Drone Advisory Committee

Public eBook

February 24, 2021 DAC Meeting • Virtual

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Virtual Meeting Logistics

- We ask that everyone remain muted during the presentations. After each briefing, there will be an opportunity for the DAC members to engage in discussion and ask questions.
- Because of the large size of the group we ask that you first raise your hand using the Zoom command on your dashboard. An FAA moderator will be monitoring the dashboard and call on you to begin speaking.
- This DAC meeting is being livestreamed and recorded. It will be made available for future viewing on the FAA's YouTube channel.
- This is a public meeting and there may be members of the media viewing the livestream. They will be instructed that all discussions are for background only.
- To access the livestream links, go to either of these websites: https://www.facebook.com/FAA or https://www.youtube.com/FAAnews

Confirmed FAA/DOT Attendees (on camera)

Name	Title	Org.
1. Jay Merkle	Executive Director, UAS Integration Office	FAA
2. Bradley Mims	Deputy Administrator	FAA
3. Angela Stubblefield	Chief of Staff	FAA
4. Laurence Wildgoose	Assistant Administrator, Office of Policy, International Affairs and Environment	FAA
5. Ali Bahrami	Associate Administrator, Aviation Safety	FAA
6. Teri Bristol	Chief Operating Officer, Air Traffic Organization	FAA
7. Timothy Arel	Deputy Chief Operating Officer, Air Traffic Organization	FAA
8. Mark Bury	Acting Chief Counsel, Office of General Counsel	FAA
9. Winsome Lenfert	Acting Associate Administrator, Airports	FAA
10. Claudio Manno	Associate Administrator for Security and Hazardous Materials Safety	FAA
11. Tonya Coultas	Deputy Associate Administrator, Security and Hazardous Materials Safety	FAA
12. Jeannie Shiffer	Acting Assistant Administrator, Office of Communications	FAA
13. Mike Romanowski	Director, Policy and Innovation Division	FAA
14. Bruce DeCleene	Director, Office of Safety Standards	FAA
15. Bill Crozier	Deputy Executive Director, UAS Integration Office	FAA
16. Gary Kolb	UAS Stakeholder and Committee Officer, UAS Integration Office	FAA

Confirmed FAA/DOT Observers		
Name	**Title**	**Org.**
1. Erik Amend	Manager, Executive Office, UAS Integration Office	FAA
2. Leesa Papier	Director, Office National Security Programs and Incident Response	FAA
3. Adrienne Vanek	Director, International Division, UAS Integration Office	FAA
4. Joe Morra	Director, Safety and Integration Division	FAA
5. Katherine Inman	Senior Attorney, Office of General Counsel	FAA
6. Elizabeth Forro	Special Assistant, UAS Integration Office	FAA
7. Marcus Cunningham	UAS Liaison, Aviation Safety Standards	FAA
8. Allison LePage	Digital Communications Manager, Office of Communications	FAA
9. Jessica Orquina	Lead Communications Specialist, UAS Integration Office	FAA
10. Khurram Abbas	Communications Specialist, UAS Integration Office	FAA
11. Jennifer Riding	Program Analyst, UAS Integration Office	FAA
12. Kristen Alsop	Digital Communications Strategist	FAA

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February 24, 2021 DAC Meeting • Virtual

Public Meeting Agenda
Time: 12:00 pm. to 2:00 p.m. Eastern Time
Location: Virtual Video Conference

	Start	Stop	
1.	12:00 pm	12:05 pm	**FAA – Greetings & Logistics**
2.	12:05 pm	12:10 pm	**DFO – Read Official Statement of the Designated Federal Officer**
3.	12:10 pm	12:15 pm	**DFO – Review of Agenda and Approval of Previous Meeting Minutes**
4.	12:15 pm	12:20 pm	**DFO – Opening Remarks**
5.	12:20 pm	12:25 pm	**Chair – Opening Remarks**
6.	12:25 pm	12:50 pm	**FAA – Response to Task Group #6 Recommendations – BVLOS Challenges**
7.	12:50 pm	1:15 pm	**FAA – Response to Task Group #8 Recommendations – Safety Culture**
8.	1:15 pm	1:25 pm	**Chair – Task Group #9 Update**
9.	1:25 pm	1:30 pm	**Chair – Operations and Technology Subcommittee Update**
10.	1:30 pm	1:40 pm	**FAA – New Tasking to DAC**
11.	1:40 pm	1:50 pm	**Chair – New Business/Future Agenda Topics**
12.	1:50 pm	1:55 pm	**DFO – Closing Remarks/Final Thoughts**
13.	1:55 pm	2:00 pm	**Chair – Closing Remarks/Final Thoughts**
14.	2:00 pm	2:00 pm	**Chair – Adjourn**

Questions/Comments: Contact Gary Kolb, UAS Stakeholder & Committee Officer (gary.kolb@faa.gov or 202-267-4441).

Drone Advisory Committee

DAC Membership – As of 2/23/2021

Stakeholder Group	Members
Designated Federal Officer	**Jay Merkle**, Executive Director, UAS Integration Office, Federal Aviation Administration
Chair	**Michael Chasen**, Chairman of the Advisory Board, PrecisionHawk USA, Inc.
Airports and Airport Communities	**Seleta Reynolds**, General Manager, Los Angeles Department of Transportation **Dr. Paul Hsu**, Founder and Chair, HSU Educational Foundation
Labor (controllers, pilots)	**Trish Gilbert**, Executive Vice President, National Air Traffic Controllers Association **Joseph DePete**, President, Air Line Pilots Association (ALPA)
State, Local, Tribal and/or Territorial Government or Appropriate International Entity	**David Greene**, Bureau of Aeronautics Director, Wisconsin Department of Transportation **Bob Brock**, Director of Aviation and UAS, Kansas Department of Transportation **Mark Colborn,** Senior Corporal, Dallas Police Department **Michael Leo**, Captain, New York City Fire Department
Navigation, Communication, Surveillance, and Air Traffic Management Capability Providers	**Mariah Scott**, President, Skyward (a Verizon company) **Matt Parker**, President, Precision Integrated Programs
Research, Development, and Academia	**Robie Samanta Roy**, Vice President, Technology, Government Affairs, Lockheed Martin Corporation
Traditional Manned Aviation Operators	**Mark Baker**, President and Chief Executive Officer, Aircraft Owners and Pilots Association **Houston Mills**, Vice President, Flight Operations and Safety, United Parcel Service (UPS) **Lorne Cass**, President**,** Aero NowGen Solutions, LLC **Molly Wilkinson**, Vice President, Regulatory Affairs, American Airlines
UAS Hardware Component Manufacturers	**Brad Hayden**, Founder and Chief Executive Officer, Robotic Skies **Christian Ramsey**, President, uAvionix Corporation
UAS Manufacturers	**James Burgess**, Chief Executive Officer, Wing (an Alphabet company) **Michael Sinnett**, Vice President Product Development and Strategy, Boeing Commercial Airplanes **David Carbon**, Vice President, General Manger, Amazon Prime Air **Adam Bry**, Co-founder and Chief Executive Officer, Skydio
Corporate UAS Operators	**Greg Agvent**, Senior Director of National News Technology, CNN **Todd Graetz**, Director, Technology Services, UAS Program, BNSF Railway
Citizen UAS Operators	**Kenji Sugahara**, Chief Executive Officer and President, Drone Service Providers Alliance **Vic Moss**, Owner, Moss Photography
UAS Software Application Manufacturers	**Jaz Banga**, Co-Founder and Chief Executive Officer, Airspace Systems, Inc. **Chris Anderson**, Chief Executive Officer, 3DR

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Stakeholder Group	Members
Agricultural Interests	**Brandon Torres Declet**, Chief Executive Officer and Co-Founder, MEASURE
Advanced Air Mobility	**Dr. Jaiwon Shin**, Executive Vice President, Head of UAM Division and CEO, Genesis Air Mobility, Hyundai Motor Group **Dr. Catherine Cahill**, Director, Alaska Center for Unmanned Aircraft Systems Integration (ACUASI)
Industry Associations or other specific areas of interest as determined by the DAC DFO	**Brian Wynne**, President and Chief Executive Officer, Association for Unmanned Vehicle Systems International **Thomas Karol**, General Counsel, National Association of Mutual Insurance Companies **David Silver**, Vice President for Civil Aviation, Aerospace Industries Association **Lee Moak**, Founder & Chief Executive Officer, The Moak Group

FAA – Response to Task Group #6 Recommendations – BVLOS Challenges

UAV Certification

Recommendation 1:
Recommend FAA allow an incremental UAS type certification under 14 CFR Part 21.17(b) that varies with risk and complexity. The Means of Compliance (MOC) for the certification basis will be flight-test based and comply with the hours/population density matrix as defined in the streamlined process. To determine the flight test hour allocation for each airworthiness requirement, applicants must address operational risks to include hazards, risk classification, event likelihood and consequences. Since the current D&R approach informally addresses operational risks for risk categories 1 thru 3 (as defined in the 21.17(b) draft advisory circular), it is recommended further that a traditional operational risk assessment (ORA) approach to assessing operational risk and mitigations be employed and accepted for risk classes 4 thru 6.

FAA Response 1:
The FAA fully agrees that the certification approach for UAS should be risk-based and informed by the specific risks encountered by each UAS in its operating environment. The FAA is currently using a risk-based approach for UAS type certification, and anticipates issuing performance-based airworthiness criteria tailored as necessary to each individual applicant's design. Some applicants may pursue certification using durability and reliability (D&R) testing with the specific requirements, again tailored for different designs and concepts of operation commensurate with the risks posed. D&R testing can demonstrate an acceptable number of successful representative flight hours across the complete operational envelope and range of limits to substantiate the overall UAS reliability.

The D&R means of compliance may be used by certain UAS in Risk Class 1, 2, & 3. Larger UAS, higher-risk UAS, or other UAS that do not meet the D&R eligibility criteria may pursue certification using other airworthiness criteria and means of compliance. The FAA plans to leverage existing airworthiness standards such as 14 CFR part 23 as well as industry standards as means of compliance to certify various higher-risk UAS.

Safety assessments play a vital role in the certification process. An ORA may be helpful or needed in some cases to identify and mitigate the risks associated with a UAS operation. The ORA process as described by the previous draft 14 CFR 21.17(b) Advisory Circular (AC) may be helpful for some applicants with UAS in Risk Classes 4-6, but the ORA process may not always be required for all such certification projects. The ORA process was largely described as a tool to develop certification basis requirements. If a UAS will be certified using airworthiness standards (certification basis requirements) that are known to be fully valid and comprehensive, an ORA as described by the previous draft AC for § 21.17(b) may not be needed.

Recommendation 2:
Recommend FAA affirm use of the 44807 exemption for applicants seeking to conduct commercial operations under any operational part of the CFR (91, 135, etc.) until the applicant is issued a type certificate or FAA's section 44807 authority expires, thus allowing the applicant sufficient time to resolve the exemption issues through real operational data. Each applicant would be required to commit sufficient time and resources to their type certification efforts while operating under the 44807 exemption to continue to enjoy the privileges contained therein. Applicants cannot rely solely on the 44807 as the means to achieve commercial operations. This must be run concurrent with an active type certification campaign.

> ***FAA Response 2:***
> *The FAA concurs with the continued use of the special authority in Section 44807. Applicants should be mindful that it is a time-limited authority and should not be requested as an alternative to pursuing conventional airworthiness certification when required. We strongly encourage the UAS manufacturer and operator communities to work together toward UAS design solutions that are sufficient to conduct more complex operations beyond those allowed under 14 CFR part 107, and to start working with the FAA to certify those solutions. The FAA believes this is a crucial component to enabling more complex, non-part 107 UAS operations.*

Recommendation 3:
Recommend the FAA provide clear, actionable guidance regarding the process by which applicants will be able to demonstrate suitable mitigations for air risk and achieve approval within a 44807 exemption or Type Certificate framework. Consistency is needed regarding roles and responsibilities for aircraft, airmen, and operational approvals within the FAA. Baseline certification for UAS should be done under existing parts of the CFR and focused on the airworthiness of the aircraft, not the operational environments (noting possible exception of application of DAA standards and equipment.

> ***FAA Response 3:***
> *The FAA agrees that the baseline certification for unmanned aircraft, as well as 44807 exemptions, should focus on the airworthiness of the aircraft, and not the operational environments. While type certification is a design approval and does not provide for operational authorization, applicants may elect to demonstrate capabilities and performance within their type certification to support operations.*
>
> *Ultimately, clear, actionable guidance to address the operational risks of a mid-air collision will be included as part of a revision to the operating rules, and based on experiences gained through the IPP, partnerships for safety, and other research.*

Recommendation 4:
During the period when applicants are utilizing 44807 and 21.17(b) processes to gain type

certification, recommend that FAA form a working group with set timelines to evaluate applicability of other existing CFR parts (e.g. parts 23, 25). This effort should reference existing rules and provide recommended applications and modifications to address future and BVLOS operations—to include autonomous aircraft. The working group would conduct a section-by section evaluation for each part to identify and draft revisions (if necessary) to those parts to cover UAS certification. In the interim period the ACO should be consulted during review and approval of 44807 applications to ensure the exemption requests are closely aligned with the type certification efforts.

FAA Response 4:
The FAA concurs that evaluation of applicability of existing CFR parts is a necessary step in updating our regulatory framework to enable UAS operations by rule. Typically, this work is conducted in the course of rulemaking efforts, all of which have timelines and milestones set and agreed upon at the FAA executive level. Additionally, the FAA Aircraft Certification Service has established the Center for Emerging Concepts and Innovation (CECI) to facilitate the safe introduction of new, innovative products through early engagement with applicants and developing clear paths to design approval and entry into service. We are open to additional feedback to ensure our existing efforts meet this need.

Detect and Avoid (DAA) Technology

Recommendation #1:
Recommend FAA accept the work of standards development organizations as acceptable means of compliance for operational approval and certification of DAA systems. This includes definitions (well clear), collision risk classifications (in what airspace is the standard applicable), performance metrics (risk ratios), test methodologies, simulation and analysis tools, and supporting data (encounter models). For UAS conducting BVLOS operations. FAA should accept the work of RTCA SC-228 and ASTM F38 WK62668 DAA Performance Standards and WK62669 DAA Test Methods.

FAA Response to Recommendation #1
The FAA understands the intent of this recommendation and concurs that additional work is needed to clarify how DAA technologies will be evaluated and approved as part of more complex UAS operations. The FAA fully acknowledges that these issues are challenging for all parties. We will seek opportunities to provide more clarification in 2021, and are still weighing the appropriate method for doing so.

Industry standards provide common strategies and standards to inform the determination of requirements, and may be recognized as acceptable means of compliance with little or no change depending on the operational

requirements. The FAA does not concur that accepting specific industry standards outright is necessary for industry to take advantage of these standards – we will continue evaluating applications that use these standards based on specific operational concepts, and will look for opportunities to streamline evaluation based on consistent use over time. This approach is based on our experience working with industry to evaluate different operational concepts and candidate solutions, ranging from adherence to the principles of the existing concepts that a converging aircraft is responsible for avoiding to expanding the small UAS principle that a UAS must always yield to manned aircraft.

Additionally, for solutions that reside within the aircraft and would naturally be evaluated as part of an aircraft certification, the FAA will work with applicants to certify onboard DAA equipment and specify its capabilities through the type certification process.

Recommendation #2:
Recommend FAA define operating environments for which a DAA system is not required. Examples are obstacle shielding and terrain masking. This will enable a variety of use cases which are currently defined as BVLOS, but do not pose a significant risk of collision with manned aircraft.

FAA Response to Recommendation #2
The FAA concurs that there may be certain operating environments or concepts for which an active DAA system is not required. These concepts are currently under evaluation through infrastructure and obstacle masking applications. FAA will provide the DAC with an initial assessment of operating environments in which DAA systems may not be required by the end of calendar year 2021. Some linear infrastructure, for example power lines, represent an inherent obstacle to flight and the FAA is exploring the viability of proximity to those obstacles in combination with NOTAMs, charting, or other methods to convey information to other aircraft in the vicinity.

Recommendation #3:
Until DAA system performance standards have been accepted and conforming equipment is available, recommend FAA leverage the findings of the Pathfinder and IPP programs to enable expansion of safe BVLOS operations. FAA should provide or adopt guidance that defines strategic, tactical, and operational air risk mitigations acceptable for BVLOS authorization through 91.113 and 107.37 waivers.

FAA Response to Recommendation #3
The FAA concurs with the intent of this recommendation and acknowledges

that additional work is needed to define near term paths for operators to gain BVLOS authorization. The FAA is working with several industry partners through the programs identified in this recommendation, as well as others, to identify acceptable risk mitigations, and will seek to be more transparent, as appropriate, when approvals are issued in the near term. The FAA is preparing follow-on efforts to continue defining strategic, tactical, and operational air risk mitigations acceptable for BVLOS authorization. Additionally, the FAA is prepared and open to expanding safe BVLOS operations in the absence of DAA system performance standards – reference Recommendation #2 in this section, there may be certain BVLOS operations where DAA systems may not be required.

Recommendation #4:
Recommend FAA work with industry and aviation stakeholders to create, endorse, and promote technology suitable for collaborative Detect and Avoid (DAA) between manned and unmanned aircraft. The solution should be readily adoptable by all NAS users and anonymized. Implementations should be interoperable with existing cooperative technologies (ADS-B), and new technology could encompass portable devices, low-cost on-board transceivers, and network-connected software applications.

FAA Response to Recommendation #4
The FAA concurs with the intent of this recommendation – collaboration between the manned and unmanned industries on collaborative, interoperable airspace management tools is necessary to unlocking future economic benefits and expansion of automated aviation solutions. We believe the intent of this recommendation is captured in a more recent DAC tasking, and encourage the DAC to provide specific, actionable recommendations as part of that tasking. The FAA is already engaged with industry and academia through multiple venues to help advance DAA solutions and determine the suitability of particular technologies, including Airborne Collision Avoidance System X for Small UAS or "ACAS-sXu," Remote Identification, and UAS Traffic Management (UTM).

Autonomy

Recommendation #1:
To standardize the terminology of automation, the FAA should adopt the terminology developed by the ASTM AC377 group focused on autonomy in aviation. These terms are published in ASTM Technical Report TR1, Autonomy Design and Operations in Aviation. The terms are also being published in industry consensus standard F3060, Standard Terminology for Aircraft, from ASTM International. The FAA should adopt this terminology and encourage industry to adopt and use the same terminology.

FAA Response to Recommendation #1
The FAA considers the terminology, the detailed function, and the intended use case of each proposed product during certification. Having a single source of terminology, while desirable, is not as urgent as industry demonstrating their proposed automation technology for a specific intended function is safe, reliable, functional, and capable of safe operation in tests representative of real-world civil use cases. The FAA participated in AC377, and supports the terminology in the technical reports ASTM has published, but also recognizes other standards exist and other definitions and terminology are acceptable.

Recommendation #2:
FAA should focus on defining non mission specific operational risk profiles (parallel in thinking to the JARUS SORA Standard Scenarios) that industry can meet that define a range of performance requirements for relevant functions for that operational risk profile.

FAA Response to Recommendation #2
The FAA is open to working further with the DAC to provide sample standard scenarios that industry considers most relevant. The FAA acknowledges that there is certainly an opportunity to streamline evaluations if the industry consolidates around standard scenarios previously evaluated by the FAA, and enables the FAA to direct its focus to any deviations from the standard. As a safety regulator, the FAA must evaluate any and every operational application that industry requests.

Recommendation #3:
The FAA should agree to industry consensus standards and/or performance-based approaches for how to classify operator functions for the purpose of automation and the methodology to establish baseline operator performance for that function. Then, FAA participate and fund research to fill in any technical gaps that exist where information is not available.

FAA Response to Recommendation #3
The FAA agrees on the value of classifying operator functions to facilitate approvals, after sufficient experience and convergence on what functions and capabilities are appropriate. The FAA is committed to continued collaboration with industry and aviation stakeholders to find solutions. We will continue to focus resources on evaluating design and operating concepts as they are presented to us.

Recommendation #4:
The FAA should partner with industry to create performance-based requirements, standards, and a regulatory construct to support autonomous functions. The operational risk level should include consideration of risks and safety benefits as well as the potential for variable performance needs within the scope of individual operations.

- Standards should be based on the equivalent baseline operator performance defined in

recommendation #3 above to approve or certify the equivalent autonomous functions for the operational risk level.

- Training standards need to account for automation in creating and approving appropriate operator "qualification" requirements to operate the specific system, including how monitoring and alerting is done and only provide the operator with the information they need to safely perform their job.
- Regulatory construct needs to allow responsibilities to be dynamically allocated between the operator, onboard systems, and remote systems in any way the technology enables.

FAA Response to Recommendation #4
The FAA concurs with this recommendation; however, this work will take time and extensive collaboration. In line with the FAA's 'operations first' approach to enabling innovative technology solutions, in the near term we encourage industry to submit applications in furtherance of autonomous functions. The FAA acknowledges that these approvals will be ad-hoc and operationally specific at the outset, but that development of sustainable performance based requirements and regulations must be informed by operations first. The FAA commits to being as transparent as possible in communicating about precedent-setting approvals, while protecting applicant-specific intellectual property and proprietary data, and to ensuring the basis of precedent-setting approvals is consistently applied across its various programs. We strongly encourage industry to take a build-up approach to operational risk exposure when it comes to automation, and acknowledge this may include building up to their proposed use and business cases.

Recommendation #5:
The FAA should partner with industry to create performance-based requirements/standards for UTM and flight planning systems to approve or certify these systems. Certain waivers could be automatically approved when using an approved UTM system.

FAA Response to Recommendation #5
The FAA concurs that performance-based requirements and standards for using UTM services are needed. The FAA is already working with industry through ASTM F38 on UAS Traffic Management (UTM) Service Supplier (USS) Interoperability Standards, as well as with industry and NASA through the UTM Pilot Program (UPP), to determine the next steps of UTM and support initial implementation of UTM operations using a cloud services infrastructure. In response to DAC Task Group 7, the FAA will engage in further coordination on UTM concept development including discussion on specific standards activities, and encourages the DAC and UAS industry at large to engage in these efforts currently underway with NASA.

Ultimately, this work will necessarily take time and extensive collaboration. In line with the FAA's 'operations first' approach to enabling innovative technology solutions, in the

near term we encourage industry to submit applications using UTM services to mitigate operational risks. The FAA acknowledges that these approvals will be ad-hoc and operationally specific at the outset, but that development of sustainable performance based requirements and regulations must be informed by operations first. The FAA commits to being as transparent as possible in communicating about precedent-setting approvals, while protecting applicant-specific intellectual property and proprietary data, and to ensuring the basis of precedent-setting approvals is consistently applied across its various programs.

Recommendation #6:
The government is normally required to assess the net benefit of rulemaking activities. Embracing automation should be no different. The FAA should create a framework for assessing the net benefit of automated systems, including non-traditional aviation risks, and a reduction in overall societal risk should be taken into account in the approval process

FAA Response to Recommendation #6
The FAA concurs that assessing net costs and benefits, including non-aviation costs and benefits, of potential operations is crucial both to realizing societal benefits of unmanned technologies, as well as increasing public acceptance of those technologies. One of the biggest barriers in creating such a framework is lack of data to appropriately analyze potential risks and benefits. Non-aviation sector industries and companies have been reticent to share data about injuries or fatalities in support of their UAS operational applications, which makes it hard for the FAA to appropriately account for potential benefits of UAS use. The FAA is open to working further with the DAC to identify sources for such non-aviation data, and how best to apply it in the context of evaluating UAS operational risk.

Recommendation #7:
The FAA should work with key stakeholders (manned and unmanned aviation) to define a performance-based definition of well-clear and associated standard. Such a definition and standard should take into account terrain, obstacles, and other "masking" artifacts present at low altitude. Note: Recommendation considers the SARP recommendations (illustrated in FAA draft AC 90-WLCLR [withdrawn]) and is to include use cases outside the intent of the standard (e.g. operations in populated areas below 400ft AGL or near obstacles).

FAA Response to Recommendation #7
The FAA understands the intent of this recommendation and concurs that additional work is needed to clarify the performance level for 'seeing' and avoiding other aircraft. The FAA fully acknowledges that these issues are challenging for all parties, and will seek opportunities to provide more clarification in 2021, but are still weighing the appropriate method for doing so. Operators are free to reference the SARP recommendations of well-clear in

their proposals, but the FAA does not consider that to be the only way to meet the intent of §91.113.

Command/Control (C2) and Spectrum

Recommendation #1:
The FAA should engage in both intra-agency and inter-agency (across FAA, FCC and NTIA) collaboration, to ensure that all relevant stakeholders of these three agencies contribute to a single, comprehensive report to Congress.

FAA Response to Recommendation #1
The FAA concurs. In accordance with Section 374 of the FAA Reauthorization Act of 2018, the FAA has prepared a report on the use of spectrum by UAS. This report takes into account valuable feedback and input from the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC). Both the FCC and NTIA are submitting additional documentation to supplement the FAA's report. The FCC and NTIA documents present additional information specific to each agency's authorities and jurisdictional purviews. All three documents are in alignment on UAS use of radio spectrum and on the technological, operational, and regulatory impediments that must be addressed and overcome. The FAA continues to collaborate with the FCC, NTIA, and relevant stakeholders on UAS C2 and spectrum issues and concerns.

Recommendation #2:
UAS operations will be diverse and thus the spectrum that can meet those needs will be diverse as well. All spectrum that meet the performance-based requirements from the safety case should be considered.

FAA Response to Recommendation #2
The FAA concurs and is taking a data driven and performance-based approach towards the use of spectrum. The FAA continues to gain valuable information regarding C2 performance and spectrum acceptability through multiple industry partnership programs. The FAA and the FCC meet regularly to coordinate the UAS performance requirements, issues, and concerns on all spectrum. The FAA is open to additional feedback from the DAC on specific policy or trends it should be considering in the course of these programs and discussions.

Recommendation #3:
The World Radio Conferences of 2007 and 2012 allocated spectrum to be made available to UAS in the C-band and L-band for global exclusive use by UAS for aeronautical radio and navigation services. The FAA should assert its oversight of this use and take the lead to ensure

that this spectrum is maintained for the use of UAS operators. Any consideration of a sharing or auction must maintain safety primacy for UAS.

FAA Response to Recommendation #3
The FAA concurs and has been supporting both C-Band and L-Band for global use by UAS for aeronautical radio and navigation services, and continues to promote adequate protection from interference for all aviation-spectrum. This activity has included collaborating with standards development organizations, industry, academia, and the FCC. The FAA is open to additional feedback from the DAC on what it could be doing in furtherance of this recommendation to ensure its current activities are adequate.

Recommendation #4:
The three agencies, working within the bounds of their jurisdictional competencies, should work closely together. Specifically, the FCC as the agency with responsibility over commercial and public safety spectrum management and licensor of spectrum; the FAA with jurisdiction to ensure safe aircraft operations in the NAS, including managing availability and use of spectrum for aviation resources; and NTIA to manage spectrum policy for federal users and to coordinate with the FCC on international spectrum policy.

FAA Response to Recommendation #4
The FAA concurs that these three agencies should continue working within the bounds of their jurisdictional competencies and continues to collaborate with the Federal Communications Commission (FCC), National Telecommunications and Information Administration (NTIA), and relevant stakeholders on UAS C2 and spectrum issues and concerns. In addition to the collaboration on the report required by Section 374 of the FAA Reauthorization Act of 2018, the FAA and FCC meet regularly to discuss UAS C2 and Spectrum issues and concerns

Recommendation #5:
The FAA, as well as the FCC and NTIA, should identify a champion from each agency with a remit to create this single comprehensive report to Congress, with monthly readouts to senior agency executives.

FAA Response to Recommendation #5
In accordance with Section 374 of the FAA Reauthorization Act of 2018, the FAA has prepared a report on the use of spectrum by UAS. This report takes into account valuable feedback and input from the NTIA and FCC. Both the FCC and NTIA are submitting additional documentation to supplement the FAA's report. The FCC and NTIA documents present additional information specific to each agency's authorities and jurisdictional purviews. All three documents are in alignment on UAS use of radio spectrum and on the technological, operational, and regulatory impediments that must be addressed and overcome. The FAA continues to collaborate with the FCC, NTIA, and

relevant stakeholders on UAS C2 and spectrum issues and concerns. Regarding monthly readouts, the FAA is committed to updating FAA executives as necessary, which could be monthly or more frequently.

Recommendation #6:
The FAA should assess the existing work already completed, and standards already created and in process, to determine how spectrum resources are best utilized for UAS. This work should include recognizing commercial cellular as an available option for low altitude sUAS. Any such determination should be communicated through FAA policy or similar manner of communication to allow smaller operators to consider and evaluate for their intended application and operations.

FAA Response to Recommendation #6
The FAA continues to work with industry to evaluate UAS spectrum resources. The FAA has been collaborating with CTIA, GSMA, 3GPP and the FCC to explore commercial cellular as an available option for low altitude UAS operations, and continues to gain valuable information regarding C2 performance and spectrum acceptability through multiple industry partnership programs. The FAA participated in the ANSI UAS Standardization Collaborative to examine UAS standards usage and identify potential gaps, including in the C2 and Spectrum areas. All of these items continue to help the FAA dedicate resources and develop policy. The FAA welcomes DAC members and industry partners to share their relevant data in this area as well.

FAA – Response to Task Group #8 Recommendations – Safety Culture

FAA Response Tasking 8:
The FAA greatly appreciates the time and thought the DAC applied to this task. We acknowledge and welcome the DAC's recommendation to engrain safety culture into the UAS community as we have with the manned aviation community. The FAA response to the DAC Safety Culture recommendations as follows:

- **FAA concurs with all recommendations**
- Report will be useful to guide future programs, independent of specific recommendations and responses
- **Trust and Relationship**
    - The FAA is committed to continue to build trust and relationships with operators and UA associations. The FAA is continuously building and developing relationships based on trust and emphasizing safety. These relationships include involvement in such programs such as Beyond, PSPs, UAST and routinely dealing with UA associations such as the AUVSI, AMA, Commercial Drone Alliance and others.
    - The FAA will participate in significant UA events to promote safety and compliance. The FAA has committed to both in the past and in the future to supporting a wide variety of UAS symposiums and conferences with help desks, presentations, and Q and A from FAA executives and SMEs.
    - **Request:** The FAA seeks support from the DAC members to promote these attributes within their organizations and with their influence in the community
- **Education and Continuous Learning**
    - The FAA incorporated UA into the FAA Safety Team (FAAST) program
        - Volunteer "DronePros" work with the FAA to support education within the UA community. The DronePro Representatives function as a force multiplier for the Agency's UAS safety outreach and communications. They enable the wide dissemination of the FAASTeam's UAS safety related information, regulations, policy and/or guidance to the UAS community through the application of robust outreach resources and communication networks the FAA does not have direct access to. The DronePros are essential to promoting a UAS safety culture.
        - The FAAST educational material addresses UA operations, the FAAST Team is also engaged with the FAA's Office of Communications in the development and deployment of electronic messaging which is focused on promoting safe UAS operations.
    - The FAA uses social media platforms to reach UA operators who otherwise may not follow legacy type aviation messaging.
        - Drone Safety Week is a primary example that we intend to continue
    - The FAA is working to increase operator knowledge and safety of operations requiring a part 107 waiver with updates to the Order 8900.1, waiver guidance and drone zone enhancements.
    - **Request:** The FAA seeks support from the DAC to promote participation in FAAST, promote faasafety.gov and to follow FAA on social media

- **Operator Ownership and Accountability**
    - The FAA will continue to embed these principles into all regulations and policies. The FAA integration strategy includes "safety ownership" and "learning culture" as part of its certification and waiver/exemption processes. Existing and evolving regulatory framework ensures and promotes individual safety responsibility. Recent publication of the operations over people and night rule is an example of the FAA allowing operators take ownership of complying with a rule instead of requiring analysis of each operation.
    - The FAA had encouraged operators to perform safety risk assessments when proposing operations that require waivers or exemptions. This process which has been discussed with many industry partners allows the operator to take accountability in regards to waivers and how to mitigate to an acceptable level of safety.
    - No specific recent or planned activities
- **Other Actions**
- Promote the use of NASA's Aviation Safety Reporting System (ASRS) by UAS pilots
- Safety Culture Self-Assessment Tool and Flight Risk Assessment Tool (small commercial operators): The FAA recommends that the relevant industry associations and suppliers develop and promote these tools among their members
    - May be some differences to be adopted and applied within the target audience
    - FAA will promote the use of such tools through our educational programs
- For complex BVLOS operators, FAA will promote operator accountability and SMS that is similar to manned aviation.
- AFS is in the process of developing operational issue papers as means to ensure operators and the FAA have a common understanding of the challenges involved with requested operations from the beginning of a proposed project/operation.
- The FAA currently requires most operators with complex 107 waivers or complex exemptions to establish and maintain a Safety Management System (SMS) appropriate for the size, scope, and complexity of the operations.

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Housekeeping

- Meeting is being livestreamed on the FAA's YouTube, Twitter and Facebook pages.
- Meeting is also being recorded and will be made available for future viewing.
- Please remain muted during the presentations.
- After each briefing, there will be an opportunity for the members to engage in discussion and ask questions.
- Please raise your hand using the Zoom command on your dashboard and an FAA moderator will call on you to speak.
- FAA team is monitoring the livestream, if you have any problems during the meeting, please reach out in the comments.

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Official Statement of the DFO

Jay Merkle

Designated Federal Officer,

FAA Drone Advisory Committee

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Official Statement of the DFO

PUBLIC MEETING ANNOUNCEMENT

Read by: Designated Federal Officer Jay Merkle

Drone Advisory Committee

February 24, 2021

In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC. Notice of the meeting was published in the Federal Register on:

January 28, 2021

Members of the public may address the committee with PRIOR APPROVAL of the Chairman. This should be arranged in advance.

Only appointed members of the Advisory Committee may vote on any matter brought to a vote by the Chairman.

The public may present written material to the Advisory Committee at any time.

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Brandon Torres Declet
Chief Executive Officer
and Co-Founder, MEASURE

Dr. Catherine Cahill
Director
Alaska Center for Unmanned
Aircraft Systems Integration

Kenji Sugahara
President and Chief Executive
Officer, Drone Service
Providers Alliance

Adam Bry
Co-founder and
Chief Executive Officer
Skydio

Vic Moss
Owner
Moss Photography

Seleta Reynolds
General Manager, Los Angeles
Department of Transportation

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

David Carbon
Vice President and General Manager, Amazon Prime Air

Dr. Paul Hsu
Founder and Chair, HSU Educational Foundation

Brad Hayden
Founder and Chief Executive Officer, Robotic Skies

Molly Wilkinson
Vice President, Regulatory Affairs, American Airlines

Dr. Jaiwon Shin
Executive Vice President, Head of UAM Division and Chief Executive Officer, Genesis Air Mobility

Matt Parker
President, Precision Integrated Programs

Agenda

	Start	Stop	
1.	12:00 pm	12:05 pm	FAA – Greetings & Logistics
2.	12:05 pm	12:10 pm	DFO – Read Official Statement of the Designated Federal Officer
3.	12:10 pm	12:15 pm	DFO – Review of Agenda and Approval of Previous Meeting Minutes
4.	12:15 pm	12:20 pm	DFO – Opening Remarks
5.	12:20 pm	12:25 pm	Chair – Opening Remarks
6.	12:25 pm	12:50 pm	FAA – Response to Task Group #6 Recommendations – BVLOS Challenges
7.	12:50 pm	1:15 pm	FAA – Response to Task Group #8 Recommendations – Safety Culture
8.	1:15 pm	1:25 pm	Chair – Task Group #9 Update
9.	1:25 pm	1:30 pm	Chair – Operations and Technology Subcommittee Update
10.	1:30 pm	1:40 pm	FAA – New Tasking to DAC
11.	1:40 pm	1:50 pm	Chair – New Business/Future Agenda Topics
12.	1:50 pm	1:55 pm	DFO – Closing Remarks/Final Thoughts
13.	1:55 pm	2:00 pm	Chair – Closing Remarks/Final Thoughts
14.	2:00 pm	2:00 pm	Chair – Adjourn

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Opening Remarks from the DFO

Jay Merkle

Designated Federal Officer,

FAA Drone Advisory Committee

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Opening Remarks from the DAC Chair

Michael Chasen

Chair, FAA Drone Advisory Committee

Chairman of the Advisory Board, PrecisionHawk USA Inc.

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

DAC Task Group #6 – BVLOS

Mike Romanowski

Director, Policy & Innovation

Aircraft Certification Service

Bruce DeCleene

Director, Office of Safety Standards

Flight Standards

UAV Certification

DAC recommendations

- Recommended FAA allow incremental certification that varies with risk and complexity
- Sought clarity on the usage of 44807 exemptions – affirmation of its usage and guidance for BVLOS operations
- Recommended the FAA form a working group to evaluate applicability of existing airworthiness standards (14 CFR parts 23/25/27/29) for UAS

UAV Certification

FAA Responses

- FAA is utilizing a risk-based approach towards type certification of UAS
- FAA concurs with the continued use of 44807 exemptions; industry should transition to a Certificate of Airworthiness for operations that fall outside the scope of Part 107
- To facilitate the safe introduction of new, innovative products AIR has established the Center for Emerging Concepts and Innovation (CECI)

Detect and Avoid

DAC Recommendations

- Recommend FAA accept the DAA work of standards development organizations
- Recommend FAA define areas where a DAA system is not required
- Leverage findings from Pathfinder and IPP to enable BVLOS operations
- Recommend FAA work with industry and aviation stakeholders to create, endorse, and promote technology for DAA

Detect and Avoid

FAA Responses

- FAA can currently accommodate DAA solutions through waivers and exemptions: DAA strategy and the operational environment must provide an acceptable level of safety
  - FAA is evaluating applications where DAA systems are not required such as infrastructure and obstacle masking
- FAA will continue to work with industry as standard solutions are developed
  - FAA is actively engaged with industry and academia in many areas, to include ASSURE, industry consensus standards bodies, and efforts supporting ACAS sXu and UTM
  - FAA is continuing the momentum of the IPP through BEYOND, focusing on the expansion of safe, repeatable BVLOS operations
  - FAA acceptance of industry standards outright is not necessary for their usage

Autonomy

DAC Recommendations

- Adopt terminology from ASTM AC377
- FAA should define “standard scenarios” for requirements for particular operational risk profiles
- FAA should agree to industry consensus standards and/or performance-based approaches and fund research to fill in technical gaps
- FAA should partner with industry to create performance-based requirements and standards for autonomous functions and UTM
- FAA should create framework for assessing the net benefit of automated systems including reduction in overall societal risk
- FAA should work with key stakeholders to define performance-based definition of well-clear

Autonomy

FAA Responses

- FAA supports AC377, but recognizes other definitions and terminology are acceptable
- FAA is open to working further with the DAC on identifying standard scenarios that industry considers most relevant
- The FAA is engaged with industry, NASA, Agility Prime, ASSURE, academia, and more to help develop suitable solutions for automation and UTM
- The FAA will engage with the DAC further through Task Group 7 on UTM
- The FAA utilizes a risk-based approach for the evaluation of new technologies and is committed to the safe and efficient integration of UAS into the NAS

Command/Control & Spectrum

DAC Recommendations

- FAA should engage in collaboration internally and with other agencies (FCC and NTIA) to ensure all relevant stakeholders contribute to a single comprehensive report to Congress
- All spectrum should be considered for UAS due to diversity in operations
- The FAA should take the lead and ensure that C-band and L-band are made exclusively available for UAS
- FAA, FCC, and NTIA should work closely together, and each identify a champion to create the report to Congress
- The FAA should assess existing completed work and standards to determine how spectrum resources are best utilized for UAS

Command/Control & Spectrum

FAA Responses

- The FAA has prepared a report on UAS spectrum in accordance with Section 374 of the FAA Reauthorization Act of 2018
- The FAA is taking a data driven and performance-based approach towards spectrum usage
- The FAA continues to evaluate UAS spectrum resources and is exploring the usage of cellular for low altitude UAS operations
- The FAA has been supporting both C-Band and L-Band for global use for UAS for radio and navigations services and promotes protection from interference on all aviation spectrum
- The FAA continues to collaborate with the FCC, NTIA, and relevant stakeholders on UAS C2 and spectrum concerns

DAC Task Group #6 Discussion

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

DAC Task Group #8 – Safety Culture

Bruce DeCleene

Director, Office of Safety Standards

Flight Standards

Mike Romanowski

Director, Policy & Innovation

Aircraft Certification Service

FAA Observations

- The DAC Recommendations from four subgroups have many similarities
  - Trust & Bilateral Relationship between Operator and FAA
  - Education & Continuous Learning
  - Operator Ownership & Accountability

- Differences arose on how to promote safety culture, due to target audience
  - Common principle to meet people where they are, and promote from there
- FAA concurs with all recommendations
  - Report will be useful to guide future programs, independent of specific recommendations and responses
  - Following charts provide overview of FAA actions that are responsive

Trust and Relationship

- The FAA is committed to continue to build trust and relationships with operators and UA associations
- The FAA will participate in significant UA events to promote safety and compliance
- **Request:** The FAA seeks support from the DAC members to promote these attributes within their organizations and with their influence in the community

Education and Continuous Learning

- The FAA incorporated UA into the FAA Safety Team (FAAST) program
  - Volunteer "DronePros" work with the FAA to support education within the UA community
  - The FAAST educational material addresses UA operations
- The FAA uses social media platforms to reach UA operators who otherwise may not follow aviation messaging
  - Drone Safety Week is a primary example that we intend to continue
- **Request:** The FAA seeks support from the DAC to promote participation in FAAST, promote faasafety.gov and to follow FAA on social media

Operator Ownership and Accountability

- The FAA will continue to embed these principles into all regulations and policies
  - No specific recent or planned activities

Other Actions

- Promote the use of NASA's Aviation Safety Reporting System (ASRS) by UAS pilots (FAA and industry)
- Safety Culture Self-Assessment Tool and Flight Risk Assessment Tool (small commercial operators): The FAA recommends that the relevant industry associations and suppliers develop and promote these tools among their members
  - May be some differences to be adopted and applied within the target audience
  - FAA will promote the use of such tools through our educational programs
- For complex BVLOS operators, FAA will promote operator accountability and SMS that is similar to manned aviation (National UAS Operators)

DAC Task Group #8 – Safety Culture Discussion

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Task Group #9 Update

Lead: James Burgess

Presenter: Matthew Satterley

DAC Tasking

- **Opportunity: Can Remote ID be used to increase situational awareness between manned aviation that routinely operates at low altitudes away from airports and UAS operating in the same airspace?**
- Tasking: DAC to engage operators in low altitude airspace to obtain feedback on how remote identification might be used to increase situational awareness and use this feedback to develop recommendations on how the FAA can address responses to the RFI.

Dissecting the Problem Statement

- Follow the direction set by the FAA.
  - Voluntary participation in Remote ID for low-altitude manned operators.
- Explore the Spirit of the problem.
  - Explore existing technologies that can provide situational awareness to low-altitude aviators (traditional aircraft, GA, gliders, unmanned).
- What else do we know or need to investigate?
  - Identify areas outside of the scope of Task Group 9 that are important to consider with respect to situational awareness in low-altitude airspace.

Dissecting the Problem Statement

- Sub-Group 1 (AMA, AOPA)
  - Review *available* RFI responses; develop survey to send to low-altitude community; interview subject matter experts in industry, government, academia.

- Explore the Spirit of the problem.
  - Explore existing technologies that can provide situational awareness to low-altitude aviators (traditional aircraft, GA, gliders, unmanned).

- What else do we know or need to investigate?
  - Identify areas outside of the scope of Task Group 9 that are important to consider with respect to situational awareness in low-altitude airspace.

Dissecting the Problem Statement

- Sub-Group 1 (AMA, AOPA)
  - Review *available* RFI responses; develop survey to send to low-altitude community; interview subject matter experts in industry, government, academia.
- Sub-Group 2 (BNSF, UPS)
  - Explore the applicability of existing/developing technologies to manned and unmanned aircraft including range, human factors, and cost.
- What else do we know or need to investigate?
  - Identify areas outside of the scope of Task Group 9 that are important to consider with respect to situational awareness in low-altitude airspace.

Dissecting the Problem Statement

- Sub-Group 1 (AMA, AOPA)
  - Review *available* RFI responses; develop survey to send to low-altitude community; interview subject matter experts in industry, government, academia.
- Sub-Group 2 (BNSF, UPS)
  - Explore the applicability of existing/developing technologies to manned and unmanned aircraft including range, human factors, and cost.
- Sub-Group 3 (Dallas PD, Skyward)
  - Expectations for manned aircraft information and behavior are well-known in most airspace environments and increases in capability as regulations/standards are developed for unmanned aircraft.

Understanding the Feedback

- Sub-Group 1 (AMA, AOPA)
  - Review *available* RFI responses; develop survey to send to low-altitude community; interview subject matter experts in industry, government, academia.
- Responses consider sharing remote identification information with general aviation pilots.
- Rebroadcasting information through existing FAA-supported infrastructure.
- Further outreach to underrepresented stakeholders and subject matter experts.

Understanding the Technical Landscape

- Sub-Group 2 (UPS, BNSF)
  - Explore existing technologies that can provide situational awareness to low-altitude aviators (traditional aircraft, GA, gliders, unmanned)

	Installation	Data Provided	Range	Display	Cost
ADS-B	Installed on (manned) aircraft	In-flight data	~55 km max range	Instrument Panel, EFB	TBD
Transponder	Installed on aircraft	Pre-flight, In-flight data	~55 km	Instrument Panel, EFB	TBD
Detect and Avoid	Ground or airborne sensors	In-flight data	~3 - 30 km	Instrument Panel, EFB	TBD
UAS Remote Identification	Installed on unmanned aircraft	In-flight data	~1 - 2 km	Instrument Panel, EFB, USS, URL	TBD
Vehicle 2 Vehicle	Airborne sensors	Pre-flight, In-flight data	~10 km	Instrument Panel, EFB, USS, URL	TBD
Other	E.g., NOTAM, RF	Pre-flight, In-flight data		Instrument Panel, EFB, USS, URL	TBD

Understanding the Airspace

- Sub-Group 3 (Skyward, Dallas PD)
  - Identify areas outside of the scope of Task Group 9 that are important to consider with respect to situational awareness in low-altitude airspace.
- Given UAS use cases and concepts of operation in low-altitude airspace, what situational awareness is needed and what solutions may already exist?
- What is in development (i.e., future UTM ConOps), and how can we maximize effectiveness while avoiding mandates?
  - Information Flows – Notify & Fly.
  - Data Sources – integrating multiple data feeds (i.e., Remote ID and other available sources) to provide better situational awareness.
  - Consider mechanisms to identify both cooperative and non-cooperative.

Plan for Completion

DAC to engage operators in low altitude airspace to obtain feedback on how remote identification might be used to increase situational awareness.

Use this feedback to develop recommendations on how the FAA can address responses to the RFI.

- Assembly of broad cross-section of low altitude aviators ✓
- Survey of available and developing situational awareness methodologies and technologies ✓
- Continue to be mindful of usefulness to the pilot (manned and unmanned) and impacts to airspace safety.
- Craft recommendations.
  - Identify applicability of remote identification information to situational awareness
  - Suggest future tasking(s) that may augment this topic

Discussion

Operations and Technology Subcommittee Update

Houston Mills
Vice President, Flight Operations and Safety
UPS

DAC Operations & Technology (O&T) Subcommittee

- All DAC Committee Members automatically part of O&T Subcommittee
- Non-DAC Members Approval Process
  - Resume and Bio Submission
    - Houston Mills (hmills@ups.com)
  - Vetting
    - Subcommittee Review, AUS-10, DOT
    - Final Approval
    - 21 Submissions to join YTD

FAA New Tasking to the DAC

Jay Merkle
Executive Director
UAS Integration Office

Promoting Diversity and Inclusion in the Drone Community

- Aviation traditionally uses gender-specific terms: airman, manned, unmanned, etc.
- There is a growing awareness of the importance of using gender neutral language that promotes inclusion and facilitates a diverse workforce.
- Encourage the use of gender neutral language in day to day communication.

Recent Initiatives and Trends:

- 117th Congress requires gender neutral language in official House proceedings.
- Since 2006, NASA has shifted to use non-gender specific language.
- Businesses and industry is shifting to non-gender specific language.

DAC Tasking: Gender Neutral Language for the Drone Community

Opportunity:

- The DAC to lead promoting and instituting gender neutral language throughout the UAS/drone community.

Tasking:

- The DAC to develop recommendations for gender neutral language as an alternative to gender specific terms currently used in the the drone industry and aviation community.
- The DAC to take the lead to facilitate the adoption of gender neutral language throughout the drone community and provide recommendations that organizations across the industry and community can implement.

Discussion

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

New Business/Future Agenda Topics

Michael Chasen

Chair, FAA Drone Advisory Committee

Chairman of the Advisory Board, PrecisionHawk USA Inc.

Federal Aviation Administration

DRONE ADVISORY COMMITTEE

February 24, 2021

Closing Remarks

Jay Merkle

Designated Federal Officer,

Executive Director, UAS Integration Office

Michael Chasen

Chair, FAA Drone Advisory Committee

Chairman of the Advisory Board, PrecisionHawk USA Inc.

Adjourn

AMENDED DAC CHARTER

Charter of the Drone Advisory Committee
U.S. Department of Transportation

1. **Committee's Official Designation.** The Committee's official designation is the Drone Advisory Committee (DAC).

2. **Authority.** The Committee is established under the authority of the U.S. Department of Transportation (DOT), in accordance with the provisions of the Federal Advisory Committee Act (FACA), as amended, Pub. L. 92-463, 5 U.S.C. App 2. The Secretary of Transportation has determined that the establishment of the Committee is in the public interest.

3. **Objectives and Scope of Activities.** The objective of the DAC is to provide independent advice and recommendations to the Department of Transportation (DOT) and the Federal Aviation Administration (FAA) and to respond to specific taskings received directly from the FAA. The advice, recommendations, and taskings relate to improving the efficiency and safety of integrating Unmanned Aircraft Systems (UAS) into the National Airspace System. In response to FAA requests, the DAC may provide the FAA and DOT with information that may be used for tactical and strategic planning purposes.

4. **Description of Duties.** The DAC will act solely in an advisory capacity and will not exercise program management responsibilities. Decisions directly affecting implementation of transportation policy will remain with the FAA Administrator and the Secretary of Transportation. The DAC will:

    a. Undertake only tasks assigned by the FAA

    b. Deliberate on and approve recommendations for assigned tasks in meetings that are open to the public.

    c. Respond to ad-hoc informational requests from DOT and the FAA and or provide input to DOT and the FAA on the overall DAC structure (including the structure of subcommittees and or task groups).

5. **Agency or Official to Whom the Committee Reports.** The DAC reports to the Secretary of the U.S. Department of Transportation (DOT) through the FAA Administrator.

6. **Support.** The FAA will provide support as consistent with the act, including funding for the Committee. The UAS Integration Office is the primary entity within the FAA responsible for supporting the DAC.

7. **Estimated Annual Operating Costs and Staff Years.** The FAA's annual operating costs to support the DAC for the period and scope specified by the charter is approximately

$460,000, which includes 2.0 full-time equivalent salary and benefits at $413,000, plus $47,000 for meeting, travel, and miscellaneous expenses.

8. **Designated Federal Officer.** The FAA Administrator, on behalf of the Secretary of Transportation, will appoint a full-time or permanent part-time Federal employee to serve as the DAC Designated Federal Officer (DFO). The DAC DFO will ensure that administrative support is provided for all activities. The DFO will:

    a. Ensure compliance with FACA and any other applicable laws and regulations.

    b. Call and attend all the committee and subcommittee meetings.

    c. Formulate and approve, in consultation with the Chair, all committee and subcommittee agendas.

    d. Notify all Committee members of the time, place, and agenda for any meeting.

    e. Maintain membership records.

    f. Ensure efficient operations, including maintaining itemized contractor invoices.

    g. Maintain all DAC records and files.

    h. Adjourn any meeting when doing so would be in the public interest.

    i. Chair meetings when directed to do so by the FAA Administrator.

9. **Estimated Number and Frequency of Meetings.**
    a. DAC estimates meeting three times a year to carry out its responsibilities. DAC meetings will be open to the public, except as provided under Section 10(d) of FACA, as implemented by 41 CFR part 102-3, and DOT Order 1120.3B.

10. **Duration.** Continuing, subject to renewal every 2 years.

11. **Termination.** The charter will terminate 2 years after its effective date, unless renewed in accordance with FACA and other applicable regulations. If the DAC is terminated, the FAA will give as much advance notice as possible of such action to all participants.

12. **Membership and Designation.** DAC shall comprise members appointed by the U.S. Secretary of Transportation upon recommendation by the FAA Administrator. All DAC members serve at the pleasure of the Secretary of Transportation.

a. The DAC will have no more than 35 members. Members represent airports and airport communities; pilot and controller labor groups; local, state, and tribal governments; navigation, communication, surveillance, and air traffic management capability providers; research, development, and academia; agricultural interests; traditional manned aviation operators; UAS hardware component manufacturers; UAS manufacturers; corporate UAS operators; citizen UAS Operators; UAS software application manufacturers; advanced air mobility and industry associations or other specific areas of interest as determined by the DAC DFO.

b. Members will serve without charge, and without government compensation. Members who represent a particular interest of employment, education, experience, or affiliation with a specific aviation related organization will serve as representatives. Members appointed solely for their expertise serve as Special Government Employees.

c. Member representatives and SGEs are appointed for a 2-year term, but can continue to serve until their replacement is chosen or they are reappointed

13. **Subcommittees.** The FAA Administrator has the authority to create and dissolve subcommittees as needed. Subcommittees must not work independently of the DAC. They must provide recommendations and advice to the DAC, not the FAA, for deliberation, discussion, and approval.

14. **Recordkeeping.** The records of the DAC are handled in accordance with the National Archives and Records Administration (NARA) General Records Schedule 6.2, or other approved agency records disposition schedules. Subject to the Freedom of Information Act, 5 U.S.C. § 552, the records, reports, transcripts, minutes, and other documents that are made available to, or prepared for or by DAC will be available for public inspection at https://www.faa.gov/uas/programs_partnerships/drone_advisory_committee/.

15. **Filing Date.** This charter is effective June 12, 2020, and will expire 2 years from that date on June 12, 2022. The amended charter is effective January 13, 2021

Advisory Committee Member Roles and Responsibilities

Advisory committees have played an important role in shaping programs and policies of the federal government from the earliest days of the United States of America. Since President George Washington sought the advice of such a committee during the Whiskey Rebellion of 1794, the contributions made by these groups have been impressive and diverse.

Through enactment of the Federal Advisory Committee Act (FACA) of 1972 (Public Law 92-463), the U.S. Congress formally recognized the merits of seeking the advice and assistance of our nation's citizens to the executive branch of government. At the same time, the Congress also sought to assure that advisory committees:

- Provide advice that is relevant, objective, and open to the public;
- Act promptly to complete their work;
- Comply with reasonable cost controls and recordkeeping requirements; and
- Had government oversight through creation of the Committee Management Secretariat.

Participation in a FACA such as the Drone Advisory Committee (DAC) provides the Federal Government with essential advice from subject matter experts and a variety of stakeholders. The FACA requires that committee memberships be "fairly balanced in terms of the points of view represented and the functions to be performed." Selection of committee members is made based on the particular committee's requirements and the potential member's background and qualifications. DAC members assume the following responsibilities:

- Attend ¾ of all DAC public meetings during membership term.
- Provide oversight, deliberation, comments and approval of the DAC activities.
- Contribute respective knowledge and expertise.
- Participate as a member on a working group, if desired.
- Coordinate with the constituents in his or her Unmanned Aircraft System and aviation sector.
- Review work plans, if requested.
- Review the DAC and any subcommittee or working group recommendation reports.
- Inform the DAC Chair and the DFO when he or she can no longer represent his or her organization/association on the DAC.
    - Members may continue to serve until a replacement has been appointed or removed.

Federal Aviation Administration

Jay Merkle

Executive Director, Unmanned Aircraft Systems Integration Office

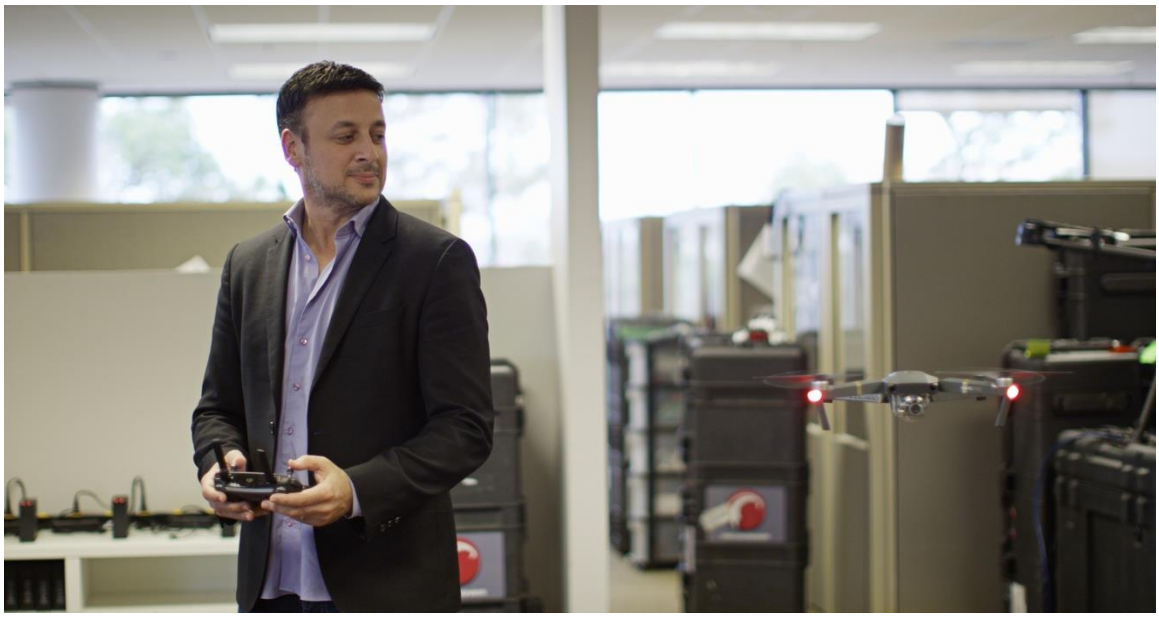
Prior to being named the new Executive Director of the Unmanned Aircraft Systems Integration Office, Peter "Jay" Merkle was the Deputy Vice President (DVP) of the Program Management Organization (PMO) within the Air Traffic Organization (ATO). The PMO is responsible for all NextGen program activity; all National Airspace System (NAS) communications; navigation, weather, surveillance and automation modernization programs; and all service life extensions to legacy NAS sensors, communications and navigation aids. Given the tight coupling between successful automation program delivery and current system operation, the PMO also leads and manages all second-level automation engineering efforts. Lastly, the PMO works with FAA operations and aviation users to ensure globally interoperable solutions for NextGen.

Prior to that position, Merkle was the Director of Program Control and Integration, AJM-1, in the PMO for the ATO. In that capacity, he led the PMO in developing effective, timely, and innovative solutions to evolving business needs. The focus areas were program control, crosscutting analysis and integration, and special initiatives.

Since joining the FAA, Merkle has served as the Manager of Systems Integration for Portfolio Management and Technology Development within the NextGen organization. He also has held positions as the Lead Engineer for tower, terminal, and en route automation systems, as the Chief System Engineer for En Route and Terminal Domains, and as the Chief Architect for NextGen at the Joint Planning and Development Office.

Merkle has over 30 years of extensive experience in engineering and program management. He started his career as an engineer working in cockpit and crew station design on several aircraft, including the C-17 large transport aircraft. Merkle holds a Bachelor's degree in Psychology from the University of Central Florida and a Master's degree in Industrial Engineering and Operations Research from the Virginia Polytechnic Institute and State University.

Michael Chasen
Chairman of the Advisory Board, PrecisionHawk



Michael Chasen is the Chairman of the Advisory Board of PrecisionHawk, a leading software and service provider in the commercial drone space. PrecisionHawk uses advanced drone technology combined with artificial intelligence (A.I.) and machine learning to provide actionable business intelligence across Energy, Agriculture, Telecom and Infrastructure industries. PrecisionHawk is also one of the thought leaders in flying Beyond Visual Line of Sight (BVLOS).

Michael served as CEO of PrecisionHawk where he oversaw a series D funding round that culminated in $75 million and represented one of the largest financings to date in the commercial drone space.

In 2018, Chasen also lead PrecisionHawk to acquire five companies: Droners.io, AirVid, HAZON Solutions, InspectTools and Uplift Data Partners. These acquisitions helped solidify PrecisionHawk as the market leader for commercial drone services with a database of over 15,000 commercially-licensed drone pilots.

Prior to PrecisionHawk, Chasen was the co-founder and CEO of Blackboard (NASDAQ: BBBB), a leader in the global eLearning space. He grew Blackboard to serve over 30,000 institutions worldwide, had 3,000 employees and 20 offices around the world. Michael took Blackboard public in 2004 and ran it as a public company for 7 years before selling to Providence Equity Partners for $1.7B. Michael then started SocialRadar, a company specializing in improving location accuracy on SmartPhones, which he sold to Verizon in 2016.

Michael has an undergraduate degree in Computer Science and an MBA from Georgetown.

Drone Advisory Committee

October 22, 2020 DAC Meeting • Washington, DC

Detailed Minutes

Introduction
The Drone Advisory Committee was held on October 22, 2020, from 11:00 AM to 2:55 PM EST. Because of the COVID-19 pandemic, this October 22nd DAC meeting was held virtually and livestreamed.

DFO Opening Remarks

Mr. Dan Elwell started his opening remarks by reading the Official DFO Statement and played for the attendees a video by the Secretary of Transportation, The Honorable Elaine Chao. The Secretary expressed her thanks for the hard work done by the DAC members and highlighted the important work being done by the FAA during COVID-19. After the conclusion of the video, Mr. Elwell moved on to the agenda and highlighted that the meeting agenda for today includes a presentation from Task Group #8 on the Safety Culture DAC recommendations. Following the DAC presentation, the FAA will provide responses to the Facility Maps and UAS Traffic Management (UTM) task group recommendations.

Mr. Elwell shared that after the conclusion of the presentations, there will be an opportunity for DAC members to discuss topics and recommend future DAC topics. The meeting will conclude with the FAA issuing a new tasking to the DAC on Remote Identification and the introduction of a standing sub-committee. The DFO also provided the attendees with an update on the DAC solicitation announcement and noted that the selection of candidates will be announced during the February 2021 meeting. Mr. Elwell noted one housekeeping item, the approval of the meeting minutes from the June 19, 2020, meeting. Mr. Elwell asked for a motion to approve the meeting minutes and if there were any objections. There were no objections and the motion passed. He then turned it over to the DAC Chairman, Michael Chasen, for his opening remarks.

For detailed meeting minutes (link is timestamped for DFO Opening Remarks):
https://youtu.be/kxTJHyjfZ6E?t=162

DAC Chair Opening Remarks

DAC Chairman Michael Chasen began his remarks by welcoming everyone to the second virtual DAC meeting. The Chairman shared that the road to recovery is long but there have been many positive steps. He shared his hopes and expectations that the aviation industry will come back stronger than before. During the pandemic, the drone industry showcased the positive potential of drone technology to aid in the public health crisis, through providing more resilient supply chains, and by offering a mechanism for people to receive goods, through socially distanced drone delivery services. The Chairman highlighted that several DAC members are directly involved in these initiatives, using drones for the public good. While the DAC has been impacted by the COVID-19 pandemic, the important work of the DAC has continued. He ended his

remarks by again thanking the DAC members for their hard work and called upon Task Group 8 to begin their presentation.

For detailed meeting minutes (link is timestamped for DAC Chairman Opening Remarks): https://youtu.be/kxTJHyjfZ6E?t=912

Task Group #8: Safety Culture

Presenters:
Lead: Captain Joe DePete, Air Line Pilots Association (ALPA)
Presenter: Captain Steve Jangelis, Air Line Pilots Association (ALPA)

Captain Steve Jangelis shared that task group lead, Captain Joe DePete, could not make it to the DAC meeting due to prior commitments. Captain DePete had written an opening statement that Captain Jangelis read aloud to the members. The statement highlighted the important work of Task Group 8 (TG8) and the hard work by the members to complete the recommendations. Throughout the process, they made sure to keep safety as the top priority and bring UAS to the level of safety of traditional manned aviation. After reading the prepared statement, Captain Jangelis shared that TG8 established four sub-groups: traditional manned, recreational unmanned, small (scale) commercial UAS operators, and national (large-scale) commercial UAS operators.

The TG8 recommendations are broken into executive summary and sub-group recommendations. TG8 developed several common safety tenets that the group members could use and support. The tenets include; safety ownership, safety modeled by leadership, organizational values, learning culture, system wide approach, and trust. The sub-groups developed recommendations with commonalities and differences. TG8 recognizes that there is no one-size-fits-all solution. After sharing the summary, Captain Jangelis, turned over the presentation to sub-group 1 presenter, Captain Houston Mills.

Captain Mills shared that the sub-group's primary recommendation is for the FAA to foster a strategy that encourages "safety ownership" and "a learning culture" throughout the UAS community. Following his presentation, Captain Mills handed off to Rich Hanson to present recommendations from sub-group 2. Mr. Hanson shared that sub-group 2 (recreational sub-group), recommends the FAA leverage existing safety programs that have been successfully demonstrated, work with different components of the drone community, further integrate the multiple stakeholders in the UAS community, and educate the general public on UAS, in order to promote safety. Mr. Hanson completed the sub-group 2 presentation and passed presenter duties to Dave Messina to speak on sub-group 3. Mr. Messina shared the sub-group 3 (small commercial) recommendations: UAS education using the existing FAASTeam, a safety culture self-assessment, and use of a flight risk assessment tool. Following the sub-group 3 presentation,

Todd Graetz presented on sub-group 4. Sub-group 4 (national manufacturers) recommends that operations should utilize the existing manned safety management system and procedures; that there should be safety policy and governance; and that there should be knowledge sharing.

Following the TG8 presentation, there was a short question and answer period between DAC members and the presenters. After the completion of the Q&A portion, the Chairman asked for a motion to forward the TG8 recommendations from the DAC to the FAA and if there were any objections. The motion was passed and there were no objections.

For detailed meeting minutes (link is timestamped for Task Group 8 presentation): https://youtu.be/kxTJHyjfZ6E?t=1010

DAC Task Group #5 – UAS Facility Maps

Presenter:
Bill Stanton, UAS Integration Lead, Air Traffic Organization

The DAC Chairman called upon Bill Stanton from the FAA to begin his presentation on FAA responses to DAC Task Group #5 – UAS Facility Maps recommendations. Mr. Stanton began the presentation by thanking the group for their recommendations and time. He shared that the FAA reviewed all four recommendations thoroughly and would speak to each recommendation. Mr. Stanton shared that on recommendation one: the FAA agrees with refining standardized grid spacing. The FAA has formed an internal working group to discuss and plan for this update and has begun initial discussions with UAS Service Suppliers (USS). For recommendation two: the workgroup developed a risk-based algorithm that generates the optimal altitude. The algorithm criteria is under refinement and will be thoroughly reviewed and tested. Implementation is targeted for mid-2021.

Mr. Stanton shared that for recommendation three: the FAA is currently planning to conduct internal beta testing on grid spacing. Details on the beta test are under discussion and the FAA will collect and analyze the potential benefits. For the last recommendation, recommendation four, the FAA formed a working group and views the grid square as a Core Air Navigation Service Provider (ANSP) responsibility. The FAA algorithm under development is based on DAC recommendations and the FAA is planning to review the algorithm periodically, in order to maximize airspace efficiency and usage.

After the conclusion of Mr. Stanton's presentation, the Chairman opened the floor to any questions. There were no questions.

For detailed meeting minutes (link is timestamped for DAC Task Group #5 – UAS Facility Maps): https://youtu.be/kxTJHyjfZ6E?t=5173

15 Minute Break

Following Mr. Stanton's presentation there was a scheduled 15-minute break.

DAC Task Group #7 – UTM Performance Capability Priorities

Presenter:
Jay Merkle, Executive Director, UAS Integration Office

After the conclusion of the 15-minute break, Jay Merkle of the FAA, began his presentation on the FAA UAS Traffic Management (UTM) Performance Capability Priorities response. Mr. Merkle shared that the recommendations by the DAC Task Group 7 (TG7) were extremely thorough and helpful. Mr. Merkle highlighted the original tasking mandate, which asked TG7 to review the UTM Concept of Operations (CONOPS) and determine industry performance capability priorities for UTM. TG7 provided a matrix to the FAA, broken down by performance capabilities. TG7 highlighted 12 areas where more discussion is needed.

Mr. Merkle addressed the important points of TG7's recommendation, especially the point that the FAA and industry should work together "prior to version 3.0 [of the CONOPS] being published to ensure that clarity occurs." Mr. Merkle shared that the FAA is very thankful to TG7 for their hard work. The FAA agrees with industry's assessment of prioritization and commitment. The FAA is committed to working together with industry on CONOPS 3.0 and is setting up interactive discussions to address specific areas highlighted by TG7.

Mr. Merkle shared that the FAA is working with NASA Aeronautics Research Institute (NARI) to set up a venue to engage with industry. This is expected to begin in the fourth quarter of 2021. The updates to CONOPS 3.0 will include topics identified by TG7 and address other general updates. The FAA is targeting the second quarter of 2021 for the release of UTM CONOPS 3.0.

After Mr. Merkle finished his presentation, there was a question and answer session. There were no questions posed.

For detailed meeting minutes (link is timestamped for DAC Task Group #7 – UTM Performance Capability Priorities): https://youtu.be/kxTJHyjfZ6E?t=6745

Present New DAC Tasking

Presenter:
Jay Merkle, Executive Director, UAS Integration Office

Mr. Merkle shared that the FAA is issuing a new tasking for the DAC from the DFO. Mr. Merkle highlighted that the FAA issued a Request for Information (RFI) on March 17 on Low Altitude Manned Aviator Participation on UAS Remote Identification (RID). The objective is to learn how manned aircraft can receive and use UAS RID and also to engage with low altitude manned aviators, to improve safety and reduce collision risk. The FAA received 30 responses from manned community concerns with RID. The main concerns were noted.

The tasking from the FAA requests that the DAC engage operators in low altitude airspace to obtain feedback on how remote identification might be used to increase situational awareness and use this feedback to develop recommendations on how the FAA can address responses to the RFI.

Following the tasking announcement, there was a short question and answer portion. Several members posed questions and contributed comments.

After the conclusion of the question and answer portion, the DAC Chairman asked for a motion to approve the new tasking. The motion was approved; there were no objections. The DAC Chairman shared that James Burgess of Wing will lead the new task group to provide recommendations to the FAA.

For detailed meeting minutes (link is timestamped for Present New DAC Tasking): https://youtu.be/kxTJHyjfZ6E?t=7090

Standing Subcommittee Proposal

Presenter:
Gary Kolb, Stakeholder Liaison, UAS Integration Office

After the conclusion of the new tasking presentation, the DAC Chairman asked Gary Kolb of the FAA to begin his presentation on the Standing Subcommittee Proposal. Mr. Kolb shared that the FAA is proposing a standing subcommittee for DAC tasking. The intent is to leverage DAC and stakeholder expertise in helping to facilitate UAS integration into the National Airspace System (NAS). Membership would be composed of 50% DAC members, from any stakeholder group, and the remaining 50% can be any non-DAC member approved by the Secretary of Transportation. Mr. Kolb concluded his presentation and opened the floor to questions and

comments. Several members posed questions and contributed comments. After the conclusion of the question and answer portion, the DAC Chairman asked for a motion to approve the creation of the standing subcommittee proposal. The motion was approved; there were no objections. The Chairman announced that Captain Houston Mills of UPS will lead the standing subcommittee.

For detailed meeting minutes (link is timestamped for Standing Subcommittee Proposal): https://youtu.be/kxTJHyjfZ6E?t=8386

New Business/Agenda Topics

The Chairman opened the floor to DAC members to bring up any new business topics or agenda topics. Captain Mills and Mr. Burgess shared their questions and comments with the DAC.

For detailed meeting minutes (New Business/Agenda Topics): https://youtu.be/kxTJHyjfZ6E?t=9059

Closing Remarks and Adjourn

Mr. Dan Elwell began his closing remarks by sharing how impressed he is with the work of the DAC during this difficult time. Mr. Elwell shared that the ideas of the DAC are also extremely important and something the FAA will be reviewing very thoroughly. Mr. Elwell highlighted that the aviation industry is rapidly growing in terms of technology and we can expect more of the same. He was thankful for all the hard work done by the DAC members.

Mr. Elwell turned the meeting over to the Chairman, Michael Chasen, for his closing remarks. Mr. Chasen thanked all the DAC members for their hard work, those tuning in for their participation, and the FAA for running the meeting. He shared that anyone interested in serving on the subcommittee should contact Captain Houston Mills and if any DAC members are interested in serving on the RID task group, they should reach out to Mr. James Burgess. Mr. Chasen shared that he hoped to see everyone at the next DAC meeting tentatively scheduled for February 2021. After concluding his remarks, the Chairman asked for a motion to adjourn the meeting. The motion was approved and the meeting was adjourned.

For detailed meeting minutes (Closing Remarks and Adjourn): https://youtu.be/kxTJHyjfZ6E?t=9269

Appendix A: Meeting Attendees

Name	Title	Org.
1. Dan Elwell	Deputy Administrator and DAC Designated Federal Officer	FAA
2. Angela Stubblefield	Chief of Staff	FAA
3. Jay Merkle	Executive Director, UAS Integration Office	FAA
4. Bill Crozier	Deputy Executive Director, UAS Integration Office	FAA
5. Arjun Garg	Chief Counsel, Office of General Counsel	FAA
6. Kirk Shaffer	Associate Administrator, Airports	FAA
7. Tonya Coultas	Deputy Associate Administrator, Security and Hazardous Materials Safety	FAA
8. Timothy Arel	Deputy Chief Operating Officer, Air Traffic Organization	FAA
9. Brianna Manzelli	Assistant Administrator, Office of Communications	FAA
10. Teri Bristol	Chief Operating Officer, Air Traffic Organization	FAA
11. William Stanton	UAS Integration Lead, Air Traffic Organization	FAA
12. Gary Kolb	UAS Stakeholder & Committee Liaison, UAS Integration Office	FAA
13. Alex Zektser	Attorney Advisor	DOT

Confirmed FAA/DOT Observers		
Name	**Title**	**Org.**
1. Adrienne Vanek	Director, International Division, UAS Integration Office	FAA
2. Michael McCrabb	Foreign Affairs Specialist, UAS Integration Office	FAA
3. Christopher Swider	International Specialist, UAS Integration Office	FAA
4. Rico Carty	Deputy Executive Director, Flight Standards	FAA
5. Genevieve Sapir	Senior Advisor, Security and Hazardous Materials Safety	FAA
6. Robert Sweet	Senior Advisor, Air Traffic Organization	FAA
7. Elizabeth Forro	Special Assistant, UAS Integration Office	FAA
8. Allison LePage	Digital Communications Manager, Office of Communications	FAA
9. Alison Duquette	Digital Communications Team Lead, Office of Communications	FAA
10. Jessica Orquina	Lead Communications Specialist, UAS Integration Office	FAA
11. Khurram Abbas	Communications Specialist, UAS Integration Office	FAA
12. Gretchen Tressler	Senior Communications Specialist, UAS Integration Office	FAA
13. Jennifer Riding	Management Support Specialist, UAS Integration Office	FAA