aeronautical Repair Station Association (ARSA)
Justin Madden	Aircraft Mechanics Fraternal Association (AMFA)
Chris Martino	Helicopters Association International (HAI)

Paul McGraw	Airlines for America (A4A)			
Keith Morgan	Pratt & Whitney, Chair of the Transport Aircraft and Engine (TAE) Subcommittee			
George Paul	National Air Carrier Association (NACA)			
Richard Peri	Aircraft Electronics Association (AEA)			
Leslie Riegle	Aerospace Industries Association (AIA)			
Larry Rooney	Coalition of Airline Pilots Association (CAPA)			
Steven Udvar-Hazy	Aviation Capital Group			
Bill Whyte	Regional Airline Association (RAA)			
Christopher Witkowski	Association of Flight Attendants			
Attendees				
Clark Badie	Federal Express (FedEx)			
Antonio Chiesa	Transport Canada Civil Aviation (TCCA)			
Maryanne DeMarco	САРА			
Sean Elliott	EAA			
Romar Frazier	Boeing			
Konrad Habina	Boeing			
Jennifer Holder	Boeing			
Doug Jury	Delta Air Lines			
Brian Koester	NBAA			
Adam Magee	The Balloon Training Academy			
Ericka Peterson	Collins Aerospace			
Randy Riebel	Delta Air Lines, Inc.			
Peter Turyk	Pratt & Whitney Canada			
FAA				
Timothy Adams	Designated Federal Officer (DFO), Office of Rulemaking (ARM)			
Angela Anderson	ARM			
Leisha Bell	Flight Standard Services (FS)			

Kathleen Bradshaw	Aircraft Certification Service (AIR)
Paul Cloutier	FS
Thuy Cooper	ARM
Jim Crotty	ARM
Thomas Cuddy	Office of Aviation Policy and Planning (APO)
Thea Dickerman	ARM
Richard Doan	Office of General Counsel (AGC)
Aliah Duckett	ARM
Ralen Gao	ARM
Katie Inman	AGC
Muhammad Kushan	Air Traffic Control (ATO)
Brian LaCross	АТО
Nellie Lew	АРО
Suzanne Masterson	AIR
Trey McClure	FS
Mallory Naill	AIR
Lakisha Pearson	ARM
Paul Preidecker	FS (FAA contractor)
Robert Reckert	FS
Puja Sardana	The Regulatory Group/FAA contractor
Tim Shaver	FS
Walt Sippel	AIR
Todd Steiner	АРО
Alan Strom	AIR
George Thurston	АРО
Alana Zautner	AIR

Welcome and Introduction

Ms. Yvette Rose, ARAC Chair, called the meeting to order at 1:02 pm. She asked Mr. Timothy Adams, Designated Federal Officer (DFO), to review features of Zoom, the teleconference platform used for the virtual meeting. Mr. Adams introduced himself and informed ARAC that Mr. Brandon Roberts was on a detail assignment in the Office of the Secretary. After introducing himself, Mr. Adams reviewed features of Zoom, noted that the meeting was being recorded, and asked that participants who dialed-in using a phone number to identify themselves through Zoom or by emailing the ARAC (9-AWA-ARAC@faa.gov) to record their attendance.

Ms. Rose confirmed the ARAC members in attendance based on the participant list provided by Zoom. Ms. Rose thanked the FAA and supporting staff for their efforts in conducting these meetings virtually and accurately tracking nonmember attendance.

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 the permission of the Chair.

Ratification of Minutes

Ms. Rose asked for a motion to accept the minutes from the March 18, 2021,¹ ARAC meeting. Mr. Larry Rooney motioned to accept the minutes, and Mr. Keith Morgan seconded the motion. ARAC voted to ratify the minutes with no objections.

Status Reports

A copy of the June 17, 2021, meeting packet, which includes the presentations, can be found at:

https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/d ocument/information/documentID/5003/

Airman Certification Systems Working Group (ACSWG)

Ms. Rose asked Mr. David Oord, ACSWG Chair, to provide 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 membership has largely stayed the same with consistent engagement from the FAA and from industry. He described the tasking, which includes standards, guidance, and test material. Mr. Oord explained that the schedule is on track and a comprehensive interim report was submitted in June 2018 with subsequent interim

¹ The June 17, 2021, meeting minutes can be found at:

https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/document/informat ion/documentID/5003/

reports consistently submitted since then. He stated that the ACSWG final report is due on December 1, 2021; however, the working group is requesting an extension.

Mr. Oord discussed the extension request and noted that the working group created a new subgroup to address the new tasking assigned to ARAC at the March 2021 meeting. Mr. Oord stated that he expects the ACSWG will submit a final recommendation report by June 2022.

Mr. Oord expressed frustrations with delays from the FAA, and he is concerned working with the industry towards mutually beneficial training and testing in a timely manner is not a priority. Mr. Oord noted that the working group continues to have concerns about the delay in publishing new Airman Certification Standards.

Ms. Rose asked if any members had questions. Mr. Justin Madden asked if the FAA can explain ex parte so that everyone can operate on the same page. Ms. Katie Inman, FAA/AGC, thanked Mr. Madden for the feedback.

Ms. Rose asked for a motion to accept the ACSWG's request for an extension. Mr. Madden motioned to accept the extension, and Mr. Larry Rooney seconded the motion. ARAC voted to approve the extension for six months with no objections.

Part 145 Working Group

Ms. Rose asked Ms. Sarah MacLeod, the Part 145 Working Group Chair, to provide the working group's status report. The update included an overview of membership, a summary of tasking, the status of tasking, and areas for ARAC consideration.

Ms. MacLeod noted she did not believe there were any changes in membership. She stated that the summary of tasking has been mostly accomplished. Ms. MacLeod reviewed the process of developing the preliminary recommendations and the working group's plan for the final recommendations. She reviewed the schedule and noted that the group has run into challenges that will require feedback from the FAA's Office of Chief Counsel.

Ms. Rose asked for feedback from the FAA on the working group's request. Mr. Adams asked that any requests should come to the Office of Rulemaking, in writing, and the Office of Rulemaking would connect with the Office of Chief Counsel, as needed. Ms. MacLeod asked if she could directly contact the Office of Rulemaking, and Ms. Rose confirmed that she could. Ms. MacLeod asked about lead time, and Mr. Adams said it would depend on how big the ask is. Ms. MacLeod clarified that the working group is requesting a one hour meeting with the Chief Counsel's office. Mr. Adams noted that, once a specific request is submitted in writing, it should not take long to receive a reply.

Ms. Inman asked the nature of the meeting. Ms. MacLeod noted that the issues deal with the scope of part 145, acceptable means of compliance, and guidance material. She stated that the interpretation of these can be controversial, and she is seeking clarity on the best

way to proceed. Ms. Rose noted that Ms. MacLeod should detail the exact clarity the group is seeking in their request letter. Ms. MacLeod noted that it would be advantageous to the agency to have a discussion with the working group. Mr. Ric Peri agreed that feedback from FAA would help clarify discrepancies the group has found in various preambles, final rules, advisory circulars, and guidance.

Training Standardization Working Group (TSWG)

Ms. Rose asked Mr. Brian Koester, TSWG Chair, to provide 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. Koester reviewed membership, summarized the tasking, summarized the schedule, and presented the order in which the group plans to complete the tasks. He noted that taskings 1 and 2 are complete, and part of the remaining task is to include a standardized curricula for each type of aircraft under Part 135 at certain training centers. Mr. Koester stated that the recommendation report includes a master schedule and has been submitted to ARAC for approval.

Transport Airplane and Engine (TAE) Subcommittee

Ms. Rose asked Mr. Keith Morgan, the TAE Subcommittee Chair, to provide the TAE Subcommittee status report update.

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

Mr. Morgan reviewed membership and the schedule of deliverables for the TAE working groups. He noted that TAE submitted the Engine Harmonization Working Group's (EHWG) Final Report for ARAC consideration. He noted the TAMCSWG Structural bonding report should be submitted by September and the TAMCSWG Crack Interaction report would be submitted by December.

Flight Test Harmonization Working Group (FTHWG)

Mr. Morgan stated the FTHWG has been working on Phase 4 of the tasking. He described a breakdown of the tasks and how the work is being delegated. Mr. Morgan said that the FTHWG continues to meet regularly and hopes to have a face-to-face meeting later in the year, but it will depend on the status of COVID, travel restrictions, etc. He reviewed the schedule, stated that the status of tasking is on track, and noted that the group does not need anything from ARAC at this time.

Transport Airplane Metallic and Composite Structures Working Group (TAMCSWG)

Mr. Morgan reviewed the TAMCSWG membership, tasking, and schedule. Mr. Morgan summarized the original tasking and described the extended topics that were added. He noted that the remaining topics are structural bonding (scheduled to present to ARAC by September) and crack interaction (scheduled to present to ARAC by December). He confirmed the schedule of deliverables and noted that the TAMCSWG does not need anything from ARAC at this time.

Ice Crystals Icing Working Group (ICIWG)

Mr. Morgan stated that the ICIWG membership or the status of tasking has not changed. Mr. Morgan reviewed the schedule, which extended to the middle of 2022. He noted that the working group has regular meetings and is making good progress. Mr. Morgan described factors related to research on air pollution affecting ice crystal icing in the report. Ms. Rose thanked him for the update and asked that he inform ARAC if a new tasking is required. Mr. Morgan stated that there were no areas for ARAC consideration at this time.

Ms. Rose asked for clarification on one of the ICIWG's slides, and Mr. Morgan noted that the slide covers the work plan.

Avionics System Harmonization Working Group (ASHWG)

Mr. Morgan summarized the ASHWG's tasking and the questions they hope to answer in their tasking. He noted that the group meets regularly, and they hope to have their work by the third quarter of next year. He stated that the ASHWG does not need anything from ARAC at this time.

Engine Harmonization Working Group (EHWG)

Mr. Morgan noted that the EHWG submitted a report to the ARAC for review.

Recommendation Reports

Training Standardization Working Group

Ms. Rose asked Mr. Brian Koester to present the recommendation report from the Training Standardization Working Group. Mr. Koester described the three recommendations within the report: developing recommendations for a master priority list of the order for creating curricula, developing recommendations for a flagship aircraft, and developing recommendations for the instructor check pilot curricula. Mr. Koester described data used to develop the report and specific factors that were taken into consideration for different types of training events, aircrafts, and operators. He asked if members had any questions about the report.

Mr. Madden asked if the working group took into account the airframe aviation maintenance (AAM) industry. Mr. Koester noted that they did not consider the AAM

industry because he does not believe they are applicable to the same training centers mentioned in the recommendations. Mr. Koester described the Part 135 pilot and Part 142 center aspects that were included in the report. He noted that the recommendations stay within a conservative approach, and he described aspects of the curricula as they apply to different aircraft types and to FAA regulations. Mr. Koester emphasized the importance of a standardized calibration system, also included in the report.

Ms. Rose asked for clarity on if the group is asking to standardize current rulemaking. Mr. Koester noted that current regulations do exist, but the group's report only includes changes to guidance, not rulemaking. He stated that national standardized curricula would help Part 135 operators and enhance safety. Ms. Rose thanked him for confirming the changes were to guidance, and not to rulemaking. Mr. Koester noted that the tasking is to create a series of addendum reports.

Ms. Rose asked for a motion to accept the recommendation report. Mr. Bill Whyte motioned to accept the report, and Mr. Walter Derosier seconded the motion. ARAC voted to accept the report with no objections.

Initial Recommendation Report: Proposed Schedule for Standardized Curriculum Designated Pilot Examiner Working Group

Ms. Rose asked Mr. Sean Elliot to present the recommendation report for the Designated Pilot Examiner Working Group. Mr. Elliott thanked the group and the FAA for working hard in an almost entirely virtual environment. He noted that the report contains 12 recommendations and appendices. Mr. Elliot reviewed the meeting schedule, which began in October 2019.

Mr. Elliott briefly described each of the 12 recommendations in the report. He noted specific benefits of each and emphasized the importance of standardization. Mr. Elliott stated that the recommendations promote enhanced safety and align with current standards. He asked if anyone had questions.

Ms. Rose thanked Mr. Elliott for the well-organized report and for his explanation. Mr. Rooney asked, regarding segmentation, how applicants could apply for different portions. Mr. Elliott noted that the recommendations were made to promote flexibility. Mr. Elliott explained opportunities for different emphasis' should be encouraged. Mr. Rooney thanked Mr. Elliott.

Ms. Rose asked for a motion to accept the report. Mr. Rooney motioned to accept the report, and Mr. Keith Morgan seconded the motion. ARAC voted to accept the recommendation report with no objections.

Transport Airplane and Engine (TAE) Subcommittee - Engine Harmonization Working Group Final Report

Ms. Rose asked Mr. Peter Turyk to present the final report from the Engine Harmonization Working Group. Mr. Turyk reviewed the task and provided some background information on the tasking. He reviewed membership and noted the work of newer members. Mr. Turyk stated that there were 6 specific items under the tasking.

Mr. Turyk described the structure of the report, which includes a detailed response to each of the six questions under the task. He noted that the letter submitted to ARAC with the report included a two-prong approach to the response. Mr. Turyk explained some rationale for the recommendations within the report. He continued describing the report, including the group's approach to answering the clarification questions and to specific performance calculations.

Ms. Rose thanked Mr. Turyk and his team for the comprehensive report. She asked if there were any questions from members, and there were none.

Ms. Rose asked for a motion to accept the final report. Mr. Whyte motioned to accept the report, and Mr. Derosier seconded the motion. ARAC voted to accept the report with no objections.

Mr. Turyk encouraged the FAA to strongly consider taking action on this report.

Other Business and FAA Updates

Ms. Rose asked Mr. Adams for any FAA updates. Mr. Adams announced that Mr. Ali Bahrami is retiring at the end of June 2021. Mr. Adams asked Mr. Tim Shaver, FAA, to provide an update on the § 65.101 Repairman Certificate Portability Working Group.

Mr. Shaver reported that FAA posted the Tasking Notice on the FAA Committee website on March 19, 2021 and that the solicitation period for nominees closed on April 19, 2021. He noted that FAA is reviewing the nominations and in the process of selecting members. Ms. Thuy Cooper reminded ARAC that working group members must be appointed by the Secretary.

Mr. Adams provided a status on the Transport Airplane Crashworthiness Working Group recommendation report, which ARAC submitted to FAA in October 2018. In response to the recommendation report, he stated that FAA is working to harmonize certain Part 25 regulations with EASA. Mr. Adams stated that FAA will continue to provide status updates on ARAC recommendations at future meetings.

Mr. Adams noted to keep an eye on the Unified Agenda for other updates. He reviewed the ARAC schedule with the next meeting on September 16, 2021. Fiscal year 2022 meetings are scheduled for December 9, 2021, March 17, 2022, June 16, 2022, and September 15, 2022.

Ms. Rose thanked Mr. Adams for the update and asked that he keep the ARAC posted on the return to in-person meetings. No other members had questions.

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Adjournment

Ms. Rose adjourned the meeting at 3:16 pm.



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

David Oord

Working Group Chair

September 1, 2021

MEMBERS of ACSWG - INDUSTRY

- David Oord, Lilium
- 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
- Lauren Haertlein, GAMA
- 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 "Mac" McWhinney, King Schools
- Crystal Maguire, ATEC
- Nick Mayhew, L3

- Phillip Poynor, NAFI
- Jimmy Rollison, FedEx
- 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



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<u>MEMBERS of ACSWG – FAA SMEs</u>

- Susan Parson
- Barbara Adams
- Bill Anderson
- Robert Burke
- Dennis Byrne
- Bryan Davis
- Joel Dickinson
- Mike Duffy
- Troy Fields
- Ramona Fillmore
- Adam Giraldes
- Vanessa Jamison
- Laurin J. Kaasa

- Jeffrey Kerr
- Ricky Krietemeyer
- Mike Millard
- Anne Moore
- Kevin Morgan
- Margaret Morrison
- Richard Orentzel
- Katie Patrick
- Andrew Pierce
- Robert Reckert
- Jason Smith
- Shelly Waddell Smith
- Jeff Spangler

- Robert Terry
- Matt Waldrop
- Stephanie Williams
- Bill Witzig
- Daron Malmorg

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.
- Added Call to Action tasking, as mandated by the Aircraft Certification, Safety, and Accountability Act.



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 1, 2021
 - Extension request to June 2022 to align with Call-to-Action tasking
 - Will continue to utilize and submit interim reports when new draft standards or guidance is ready



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<u>SCHEDULE</u>

- 2021 Meetings
 - March 16 (virtual meeting)
 - June 15 (virtual meeting)
 - September 21 (virtual meeting)
 - December 14-15 (TBD)



STATUS OF TASKING

- Continued progress on Standards, Guidance, and Test Management
 - Refinement and improvement of existing Standards
 - Change management process
 - ACS code consistency and refinement
 - Update practice exams to reflect live test questions and codes
 - New test management service implemented
 - ACS Exam Boards (AEBs)



STATUS OF TASKING

- Call to Action
 - New subgroup established and tasked with reviewing pilot certification standards, as mandated by the Aircraft Certification, Safety, and Accountability Act
 - Tasking assigned to ACSWG at last meeting
 - Workplan outline June 2021
 - Call to Action recommendation report June 2022



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

Sarah MacLeod and Ric Peri

Working Group Chairs

September 2021 Meeting

Members of the Part 145 Working Group (Unchanged)

Paul Cloutier, Working Group Representative Brent Hart, Analyst Thuy Cooper, Analyst Justin Smith, Director of Operations Craig Fabian, Regulatory Compliance Leader Sarah MacLeod, Executive Director John Fox, Accountable Manager Joe Sambiase, 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 United Airlines, Inc.

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

Sam Porter, Senior Quality Manager 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

Sikorsky—A Lockheed Martin Company

Wysong Enterprise

Wysong Enterprise Kalitta Air Green Mountain Avionics Boeing Commercial Airplanes Boeing Global Services Brian Koester, Manager, Flight Operations & Regulation Carol Giles, Aircraft Maintenance and Systems Technology Committee Liaison Art Smith, Vice President-Chief Quality Officer Steve Douglas, Vice President Certification, Compliance & Safety Paul Hawthorne, Director Global Support Quality

Gary Daniels, FAA DAR-T DMS Designee

National Business Aircraft Association National Air Transportation Association AAR Corporation Oliver Wyman – CAVOK

Moog

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
- Recommend improvements to guidance documents to ensure they—
 - ✓ Annotate the applicable regulations, laws or executive orders—AMC.
 - ✓ Are numbered to establish a relationship between the guidance and the underlying regulation—AMC
 - Communicate agency expectation of compliance to the public and FAA workforce in a comprehensive and consistent manner, with tools to ensure application and evaluation is based on performance-based oversight—AMC
 - Account for oversight of repair stations vis-à-vis amount, type, scope and complexity of the certificate holders' work and its size—recommendation for applying the appropriate "weight" to DCT elements will be in final report.
 - Align with regulations, laws and executive orders—laws, regulations, executive orders, legal interpretations in AMC.
- Develop a preliminary and final report containing the recommendations—in progress.

<u>SCHEDULE</u>

- Requesting six (6) month extension to or to align with June ARAC meeting.
- Preliminary report was submitted 24 months from the first meeting of the Part 145 Working Group (approved by ARAC December 2020).
- Final report will be submitted no later than 12 months after the preliminary report is <u>forwarded to the FAA by ARAC</u> (earliest week of December 13, 2021, or if extension is granted May 13, 2021, for June meeting) = In work.
- Task group of FAA representative, Co-Chairs, and interested industry representatives have regular meetings to—
 - ✓ Draft final report, and
 - ✓ Work on AMC

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STATUS OF TASKING

- Developing final report.
- Developing recommendation document that puts regulatory compliance information in one place so interrelationships can be shown and taught—
 - Evaluated International Civil Aviation Authority "best practices"
 - Included FAA/CAA historical documents
 - Using ARAC Working Group agreed upon structure

STATUS OF TASKING

- ARAC Working Group agreed upon structure:
 - Numbering is 145-1-A-X-X followed by the regulation copied verbatim from 14 CFR
 - Scope—the legal authority or intent expressed by the plain language.
 - Acceptable Means of Compliance—the parameters and expectations of the showing and finding of compliance.
 - Guidance Material—FAA <u>unique</u> information which will <u>not</u> repeat what is contained in the Acceptable Means of Compliance.
 - Related Regulations—regulations directly and indirectly related to the Acceptable Means of Compliance with no more than a sentence explaining why the section or paragraph is being referenced.
 - Additional Information—legal opinions or interpretations and other historical references that explain or illustrate the verbiage in Scope, Acceptable Means of Compliance, and Guidance Material.

AREAS of ARAC CONSIDERATION

Request extension of final report deadline for six month or to align with June 2021 meeting from FAA.

AREAS of ARAC CONSIDERATION

Call to Action Subgroup – Interim Recommendation Report

- Outlines the CtA SG's concerns regarding the delay in publishing revised and new ACS documents.
 - Concerned with continued delays and uncertainty.
- Need a path that provides for effective, efficient, and transparent maintenance and publication of ACS documents that have been approved by ARAC. Such a path must:
 - accommodate safety needs (including NTSB, FAA, and stakeholder input);
 - allow timely changes when circumstances require;
 - provide for predictable revisions;
 - allow for public consultation; and
 - promote continued communication and interaction with community partners.
- Concern that, without a path forward, Call to Action tasking would have no purpose.





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



Brian Koester Working Group Chair

September 09, 2021

MEMBERS of

Training Standardization Working Group

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.
Annmar ie	Stasi	Talon Air, LLC
Daniel	Von Bargen	Jet Aviation Flight Services, Inc.
Mike	Walton	Textron

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* 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:

1. Recommend a detailed master schedule for the development of part 135 standardized curricula for each aircraft or series of aircraft;

2. 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.

<u>SCHEDULE</u>

- ✓ 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.
- If unable to meet the abovementioned deadlines, the TSWG Chair will recommend that ARAC request an extension from the FAA.
- 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.

STATUS OF TASKING

- Milestones:
 - TSWG has created Action Team breakout groups with specific tasking assignments, such as:
 - Regulatory Analysis
 - Aircraft-Specific Curriculum
 - Instructor and Check Pilot Qualification
 - Continuous Improvement
 - Instructional System Design (ISD)
 - The voting members of the TSWG meet monthly, with Action Teams meeting on a regular basis in between.
 - Tasking 1 (schedule) and 2 (instructor curriculum) are complete.
 - Anticipate first curriculum recommendation at the December ARAC meeting

AREAS of ARAC CONSIDERATION

- The ISD action team
 - Completed their training needs analysis
 - Started an SOP sub team
- Continuous Improvement Action Team is developing a framework document to:
 - Determine data-driven methods and element criteria to identify program effectiveness to make recommendations for continuous improvement
 - Identify methods for ongoing SC maintenance and development (who, how, when/triggers for revisions)
Transport Aircraft and Engines Subcommittee Status Report to the Aviation Rulemaking Advisory Committee

Keith R. Morgan Subcommittee Chair

16 Sept. 2021

This document does not contain any export regulated technical data

Members of the Transport Aircraft and Engines Subcommittee

Pratt & Whitney

ALPA

A4A

ASD

Airbus

Boeing

GAMA

AIA

Bombardier

NADA/F

Embraer

SRCA

TAE Meeting Schedule

- 2021 Meetings
 - January 26, 2021
 - February 11, 2021 (Ad hoc)
 - April 27, 2021
 - July 27, 2021
 - October 26, 2021

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 2021
 - TAMCSWG Structural bonding
- December 2021
 - TAMCSWG Crack Interaction

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

27 July, 2021

MEMBERS of

Flight Test Harmonization Working Group Phase 4

Authorities	OEM's			Observers
FAA Bob Stoney Paul Giesman (sponsor)	Airbus Philippe Genissel + SME's	Embraer Murilo Ribeiro + SME's	ATR Matthieu Ollivier Jean-Pierre Marre	JCAB (Japan) Shinsuke Yamauchi Teruke Koike
			+SME's	CAAI (Israel) Yshmael Bettoun
EASA Matthias Schmidt	Boeing Matt Muehlhausen	Gulfstream Mike Watson	Airbus Canada Scott Black Joel Boudreault +SME's	Norwegian Airlines John Lande
	+ SIVIE'S	+SIME'S		Operations SME David Anvid
Transport Canada Lee Fasken	Dort CanadaBombardierTextronDeHavilland CanadaFaskenTony SpinelliKurt LaurieEric Herrmann+SME's+SME's+SME's+SME's	DeHavilland Canada Eric Herrmann	Centre d'Essais en Vol Francois MEIGNIEN	
		+SME's	+SME's	Operators
ANAC (Brazil) Pedro Donato (Transitioning)	Dassault Philippe Eichel +SME's			ALPA John Cinnamon

STATUS OF TASKING

- Tasking for Phase 4 Received in December
- Planning for the 6 tasks is complete
- Work is under way

• 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

FTHWG Phase 4 under way

- Initial deliberation have begun (and are well along) on:
 - TALPA (Key participants to retire)
 - Dry Runway Braking
 - Narrow Runway Certification
 - Not as far along (as TALPA and Dry Runway Braking), but it's a 24 month tasking (vs 18)
 - To discuss "Narrow" runway, we first must define "Baseline" runway
 - Current regulations do not address runway width
- Initial conversations (following extensive planning by leadership team) have begun on Topic 16 (FAME)
 - Kickoff in January
 - Monthly telecons
 - First F2F meeting scheduled for June September December to include other discipline SMEs

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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.)
- Sept, 2021 meeting (Cologne) is now planned to be virtual
- Next face-to-face now planned for Melbourne, FL, December 2021
 - Have reserved large room to accommodate distancing
 - Will depend on:
 - International travel restrictions
 - Corporate travel restrictions
 - Personal travel restrictions
 - Decision gate in October
- Implications:
 - Lost hours (vis-à-vis planning)
 - SME travel budget implications raise concerns

FTHWG Phase 4 Meeting Plan (Accommodating Coronovirus)



Recommendation Report to TAE to meet tasking requirements to ARAC

Mostly Performance Specialists

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STATUS OF TASKING ACTIVITIES

- Continuing to progress three of the Phase 4 topics virtually
 - Weekly telecons
 - Planned concentrated quarterly meetings face-to-face when we can return to that format
- Status of progress is getting perilous with loss of productivity due Covid
 - 2022 deliverables will be at risk if we cannot resume face-to face meetings in December
- TALPA topic is becoming at risk due to upcoming retirement of topic leader and FAA sponsor, with no replacement being groomed yet
- For now, consider progress to be on-track (so far, as best we can tell), but with risks looming

2021: Anticipated TAE: 26 January, 27 April, 27 July, 26 October ARAC: 18 March, 17 June, 16 September, 9 December

AREAS for ARAC CONSIDERATION

- FAME is a very important, multi-disciplinary topic which has caused confusion and has been dis-harmonized for a very long time. We want very much to "get it right" this time.
- Working Group leadership has worked hard to:
 - Allow appropriate time for deliberation
 - Schedule meetings and meeting venues which will maximize multi-disciplinary participation (both from FAA and from EASA; also TCCA, and ANAC and the industry participants)
 - With COVID forcing virtual (less productive) meetings, we considered many options
 - Change of venues, swapping meeting venues, addition of "extra" meetings to accommodate FAME SME's
- The best approach was a face-to-face kick-off in Europe, following up with the December face-to-face in the US, but we need the systems safety and other specialists at these meetings
 - By "kick-off" we mean with the expanded SME participation; FTHWG has been meeting on this topic virtually since January.
- COVID limitations are forcing a flip-flop of planned meetings, but all participants need to budget appropriately for those contingencies
 - A Cologne meeting would have allowed EASA specialists to attend; moving that kick-off to December will now require EASA SME's to travel, which has not been budgeted. It is very important for harmonization that we have appropriate representation across authorities and across disciplines.
 - We are seeking some budgetary flexibility as we progress these topics while accommodating health and safety considerations.
- Our FAA sponsor (and TALPA topic leader and Performance SME) is to retire in December. TALPA recommendation report is due to TAE in March.
 - These topics are complex and have significant historical context
 - A replacement must be given adequate time and involvement to "spin up" on these topics

Transport Airplane Metallic and Composite Structures Working Group

Recommendation Report, Extension Topics, Briefing to the TAE – April 2021 meeting

Doug Jury (Delta Air Lines)

Working Group Chair

April 27, 2021

Members of the Working Group

• Industry WG voting members:

1.	Kevin Davis	(Boeing)
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.	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); 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)

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 <u>three</u> <u>separate topics were raised as needing further evaluation and recommendation</u> from this existing WG.

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<u>SUMMARY OF TASKING – extended topics</u>

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
- 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.

SUMMARY OF TASKING – extended topics (continued)

Working Group continues to work through the remaining two items through smaller tasking groups, consisting of 4-8 WG member teams (aka subteam)

Final report delivery scheme will be two separate reports

- As with SDC/SLP report, no rule change expected for any of the tasks. Guidance change only.
- Structural bonds guidance development is progressing.
- Evident there is wider variety of engineering positions on guidance for crack interaction some generally favorable direction on development of general guidance recommendations.

COVID-19 pandemic created challenges for the Aviation Industry to continue full-time efforts on remaining topics.

- A negative economic impact experienced by most companies
- Resources (finances and personnel) are diminished, which has resulted in higher work-load, furloughs, or shorter work hours for working group members
- Working Group focused efforts mostly on one report at a time

<u>SUMMARY OF TASKING – extended topics (continued)</u>

Item 2: Structural bonds & Weak Bonds

- FAA requests further clarification from the working group on how to address disbands and weak bonds as a manufacturing defect
 - "Weak bonds listed under manufacturing defects is somewhat confusing because, although it is clearly a manufacturing defect, it is unlike any of the other manufacturing defects that are typically listed (i.e., all others are relatively small and either starter flaws for metal fatigue or allowable defects for composites)."
 - "Bonding may be acceptable to use if stringent/reliable manufacturing in-process quality control practices are in place to ensure that a weak bond is: 1) extremely rare (justifying the size constrained by 2.) and 2) localized to a size at or within arresting design features."
 - No rule change proposed.

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- Guidance changes under consideration:
 - AC 20-107B: additional modification proposed change recommendations for WG review: Parag. 6, 8, 10
 - AC 25.571-1D: under the original report (section 3.1.2 wrt metal-to-metal bonding)
 - AC 21-26: reviewed but no changes proposed because of no mention of structural bonding
 - BRSL proposed edits to para. 10 in AC 20-107B; objective: alignment with BRSL
- Other proposals include continuation of regulatory & industry activities to promote knowledge transfer and best practices (manufacturing, design and engineering) that can provide benefit supplemental to regulatory materials updates (guidance)
- Rationale for quality control document content

<u>SUMMARY OF TASKING – extended topics (continued)</u>

Item 2: Structural bonds & Weak Bonds (Continued)

- Much of work prepared and under review by subteam
 - Initial draft shared with full WG team and responses, mostly favorable, received.
 - Two WG members sharing dissenting position on classification of large disbond (between arresting features) being Category 2 damage (damage that hasn't lowered strength below limit load capability and detectable at next maintenance visit).
 - One expressed concern about whether disbond will be reliably detectable by visual alone (i.e., without specialized NDT)
 - Updated discussions on SDC vs new term Damage Tolerance Design Considerations (DTDC).
 - Other addition of corrosion having been seen as precursor to bond degradation in metal bond applications
 - Updated cost & benefit
- Discussed with ARAC to present report at the June 2021 meeting. Should be prepared for presentation at next TAE meeting.
 - Need ad hoc TAE meeting to support

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SUMMARY OF TASKING - extended topics (continued)

Item 3: Crack interaction

- Team direction:
 - Rule change:
 - No general consensus position as of now
 - Currently one two dissenting positions related to harmonization with EASA rule language
 - Guidance changes:
 - WG agreement on need for change, but no consensus on extent of clarification needed in guidance.
 - Will likely be two sets of recommendations each supported by rationale by subset of WG team
 - Based on observed roadblocks, FAA has provided feedback to sub-team as to what items they would like to see addressed in report.
 - Latest attempt to draft report to capture the above has been prepared by WG member submitted to smaller team for initial review. Work has
 progressed in development of a draft report in review and editing process, but nothing otherwise new to report at this time.
 - ARAC agreeable to presenting this report at September 2021 meeting.

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

<u>Milestones ^[1]:</u>

•TAE Status 2	March 2019
•WG face to face meeting (San Francisco)	April 2019
•TAE Status 3	May 2019
•Second Face to Face, ATL	
•Three recommendation reports – submitted to TAE	
•1: Structural Damage Capability – Single Load Path	Oct/Nov 2020 DONE
•2: Structural Bonding	Mid 2021
•3: Crack Interaction	Late 2021

^[1] May find impact to WG member availability to participate due to COVID-19 related business decisions (furloughs, leave of absences, etc.)

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 Transport Aircraft and Engines Subcommittee

Melissa Bravin Allan van de Wall Working Group Co-Chairs

22 July 2021

MEMBERS of ICI WG

Member Name	Organization	Role
Alan Strom	(FAA-ANE Standards) <u>FAA</u> <u>Representative</u>	FAA Representative
Philip Haberlen	(FAA-ANE Standards) <u>FAA</u> <u>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
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
Masato Fukushi	JCAB	Non-voting role
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, Turboshaft 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.

<u>SCHEDULE</u>

- Biweekly teleconferences through 2021
- WG was granted a schedule extension to July 2022
- FAA approved high aerosol flight campaign off coast of Japan to assess additional TWC data: Summer 2022
- WG proposed the following schedule to TAE:
 - July 2022: WG submits an interim report to FAA
 - Summer 2022: FAA conducts flight campaign, processes data
 - January 2023: WG reconvenes to assess flight campaign data
 - December 2023: WG submits a final report to FAA

STATUS OF TASKING

Complete:

- Appendix D Altitude-Temperature envelope to be extended to -90 C / ~FL550 to accommodate business jets (Task 1, 2)
- Appendix D TWC-Altitude envelope "cold side" (upper left-hand portion) will be scaled from adiabatic down to TBD scalar where flight campaign data exists (Task 1, 2)
- FAA funding approved to conduct high aerosol flight campaign off coast of Japan to assess TWC levels in polluted environments; 99th percentile TWC values may be affected (Task 1, 2)

To Do:

- Complete Task 2 (winter convection, oceanic vs. continental, peak TWC)
- Joint Probability Analysis study (Task 2)
- 90% complete: industry probe ICI event analysis (Task 3)
- Discuss non-harmonized FAA / EASA ICI regulations / guidance (Task 5)
- AC 20-147A update recommendations (Task 6)
- Assist FAA in determining cost / benefit analysis based on WG recommendations (Task 7)
- Develop ARAC report (Task 8)

AREAS of ARAC CONSIDERATION

• None

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

Clark Badie

Working Group Chair

27 May 2021

MEMBERS of ASHWG

Dave Leopold	Boeing	David.D.Leopold@boeing.com
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Damien Roujas	ATR	DAMIEN.ROUJAS@atr-aircraft.com
Jean Baron	EASA	jean.baron@easa.europa.eu

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.

<u>SCHEDULE</u>

- Initial meeting held February, 2021
- Monthly meetings will be needed to facilitate the discussion needed to complete this task. Telecons and electronic correspondence will be used to the maximum extent possible.
- Planned completion: Q3 2022

STATUS OF TASKING

- The ASHWG has been collecting data to help characterize the relationship between runway overruns and aircraft equipped with ground spoilers, and whether ground spoilers were armed prior to landing.
 - For awareness, the group has been reaching out though group connections for data sources including data from IATA, CAST, and ASIAS
 - Findings have been inclusive to date
 - Other information about ground spoiler operation is being reviewed.
- Next meeting is to determine whether the team agrees (proposes) to implement or not implement recommendations for alerting
 - If recommended, then the associated rule/advisory objectives will be established, along with proposals of where to insert new rule/advisory material
 - If not recommended, the group will complete the report and provide rationale

AREAS of ARAC CONSIDERATION

None at the moment

Transport Airplane Metallic and Composite Structures Working Group

Recommendation Report, Extension on Structural Bonding, Briefing to the TAE – July 2021 meeting

Kevin Davis, Boeing, Co-Lead Author

Douglas Jury, Delta Air Lines, WG Chair

Linda Jahner, FAA WG representative

Larry Ilcewicz, FAA CSTA WG Technical Support

July 27, 2021
Members of the Working Group

- Industry WG voting members:
 - 1. Kevin Davis
 - 2. Chantal Fualdes
 - 3. Salamon Haravan
 - 4. Benoit Morlet
 - 5. Antonio Fernando Barbosa
 - 6. Kevin Jones
 - 7. Toshiyasu Fukuoka
 - 8. David Nelson
 - 9. Ryan Higgins
 - 10. Doug Jury
 - 11. Mark Boudreau
 - 12. Eric Chesmar

(Boeing) (Airbus) (Bombardier) (Dassault Aviation) (Embraer) (Gulfstream) (Mitsubishi Aircraft) (Textron Aviation) (British Airways)

(Delta Air Lines) – Chairperson

(FedEx)

(United Airlines)

Structural Bonding Sub-Team supporting report development highlighted in green italics

- NAAs: FAA (Walt Sippel, Larry Ilcewicz, Michael Gorelik, Patrick Safarian, Linda Jahner); 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 Boeing participant), Mike Gruber (retired, former WG member & chair)

SUMMARY: Structural Bonding

FAA Extension Tasking for Structural Bonding, using a sub-team (see previous page)

- FAA requests further clarification from the working group on how to address disbonds and weak bonds as manufacturing defects
- Sub-team members had concerns from weak bonds and other understrength bond experiences involving processing surprises and expanded the tasking to address all known challenges potentially affecting safety
 - Weak bonds listed under manufacturing defects is somewhat confusing because, although it is clearly a manufacturing defect, it is unlike any other manufacturing defects that are typically listed (i.e., all other manufacturing defects are relatively small, more common and either starter flaws for metal fatigue or allowable defects for composites).
 - Bonding: 1) requires stringent/reliable manufacturing in-process QC practices of a qualified bond system to ensure a weak or understrength bond is extremely rare (justifying the secondary size constraint) and 2) localized to a size reliably protected by SDC or redundant design features + most members felt the need for 3) a substantiated inspection

Top-Level Summary of the Working Group Report Recommendations on Structural Bonding

- As with SDC/SLP report, no additional rule change is recommended for structural bonding.
- Several recommended guidance changes
 - > Primarily to AC 20-107B, recognizing other sources of FAA composite and metal bonding guidance
 - Limited content added to AC 25.571-1D (currently has no content on bonding), incl. more Refs to AC 20-107B
 - Other AC receiving some recommendations include AC 21-26: Quality System for the Manufacture of Composite Structures and Policy Statement PS-AIR-100-14-130-001: Bonded Repair Size Limit (BRSL)
- Develop detailed industry/regulatory international standards on best practices for bond knowledge transfer

Figure 1: Bonded Structural Integrity Properties Listed from Top to Bottom in Order of Importance

Showing the Priority in Mechanics and Physics of the Structural Bond Challenges

- Bond Material & Process Controls are the primary safety risk mitigation for bonded structure.
- Metallic weak bonds and composite understrength bonds of significant size are unacceptable and must be eliminated or controlled within acceptable size limits.
- Design limits are typically established to minimize peel loads in bonded structure (done through design constraints that avoid structural details leading to high peel loads).

2

- Adhesive materials have complex aging mechanisms that may depend on processes, real time & inelastic behaviors (difficult to predict). Adhesion failures between substrate & adhesive are unacceptable and unpredictable (related to aging).
- Secondary risk mitigation start with redundant design features to ensure sufficient residual strength and repeated load tolerance as a design precaution for any bond deficiencies no larger than critical size limits.

Primary Guidance Updates: AC 20-107B

- Add more structural bond material & process controls in para. 6 content
 - Expanded composite and metal bond content on stringent process controls
 - Building on industry best practices to qualify a "bond system", which requires re-qualification if any important part of the system changes
- Advance design and fabrication development with industry best practice
 - Past regulatory content in §23.573, which was used to specify structural bond guidance, no longer exists but has been adopted as industry best practice
 - Retaining redundant structural bond design was generalized to structural damage capability (SDC) to allow freedom in company-specific design criteria
- Advance fatigue, damage tolerance and related maintenance practices
 - Most TAMCSWG members recommended extending redundant design practice to classify the related maximum disbond as a Category 2 damage by definition, requiring structural substantiation and inspection (procedures and intervals)
 - Small transport & business jet OEM did not want added cost for risk mitigation, which would be achieved in company-specific, residual strength design criteria (needed for small airplane and rotorcraft applications of AC 20-107B)
 - Building on 2018 final report, more maintenance updates noted for para. 10

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Other Guidance Updates

- AC 25.571-1D
 - Additional references to AC 20-107B for stringent metal and composite bond material & process controls
 - Need to consider behavior of bonded structural details in crack growth analyses
 - Also adds recommendations to add bond defects into damage tolerance and LOV considerations, particularly as related to the metal weak bond phenomena
 - Note importance of tracking corrosion in the proximity of metal bonded structure for early indications of hydration and the onset of mixed mode failures
- AC 21-26A
 - Somewhat outdated versus AC 20-107B bond guidance
 - Recommends a cross-reference to AC 20-107B would remove possible inconsistent information on complex interactions between bond materials, process and design
- Others
 - Added guidance recommendations for updates to FAA Policy on Bonded Repair
 Size Limits (PS AIR-20-130-01), while retaining harmonization with EASA equivalent

Essential Guidance and Knowledge Transfer

Industry Regulatory Composite Working Group (IRCWG), chartered in 2005

- Developed industry best practices documented in CMH-17 as basis for AC 20-107B guidance: bonded structures (see Appendices 1 + 2 for processing detail, incl. recent critical defects) and fatigue & damage tolerance (F&DT) and maintenance
- Seven FAA/Industry Workshops for Bonded Structures (Seattle & Gatwick, UK, 2004) and F&DT/Maintenance (Chicago, 2006, Amsterdam, 2007, Tokyo, 2009, Atlanta, 2011 and Montreal, 2015 as a TAMCSWG Meeting for Hybrid F&DT)
- Currently focused on efficient maintenance practices for hybrid composite and metal structures workforce education and special projects (listed below)

IRCWG Meeting, Initiatives and Outcomes



- Efficient composite structural design (Sec. 4.2.4, including allowances for bonded composite SLP) & certification practices, including technology readiness, integrated product teams, and product value estimates
- Knowledge transfer for a sustainable workforce, with initial focus on maintenance (see Sections 4.2.5 through 4.2.7)
- Structural modifications and major repairs involving composites (SAE & CMH-17 initiatives for base & modified structure or repair certification issues and substantiation approaches, see 2018 Final Report)

Costs and Benefits

Cost (Section 5.1)

- Since none of the recommendations are for rules, but guidance, the costs are not related to mandatory actions. Regardless, the WG considered the affect of implementation of the guidance relative to a design/product that has not already implemented the actions (many OEMs have)
- Cost Estimates:
 - Addition of fasteners as disbond arrestment features: ~\$2900 / airplane
 - Enhanced quality control process testing: ~\$2.2M for ~600 airplanes/year
 - Additional non-destructive inspection (NDI) for treating disbonds between arrestment features as Cat 2 damage if visual inspections are ineffective: ~15 man-minutes/1 meter of stringer (is about 60 manhours for each wing skin / airplane)

Benefits (Section 5.2)

- Noted in final report
 - > Robust/stringent bond qualification and quality control plan already part of certification expectations
 - > Design precaution (chicken bolts, with freedom to use SDC design criteria) and bond life extension is expected
- The final report also covers indirect benefits as described in knowledge transfer

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Structural Bonding Background Chart Appears Directly Below

Followed by 2 Crack Interaction Status Charts

Flow Diagram of Structural Bonding TAMCSWG Task Extension



Damage Tolerance Design Criteria (DTDC)

Extension Topic 3: Crack Interaction

- Team direction:
 - Rule change:
 - No general consensus position as of now
 - Currently one two dissenting positions related to harmonization with EASA rule language
 - Guidance changes:
 - WG agreement on need for change, but no consensus on extent of clarification needed in guidance.
 - Will likely be two sets of recommendations each supported by rationale by subset of WG team
 - Based on observed roadblocks, FAA has provided feedback to sub-team as to what items they would like to see addressed in report.
 - Latest attempt to draft report to capture the above has been prepared by WG member submitted to smaller team for initial review. Work has progressed in development of a draft report in review and editing process, but nothing otherwise new to report at this time.
 - One proposal under consideration now is to propose further technical guidance (potential MoC) to be developed by an industry standards organization
 - Some reluctance shared by WG members on this proposal as well.
 - ARAC agreeable to presenting this report at December 2021 meeting. This may be ambitious given the reduced tolerance by WG members for frequent meetings, but there is some relief as having no other WG tasking on table full WG member attention can be paid. Hope to have a better sense of likelihood of getting a final report to TAE to support December ARAC within next couple of weeks.

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

Milestones^[1]:

•TAE Status 2	March 2019
•WG face to face meeting (San Francisco)	April 2019
•TAE Status 3	<u> </u>
•Second Face to Face, ATL	Oct 2019
 Three recommendation reports – submitted to TAE 	
•1: Structural Damage Capability – Single Load Path	Oct/Nov 2020 DONE
•2: Structural Bonding	Mid 2021 SUBMITTED to TAE
•3: Crack Interaction	Late 2021/Early 2022?

^[1] May find impact to WG member availability to participate due to COVID-19 related business decisions (furloughs, leave of absences, etc.)

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