



Drone Advisory Committee eBook

**DAC Member (Public) Information for the
February 27, 2020 DAC Meeting • Washington, DC**



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

DAC Member eBook Table of Contents

DAC Member Information (Public)	Page
1) Meeting Logistics	3
2) Confirmed FAA/DOT Attendees	4
3) Meeting Agenda	5
4) DAC Membership Roster	6
5) FAA Response: Task Group #1 Recommendation: Early Equipage	9
6) FAA Response: Task Group #2 Recommendation: UAS Security Issues	17
7) FAA Response: Task Group #3 Recommendation: 107 Waivers	24
8) Report: DAC Recommendation and Discussion: Tasking #5 – Facility Maps	30
9) Report: DAC Recommendation and Discussion: Tasking #6 – BVLOS Challenges	35
10) Report: DAC Recommendation and Discussion: Tasking #7 – UTM	40
11) Slides	48
12) DAC Charter	102
13) Fact Sheet: Advisory Committee Member Roles and Responsibilities	105
14) Biography: Dan Elwell, Deputy Administrator and DAC DFO	106
15) Biography: Jay Merkle, Executive Director of the FAA UAS Integration Office	107
16) Biography: Michael Chasen, Chief Executive Officer, PrecisionHawk USA, Inc.	108
17) Meeting Minutes – October 17, 2019 Meeting	109
18) Public Comments Submitted After Last DAC Meeting	156



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Schedule

Thursday, February 27, 2020 National Transportation Safety Board Boardroom and Conference Center 420 10th Street SW, Washington, DC 20594	
9:00 a.m. – 10:15 a.m.	DAC Meeting Begins and First Morning Session <i>(Coffee will not be provided BEFORE the meeting)</i>
10:15 a.m. – 10:30 a.m.	Break <i>(Water will be available)</i>
10:30 a.m. – 11:30 a.m.	DAC Meeting Second Morning Session
11:30 a.m. – 12:45 p.m.	Open Lunch and Networking <i>(Lunch will not be provided, a food court is upstairs from the meeting location)</i>
12:45 p.m. – 2:30 p.m.	DAC Meeting First Afternoon Session
2:30 p.m. – 2:45 p.m.	Break <i>(Water will be available)</i>
2:45 p.m. – 4:00 p.m.	DAC Meeting Second Afternoon Session
4:00 p.m.	Meeting Adjourned

Transportation and Parking

Parking
<ul style="list-style-type: none"> • Paid self-parking is available on site: https://aceparking.com/lenfant/
Metro and Trains
<ul style="list-style-type: none"> • L’Enfant Plaza Station is serviced by Blue, Orange, Silver, Yellow, and Green Line trains, as well as Virginia Railway Express



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Confirmed FAA/DOT Attendees

Name	Title	Org.
1. Dan Elwell	Deputy Administrator and DAC Designated Federal Officer	FAA
2. Jay Merkle	Executive Director, UAS Integration Office	FAA
3. Bill Crozier	Deputy Executive Director, UAS Integration Office	FAA
4. Erik Amend	Manager, Executive Office, UAS Integration Office	FAA
5. Gary Kolb	UAS Stakeholder & Committee Liaison, UAS Integration Office	FAA
6. Jessica Orquina	Lead Communications Specialist, UAS Integration Office	FAA
7. Khurram Abbas	Communications Specialist, UAS Integration Office	FAA
8. Gretchen Tressler	Technical Writer, UAS Integration Office	FAA
9. Teresa Denchfield	Logistics Coordinator, UAS Integration Office	FAA
10. Jennifer Riding	Communications Specialist	FAA
11. Arjun Garg	Chief Counsel	FAA
12. Lorelei Peter	Assistant Chief Counsel for Regulations	FAA
13. Winsome Lenfert	Deputy Associate Administrator for Airports	FAA
14. Bailey Edwards	Associate Administrator for Policy, International Affairs and Environment	FAA
15. Tim Arel	Deputy, Chief Operating Officer	FAA
16. Claudio Manno	Associate Administrator for Security and HAZMAT Safety	FAA
17. Brianna Manzelli	Associate Administrator, Office of Communications	FAA
18. Robert Sweet	Manager, Strategic Operations Security	FAA
19. Michael O'Donnell	Acting Deputy Associate Administrator for Aviation Safety	FAA
20. Joshua Holtzman	Acting Deputy Associate Administrator, Security and Hazardous Materials Safety	FAA
21. Maureen Keegan	UAS Integration Lead for Air Traffic Organization	FAA
22. Genevieve Sapir	Senior Attorney	DOT
23. Andrew Giacini	Special Assistant for Government and Industry Affairs	FAA
24. Robert Carty	Deputy Executive Director, Flight Standards	FAA
25. Alexandra Randazzo	Attorney, Information Law Practice	FAA
26. Julie Marks	Deputy Director, UAS Safety & Integration Division	FAA
27. Mara Jenkins	Special Technical Assistant, Aviation Safety	FAA
28. Joseph Morra	Director, UAS Safety and Integration Division	FAA
29. Maria DiPasquantonio	Program Manager, Integration Pilot Program	FAA
30. Reed Garfield	Deputy Chief Economist	DOT



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Public Meeting Agenda

Time: 9:00 a.m. to 4:00 p.m. Eastern Time

Location: National Transportation Safety Board Boardroom and Conference Center
420 10th Street, SW, Washington, DC 20594

	Start	Stop	
1.	9:00 a.m.	9:01 a.m.	Greeting from FAA
2.	9:01 a.m.	9:05 a.m.	Official Statement of the Designated Federal Officer
3.	9:05 a.m.	9:15 a.m.	Review of Agenda and Approval of Previous Meeting Minutes
4.	9:15 a.m.	9:30 a.m.	Opening Remarks from DAC Chairman
5.	9:30 a.m.	9:45 a.m.	FACA Overview
6.	9:45 a.m.	10:15 a.m.	FAA Response to Early Equipage Recommendations
7.	10:15 a.m.	10:30 a.m.	Break
8.	10:30 a.m.	11:00 a.m.	FAA Response to UAS Security Recommendations
9.	11:00 a.m.	11:30 a.m.	FAA Response to Part 107 Waiver Recommendations
10.	11:30 a.m.	12:45 p.m.	Lunch and Networking
11.	12:45 p.m.	1:20 p.m.	DAC Recommendation and Discussion: Tasking #5 – Facility Maps
12.	1:20 p.m.	1:55 p.m.	DAC Recommendation and Discussion: Tasking #6 – BVLOS Challenges
13.	1:55 p.m.	2:30 p.m.	DAC Recommendation and Discussion: Tasking #7 – UTM
14.	2:30 p.m.	2:45 p.m.	Break
15.	2:45 p.m.	3:20 p.m.	Industry-Led Technical Topics
16.	3:20 p.m.	3:50 p.m.	New Business/Agenda Topics/Review Taskings
17.	3:50 p.m.	4:00 p.m.	Closing Remarks
18.	4:00 p.m.	4:00 p.m.	Adjourn

RSVP Required: Email DACmeetingRSVP@faa.gov providing your full name and organization (if representing an organization).

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



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

DAC Membership – As of 2/26/2020

Stakeholder Group	Members
Designated Federal Officer	Dan Elwell , Deputy Administrator, Federal Aviation Administration
Chair	Michael Chasen , Chief Executive Officer, PrecisionHawk USA, Inc.
Airports and Airport Communities	Deborah Flint , Chief Executive Director, Los Angeles World Airports Marilyn Mora , President and Chief Executive Officer, Reno-Tahoe Airport Authority
Labor (controllers, pilots)	Trish Gilbert , Executive Vice President, National Air Traffic Controllers Association Joseph DePete , President, Air Line Pilots Association (ALPA)
Local Government	David Greene , Bureau of Aeronautics Director, Wisconsin Department of Transportation Wade Troxell , Mayor of Fort Collins, Colorado, and the National League of Cities 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 Steve Ucci , Senior Deputy Majority Leader, Rhode Island State Assembly
Navigation, Communication, Surveillance, and Air Traffic Management Capability Providers	George Kirov , Vice President and General Manager, Commercial UAS Solutions, Harris Corporation Christopher Penrose , Senior Vice President of Emerging Devices, President of Internet of Things, AT&T Mariah Scott , President, Skyward (a Verizon company)
Research, Development, and Academia	Robie Samanta Roy , Vice President of Technology, 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) Vacant Lorne Cass , Vice President, Operations / Industry Affairs, American Airlines (AA)
UAS Hardware Component Manufacturers	Phil Straub , Executive Vice President and Managing Director, Aviation Division, Garmin, Ltd. Christian Ramsey , President, uAvionix Corporation



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Stakeholder Group	Members
UAS Manufacturers	<p>James Burgess, Chief Executive Officer, Wing (an Alphabet company) Michael Chasen, Chief Executive Officer, PrecisionHawk USA Inc. Gur Kimchi, Co-Founder and Vice President, Amazon Prime Air Brendan Schulman, Vice President of Policy and Legal Affairs, DJI Technology Michael Sinnett, Vice President Product Development and Strategy, Boeing Commercial Airplanes</p>
UAS Operators	<p>Greg Agvent, Senior Director of National News Technology, CNN Todd Graetz, Director, Technology Services, UAS Program, BNSF Railway</p>
UAS Software Application Manufacturers	<p>Jaz Banga, Co-Founder and Chief Executive Officer, Airspace Systems, Inc. Chris Anderson, Chief Executive Officer, 3DR Vacant</p>
Other	<p>Rich Hanson, President, Academy of Model Aeronautics 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 of The Moak Group</p>



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

DAC Taskings & FAA Responses to DAC Recommendations



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Background:

On June 6, 2019, the FAA assigned the Drone Advisory Committee (DAC) to review and provide recommendations on three tasks. The tasking groups were assigned 90 days to analyze and provide recommendations back to the FAA.

The three tasks:

- Tasking #1, Early Equipage
- Tasking #2, UAS Security Issues
- Tasking #3, Part 107 waivers

Task Group 1, Early Equipage:

The Final Rule for remote identification of unmanned aircraft systems (UAS) is likely up to 24 months away. In the absence of remote identification of UAS and in consideration of security partners' concerns regarding operations over people and other waived operations under part 107 in the intervening period:

1. What voluntary equipage of remote identification technologies by UAS manufacturers or operators could occur in the short-term prior to a Final Rule for remote identification with the understanding that the requirements finalized in that rule may differ from short-term solutions based on the rulemaking proposal and any comments received during rulemaking.
2. What types of incentives, if any, could be provided by the FAA for operators who voluntarily use UAS equipped in accordance with the recommendations in #1?
3. Are there other drivers that could lead to widespread use of remote identification prior to the enactment of a Final Rule for remote identification and finalization of remote identification requirements?

DAC Recommendation:

1. The entire Task 1 group unanimously agreed to recommend the ASTM Remote ID (RID) standard to the DAC as the equipage basis for the voluntary program. The Remote ID standard has a scope that includes various means to perform Remote ID. The standard is intended to be a world-wide adaptable standard. Therefore, it is expected that a regulator would add a regulatory "overlay" and Minimal Operational Performance Standard (MOPS) on top of the ASTM standard as part of regulatory implementation. As with other ASTM references by the FAA, this overlay may specify requirements for certain fields and may override other standard requirements.
2. DAC recommends a combination of incentives for voluntary use UAS equipped in accordance with Task #1 and drivers that could lead to widespread use of remote identification prior to enactment of a Final Rule as listed in Task #3.



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

– *Ease of compliance*

- The cost and ease of compliance should be kept at a reasonable level such that commercial and recreational operators see that the benefits outweigh the cost of adopting Remote ID

– *Incentives Provided by FAA*

- Contract Preference
 - The FAA and other government agencies procuring contracts for UAS services or systems should give preferential treatment to operators or systems that have Remote ID
- Waiver Application Preference
 - The FAA should prioritize part 107 waiver applications from operators who have Remote ID and provide accelerated processing of their applications
- Satisfy a Component of Waiver, Exemption, or Application Requirement
 - Remote ID should help mitigate the security concerns surrounding anonymous flying for operations over people or beyond visual line of sight waivers
 - Night operations should be facilitated through a blanket waiver when the operator has Remote ID and operates consistent with the “Operation of Small Unmanned Aircraft Systems Over People” proposed rule requirements that relate to night operations

– *Acknowledgement of Equipage*

- To raise awareness and acceptance of Remote ID for consumers, manufacturers and service providers, the FAA should:
 - Create an online database of manufacturers who have self-declared Remote ID equipped drones
 - Create an online database of self-certified network Remote ID service providers

– *Airspace Access*

- The FAA should partner with security agencies to allow Remote ID equipped UAS operations that are otherwise compliant with FAA rules and regulations in the outer ring (between the 10 and 30 NM ring) of a 14 CFR 91.141 VIP Temporary Flight Restriction (TFR)
- In cooperation with other security agencies, the FAA should grant access to allow Remote ID equipped UAS operations in other airspace areas that are restricted due to security concerns
- FAA should promote voluntary Remote ID equipage via future rulemaking efforts, such as Section 2209, that promote improved airspace access
- In many locations, the LAANC grid squares indicate a 0-foot allowable altitude for automatic LAANC approvals. The FAA should evaluate raising the allowable altitude for automatic LAANC approvals from 0 ft up to 100 ft in those locations for Remote ID equipped UAS operations if such an increase does not create a material decrease in safety for manned aircraft operations



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

- ***FAA Rebate***
 - The FAA should provide a financial rebate in collaboration with Remote ID drone manufacturers or software suppliers to offset the cost for compliance, similar to the FAA ADS-B rebate
- ***Monetary Incentive***
 - Operators who have taken the part 107 knowledge exam should be eligible for some amount of reimbursement provided they utilize a UAS with Remote ID
 - The FAA should provide a discount on FAA UAS Symposium or other FAA events with associated costs
 - The FAA should waive future drone registration fees for additional UAS or renewals after the initial application
- ***Other Drivers to Incentivize Equipage***
 - Insurance Incentive
 - If Remote ID is seen to decrease risk by insurance providers, a monetary discount should be given from insurance companies to operators utilizing Remote ID
- ***Advertisement on FAA Apps***
 - FAA applications such as B4UFLY should list incentives available for Remote ID equipped drones
- ***Enabling Local and State Privileges***
 - Local municipalities and states should consider providing UAS fliers using Remote ID access to additional takeoff and landing locations, and should consider Remote ID as satisfying policies that require notification of takeoff or landing activities
 - Working with the FAA, local municipalities and states should consider adjusting their local and state drone restrictions for operators who voluntarily use Remote ID
- ***Partnership with Federal Agencies***
 - Federal Agencies should provide UAS fliers using Remote ID access to additional takeoff and landing locations as well as allowing flight in “no-drone zones,” and should use Remote ID to satisfy policies that require notification of takeoff or landing activities
 - Federal Agencies, including the National Park Service, should work collaboratively with the FAA to examine how to designate regular or ad-hoc locations, dates, and times to allow drone takeoff and landing using Remote ID, in locations currently restricted
- ***Industry Recognition***
 - Industry should establish a marketing sticker or slogan promoting Remote ID, which should be amplified through FAA and industry websites, social media channels, and during the National Drone Awareness Week



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

- Manufacturers or operators who equip their UAS with Remote ID should be incentivized to do so through positive recognition such as through positive articles or industry rating reviews



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

FAA Response Tasking 1:

The FAA greatly appreciates the time, thought, and creativity the DAC applied to this task. We acknowledge the DAC's consensus agreement to recommend the pending ASTM remote identification (RID) standard as the basis for any voluntary equipage incentives, and welcome the DAC's layered approach to incentivizing as described in your recommendation.

In reviewing the DAC's recommendations, the FAA recognized three distinct time periods between this response and full implementation of the remote identification regulations and standards –

- Period 1: starts when an industry consensus Remote ID standard is published, and ends when the FAA's Remote ID rule is final
- Period 2: starts when the FAA's Remote ID rule is final and a UAS Service Supplier (USS) network is established for Remote ID, prior to the FAA's formal acceptance of means of compliance for Remote ID standard
- Period 3: starts when the FAA has accepted a standard to comply with Remote ID, and ends on the required operational compliance date with the rule (currently proposed as 3 years after rule effectivity in the NPRM)

This task was written prior to the publication of the FAA's Notice of Proposed Rulemaking (NPRM) for Remote ID, which articulates a proposed compliance timeline in accordance with this breakdown. Thus, we considered the recommendations across all three periods.

Incentives Provided by the FAA

The DAC recommended incentives regarding waiver application processing and requirements, contract preference, equipage acknowledgement, airspace access, and rebates or monetary incentives.

Waiver application processing and requirements

- The FAA commits to conducting a gap analysis of any Remote ID industry consensus standard published during period 1 and communicating to manufacturers and operators any additional information part 107 waiver applicants would need to provide in order for the FAA to give credit for, as appropriate, using Remote ID as a risk mitigation in a waiver application. This is how operators may take advantage of the availability of industry consensus standards prior to a final rule concerning Remote ID. This can start in period 1
- While voluntary Remote ID equipage will not equate to automatic waiver approval, the FAA commits to considering Remote ID equipage prior to any required compliance date set forth by the final rule as a risk mitigation during the evaluation of part 107 waiver applications. In order to be considered a risk mitigation strategy for a particular operation, applicants will be required to demonstrate the UAS are equipped with Remote ID capability and are compliant with the final rule during operations in their waiver



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

application. The FAA will determine available options for applicants to demonstrate early compliance with Remote ID in their DroneZone applications and will evaluate the need for additional resources to processing waiver applications where the proposed operation will comply the Remote ID final rule. The FAA anticipates such updates will result in handling applications for waiver in an efficient manner. The FAA is aware of the DAC's recommendation to issue blanket waivers to permit operations at night. In addition to considering other applications for waiver, the FAA will use the above-described framework for waiver applications to permit operations at night prior to the final rule for Operation of Small Unmanned Aircraft Systems over People. This can start in period 3

- The FAA is regularly monitoring new data, research, and standards as they are developed and published, and will consider how they can be used to more expeditiously evaluate part 107 waiver applications and inform applicants on how to better prepare waiver applications. We encourage operators and manufacturers to make use of small UAS industry standards as they become available when applying for part 107 waivers or other approvals for advanced small UAS operations

Contract preference

- Government procurement and contracting would require compliance with certain, specific regulations and standards. In order to be fair and equitable, the FAA's procurement processes do not enable preferential treatment for voluntary early adoption of equipment or compliance to regulations

Equipage acknowledgement

- As stated in the FAA's Remote ID NPRM, the FAA will maintain an online database of manufacturers that have declared compliance with an industry consensus standard recognized by the FAA as a means of compliance with the Remote ID rule. We will begin this database with the first declaration of compliance. This can start in period 3
- As we do for the USS's providing LAANC services today, the FAA will maintain an online database of its approved Remote ID service suppliers. This can start in period 2
- The FAA commits to linking to both of these online lists in all applicable apps, including B4UFLY, and on all relevant webpages. We will take advantage of every "advertising" opportunity we control to ensure information is disseminated as far as possible. This can start in period 2

Airspace access

- The FAA supports the proposition Remote ID will provide security benefits, which underlies the DAC's recommendations regarding increasing access by equipped UAS to airspace restricted for security reasons. The agency is committed to working with interagency security partners to realizing those benefits, including using Remote ID equipage as a positive consideration in authorizing access to airspace to which security



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

instructions have been applied. Remote ID equipment will be, however, only one of many complex factors driving decisions made by the FAA to enable access by UAS to this sort of secured airspace

- The FAA will continue to coordinate with security agencies, as well as industry, to determine how to best leverage the security benefits offered by Remote ID. Near term efforts may include incorporating information on Remote ID equipment into the Special Governmental Interest process used by the FAA for expedited authorization of access into security and emergency operations driven Temporary Flight Restrictions and other similarly restricted airspace
- The FAA commits to considering the added safety and security benefits provided by Remote ID equipment in development of future rules related to UAS and airspace access
- While the FAA understands the DAC's recommendation related to 0-foot LAANC grids, the situational awareness provided by Remote ID-compliant UAS does not fully address the safety concerns presented by the operation of UA in these areas. However, the FAA can commit to evaluating Remote ID equipment as a risk mitigation to operate in 0-foot grids. This can start in period 3

Rebates or monetary incentives

- As stated in the FAA's Remote ID NPRM, the FAA is willing to consider methods to offset the registration costs associated with final Remote ID rule compliance. 84 FR 72438, 72463 (Dec. 31, 2019) at Sec. IX.C. The FAA will consider opportunities for cost reduction and off-setting during period 3, while remaining mindful of statutory requirements that apply to the collection of registration fees
- The FAA has no part in the administration of or fee collection for the part 107 knowledge exam, and thus has no legal mechanism for reimbursement
- The FAA has no part in the fee collection for the UAS Symposium; there is no prohibition on industry members from speaking with the FAA's Symposium partner(s) about offering this option

Incentives Provided by Others

The DAC also recommended incentives that are the purview of non-FAA entities regarding local and state privileges, federal agencies, insurance, and industry recognition.

- The FAA does not exercise authority over local and state privileges or the work of other federal agencies, insurance entities, or organizations that provide recognition in industry. The FAA will, however, work with other organizations as appropriate in informing the public of the existence of the FAA's rule on remote identification. We strongly encourage states and municipalities to proactively consider the benefits of Remote ID equipped aircraft in their jurisdictions, and we commit to undertaking an educational campaign for states/cities/municipalities specifically related to the benefits Remote ID provides in



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

terms of situational awareness for their law enforcement and public safety officials. This can start in period 2

- The FAA commits to opening dialogue with the National Park Service regarding takeoff and landing restrictions in their parks and the benefits of Remote ID. This can start in period 1
- The FAA strongly encourages insurance companies to consider whether an operator is flying Remote ID equipped UAS when calculating insurance premiums and monetary discounts. This could be akin to discounts provided by auto insurers for optional safety equipment like blind-spot indicators and rear-facing cameras

Finally, the FAA strongly encourages the industry to continue collaborating in this area. It is important to recognize that the broad safety and security benefits of Remote ID equipage for UAS are realized only with widespread compliance with the rule and equipage standards. The result is a cooperative user community that becomes its own mitigation against risk presented by other unmanned air traffic, especially in circumstances with UAS flying beyond visual line-of-sight (BVLOS). The FAA recognizes that while this may not be a direct incentive for individual operators and recreational flyers, it should broadly incentivize the UAS manufacturer community to produce aircraft in compliance with published industry consensus standards (e.g., the serial number standard) as early and quickly as possible.

The FAA's final commitment is to reconsider the DAC's recommendations, as well as any additional ideas to incentive voluntary Remote ID equipage, as we get closer to finalizing the rule. We recognize the assumptions and environment of today's responses might not reflect the FAA's ultimate policy, but the FAA remains open to all reasonable means of encouraging compliance with Remote ID generally, as widespread and early as possible.



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Task Group 2, UAS Security Issues:

1. The FAA tasks the DAC to identify what currently existing or near term technical solutions at the aircraft or operational limitation/capability level could make it less likely that clueless and careless operators could operate UAS in ways that can be perceived as posing a safety or security threat.
2. Identify what is the universe of actions that IF relevant industry stakeholders agreed to do them, would substantially reduce the likelihood of unintentional threatening behavior.

DAC Recommendation:

The Task Group used, as a central assumption, the precept that National Airspace System (NAS) security is comprised of three core pillars: airframe security, airspace/operational security, and airmen/operator security.

- ***OEMs should equip their UAS with geofencing1 capabilities***
 - Geo-fencing is defined in this report as some form of automated flight limitation that prevents the UAS from entering a pre-defined area (e.g. airspace around a sensitive facility/location). Rationale: Geofencing is one of the most immediate and scalable technology solutions that can be quickly fielded to help reduce the security risks posed by careless and clueless UAS operators
 - Encourage the standardization of voluntary OEM geofencing around permanent critical infrastructure and fixed assets
 - Encourage OEMs to use the most up-to-date critical infrastructure information in UAS software (see Recommendation III)
 - Encourage industry-led geofencing compliance, similar to AUVSI's Trusted Operator Program
 - The federal government should consider contracting with geofencing-compliant systems
 - It is critical to note, many of the following recommendations require geofencing or build on safety controls implemented by geofencing
- ***The federal government should make available a consolidated, standardized, and up-to-date database for critical infrastructure and TFRs issued, that are machine processable***
 - Rationale: Industry and operators have consistently faced challenges staying up to date on critical infrastructure locations due to the general pace of government, as well as differing data sources. Additionally, with the exception of Recommendations IV and VI, the success of the Task Group's recommendations require industry's access to a well maintained, easily understandable, and accessible database for critical infrastructure and TFRs
 - TFRs are issued with varying degrees of uniformity, within and across the FAA and Department of Interior databases, making it challenging for industry to accurately and automatically interpret and use TFR contents



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

- FAA should require periodic and transparent updating of such databases to instill public and industry confidence in the critical infrastructure and TFR data
- To lower implementation cost and difficulty, a government database containing this information should be made available online with an application program interface (API) designed to easily extract the data
- ***OEMs should create alerts for UAS operators when their UAS is approaching sensitive flight areas, such as controlled airspace, prohibited flight areas, TFRs, etc.***
 - Rationale: Clueless/careless operators often do not understand or know that they may be operating near sensitive facilities, areas, etc. Providing some form of pop-up alert (e.g. on the user display being used to fly the UAS) will give the operator situational awareness of the area of operations the UAS is about to enter and allow them to take corrective action
 - FAA should work with industry to standardize performance-based distances from sensitive flight areas at which the UAS operator should receive an alert
 - For operators flying a predetermined route that takes the geofence into account (such as one generated by a UTM system), the operator should be alerted if the UAS is off course and approaching a sensitive flight area, TFR, etc
 - OEMs should assist operators in ensuring the latest critical infrastructure/TFR database (see Recommendation II) is loaded into the UAS software before flight. Many UAS utilize smartphone or tablet apps for flight controls, so a pop-up alert, based on the latest critical infrastructure/TFR database on the controlling device, would be no different from the notification of an incoming text message
- ***OEMs should voluntarily equip “ADS-B In” receivers on UAS systems (i.e., airframe and/or controller), combined with the notification system in Recommendation II above. A follow-on to this would be voluntary equipage of an airborne conflict resolution/collision avoidance capability for the UAS operator.***
 - Rationale: Allowing UAS operators to receive ADS-B transmissions would alert operators of nearby manned aircraft flight, allowing the UAS operator to take action to avoid a conflict. The addition of an Airborne Collision Avoidance System (ACAS) or UAS-based, ADS-B In conflict resolution recommendation system would provide the UAS operator with recommendations for resolving airborne conflicts. Note that the conflict resolution notifications should primarily be for the UAS operator (not the manned aircraft operator)
 - Even outside the airport environment, ADS-B receivers would provide situational awareness for careless and clueless pilots operating within the broader NAS
 - Additionally, voluntary equipage of ACAS or an ACAS-like system goes beyond simply knowing the location of an airborne threat but provides the UAS operator with a recommended evasive action to resolve the conflict. A



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

UAS operator without this type of warning might make a flight control input that increases the potential for a collision

- ***OEMs should explore the voluntary enablement of automated UAS flight performance limitations—such as altitude limitations, return-to-home features, and decrease in UAS speed or maneuverability—while in or near sensitive flight areas.***
 - Rationale: UAS automated flight performance limitations represent a less extreme version of geofencing—whereas with geofencing, a UAS would be unable to fly in a certain area, with UAS flight performance limitations the UAS would still have the capability to fly in such areas, it would simply have decreased capabilities when doing so
 - FAA and industry must collaborate to conduct research to ensure this security recommendation does not compromise safety. Care must be taken that the automated flight performance limitations do not prevent the UAS operator from operating the UAS safely, including for contingency actions, such as evading objects while in flight (e.g., manned aircraft, a structure, etc.)
 - As a UAS approaches a TFR, covered asset, or some other sensitive flight area, using automated flight performance limitations serves two purposes:
 - i. First, it can limit a clueless/careless operator’s ability to unknowingly engage in dangerous or threatening behavior by impairing the UAS’s capabilities
 - ii. Second, it can inform a clueless/careless operator of the UAS’s location in an area where it is not supposed to be
 - Some OEMs already offer automated flight performance limitations in the form of “beginner mode”
 - This recommendation is only possible with a UAS software modification similar to geofencing, combining both the geolocation abilities of a UAS with updated information on sensitive flight areas
- ***OEMs should explore the voluntary development and equipage of UAS with performance-based detect and avoid (DAA) technology, for collision/obstacle avoidance, on the airframe, using acoustic, optical, and/or other sensors, as well as robust DAA algorithms.***
 - Rationale: Providing careless and clueless operators with detect and avoid technology would likely further reduce the potential harm such operators can cause
 - UAS with detect and avoid technology will allow for safer interaction between UAS and other objects in the NAS, be it other UAS or manned aircraft flight



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

FAA Response Tasking 2:

The FAA response to the DAC UAS Security Task Group's six recommendations as follows:

- ***OEMs should equip their UAS with geofencing capabilities.***
 - On December 31, 2019 the Federal Aviation Administration (FAA) and Department of Transportation (DOT) published a proposed rule “Remote Identification of Unmanned Aircraft Systems” (RID)¹
 - The FAA addresses geo-fencing in the proposed rule
 - FAA is not responding to comments relative to the proposed rule other than through the mechanisms for comment contained within the proposed rule
 - Comments are being accepted until March 2, 2020
 - The rule proposes performance-based requirements so that persons submitting means of compliance can innovate and develop their own means to meet the requirement
 - The FAA envisions that this requirement can be met through a range of solutions, such as
 - a. geo-fencing or
 - b. command and control link power limitations
 - The FAA did not propose to impose any range limitation on standard remote identification UAS²
 - FAA recommends that OEMs cooperate with the FAA and other stakeholders to develop and field geo-fencing capabilities, which support restrictions to accessing defined airspace, rather than outright airspace prohibitions. These more sophisticated capabilities should incorporate features that address, for example:
 - a. Airspace prohibitions or restrictions
 - b. Access restrictions based on part-time prohibitions to defined airspace
 - c. Access restrictions based on conditions, including obtaining FAA authorization, types of operations (e.g., public safety drone missions), etc.
 - d. Cautionary advisories applied to select airspace
 - FAA further proposes that this geo-fencing capability support future expanded links to FAA provided, dynamic airspace access authorization and restriction data – e.g., activation of Temporary Flight Restrictions (TFR)

¹ [ID: FAA-2019-1100-0001] .

² “...13. Range Limitation, The FAA is proposing in § 89.320(l) to require that a limited remote identification UAS be designed to operate no more than 400 feet from its control station. The FAA is proposing this as a performance-based requirement so that persons submitting means of compliance can innovate and develop their own means to meet the requirement. The FAA envisions that this requirement can be met through a range of solutions, such as geo-fencing or command and control link power limitations. The FAA is not proposing to impose any range limitation on standard remote identification UAS...”



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

- Of note: under current law, states are prohibited from enforcing FAA statutes (i.e. preemption) and regulations, including operational regulations applying to unmanned aircraft systems (UAS)³
 - a. State or local law enforcement have the responsibility to enforce state or local law. In the context of UAS, state or local jurisdictions may use their police powers to regulate such areas as land use, zoning, privacy, trespass, and law enforcement operations, and it is generally permissible if such enforcement has an indirect effect on UAS including UAS operations
 - b. Examples include specifying that UAS may not be used for voyeurism, prohibiting use of UAS for hunting or fishing, or for interfering with an individual who is hunting or fishing, and applying an existing reckless endangerment statute or ordinance to the operation of a UAS
 - c. In addition, the designation of aircraft landing sites is not pervasively regulated by federal law, but instead is a matter left primarily to state or local control

- ***The federal government should make available a consolidated, standardized, and up-to-date database for critical infrastructure and TFRs issued, that are machine processable.***
 - The FAA already provides standardized sources capturing TFRs and other security driven airspace restrictions, which are automation-compatible, including systems used by Low Altitude Authorization and Notification Capability (LAANC) UAS Service Suppliers (USS)

 - In addition to Notice to Airmen (NOTAM) related information on conventional TFRs, the agency also provides Geographic Information System (GIS) compatible data on UAS-specific airspace features, including special security instructions applied to airspace overlying select sensitive locations, via its UAS Data Delivery Service (UDDS)

 - The FAA is continuing to push forward on enhancements to its Aeronautical Information Services (AIS), which will further improve its ability to share standardized, automation-compatible data on airspace restrictions. This effort includes a NOTAM Modernization effort, which is expected to enable UAS operators to be more aware and, as appropriate, avoid airspace to which restrictions have been applied for security purposes

 - FAA is currently engaged in congressionally mandated rulemaking relating to airspace around critical infrastructure (§ 2209). Section 2209 of the FAA Extension, Safety and Security Act of 2016 required the Secretary of Transportation to establish a process to prohibit or restrict the operation of UAS in close proximity to certain fixed site facilities

³ FAA has sole authority to enforce its flight regulations, such as 14 CFR parts 91 and 107.



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

- a. The only fixed site facilities this applies to include: critical infrastructure, such as energy production, transmission, and distribution facilities and equipment. Oil refineries and chemical facilities. Amusement parks; and, other locations that warrant such restrictions
 - b. As an interim solution to implementation of Section 2209 through rulemaking, the FAA is utilizing existing authority under 14 CFR § 99.7 to establish Special Security Instructions (SSI) implemented as Temporary Flight Restrictions (TFRs) over qualifying infrastructure—including, but not limited to, military installations, Federal prisons, Federal courts, and certain federal law enforcement offices. The FAA shares information on these restrictions in UDDS, which supports processing by automation. These SSI are expected to be replaced in the future by a longer-term solution being developed by USDOT
- ***OEMs should create alerts for UAS operators when their UAS is approaching sensitive flight areas, such as controlled airspace, prohibited flight areas, TFRs, etc.***
 - FAA supports the expedited development and fielding of automation enabling alerting supported by geospatial cross-referencing of UA positions with airspace features, specifically including airspace restrictions (e.g., TFRs)
 - FAA further supports expanding this functionality to include 4D trajectory analysis as UAS platforms become more sophisticated and the FAA and industry field UAS Traffic management (UTM) related services
 - ***OEMs should voluntarily equip “ADS-B In” receivers on UAS systems (i.e., airframe and/or controller), combined with the notification system in Recommendation II above. A follow-on to this would be voluntary equipage of an airborne conflict resolution/collision avoidance capability for the UAS operator.***
 - On December 31, 2019 the Federal Aviation Administration (FAA) and Department of Transportation (DOT) published a proposed rule “Remote Identification of Unmanned Aircraft Systems”
 - The FAA addresses ADS-B in the proposed rule
 - FAA is not entertaining comments relative to the proposed rule other than through the mechanisms for comment contained within the proposed rule
 - Comments are being accepted until March 2, 2020
 - The rule proposes a prohibition from using Automatic Dependent Surveillance Broadcast (ADS-B) to satisfy Remote Identification requirements⁴

⁴ “B. Prohibition from Using Automatic Dependent Surveillance Broadcast (ADS-B) To Satisfy Remote Identification Requirements”

“XVI. Use of ADS-B Out and Transponders, and others.”

“I. Executive Summary, A. Introduction and Overview ...Current rules for registration and marking of unmanned aircraft facilitate the identification of the owners of unmanned aircraft, but normally only upon physical examination of the aircraft. Existing electronic surveillance technologies like transponders and Automatic Dependent



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

- Current rules for registration and marking of unmanned aircraft facilitate the identification of the owners of unmanned aircraft, but normally only upon physical examination of the aircraft
- Existing electronic surveillance technologies like transponders and Automatic Dependent Surveillance communications with air traffic control (ATC), were all considered as potential solutions for the remote identification of UAS but were determined
 - a. to be unsuitable due to the lack of infrastructure for these technologies at lower altitudes and the potential saturation of available radio frequency spectrum
 - b. The FAA proposes to address the identification issues associated with UAS by requiring the use of new services and technology to enable the remote identification of UAS
- FAA notes that the integration of any conflict resolution / collision avoidance capabilities must be based on overarching, default requirement that UAS operators ensure that their aircraft remain clear of manned aircraft, not vice versa
- ***OEMs should explore the voluntarily enablement of automated UAS flight performance limitations—such as altitude limitations, return-to-home features, and decrease in UAS speed or maneuverability—while in or near sensitive flight areas.***
 - FAA supports the development and integration by industry, in cooperation with the FAA, of automated UAS flight performance limitations linked to proximity to airspace restrictions and other sensitive areas
 - FAA notes that the development of any such automation, which significantly alters UAS flight performance and behavior, must be closely coordinated with FAA to address potential safety, as well as security, implications
- ***OEMs should explore the voluntarily development and equipage of UAS with performance-based detect and avoid (DAA) technology, for collision/obstacle avoidance, on the airframe, using acoustic, optical, and/or other sensors, as well as robust DAA algorithms.***
 - FAA supports the OEMs exploring the voluntarily development and equipage of UAS with performance-based detect and avoid (DAA) technology, for collision/obstacle avoidance, on the airframe
 - FAA notes that the development of any such automation, which significantly alters UAS flight performance and behavior, must be closely coordinated with FAA to address potential safety, as well as security, implications

Surveillance communications with air traffic control (ATC), were all considered as potential solutions for the remote identification of UAS but were determined to be unsuitable due to the lack of infrastructure for these technologies at lower altitudes and the potential saturation of available radio frequency spectrum. The FAA proposes to address the identification issues associated with UAS by requiring the use of new services and technology to enable the remote identification of UAS....”



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Task Group 3, Part 107 Waivers:

1. The FAA tasks the DAC to review the framework of the existing 107 waiver process provided by the FAA and develop recommendations on improving this process.

DAC Recommendation:

The Task Group ultimately executed three primary work products to reach the below recommendations. A subset of the Task Group received a baseline briefing from the FAA on the process of analyzing part 107 waivers requests. From that briefing the Task Group developed a question set designed to better understand specific aspects of the internal processing of the part 107 waivers. The question set consisted of seven questions which the FAA responded to in writing.

Second, the Task Group developed a survey to collect data from appropriate stakeholders with experience navigating the application process. This survey was distributed to UAS pilot communities through social media channels, AUVSI chapters, and other UAS pilot community communication methods. The survey consisted of 24 questions to gauge the experience of the UAS Community and their experiences in the part 107 waiver process. Most questions were either check the box, or yes or no answers. Three questions in the survey allowed respondents to enter written comments. 632 total responses were received and included many interesting and informed comments.

- ***Auto-renewal of expiring waivers***
 - Expiring waivers should auto-renew unless there is a compliance issue or change in regulations to reduce administrative burden and limit re-submissions. If this is not possible, then only require entry of renewal dates or other changes, not re-entry of the entire waiver application
 - Rationale: Reduce administrative burden
- ***Modify Drone Zone***
 - FAA should modify Drone Zone to allow the operator to update non consequential information without having to file an application for an amendment to their waiver, i.e. change responsible person, office address etc
 - Rationale: Avoid duplication and reduce administrative burden
- ***Checklist of safety cases for complex waiver approvals***
 - FAA should create a checklist inventorying appropriate examples of satisfying safety cases for complex waiver approvals, like BVLOS, which is then used to provide constructive feedback to those applicants that do not meet the required thresholds pointing the applicant to specific examples that would have satisfied the requirement
 - a. Additionally, the FAA should consider creating a testing procedure for 107.29, 107.39, 107.41 (above UASFM AGL), 107.31 that should be graduated (< 2SM w. clear view of airspace, >2SM or restricted view of airspace). By providing an online test and guidelines for automatic waiver



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

approvals, waiver office personnel waiver quantity and work load would be significantly improved

– ***Streamlined automated approval***

- The FAA should consider a streamlined automated approval for those applicants trained by an operator who has flown under an existing waiver for at least 1 [or X years] year and complies with all waiver requirements; or, an operator who has received a Special Airworthiness Certificate-Experimental Aircraft from a UAS Test Site
 - Rationale: Avoids duplication, promotes consistency within the FAA, and reduces administrative burden for processing waiver
- The FAA should consider automated approval for applicants who leverage the work of programs in UAST, TOP and industry standards etc., and give operators credit for undergoing audits, certification and other training beyond part 107 compliance. This normalizes the use of consensus-based industry standards (see attached table) as mandated by National Technology Transfer and Advancement Act (NTTAA; United States Public Law 104-113)
 - Rationale: reduce administrative burden and compliance with USPL 104-113

– ***Streamlined process for operators***

- The FAA should consider a streamlined process for groups of operators applying for waivers of the same type of operations for a business use case. Current Drone Zone processes actively discourage the shared use of templates or flow-down procedures
 - Rationale: Reduce administrative burden

– ***Increased transparency and accountability of part 107***

- The FAA should increase transparency and accountability of part 107 analysts by creating a pathway for applicants to learn who reviewed their application and why it was not approved. There is currently no effective way to pose questions or communicate with part 107 analysts other than the organizational email
 - Rationale: Increases transparency and accountability

– ***Structured program for part 107 waiver inspectors***

- The FAA should require part 107 waiver inspectors to attend a structured program similar to that mandated by AIR-900 Enterprise Operations Division program that provides FAA ASIs and UAS Designated Airworthiness Representatives the background, key policies, and procedures
 - Rationale: This training already exists and would serve to reduce inconsistencies in waiver evaluation



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

FAA Response Tasking 3:

The FAA response to the DAC part 107 waiver recommendations are as follows:

- ***Auto-renewal of expiring waivers***
 - The FAA is implementing an expedited part 107 waiver renewal application process within DroneZone. This process is designed to reduce the reapplication burden for existing waiver holders and not duplicate the FAA review process for waivers where the residual operational risk, regulatory structure, and policy has not changed since original waiver issuance. The updated process will be announced during the FAA UAS Symposium in June 2020, and is planned for implementation prior to expiration of waivers issued in August of 2016. The process will continue to allow for FAA verification and review, as this is an important component of the FAA’s obligation to oversee compliance with the provisions contained in waivers
 - Most part 107 waivers are issued with a 48-month valid timeframe. The FAA considers this timeframe necessary for safety in order to maintain awareness of any notable changes in operations or methods and practices used to mitigate risk. Given that advances in technology occur quickly, the FAA has found that 48 months is an appropriate benchmark for validity of existing waivers granting relief from limitations that apply in part 107

- ***Modify Drone Zone***
 - The FAA and the responsible person are obligated to ensure issued waivers correctly depict information such as the responsible person and the responsible person’s contact information. Currently, the FAA allows operators to continue operations if a waiver needs to incorporate changes that are administrative in nature. The responsible person must notify the FAA of the changes prior to continuing operations. The FAA considers notification occurring when an application is submitted in DroneZone. For example, if the contact information for the responsible person changes, the waiver holder may submit a waiver request in DroneZone to update the information on the currently issued waiver. This application may only need to include the previously granted waiver and the requested updates to the previously granted waiver. Once notification of submission is sent to the applicant, the operator may continue to operate under the existing waiver by attaching the new application to the existing waiver and having both documents available for inspection during operations. The FAA is exploring adding functionality in DroneZone to respond more quickly to waiver applications that reflect only administrative updates

- ***Checklist of safety cases for complex waiver approvals***
 - The FAA continues to update its part 107 waiver website and will update disapproval letters by the end of third quarter FY20 to provide additional information and more constructive feedback to waiver applicants whose application did not result in the FAA issuing a certificate of waiver. In the meantime, the part 107 waiver team and UAS Support Center staff will engage in recurring meetings to address waiver



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

applicants' questions and concerns and will provide additional details to applicants who contact the UAS Support Center for assistance with their waiver applications. The FAA makes detailed information available in DroneZone to UAS Support Center staff to provide insight to applicants who may have questions about pending waiver applications, disapprovals, or the provisions of an approved waiver. The FAA is currently developing a risk tool that will be made available to applicants to provide methods, methodologies, acceptable mitigations, and more responsive and direct feedback to applicants where their application did not mitigate risk to an acceptable level. This tool is planned to be made available to applicants in the first half of calendar year 2021. To assist applicants currently with the part 107 waiver application process, the FAA provides Waiver Safety Explanation Guidelines, examples of approved waiver applications, and a trend analysis of complex waivers the FAA has issued. (Please click on the following link for waiver trend analysis: https://www.faa.gov/uas/commercial_operators/part_107_waivers/waiver_trend_analysis/) The FAA continues to evaluate the waiver application process and part 107 waiver approval information, with the intention of improving the process on a continuous basis

– *Streamlined automated approval*

- The FAA acknowledges the potential safety benefits of specialized experience, advanced programs providing a higher level of training than required to obtain a part 107 Remote Pilot Certificate, and airworthiness certificates issued by the FAA. All of these can increase the safety and reduce the residual risk of a proposed operation. Accordingly, the FAA considers these as risk mitigations when proposed in a waiver application. The FAA is currently sponsoring and funding research projects to identify aspects of training in FY20 and may publish the research results and recommendations in FY21, in the interest of determining that certain types of training might serve as a mitigation of risk for potential applications of waiver. If and when the research results are published, the FAA will work with standards bodies to develop publically available recommendations for training items based on the research. Waiver applicants may request the FAA consider completion of such training as a means of mitigating the risk of a proposed operation
- Once industry and consensus standards are published, the FAA will consider whether compliance with a published industry or consensus standard for a particular operation could be an acceptable method to demonstrate that the proposed operation could be conducted safely under the terms of a certificate of waiver. The FAA has recently successfully used this approach in some waiver applications that establish compliance with ASTM 3322-18, *Standard Specification for Small Unmanned Aircraft System (sUAS) Parachutes*

– *Streamlined process for operators*

- The FAA is exploring different DroneZone application formats to streamline the application, receipt, and analysis of the waiver applications. The FAA plans to begin implementing these changes in calendar years 2020-2021. The FAA is continuously



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

evaluating new strategies and methods to make our part 107 waiver application and evaluation system more efficient, including streamlining applications for waivers and the development and implementation of new regulations, which will obviate the need to obtain a part 107 waiver for many proposed operations

- ***Increased transparency and accountability of part 107***
 - The waiver team has improved transparency of process and accountability of analysts by providing the UAS Support Center staff with waiver application and analysis information and an open line of communication with the waiver analysts. The Support Center serves as the primary point of contact for applicants who seek explanation or guidance regarding waivers. The Support Center staff will continue to coordinate directly with waiver analysts to provide support to applications about waiver applications, disapprovals, and general UAS questions. The UAS Support Center is available by telephone and will respond to emails between 8 am to 4 pm eastern time, Monday through Friday, excluding government holidays

- ***Structured program for part 107 waiver inspectors***
 - All FAA waiver analysts are certified and duly accredited Aviation Safety Inspectors who are specifically trained in waiver processing. Analysts assigned to the part 107 waiver team attend additional training unique to part 107 waiver processing. The part 107 training addresses consistency in waiver application evaluation, part 107 waiver history and background, and part 107 waiver policies. FAA waiver analysts receive ongoing on the job training by agency subject matter experts in areas such as UAS policies, UAS research, UAS design and function, UAS command and control links, Detect and Avoid, and UAS human factors



DAC Recommendations

for Task Groups:

#5 – Facility Maps

#6 – BVLOS Challenges

#7 - UTM

Problem Statement:

The FAA DAC UAS Facility Maps Tasking Group has determined the UAS Facility Maps should be refined. Three years have passed since the initial creation of the UAS Facility Maps. Technology has evolved and data now exists to support a refinement to more precisely define appropriate safety margins of UAS flying near airports in controlled airspace. The UAS Facility Maps Tasking Group acknowledges that some airports have zero, or unnecessarily low, AGL UAS limits where UAS may be allowed to fly safely. Similarly, there are some airports with grid squares with allowable altitudes that may conflict with common manned aircraft flight routes.

Recommendations include the topics of:

- Grid square refinement, proposed changes from grid square size and treatment today
- Pilot Program, using data and experience, proposals to prioritize and roll out refinement of UAS Facility Maps
- Greater stakeholder input will be essential in the UAS Facility Maps refinement
- Reassessment of UAS Facility Maps within Class E airspace

UAS Facility Maps Grid Refinement:

The Tasking Group recommends the FAA utilize manned aircraft airspace protection surfaces, air traffic surveillance data, obstacle and obstruction data as well as experience gained from the three years use of UAS Facility Maps, to provide more precise guidance to facility management. The Tasking Group recommends that the refinement process ultimately be applied to all classes of controlled airspace (Class B, C, D and E) in proximity to airports.

The current UAS Facility Maps are comprised of grid squares that are rectangles of one minute of longitude by one minute of latitude (roughly one mile square). The initial recommendation is to refine the standardized grid spacing to 30 seconds of latitude by 30 seconds of longitude, creating four rectangles where one was initially defined. This recommendation will allow greater UAS utilization of airspace immediately by reducing the amount of area covered by a single number.

It is recommended that further refinement of UAS Facility Maps should incorporate a standardized approach when reviewing and assigning grid squares altitude ceilings around airports. This will help ensure consistency, where appropriate, across the NAS. Utilizing an existing standard such as those found in TERPS or Part 77, intended to protect manned operations, or modifying such a standard to fit the UAS use case, would help by establishing a more formulaic approach to use when determining separation requirements for UAS.¹ Using a standard like this should in most cases allow a consistent formula to be applied as the baseline.

For example, the lateral areas to the sides of runways have aircraft operating at higher altitudes than areas aligned with approach departure paths. Known alternate routes, such as those

¹ The UAS Facility Maps Tasking Group does not recommend a strict application of TERPS / Part 77. Rather, the grid refinement process should include the principles of TERPS / Part 77.

routinely used by helicopters, should be protected based on established routes or customary altitudes.

Working from this baseline, other considerations can then be evaluated to customize the UAS Facility Maps to reflect local conditions:

1. Surveillance Data – It is possible that protection surfaces are provided for existing procedures and or traffic patterns however, due to lack of use or other considerations, these procedures and/or traffic patterns are not used. Reviewing surveillance data can allow theoretical protections to be adjusted to reflect actual utilization, however, it is understood many areas, particularly at low altitude, do not have adequate surveillance data to make a determination on manned operations.
2. Shielded Operations - The UAS Facility Maps Tasking Group recommends the FAA establish a process to facilitate Shielded Operations in the NAS as soon as practicable because shielded operations will have an easy-to-understand explanation and will convey a positive sentiment to new recreational Fliers. Shielded operations will convey an acceptance of recreational UAS Fliers and at the same time reinforce the critical safety requirements of flying below the top of obstacles and structures when flying under shielded operations.

Shielded operations could be defined as flight within close proximity to existing obstacles and not to exceed the height of the obstacle. This should be considered to enhance access to the NAS for both Part 107 and recreational UAS pilots. This is already partially contemplated in 14 CFR 107.51(b)(1) and New Zealand uses a similar concept. This model could be implemented in a number of ways. FAA could use a data driven approach and map existing survey or other obstacle data for reference on UAS Facility Map grid squares or could use a case by case approval mechanism for shielded operations. Both of these approaches seem to have challenges including high workload and limited returns in terms of enhanced access to airspace. The Tasking Group recommends a blanket rule-based approach that includes automated approvals via the LAANC system as this removes the need to make case by case determinations or to try and define these altitudes on UAS Facility Map grid squares. One key aspect of this recommendation is the incorporation of shielded operations into the LAANC system, this may also serve to facilitate UAS manufacturer geofence unlocking. This could be a simple button or switch that can be utilized when making a LAANC request. If a request for a shielded operation is made, the LAANC system would automatically generate the approval without respect to the grid square altitude. The system would explicitly state and gain confirmation from the pilot that the flight would be entirely flown within the confines of the shielded operation requirements or the existing grid square altitude. Grid squares should be coded in metadata by FAA as either eligible or ineligible for this automated shielded operation approval and this would be critical in ensuring the safety and security interests of airports and other facilities where such limitations might be warranted. As stated in the stakeholder recommendations, the Airport Operator/Sponsor should be included in all discussions about restrictions in the immediate airport area due to security and other operational concerns.

For potential future consideration, shielded operations in New Zealand, provides for approved night flying and has eliminated the requirement for prior authorization. The DAC UAS Facility Map Tasking Group proposes the FAA consider these two features of shielded operations separately from shielded operations incorporation in UAS Facility Map refinement as proposed in the preceding paragraph.

3. Gained Operational Experience – Over the last three years UAS activity has been allowed in controlled airspace. Reviewing the “approvals” and “denials” for UAS flights in these controlled airspace environments can help in the refinement process (i.e. If UAS flight requests above the existing grid altitude is consistently approved that would suggest the altitude in that grid could be increased).
4. Low Altitude Operations - Low altitude operations are a consideration in the assumptions of defining UAS Facility Maps, however, certain manned operations have not been fully considered in multiple instances. For example, the New York South Shore route near JFK is flown by helicopters at altitudes below 500’ AGL but the UAS Facility Maps approve UAS operations up to 400’ AGL, which creates a conflict with charted and routinely utilized manned flight route. Additionally, private airports in surface areas are not always fully considered. It is important the FAA provide additional guidance on other types of low altitude operations, like helicopter routes and private airports, to ensure safe integration.

The Tasking Group also recommends that the FAA investigate the possible use of dynamic grid maps which may be adopted by the local team wherein the grid square altitudes change based on the utilization of specific runways.

Pilot Program:

The DAC UAS Facility Maps Tasking Group recommends a process of refining UAS Facility Maps across the country incorporating a criterion to determine prioritization of the modification rollout. Within that prioritization, the first airports participating in the UAS Facility Maps refinement form a pilot program (approximately 10 airports) including a broad cross-section of airport size and airspace complexity (Class B, C, D and E) to identify best practices and establish procedures for subsequent UAS Facility Maps refinement at the remaining airports.

The primary purpose of the pilot program is to assemble the data described in the UAS Facility Maps Grid Refinement section and determine which information is useful and which is not for the roll-out of the UAS Facility Maps refinement to other airports beyond the group within the pilot program.

The prioritization of airports subsequent to the pilot program should utilize a study considering the number of zero altitude grid rectangles to locate UAS Facility Maps where overly restrictive decisions may have been made. As an example, airports which are in the top quartile of airports with zero grid rectangles will be considered first in priority for refinement followed by airports in successive quartiles. Another indicator of required grid refinement prioritization would be

high levels of LAANC further coordination requests (i.e. requests for flight above grid altitude level) and/or LAANC denials.

Stakeholder and UAS Facility Maps Grid Refinement Team:

From a time line perspective, from the sections above, the Tasking Group has identified the refinement of grid squares and have suggested ideas to vet and prioritize airports where the UAS Facility Maps should be refined. Also the Tasking Group has proposed a pilot program. Next, the Tasking Group proposes the individuals responsible for this refinement effort comprise the following team and stakeholders:

- Air Traffic Management, team lead
- National Air Traffic Controllers Association (NATCA)
- Airport Facility Operator and Management
- Manned aircraft stakeholders
- UAS stakeholders

HQ and Local participation:

The tasking group recommends FAA HQ Air Traffic Management manage the roll-out of the program and empower local, Air Traffic Management, working collaboratively with NATCA, to take the lead in each UAS Facility Maps refinement effort. As Air Traffic Management led the initial UAS Facility Maps creation, the Tasking Group proposes the FAA go back to this team to ensure their experience and insight is leveraged for the refinement program. However, it is further recommended that other key stakeholders have the opportunity to provide input into the refinement process.

Key Stakeholders:

The Airport Operator and Management staff is considered by the Tasking Group a key stakeholder due to their local management as well as experience working with UAS over the last three years.

The Airport and Management Staff's input is especially important because the airport has unique issues that should be considered in assigning UAS altitude limits around the airport facility. These issues may include low altitude helicopter transition routes between runways or transition routes under arrival/departure runways, such as the Highway 183 and Spine Route transitions at DFW International Airport, or local security concerns that are not public knowledge and can't be exposed to the public.

To ensure the refinement project incorporates voices by manned and UAS stakeholders, the Tasking Group proposes the local team issue an application form for interested stakeholders to submit a request for invitation.

Reassessment of Class E airspace:

The stakeholder UAS Facility Maps refinement team should include analysis of Class E airspace, to reconsider the approach originally used to define facility map altitudes for Class E airspace.

For example, some class E airports have zero altitude grid squares located two miles laterally from a single runway while some Class B airports have 50' above ground level (AGL) grid squares located 2,000' laterally from the runway. The original approach highlights the importance of including stakeholder groups, particularly the airport operator, local manned aircraft operators, and local UAS operators to help fill in the knowledge gap created by the lack of a local on airport FAA Air Traffic Facility.

The UAS Facility Maps Tasking Group met five times by conference call/webinar. The following companies/agencies that participated on the Tasking Group were: American Association of Airport Executives, Jeppesen, Memphis International Airport, Aircraft Owners and Pilots Association, PrecisionHawk, Intel Corporation, Verizon Skyward, Wing, Academy of Model Aeronautics, New York Fire Department, New York Police Department, Dallas/Fort Worth International Airport, Dallas Police Department, First Person View Freedom Coalition, Reno-Tahoe Airport Authority, Los Angeles World Airports, FAA UAS Services Program, CNN Air, Airports Council International - North America, Air Line Pilots Association International, Airmap, Port of Portland, Boeing, National Air Traffic Controllers Association and Alaska Department of Transportation & Public Facilities.

Drone Advisory Committee –Task Group Six, BVLOS

Recommendations Summary – January 28th, 2019

Task Group Six (TG6) Tasking Summary

Have the DAC provide information about what they think are the remaining challenges for BVLOS. This can help inform upcoming decisions on what comes after IPP, PSPs, etc. and future FAA work plans.

Background

Tasked at the October 2019 DAC meeting, 42 individuals joined Task Group Six and created four subgroups focused on areas that the task group believed were challenges that represented areas of near-term regulatory and technical opportunity that if addressed, would provide significant benefits to both existing and new entrants into the national airspace. The subgroups created by TG6 focused on *Command/Control (C2)*, *UAV Certification*, *Detect and Avoid (DAA) Technologies and Autonomy*. The subgroup selected the topics via conference call and online polling. In addition to extensive email communication, the subgroups held a number of conference calls to create their recommendations.

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 D&R 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.

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.

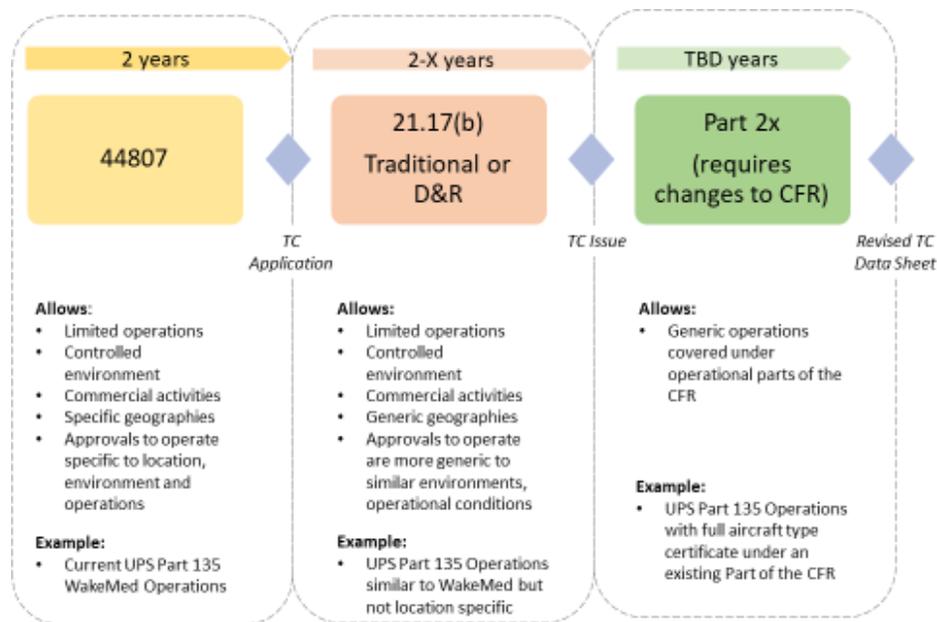
Recommendation 3:

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 BVLOS 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).

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.

Evolution of Pathway to Certified Aircraft



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.

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.

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.

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.

Autonomy

Recommendation 1:

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.

Recommendation 2:

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.

Recommendation 3:

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.

Recommendation 4:

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.

Recommendation 5:

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.

Recommendation 6:

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).

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. – *Technical Implications & Agency Roles*

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. – *Technical Implications & Agency Roles*

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. – *Safety & Technical Implications*

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.
– *Agency Roles & Economic Implications*

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. – *Agency Roles*

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. -- *Safety Technical Implications*

Report to the FAA Drone Advisory Committee
Work Product of Task Group #7—UTM Performance Capability Priorities
Task Group Lead—David Silver, VP for Civil Aviation Aerospace Industries Association

At the October 17, 2019 meeting of the Federal Aviation Administration’s (FAA) Drone Advisory Committee (DAC), the Designated Federal Officer (DFO) established Task Group #7 (TG7), led by David Silver from the Aerospace Industries Association, to review “UTM CONOPs 2.0” and determine industry performance capability priorities for “UAS Traffic Management” (UTM).

While the tasking specifically referenced CONOPs 2.0, that version of the draft was not released during the 90-day duration of the task group. Therefore, the group worked off UTM CONOPs 1.0 and information obtained from early drafts of CONOPs 2.0. Because the group was unable to review CONOPs 2.0, the task group primarily focused on the prioritization of UTM capabilities.

INTRODUCTION

The FAA’s DAC is made up of high-level industry participants from various companies, levels of governments, and airports, as well as the manned aviation community. The volunteer members provide their expertise to the FAA on critical issues facing the future of the unmanned aircraft systems (UAS) industry at public meetings and in task group settings.

TG7 comprises 47 members representing 33 organizations¹ from the UAS ecosystem who provided their expertise to compile a list of priorities for UTM capabilities. The final work product from the group includes this high-level report, a definitions document, and a “road map” that looks at industry and FAA resource requirements and priority levels for the identified specific performance capabilities.

SCOPE OF TASK GROUP’S WORK

TG7 recognized that certain items are critically important to the future of UTM and the UAS ecosystem, but fall outside the specific scope of this tasking. These include the roles and responsibilities of actors to carry out actions related to UAS and UAS Security. While this group did not specifically make recommendations on those items, TG7 believes that it will be important for relevant UAS Stakeholders and the FAA to continue to work together on the development of necessary policies, standards and other items that are needed for the development and implementation of a consistent UTM and the UAS ecosystem.

OVERVIEW OF WORK PRODUCT

Over the course of the 90-day tasking, TG7 met 5 times to build out two main deliverables:

1. A definition document describing the performance capabilities in the subsequent matrixed document (Note: these definitions are not meant to be set in stone, but merely used for context in describing a capability);

¹ Full list of participants is included in the appendix

2. A matrixed document that breaks down each specific performance capability by responsibility (e.g. FAA or UAS Service Supplier [“USS”]), the type of resource required to make that performance occur (e.g. industry standard), the current status of that capability, and the industry’s priority level for that performance capability in the next 12-24 months.

The definitions of the performance capabilities used in the documents came from the FAA’s UTM CONOPs 1.0, early drafts of CONOPs 2.0, and industry driven priorities. TG7 believes this list encompasses a mature view of the UTM system and accounts for six critical pieces of the UTM puzzle, including:

- IT Services
- Security Services
- Operations Support Services
- Conflict Management Services
- Communications Services
- Data Services

These capabilities were then prioritized into low, medium, and high categories for resources in the near term (0-24 months).

TG7 believes that these documents will provide the DAC, FAA, and other relevant stakeholders a comprehensive overview of the current state of UTM performance capability development, as well as set up a road map for areas for the FAA to prioritize resources in the near term.

RECOMMENDATIONS

1. TG 7 recommends that the FAA and relevant UAS Stakeholders work to put a timeline together in advance of the next Drone Advisory Committee meeting that includes dates of when the FAA and industry believe that the task will be accomplished.
2. TG 7 asks the FAA to allocate resources based on the priority levels contained in this report.
3. TG 7 recommends that it remains in existence to address CONOPs 2.0 when available.

UTM Capability Definitions

General Terms

1. UAS Service Supplier (USS): USSs provide UTM services to support the UAS community, to connect operators and other entities to enable information flow across the USS network, and to promote shared situational awareness among UTM participants.

IT Services:

1. FAA Messaging--A service which provides static, periodic, or event driven authoritative information from the FAA to USSs and UAS operators (e.g. airspace information, NOTAMs, TFRs).
2. Operator Messaging--A service which provides on demand, periodic, or event driven information on UAS operations (e.g. position reports, intent information, and status information) occurring within the subscribed airspace volume and time.
3. USS Network Discovery--A service which allows for service suppliers and UAS operators to be aware of other service suppliers providing specific services of varying levels of capability in a specific geographical region.

Security Services:

1. Operator Registration--A service which provides the ability for vehicle owners to register data related to their UAS and a query function to allow appropriate stakeholder to request registration data.
2. USS Registration/Approval--A service which provides the ability for USS operators to register and be approved by the FAA and authenticate data related to their USS and their actions. Approval should be requirement-based and automated to the greatest degree possible.
3. Remote ID--A service that will allow for the UAS to be identified by authorized stakeholders and the public through broadcast and/or network means.
4. Communication Security--A service which provides keys and other security mechanisms necessary to authenticate the users and secure network transmissions.

Operations Support Services:

1. Airspace Authorization--A service which provides airspace authorization from the Airspace Authority/Air Navigation Service Provider to a UAS Operator.
2. Restriction Management--A service which manages and pushes operational restrictions from the Airspace Authority/ANSP to affected UAS operations.
3. UTM System Monitoring--A service which monitors USSs and other UTM components and provides status information to authorized parties.
4. Emergency-- A USS service which provides a path for the safe passage or landing of an aircraft in emergency status by means of deconfliction or other conflict resolution.
5. ATM Interface--the way in which USSs will communicate with traditional Air Traffic Control.

Conflict Management Services:

1. Pre-flight Planning--The ability of USSs to facilitate UAS operations taking into account airspace constraints, operator registration, information, restrictions, etc.

2. Strategic Deconfliction--A service which arranges, negotiates, and prioritizes intended operational volumes/trajectories of UAS operations with the intention of minimizing the likelihood of planned airborne conflicts between operations.
3. Conformance Monitoring--A service which provides real-time alerting of non-conformance to intended operational volume/trajectory to an operator or another airspace user.
4. Conflict Advisory and Alert--A service which provides real-time monitoring and alerting through suggestive or directive information of UA proximity for other airspace users.
5. Dynamic Rerouting--real-time service which provides modifications to intended operational volumes/trajectories to minimize the likelihood of airborne conflicts and maximize the likelihood of conforming to airspace restrictions and maintaining mission objectives. This service arranges, negotiates, and prioritizes inflight operational volumes/trajectories of UAS operations while the UAS is aloft.
6. Surveillance--The ability to monitor the UAS and/or other airspace users through the USS in real time to ensure safe operations.
7. UAS Safety--The ability to incorporate multiple risk factors in assessing a UAS flight including ground risk data, population, hazards, weather, airspace density, etc. in the context of an SMS.
8. Manned Participation--Current aircraft equipage and communication links used when operating in airspace used for UTM operations.

Communications Services:

1. Communication/ C2--A service which provides infrastructure and quality of service assurance for radio frequency (RF) Command and Control (C2) capabilities to UAS Operators.
2. Alternative Navigation--Non-GPS Position, Navigation and Timing operations

Data Services:

1. Weather--A service which provides forecast and/or real-time weather information to support operational decisions of individual Operators and/or services.
2. Mapping--A service which provides terrain and/or obstacle data appropriate and necessary to meet the safety and mission needs of individual UAS operation or support the needs of separation or flight planning service.

UTM Capability	Responsibility?	FAA Resource Requirement	Current Status	Industry Priority Level in Near Term
IT Services:				
FAA Messaging	FAA	IT	TBD	High
Operator Messaging	USS	Standard	In progress	Medium
USS Network Discovery	USS	Standard	Developed	High
Security Services:				
Operator Registration	FAA	IT/Rulemaking	Complete	Complete
USS Registration	FAA	Advisory Circular	LAANC only	Medium/High
Remote ID	FAA	Rulemaking	TBD	High
Communications Security	USS	Standard	LAANC only	Medium
Operations Support Services:				
Airspace Authorization	FAA	IT/Notice of some kind	LAANC only; evolving	High
Restriction Management	FAA/USS	Standards/Advisory Circular	In progress	High
UTM System Monitoring	FAA/USS	IT	LAANC only; evolving	Low/Medium
Emergency	USS	Notice of some kind	TBD	Medium
ATM Interface	USS	Notice of some kind	TBD	Medium
Conflict Management Services:				
Pre-Flight Planning	USS	None	In development/Deployed	Low
Strategic Deconfliction	USS	Standard	In development	High
Conformance Monitoring	FAA/USS	Standard	TBD	Medium/High

Conflict Advisory and Alert	USS	Standard	In development	High
Dynamic Rerouting	USS	None	TBD	Medium
Surveillance	USS	None	In development	High
UAS Safety	USS	Standard or Advisory Circular	TBD	High
Manned Participation	FAA	Policy	TBD	Low
Communications Services:				
Communication/C2	Operator	None	In development	Medium
Alternative Navigation	USS/Operator	None	TBD	Low
Data Services:				
Weather	USS	None	TBD	Low
Mapping	FAA/USS	None	Limited obstacle info	Low

Appendix 1

Full list of participants include:

1. David Silver, Aerospace Industries Association
2. Max Fenkell, Aerospace Industries Association
3. Brian Wynne, AUVSI
4. Karen DiMeo, Airxos
5. Lisa Ellman, Commercial Drone Alliance
6. Dan Dalton, Airspace Systems, Inc.
7. Vas Patterson, ALPA
8. Stella Weidner, The Boeing Company
9. Jon Standley, L3Harris
10. John Deepu, NYPD
11. Andy Thurling, NUAIR
12. Mark Reed, ALPA
13. Just Barkowski, AAAE
14. Basil Yap, NCDOT
15. Rich King, AUVSI
16. Diana Cooper, Precision Hawk
17. Brendan Schulman, DJI
18. Mark Colborn, Dallas PD
19. Charlie Keegan, AVMGT
20. Brittney Kohler, National League of Cities
21. Rune Duke, AOPA
22. Greg Walden, Small UAV Coalition
23. Dustin Kilgore, Garmin
24. Jacob Ruytenbeek, Airmap
25. Robert Champagne, Amazon
26. Darshan Divakaran, NCDOT
27. Mike Glasgow, Google
28. Amit Ganjoo, ANRA Technologies
29. Margaret Nagle, Wing
30. Wade Traxell, City of Fort Collins, Colorado
31. Andrew Scharf, FDNY
32. Matt Fanelli, Skyward
33. Mildred Troegeler, The Boeing Company
34. Ted Lester, Airxos
35. Steve Weidner, NATCA
36. Ryan Terry, The Lockheed Martin Corporation
37. Chris Keyes, NATCA
38. Matt Satterley, Wing
39. Mark Aitken, DJI
40. Sean Cassidy, Amazon
41. Lorne Cass, American Airlines
42. Brent Klavon, ANRA Technologies

43. Ken Stewart, Airxos
44. Drew Colliatie, AUVSI
45. Heidi Williams, NBAA
46. Luke Fox, WhiteFox Defense
47. Ally Ferguson, Precision Hawk



Federal Aviation
Administration



DRONE ADVISORY COMMITTEE

FEBRUARY 27, 2020



Official Statement of the DFO

PUBLIC MEETING ANNOUNCEMENT

Read by: Designated Federal Officer Dan Elwell
Drone Advisory Committee
February 27, 2020

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:

February 11, 2020

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 27, 2020

Review of Agenda and Approval of Previous Meeting Minutes

Dan Elwell

Designated Federal Officer,
FAA Drone Advisory Committee
Deputy Administrator, FAA



Agenda

9:00 a.m.	9:01 a.m.	Greeting from FAA
9:01 a.m.	9:05 a.m.	Official Statement of the Designated Federal Officer
9:05 a.m.	9:15 a.m.	Review of Agenda and Approval of Previous Meeting Minutes
9:15 a.m.	9:30 a.m.	Opening Remarks from DAC Chairman
9:30 a.m.	9:45 a.m.	FACA Overview
9:45 a.m.	10:15 p.m.	FAA Response to Early Equipage Recommendations
10:15 a.m.	10:30 a.m.	Break
10:30 a.m.	11:00 a.m.	FAA Response to UAS Security Recommendations
11:00 a.m.	11:30 a.m.	FAA Response to Part 107 Waiver Recommendations
11:30 a.m.	12:45 p.m.	Lunch and Networking
12:45 p.m.	1:20 p.m.	DAC Recommendation and Discussion: Tasking #5 – Facility Maps
1:20 p.m.	1:55 p.m.	DAC Recommendation and Discussion: Tasking #6 – BVLOS Challenges
1:55 p.m.	2:30 p.m.	DAC Recommendation and Discussion: Tasking #7 – UTM
2:30 p.m.	2:45 p.m.	Break
2:45 p.m.	3:20 p.m.	Industry-Led Technical Topics
3:20 p.m.	3:50 p.m.	New Business/Agenda Topics/Review Taskings
3:50 p.m.	4:00 p.m.	Closing Remarks
4:00 p.m.	4:00 p.m.	Adjourn



Federal Aviation Administration



DRONE ADVISORY COMMITTEE
FEBRUARY 27, 2020

Opening Remarks from DAC Chairman

Michael Chasen

Chairman, FAA Drone Advisory Committee
PrecisionHawk USA Inc.



Federal Aviation Administration



Moving the Industry Forward



TECHNOLOGY that can keep drones in the air for longer, carrying heavier payloads, and can operate safely with our existing national airspace system.



POLICIES that can support all of the use cases we are thinking of for drones today but also don't limit the ideas we will think of tomorrow.



Previously Discussed Top 5 Priorities for the DAC

- 1 Remote ID
- 2 Beyond Visual Line of Sight (BVLOS)
- 3 Counter UAS
- 4 The Waiver Process
- 5 Public-Private Partnerships



Today's Meeting

- Moving Forward on Top Priorities
- FAA responses on previously submitted DAC recommendations around:
 - Early Equipage
 - UAS Security Issues
 - Part 107 Waivers
- Next focus areas:
 - UTM group extended
 - Creating a safety culture



Filling DAC Vacancies

DOT is issuing a solicitation for DAC membership

- Maintain committee at chartered number of 35 members
- Have pool of qualified candidates for future vacancies
- Seek underrepresented sectors of the drone community



Federal Advisory Committee Act (FACA) Requirements

Alexandra R. Randazzo
Office of the Chief Counsel
AGC-2B





Federal Advisory Committee Act

FACA governs the DAC activities

FACA dictates that:

- Unless specified by a law or presidential directive, federal advisory committees (FAC) must be used solely for advisory functions
- Congress and the public must be kept informed of the advisory committee's purpose, membership, activities, and cost

FACA includes requirements on:

- Advisory committee procedures
- Meetings
- Publication of notices in the Federal Register
- Federal officer responsibilities
- Recordkeeping
- Annual Reports



Establishing a Federal Advisory Committee

- A charter must be filed with the agency head, the Library of Congress, the appropriate Senate/House standing committees, and the Committee Management Secretariat before a FAC can meet or take any action
- *Federal Register* notice is required when a discretionary advisory committee is established, renewed, or reestablished
 - Must appear at least 15 calendar days before the charter is filed
- A FAC terminates two years after its date of establishment unless otherwise provided by statute or renewed



Meetings

- Agency must publish a *Federal Register* notice at least 15 calendar days before the meeting, including:
 - Date, time, place, and purpose of meeting
 - Summary of the agenda, and/or topics to be discussed
 - A statement whether all or part of the meeting will be closed
- Agency, through the Designated Federal Officer (DFO), manages arrangements for meetings, including:
 - Approving and attending the meetings called
 - Approving agenda of the meetings
 - Adjourning any meeting when he or she determines to be in the public interest
 - Chairing meetings when directed by Agency head



Records/Minutes

Agency:

- Ensures detailed minutes are kept and certified of each FAC meeting within 90 days of meeting, including ones that are closed or partially closed to the public
 - The Chair must certify the accuracy of meeting minutes
- Makes minutes and other documents available to the public at a single location for copying and inspection (unless related to closed/partially closed meeting)
 - FACA requires that FAC reports, transcripts, minutes, appendixes, working papers, studies, agenda, or other documents which were made available to or prepared for or by the FAC be made publicly available, unless they are subject to a Freedom of Information Act (FOIA) exemption
- Manages committee records in accordance with General Records Schedule 6.2



Membership

- The Secretary will appoint all FAC membership, including the Committee chairs, to parent committees
- Non-voting membership designations are prohibited unless otherwise required by statute
- All nominations must be reviewed by the FAA Ethics Official for proper classification prior to submission to the Office of the Secretary



Member Responsibilities

- Prepare all committee reports, recommendations, and other similar committee work products based on FAA taskings
- Attend all meetings called by the DFO
- Speak with Congress and the media only in his or her personal capacity, not on behalf of the FAC
- Unless prior approval is received, members should not receive or discuss information concerning matters which would be covered by what are known as FOIA exemptions 4 and 6
 - trade secrets, commercial or financial information
 - records, the release of which would constitute a clearly unwarranted invasion of personal privacy



Subcommittee

- FAC subcommittees must report back to the parent committee and must not provide advice or work product directly to the agency
- Not subject to the requirement to hold public meetings unless determined otherwise by the agency
- Not subject to the requirement to announce meetings in the Federal Register
- Not subject to the requirement to take minutes



Questions???



FAA Response to DAC Recommendations Presented at October 2019 Meeting

Dan Elwell
Designated Federal Officer,
FAA Drone Advisory Committee
Deputy Administrator, FAA



FAA Response DAC Tasking #1: Early Equipage

Jay Merkle
Executive Director, UAS Integration Office
AUS-1





FAA Response Task Group #1

The FAA recognized three distinct time periods between this response and full implementation of the remote identification regulations and standards –

Period 1: Starts when an industry consensus Remote ID (RID) standard is published, and ends when the FAA's RID rule is final.

Period 2: Starts when the FAA's RID rule is final and a UAS Service Supplier (USS) network is established for RID, prior to the FAA's formal acceptance of means of compliance for RID standard.

Period 3: Starts when the FAA has accepted a standard to comply with RID, and ends on the required operational compliance date with the rule (currently proposed as 3 years after rule effectivity in the NPRM).



FAA Response Task Group #1

DAC Recommendation: Recommend the ASTM Remote ID (RID) standard to the DAC as the equipage basis for the voluntary program.

FAA Response: We acknowledge the DAC's consensus agreement to recommend the pending ASTM remote identification (RID) standard as the basis for any voluntary equipage incentives, and welcome the DAC's layered approach to incentivizing as described in your recommendation.



FAA Response Task Group #1

Incentives Provided by the FAA

The DAC recommended incentives regarding waiver application processing and requirements, contract preference, equipage acknowledgement, airspace access, and rebates or monetary incentives.

FAA Response:

Waiver application processing and requirements - The FAA commits to conducting a gap analysis of any RID industry consensus standard published during period 1, and communicating to manufacturers and operators any additional information part 107 waiver applicants would need to provide in order for the FAA to give credit to using RID as a risk mitigation in a waiver application.

Contract preference - In order to be fair and equitable, it is highly unlikely that the FAA's procurement processes would enable preferential treatment for voluntary early adoption of equipment or compliance to regulations.

Equipage acknowledgement - The FAA will maintain an online database of manufacturers who have declared compliance with an industry consensus standard recognized by the FAA as a means of compliance with the RID rule. We will begin this database with the first declaration of compliance.



FAA Response Task Group #1

Incentives Provided by the FAA continued

The DAC recommended incentives regarding waiver application processing and requirements, contract preference, equipage acknowledgement, airspace access, and rebates or monetary incentives.

FAA Response:

Airspace Access - The FAA commits to working with our federal security partners to determine whether an expedited process for RID compliant aircraft could be established in order to approve airspace access for certain UAS in certain circumstances. Additionally, we will add a field on the FAA SOSC SGI form for indication of RID compliant aircraft, which could facilitate coordination with incident commanders and security partners in certain circumstances.

Rebates or monetary incentives - The FAA commits to considering this option as an incentive for early RID compliance and equipage, for a fixed period of time and a specific number of UAS, but would need additional input from manufacturers in order to determine the best window to make this offer.



FAA Response Task Group #1

Incentives Provided by Others

The DAC recommended incentives regarding waiver application processing and requirements, contract preference, equipage acknowledgement, airspace access, and rebates or monetary incentives.

FAA Response:

We strongly encourage states and municipalities to favorably consider RID equipped aircraft when establishing their restrictions and conditions, and we commit to undertaking an educational campaign for states/cities/municipalities specifically related to the benefits RID provides in terms of situational awareness for their law enforcement and public safety officials.

The FAA recognizes that while this may not be a direct incentive for individual operators and recreational flyers, it should broadly incentivize the UAS manufacturer community to produce aircraft in compliance with published industry consensus standards (e.g., the serial number standard) as early and quickly as possible.

The FAA's final commitment is to reconsider the DAC's recommendations, as well as any additional ideas to incentivize voluntary RID equipage, as we get closer to finalizing the rule.



Questions/Comments??



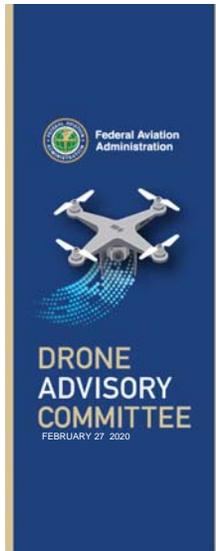
FAA Response DAC Tasking #2: UAS Security Issues

Elizabeth Soltys
Acting Division Manager, UAS Security



TASKING

- Identify what currently existing or near-term technical solutions at the aircraft or operational limitation/capability level could make it less likely that clueless and careless operators could operate UAS in ways that can be perceived as posing a safety or security threat
- Identify what is the universe of actions that IF relevant industry stakeholders agreed to do them, would substantially reduce the likelihood of unintentional threatening behavior



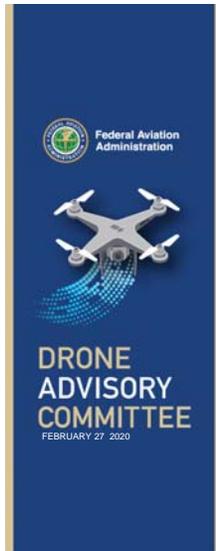
1. OEMs should equip their UAS with geo-fencing capabilities

- On December 31, 2019, FAA and DOT published the proposed “Remote Identification of Unmanned Aircraft Systems” (RID) rule
 - Proposed rule addresses geofencing
- Proposes performance-based requirements so that persons submitting means of compliance can innovate and develop their own means to meet the requirement
- FAA recommends OEMs cooperate with FAA and other stakeholders to develop and field geofencing capabilities, which support restrictions to accessing defined airspace, rather than outright airspace prohibitions



2. Federal government should make available a consolidated, standardized, and up-to-date database for critical infrastructure and TFRs issued, that are machine processable.

- FAA already provides standardized sources capturing TFRs and other security driven airspace restrictions, which are automation-compatible, including systems used by LAANC USS
- In addition to NOTAM related information on conventional TFRs, the agency also provides GIS compatible data on UAS-specific airspace features, including special security instructions applied to airspace overlying select sensitive locations, via its UDDS
- FAA is continuing to enhance its AIS, which will further improve its ability to share standardized, automation-compatible data on airspace restrictions.
 - Includes a NOTAM Modernization effort, which is expected to enable UAS operators to be more aware and, as appropriate, avoid airspace to which restrictions have been applied for security purposes
- FAA actively engaged in rulemaking related to airspace around critical infrastructure (§ 2209)



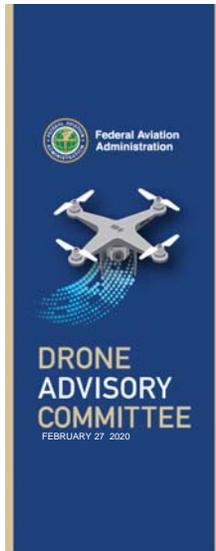
3. OEMs should create alerts for UAS operators when their UAS is approaching sensitive flight areas, such as controlled airspace, prohibited flight areas, TFRs, etc

- FAA supports the expedited development and fielding of automation enabling alerting supported by geospatial cross-referencing of UA positions with airspace features, specifically including airspace restrictions (e.g., TFRs)
- FAA further supports expanding this functionality to include 4D trajectory analysis as UAS platforms become more sophisticated and UTM related services are fielded



4. OEMs should voluntarily equip "ADS-B In" receivers on UAS systems (i.e., airframe and/or controller), combined with the notification system in Recommendation II above. A follow-on to this would be voluntary equipage of an airborne conflict resolution/collision avoidance capability for the UAS operator

- On December 31, 2019, FAA and DOT published the proposed "Remote Identification of Unmanned Aircraft Systems" (RID) rule
 - Proposed rule addresses Automatic Dependent Surveillance - Broadcast (ADS-B)
- Note that integration of any conflict resolution/collision avoidance capabilities must be based on overarching, default requirements that UAS operators ensure their aircraft remain clear of manned aircraft, not vice versa



5. OEMs should explore the voluntary enablement of automated UAS flight performance limitations—such as altitude limitations, return-to-home features, and decrease in UAS speed or maneuverability—while in or near sensitive flight areas

- FAA supports the development and integration by industry, in cooperation with the FAA, of automated UAS flight performance limitations linked to proximity to airspace restrictions and other sensitive areas
- FAA notes the development of any such automation, which significantly alters UAS flight performance and behavior, must be closely coordinated with FAA to address potential safety, as well as security, implications



6. OEMs should explore the voluntary development and equipage of UAS with performance-based detect and avoid (DAA) technology, for collision/obstacle avoidance, on the airframe, using acoustic, optical, and/or other sensors, as well as robust DAA algorithms

- FAA supports the OEMs exploring the voluntary development and equipage of UAS with performance-based DAA technology, for collision/obstacle avoidance, on the airframe
- FAA notes the development of any such automation, which significantly alters UAS flight performance and behavior, must be closely coordinated with FAA to address potential safety, as well as security, implications



Federal Aviation
Administration



**DRONE
ADVISORY
COMMITTEE**
FEBRUARY 27, 2020

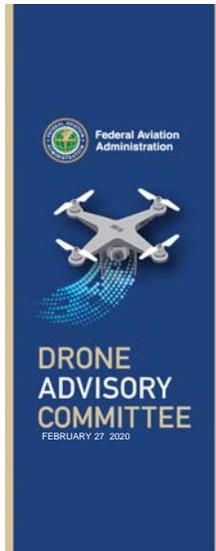
FAA Response DAC Tasking #3: 107 Waivers

Mr. Rico Carty
Deputy Executive Director, AFX-2
Flight Standards



DAC Recommendation Auto-renewal of expiring waivers

- Expiring waivers should auto-renew
 - Unless there is a compliance issue, or
 - change in regulations
- If not able to auto renew, only require entry of renewal dates, not re-entry of the entire waiver application



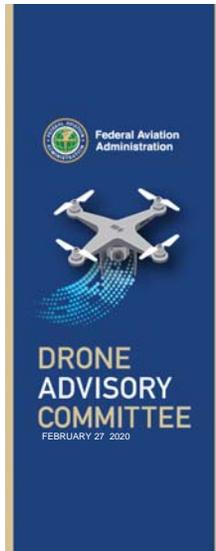
FAA Response Auto-renewal of expiring waivers

- FAA is currently planning an expedited part 107 waiver renewal application process in DroneZone
 - Will reduce reapplication burden for waiver renewals for applications where the residual operational risk, regulatory structure, and policy has not changed since the original waiver issuance
 - Scheduled to be announced at UAS Symposium June 2020



DAC Recommendation Modify Drone Zone

- Allow the operator to update non-consequential waiver application information and forgo filing an amendment
 - Examples-
 - Change responsible person, and
 - Office address



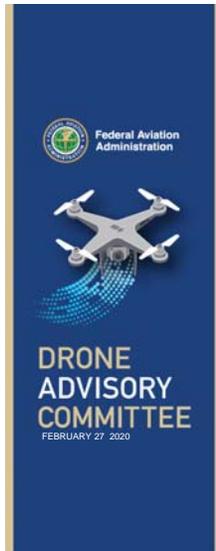
FAA Response Modify Drone Zone

- FAA and responsible person are obligated to ensure all pertinent data in a waiver application and issued waiver are accurate and up to date
- Process in place for changing of information on an issued waiver such as responsible person or addresses



DAC Recommendation Checklist of safety cases for complex waiver approvals

- The FAA should create a checklist of successful safety cases involving complex waiver approvals
 - i.e. BVLOS, Multi-ship, etc
- The FAA should consider creating a testing procedure for:
 - 107.29, 107.39, 107.41 (above UASFM AGL), 107.31, 107.31 that should be graduated
 - Provide online test and guidelines for automatic waiver approvals



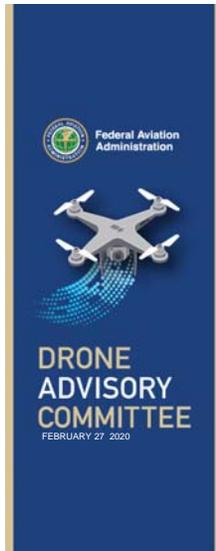
FAA Response Checklist of safety cases for complex waiver approvals FAA response

- The FAA has published examples of approved safety cases for each regulation waived online as required by Section 352
- The FAA is developing a risk tool to assist applicants in identifying and reducing UAS operational risks
- Disapproved waiver applicants may contact the UAS Support Center which may provide additional insight on deficiencies in disapproved waiver applications
- The FAA is updating disapproval letters to provide more constructive feedback



DAC Recommendation Streamlined automated approval

- Consider a streamlined automated approval for applicants
- FAA should leverage the work of programs in UAST, TOP and industry standards, etc
- Give operators credit for undergoing audits, certification and other training beyond part 107 compliance



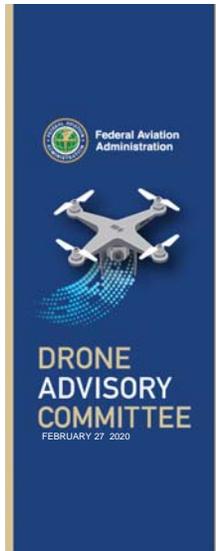
FAA Response Streamlined automated approval

- The FAA is required to review each waiver application submitted
- The FAA recognizes the potential safety benefits specialized experience, advanced training programs, and industry audits can provide
 - Currently sponsoring research projects to identify and quantify the appropriate amount of mitigation credit for specialized experience and advanced training
 - FAA will collaborate with industry to leverage the research outcomes to develop publically available guidelines for training, training programs, and specialized experience



DAC Recommendation Streamlined process for groups of operators

- Consider a streamlined process for groups of operators applying for waivers of the same type of operations for a business use case



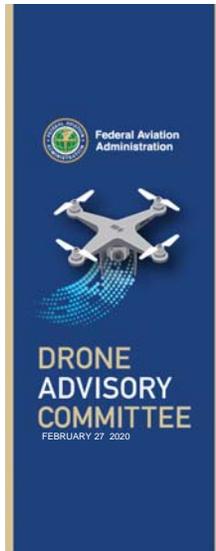
FAA Response Streamlined process for operators

- FAA is currently exploring and modifying DroneZone application formats to streamline:
 - Application
 - Receipt,
 - Analysis of waiver applications
- For Part 107 waivers, changes will begin being implemented calendar year 2020
- The FAA is continuously evaluating strategies and methods to facilitate improvement in our processes



DAC Recommendation Increased transparency and accountability of part 107

- Increase transparency and accountability of part 107 analysts by creating a pathway for applicants to learn who reviewed their application and why it was not approved



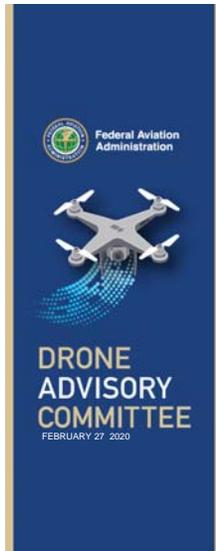
FAA Response Increased transparency and accountability of part 107

- FAA waiver analysts cannot act as risk acceptors for the agency
- All risk acceptance occurs at AFS-800 branch or division manager levels or above for part 107 waivers
- The FAA has improved transparency of process by
 - Creating an open line of communication between the UAS Support Center and waiver analysts
 - Support center serves as the primary point of contact and information pathway for applicants who seek explanation or guidance regarding waivers



DAC Recommendation Structured program for part 107 waiver inspectors

- Require part 107 waiver inspectors to attend a structured program similar to that mandated by AIR-900 Enterprise Operations Division program that provides FAA ASIs and UAS designated airworthiness representatives the background, key policies, and procedures



FAA Response Structured program for part 107 waiver inspectors FAA response

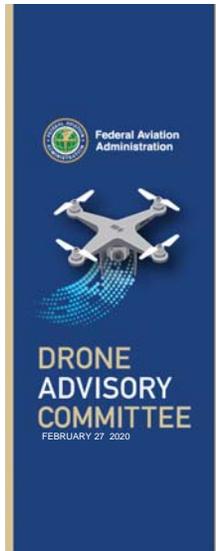
- All FAA waiver analysts are certified and duly accredited aviation safety inspectors who are trained in waiver processing
- Additionally inspectors assigned to the waiver team receive additional part 107 specific waiver training
 - Part 107 waiver analysis
 - Part 107 risk recommendation standardization
 - Part 107 waiver quality control processes
- Ongoing part 107 waiver agency subject matter expert engagement and education based on complexity of waiver application being analyzed



FAA Response DAC Tasking #4: FAA UAS Comprehensive Plan

Dan Elwell
Designated Federal Officer,
FAA Drone Advisory Committee
Deputy Administrator, FAA





FAA Response: DAC Tasking #4

DAC Feedback on UAS Comprehensive Plan

- The FAA thanks the DAC for their comments
- The FAA will be incorporating the feedback into the final plan



DAC Recommendations from October 2019 Taskings

Michael Chasen

Chair, FAA Drone Advisory Committee
Advisory Board Chairman, PrecisionHawk USA Inc.





Recommendation & Discussion DAC Tasking #5: UAS Facility Maps

Marilyn Mora

Lead, DAC Task Group #5
President and Chief Executive Officer
Reno-Tahoe Airport Authority



FAA Drone Advisory Committee Tasking Group #5 UAS Facility Maps

Presenting:

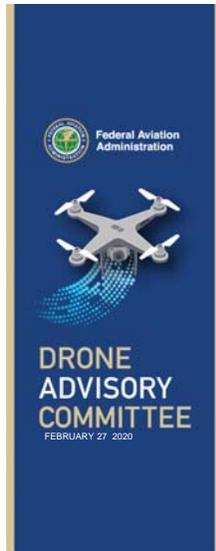
Dave Messina

**President & CEO, FPV Freedom
Coalition**

Dean Schultz

**EVP/COO Reno-Tahoe Airport
Authority**





Our Task and Our Team

DAC remit for UAS Facility Maps Tasking Group #5

- What are options for better FAA/industry collaboration to update and improve UAS Facility Maps and airspace for all operators?

• **Our Tasking Group team was diverse:**

--Airport Management teams

- Alaska DOT, Memphis, DFW, Reno-Tahoe, Portland, OR, LAX

--Aviation manufacturers:

- Boeing, Intel, Google Wing, Verizon-Skyward, PrecisionHawk

--Airline and manned aviation associations:

- ALPA, AOPA, AAAE, NATCA, ACI

--Operators:

- Dallas PD, NYFD, NYPD, AMA, FPVFC, CNN Air

--Software utilities:

- Airmap, Jeppesen

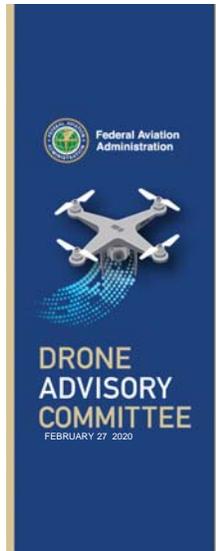


Problem Statement

The FAA DAC UAS Facility Maps Tasking Group has determined the UAS Facility Maps should be refined.

Three years have passed since the initial creation of the UAS Facility Maps. Technology has evolved and data now exists to support a refinement to more precisely define appropriate safety margins or UAS flying near airports in controlled airspace.

The UAS Facility Maps Tasking Group acknowledges that some airports have zero, or unnecessarily low, AGL limits where UAS may be allowed to fly safely. Similarly, there are some airports with grid squares with allowable altitudes that may conflict with common manned aircraft flight routes.



Recommendations

1. UAS Facility Maps grid refinement
2. Next steps: A Pilot Program
3. Who: The Stakeholders of the UAS Facility Maps grid refinement team

Take Away:

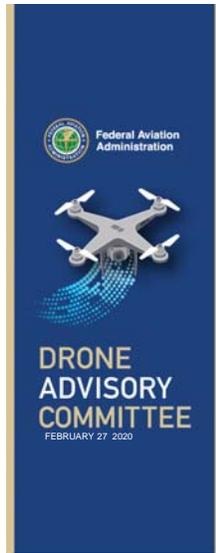
The diverse UAS Facility Maps Tasking Group supports refining the UAS Facility Maps.



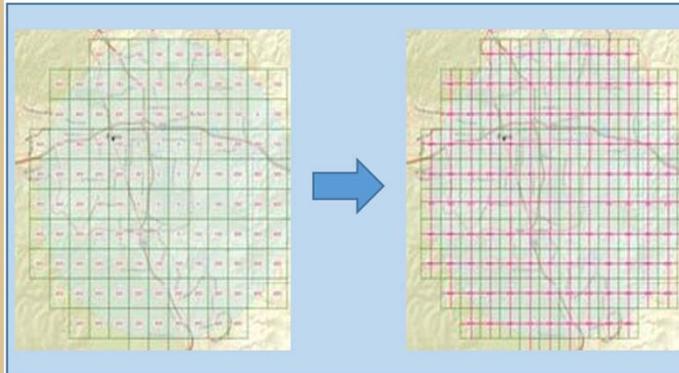
Recommendations

1. UAS Facility Maps grid refinement

- ➔ Grid size reduced from 1 degree to $\frac{1}{2}$ degree grid "squares"
 - 3 years of history
 - Some airports have zero or unnecessarily low AGL limits
 - Team consensus we can open up more space for UAS
- The work of determining the correct altitude within each grid square will be the responsibility of a Stakeholder team
- The Stakeholder team has readily available data:
- And a new addition to the UAS Facility Maps: Shielded Operations



Grid Refinement



Recommendations

1. UAS Facility Maps grid refinement

- Grid size reduced from 1 degree to 1/2 degree grid "squares"
- ➔ • **The work of determining the correct altitude within each grid square will be the responsibility of a Stakeholder team**
 - Led by local Air Traffic Management
 - National Air Traffic Controllers Association, Airport Facility Operator and Management, Manned aircraft stakeholders and UAS stakeholders

The Stakeholder team has readily available data:

Surveillance Data

- Reviewing surveillance data can aid in understanding actual utilization of airspace around an airport

Gained operational experience

- Reviewing the "approvals" and "denials" for UAS flights in controlled airspace can help the refinement process

Low Altitude Operations

- Low altitude operations are a consideration in the assumptions of defining UAS Facility Maps, local knowledge and stakeholder input are vital



Part 77 and dynamic data

Existing data including surveillance data, departure and landing tracks, topological data and local experience will be used to refine grids.



The local Stakeholder team may even identify dynamic changes to the UAS Facility Maps



Recommendations

1. UAS Facility Maps grid refinement

- Grid size reduced from 1 degree to ¼ degree grid “squares”
- The work of determining the correct altitude within each grid square will be the responsibility of a Stakeholder team
- The Stakeholder team has readily available data:
- ➔ • **And a new addition to the UAS Facility Maps: Shielded Operations**
 - Flying below the top of a structure or obstacle
 - Easy to understand
 - Positive signal to drone flying public



Shielded Operations



Grids, previously set to zero AGL, could be considered for UAS flight if they are obstructed by a natural or man-made obstacle.

- **Shielded Operations defined:** Shielded Operations is allowable flight below the altitude of a nearby obstacle or obstruction which manned aircraft would not fly below.
- Shielded Operations is intended for both Part 107 and recreational operations.



Recommendations

Concepts to take away:

- Recommendation of a diverse group of professionals
- Grid refinement appears achievable with information at hand and performed by a stakeholder team
- The Tasking Group wants to emphasize the Stakeholder team should have flexibility and authority to trust their local expertise



Next Steps and the Stakeholder teams

2. Next Steps: A Pilot Program

- Tasking Group recommends starting with approximately 10 airports to identify best practices and useful data
- Tasking Group recommends the FAA could select airports for refinement by:
 - Identify top quartile of zero AGL grids as top priority
 - Identify airports with high levels of LAANC “further coordination” requests and LAANC denials as top priority

3. The Stakeholders of the UAS Facility Maps grid refinement team:

- Led by local Air Traffic Management
- National Air Traffic Controllers Association
- Airport Facility Operator and Management
- Manned aircraft stakeholders
- UAS stakeholders



Thank you to the Tasking Group #5 Team!

Airport management teams

- Alaska DOT, Memphis, DFW, Reno-Tahoe, Portland, OR, LAX

Aviation manufacturers:

- Boeing, Intel, Google Wing, Verizon-Skyward, PrecisionHawk

Airline and manned aviation associations:

- ALPA, AOPA, AAAE, NATCA, ACI

Operators:

- Dallas PD, NYFD, NYPD, AMA, FPV Freedom Coalition, CNN Air

Software utilities:

- Airmap, Jeppesen

Special thanks to Effie Nidam from CNN Air for the graphics!



FAA Drone Advisory Committee Tasking Group #6 BVLOS



Overview

Task Group Six (TG6) Tasking Summary

Have the DAC provide information about what they think are the remaining challenges for BVLOS. This can help inform upcoming decisions on what comes after IPP, PSPs, etc. and future FAA work plans.

Background

Tasked at the October 2019 DAC meeting, 42 individuals joined Task Group Six and created four subgroups focused on areas that the task group believed were challenges that represented areas of near-term regulatory and technical opportunity that if addressed, would provide significant benefits to both existing and new entrants into the national airspace. The subgroups created by TG6 focused on Command/Control (C2), UAV Certification, Detect and Avoid (DAA) Technologies and Autonomy. The subgroup selected the topics via conference call and online polling. In addition to extensive email communication, the subgroups held a number of conference calls to create their recommendations.



Task Group #6 BVLOS

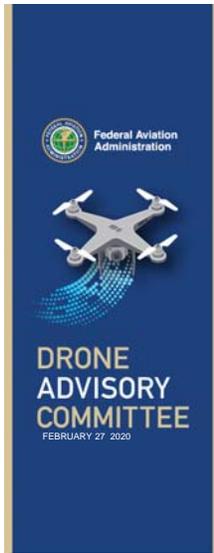
Certification Sub-Group

Sub-Group Chair: Sean Cassidy
Amazon Prime Air
Presented at the February 27, 2020
FAA Drone Advisory Committee

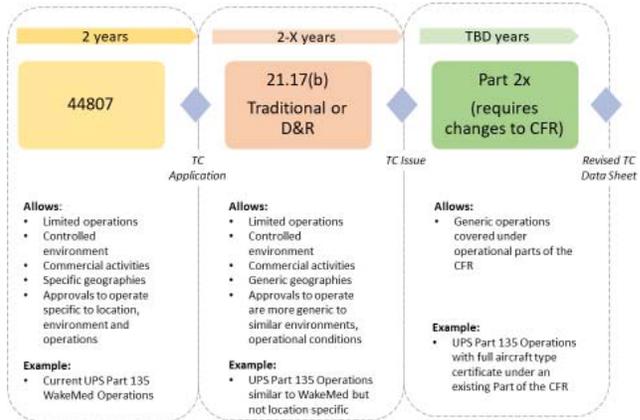


Certification - Recommendations

- Recommend FAA allow an incremental UAS type certification under 14 CFR Part 21.17(b) that varies with risk and complexity
- 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
- 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 BVLOS approval within a 44807 exemption or Type Certificate framework
- 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)



Certification – Recommendations (cont)



Task Group #6 BVLOS

Spectrum/C2 Sub-Group

Sub-Group Chair: Dave Messina
 President & CEO, FPVFC
 Presented at the February 27, 2020
 FAA Drone Advisory Committee



BVLOS – Sub-Group: Spectrum/C2

Introduction:

- Section 374 of the FAA Reauthorization Act of 2018 mandated the FAA, FCC and NTIA to collaborate and report to Congress a determination of whether manned aircraft systems operations should be permitted, but not required, to operate on spectrum allocated at the World Radio Conferences of 2007 and 2012
- The report by the these three Federal agencies should address any technical, statutory, regulatory or operational barriers to UAS operation
- The report should identify other spectrum if the two bands being analyzed (L-Band, 960-1164 MHz and C-Band, 5030 -5091 MHz) are not suitable



CONTINUED

Problem Statement:

1. As of December 2019, the FAA, FCC and NTIA do not appear to be coordinating on a single report addressing the allocated L-band and C-band for UAS operations.
2. The FAA, in its request for stakeholder feedback on October 2019, failed to mention or acknowledge standards and analysis already completed that will advance the creation of regulations regarding the safety of UAS operations and inform spectrum usage.
3. Industry leaders provided stakeholder feedback to the FAA's October request in November 2019 proposing that the L-band and C-band not be opened for sharing. While the statutory language establishing the Report envisions consideration of sharing opportunities, it is important that the FAA consider all radio frequency spectrum bands that can enable safe UAS operations in the national airspace system, particularly the C-band. There are no aviation incumbents currently utilizing the C-band, allowing for the potential to have a nationwide, contiguous frequency range enabling C2 link services for wide-area UAS operations.
4. The lack of spectrum regulations that enable BVLOS missions and ensure the safety of operations is hampering commercial growth of UAS in the United States. Additionally, new entrants and smaller operators may be discouraged from considering commercially and readily available spectrum (via cellular carriers) due to uncertainty regarding its use.



BVLOS – Sub-Group: Spectrum/C2

Recommendations:

- 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
- UAS operations along with spectrum will be diverse in UAS operations – All spectrum requirements must consider safety
- 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.



Continued

- The three agencies, working within the bounds of their jurisdictional competencies, should work closely together
 - The FCC as the agency -- 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
 - The NTIA to manage spectrum policy for federal users and to coordinate with the FCC on international spectrum policy
- The FAA, as well as the FCC and NTIA, should identify a champion from each agency to create this single comprehensive report to Congress
- 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 UAS



Task Group #6 BVLOS

Detect and Avoid (DAA) Sub-Group

Sub-Group Chair: Jennifer Player
Avineer

Presented at the February 27, 2020
FAA Drone Advisory Committee



Detect and Avoid – Recommendations

- Recommend FAA accept the work of standards development organizations as acceptable means of compliance for operational approval and certification of DAA systems
- Recommend FAA define operating environments for which a DAA system is not required (i.e. obstacle shielding and terrain masking)
- 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
- 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



Task Group #6 BVLOS

Autonomy Sub-Group

Sub-Group Chair: Tony Nannini
Wing
Presented at the February 27, 2020
FAA Drone Advisory Committee



Autonomy– Recommendations*

- 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
- 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
- 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

*Please note, original sub-group recommendation 1 is still being discussed with members of the sub-group that have voiced concerns.



Autonomy– Recommendations (cont)

- 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
- 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
- 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



Recommendation & Discussion DAC Tasking #7: UTM Performance

David Silver

Lead, DAC Task Group #7
Vice President for Civil Aviation
Aerospace Industries Association



FAA Drone Advisory Committee

Tasking Group #7 UTM Performance Capability Priorities

Tasking Group lead: David Silver
Vice President for Civil Aviation
Aerospace Industries Association



Overview

- At the October 2019 meeting of the Drone Advisory Committee (DAC), the Designated Federal Officer (DFO) tasked the DAC with looking at the future of UAS Traffic Management (UTM)
- David Silver (VP, Civil Aviation at the Aerospace Industries Association) was tasked as the Chair of the Task Group
 - The Task Group met 5 times over the 90 day period and was made up of 47 members representing 33 organizations



Scope of Tasking

The tasking's scope was specific to:

- Review of UTM CONOPs 2.0
- Industry prioritization of UTM performance capabilities
- UTM CONOPs 2.0 have not yet been released so the group focused primarily on the prioritization of UTM performance capabilities
- While certain topics are critical for industry and the government to continue to work on (e.g. roles/responsibilities, UAS security, etc.), the task group focused specifically on the scope provided to it by the DFO



Deliverables

1. **Definitions of the specific UTM performance capability**
2. **Roadmap compiling the capability, responsibility, resource requirement, current status and industry priority level in the near term**
Note: Near Term refers to the time period of 0-24 months
3. **Recommendations to the FAA**



High Priority Capabilities

FAA Messaging

Definition: A service which provides static, periodic, or event driven authoritative information from the FAA to USSs and UAS operators (e.g. airspace information, NOTAMs, TFRs)

Responsibility: FAA

FAA Resource Requirement: IT

Current Status: TBD

USS Network Discovery

Definition: A service which allows for service suppliers and UAS Operators to be aware of other service suppliers providing specific services of varying levels of capability in a specific geographical region.

Responsibility: USS

FAA Resource Requirement: Standard

Current Status: Developed (Remote ID)

Remote ID

Definition: A service that will allow for the UAS to be identified by authorized stakeholders and the public through broadcast and/or network means.

Responsibility: FAA

FAA Resource Requirement: Rulemaking

Current Status: NPRM



High Priority Capabilities

Airspace Authorization

Definition: A service which provides airspace authorization from the Airspace Authority/Air Navigation Service Provider to a UAS Operator.

Responsibility: FAA

FAA Resource Requirement: IT/Notice of some kind

Current Status: LAANC only; evolving

Restriction Management:

Definition: A service which manages and pushes operational restrictions from the Airspace Authority/ANSP to affected UAS operations.

Responsibility: FAA/USS

FAA Resource Requirement: Standards/Advisory Circular

Current Status: In progress

Strategic Deconfliction

Definition: A service which arranges, negotiates, and prioritizes intended operational volumes/trajectories of UAS operations with the intention of minimizing the likelihood of planned airborne conflicts between operations.

Responsibility: USS

FAA Resource Requirement: Standard

Current Status: In development



HIGH PRIORITY CAPABILITIES

Conflict Advisory and Alert

Definition: A service which provides real-time monitoring and alerting through suggestive or directive information of UA proximity for other airspace users.

Responsibility: USS

FAA Resource Requirement: Standard

Current Status: In development

Surveillance

Definition: The ability to monitor the UAS and/or other airspace users through the USS in real time to ensure safe operations.

Responsibility: USS

FAA Resource Requirement: None

Current Status: In development

UAS Safety

Definition: The ability to incorporate multiple risk factors in assessing a UAS flight including ground risk data, population, hazards, weather, airspace density, etc. in the context of an SMS.

Responsibility: USS

FAA Resource Requirement: Standards/Advisory Circular

Current Status: TBD



MEDIUM/HIGH PRIORITY CAPABILITIES

USS Registration

Definition: A service which provides the ability for USS operators to register and be approved by the FAA and authenticate data related to their USS and their actions. Approval should be requirement-based and automated to the greatest degree possible.

Responsibility: FAA

FAA Resource Requirement: Advisory Circular

Current Status: LAANC Only

MEDIUM PRIORITY CAPABILITIES

Operator Messaging

Definition: A service which provides on demand, periodic, or event driven information on UAS operations (e.g. position reports, intent information, and status information) occurring within the subscribed airspace volume and time.

Responsibility: USS

FAA Resource Requirement: Standard

Current Status: In progress



MEDIUM PRIORITY CAPABILITIES

ATM Interface

Definition: The way in which USSs will communicate with traditional Air Traffic Control
Responsibility: USS
FAA Resource Requirement: Notice of some kind
Current Status: TBD

Conformance Monitoring

Definition: A service which provides real-time alerting of non-conformance to intended operational volume/trajectory to an Operator or another airspace user.
Responsibility: USS
FAA Resource Requirement: Standard
Current Status: TBD

Emergency

Definition: A USS service which provides a path for the safe passage or landing of an aircraft in emergency status by means of deconfliction or other conflict resolution.
Responsibility: USS
FAA Resource Requirement: Notice of some kind
Current Status: TBD



MEDIUM PRIORITY CAPABILITIES

Dynamic Rerouting

Definition: A real-time service which provides modifications to intended operational volumes/trajectories to minimize the likelihood of airborne conflicts and maximize the likelihood of conforming to airspace restrictions and maintaining mission objectives. This service arranges, negotiates, and prioritizes inflight operational volumes/trajectories of UAS operations while the UAS is aloft.
Responsibility: USS
FAA Resource Requirement: None
Current Status: TBD

Communications/C2

Definition: A service which provides infrastructure and quality of service assurance for radio frequency (RF) Command and Control (C2) capabilities to UAS Operators.
Responsibility: Operator
FAA Resource Requirement: None
Current Status: In development

LOW/MEDIUM PRIORITY CAPABILITIES

Communications Security

Definition: A service which provides keys and other security mechanisms necessary to authenticate the users and secure network transmissions.
Responsibility: USS
FAA Resource Requirement: Standard
Current Status: LAANC only



LOW/MEDIUM PRIORITY CAPABILITIES

UTM System Monitoring

Definition: A service which monitors USSs and other UTM components and provides status information to authorized parties.

Responsibility: FAA/USS

FAA Resource Requirement: IT

Current Status: LAANC only; evolving

LOW PRIORITY CAPABILITIES

Pre-Flight Planning

Definition: The ability of USSs to facilitate UAS operations taking into account airspace constraints, operator registration, information, restrictions, etc.

Responsibility: USS

FAA Resource Requirement: None

Current Status: In development/Deployed

Manned Participation

Definition: Current aircraft equipage and communication links used when operating in airspace used for UTM operations.

Responsibility: FAA

FAA Resource Requirement: Policy

Current Status: TBD

Alternative Navigation

Definition: Non-GPS Position, Navigation and Timing operations

Responsibility: USS/Operator

FAA Resource Requirement: None

Current Status: TBD



LOW PRIORITY CAPABILITIES

Weather

Definition: A service which provides forecast and/or real-time weather information to support operational decisions of individual Operators and/or services.

Responsibility: USS

FAA Resource Requirement: None

Current Status: TBD

Mapping

Definition: A service which provides terrain and/or obstacle data appropriate and necessary to meet the safety and mission needs of individual UAS operation or support the needs of separation or flight planning service.

Responsibility: FAA/USS

FAA Resource Requirement: None

Current Status: Limited Obstacle Information

COMPLETED PRIORITIES

Operator Registration

Definition: A service which provides the ability for vehicle owners to register data related to their UAS and a query function to allow appropriate stakeholder to request registration data.

Responsibility: FAA

FAA Resource Requirement: IT/Rulemaking

Current Status: Complete



RECOMMENDATIONS

1. TG 7 recommends that the FAA and relevant UAS Stakeholders work to put a timeline together in advance of the next Drone Advisory Committee meeting that includes dates of when the FAA and industry believe that the task will be accomplished.
2. TG 7 asks the FAA to allocate resources based on the priority levels contained in this report.
3. TG 7 recommends that it remains in existence to address CONOPs 2.0 when available.



Industry-Led Technical Topics

Michael Chasen

Chair, FAA Drone Advisory Committee
Advisory Board Chairman, PrecisionHawk USA Inc.





Federal Aviation
Administration



DRONE
ADVISORY
COMMITTEE
FEBRUARY 27, 2020

Introducing Simulation Into a D&R Certification Process

A discussion topic for the DAC

Feb 27, 2020

Chris Anderson, 3DR, ASTM D&R Working Group
Lead



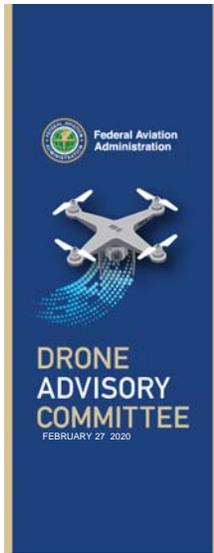
Durability and Reliability- based Certification

Goals:

- Faster
- Easier
- Cheaper
- Allows for continuing rapid innovation (especially in software)
- Pathfinder towards future certification methods for other aircraft

Methods:

- Performance-based (tests system, not components)
- Just for low- and medium-risk aircraft
- Substitutes large number of demonstrated system flight hours without failure for individual component-level tests



Possible Limitations

- 1) Since certification is only granted for environmental and operational envelopes for which real world-testing has been done, the burden to find test sites and scenarios that are “representative” of all desired operations is high (temperature, pressure, wind range, etc)
- 2) Individual component testing in ovens/refrigerators/pressure chambers are not sufficient due to performance-based approach
- 3) Likewise for combinations of operating scenarios
- 4) Introducing wide range of DAA scenarios just makes this tougher



Simulation as a possible solution

Pros:

- In keeping with less-expensive, faster approach to certification of low-risk vehicles
- Already used by most manufacturers in sUAS development
- Opportunity to create industry standards for simulation with FAA/NASA participation

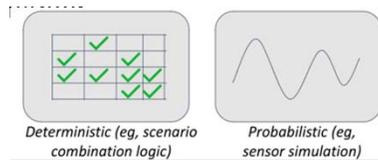
Cons:

- General regulatory discomfort in assessing risks of “probabilistic” systems
- Few accepted standards for assessing “fidelity” of sUAS simulators in modeling complex system and environment interactions



One option

- 1) Differentiate between “system logic” simulation (deterministic) and “sensing” simulation (probabilistic)
- 2) Start by asking manufacturers to submit output of system logic simulation to supplement real-world test results (see next slide)
- 3) Work with ASTM to establish standards for establishing simulation fidelity so that future simulation data can be assessed as a possible compliance method

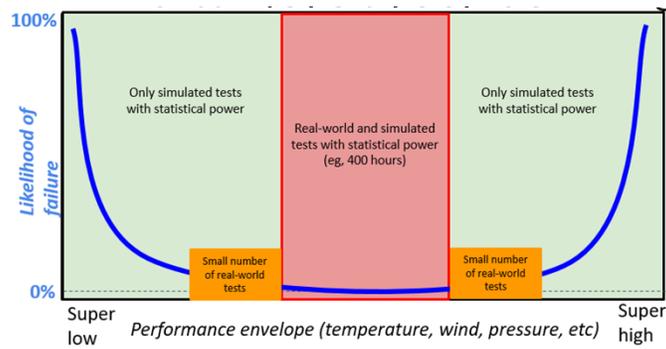


Deterministic: Sample Failsafe

Scenario Test Matrix

System States	1	2	3	4	5	6	7
1	N/A	Sim	Real	Real	Real	Sim	Real
2	Sim	N/A	Sim	Sim	Real	Real	Sim
3	Real	Sim	N/A	Real	Sim	Sim	Sim
4	Real	Sim	Real	N/A	Real	Real	Real
5	Real	Real	Sim	Real	N/A	Sim	Sim
6	Sim	Real	Sim	Real	Sim	N/A	Real
7	Real	Sim	Sim	Real	Sim	Real	N/A

Sample of typical system performance testing with hybrid real-world and simulator testing



Federal Aviation Administration



DRONE ADVISORY COMMITTEE

FEBRUARY 27, 2020

Discussion



Federal Aviation Administration



New Business Agenda Topics / Review Taskings

Dan Elwell

Designated Federal Officer, FAA Drone Advisory Committee
Deputy Administrator, FAA

Michael Chasen

Chair, FAA Drone Advisory Committee
Advisory Board Chairman, PrecisionHawk USA Inc.



Tasking Discussion

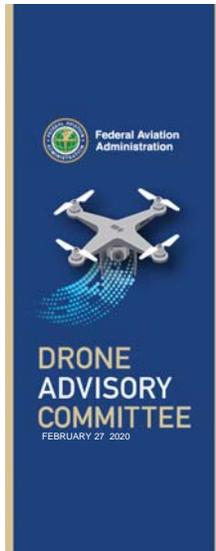
Proposed DAC Tasking #7: UTM (continuation of Tasking #7)

Proposed Tasking:

- The UAS Traffic Management (UTM) concept of operations (ConOps) v2.0 was not released during the time period of task group #7's work. The FAA proposes the DAC continue work and provide comments on the release of v2.0

Summary:

- Comment on the UTM ConOps 2.0 concept and provide recommendations about what is most important regarding UTM capabilities. This will help inform FAA priorities and planning as we work toward building UTM capabilities and fully integrating UAS into the National Airspace System



Tasking Discussion

Proposed DAC Tasking #8: Aviation Safety Culture for Drone Operators

Proposed Tasking:

What are ways we can help the drone community fully adopt the safety culture that is so ingrained in manned aviation?

Summary:

Develop recommendations and ideas to assist the drone community in adopting an aviation safety culture. This includes ideas for motivation and suggestions for industry involvement



Federal Aviation
Administration



**DRONE
ADVISORY
COMMITTEE**
FEBRUARY 27, 2020

Closing Remarks

Dan Elwell

Designated Federal Officer, FAA Drone Advisory Committee
Deputy Administrator, FAA

Michael Chasen

Chair, FAA Drone Advisory Committee
Advisory Board Chairman, PrecisionHawk USA Inc.



Federal Aviation
Administration



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

**ORDER
1110.157**

Effective Date:
06/15/18

SUBJ: Charter of the Drone Advisory Committee

1. Enter overview of the Order here. This will help provide a uniform look for all FAA directives. **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. 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 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 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 the FAA and or provide input to 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 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. For the period of this charter, the FAA plans to utilize contractual support to provide for logistics and administrative support.

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 \$704,000, which includes 1.0 full-time equivalent salary and benefits at \$204,000, plus \$500,000 in contractor costs.

8. Designated Federal Officer. The FAA Administrator, on behalf of the Secretary of Transportation will appoint a full-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 Designated Federal Officer 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. Committees will meet as follows:

- a. It is estimated that the DAC will meet three times a year to carry out its responsibilities.
- b. Meetings of the DAC will be announced in the *Federal Register* at least 15 days before each meeting, unless exceptional circumstances require shorter notice. Such circumstances will be explained in the notice. DAC meetings will be open to the public, except as provided by section 10(d) of the FACA and applicable regulations. The DAC will publish an annual report summarizing activities held in closed or partially closed meetings, consistent with the policies of the Freedom of Information Act.
- c. Anyone interested may attend committee meetings and appear before the DAC within reasonable limits of space and time. Additionally, anyone interested may file written statements with the committee.

10. Duration. 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. The FAA will submit recommendations for membership to the Secretary of Transportation, who will appoint members to the DAC. All DAC members serve at the pleasure of the Secretary of Transportation.

a. The DAC will have no more than 35 members.

b. Members will serve without charge, and without government compensation. The employing organization bears all costs related to its participation. Members must represent a particular interest of employment, education, experience, or affiliation with a specific aviation-related organization.

13. Subcommittees. The DAC DFO 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.

a. The records of the committee and subcommittee will be handled in accordance with the General Records Schedule 6.2, or other approved agency records disposition schedules.

b. Meeting minutes must be kept in accordance with GSA standards as published in 41 CFR Part 102-3 Subpart D - § 102-3.165.

c. These records will be available for public inspection and copying, 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 provided for or by the DAC are available for public inspection at www.faa.gov/regulations_policies.

15. Filing Date. This charter is effective June 15, 2018, the date on which it was filed with Congress. This Committee will remain in existence for 2 years after this date unless sooner terminated or renewed.



Daniel K. Elwell
Acting Administrator

Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC



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 $\frac{3}{4}$ 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.

Daniel K. Elwell

Deputy Administrator

Daniel K. Elwell is the Deputy Administrator of the Federal Aviation Administration (FAA). Mr. Elwell was sworn in to office on June 26, 2017 following his appointment by President Trump. He also served as Acting FAA Administrator from January 2018 until August 2019.

Elwell previously served at the FAA as the Assistant Administrator for Policy, Planning, and Environment from 2006–2008. Most recently, he was Senior Advisor on Aviation to U.S. Secretary of Transportation Elaine L. Chao. Earlier in his career, he served as a legislative fellow for the late Senator Ted Stevens (R-Alaska).

From 2013–2015, as Senior Vice President for Safety, Security, and Operations at Airlines for America (A4A), Elwell was responsible for leading the advancement of commercial aviation safety and security excellence for major U.S. air carriers.



Prior to A4A, Elwell was Vice President of the Aerospace Industries Association (AIA) from 2008–2013. In this role, Elwell represented civil aerospace manufacturers and led policy development and advocacy for the civil aerospace manufacturing interests of more than 300 AIA member companies.

Elwell was a commercial pilot for 16 years with American Airlines, flying DC-10, MD-80, and B-757/767 aircraft. While maintaining his proficiency as an MD-80 Captain, he served as Managing Director for International and Government Affairs at American Airlines.

Dan earned his pilot wings at Williams Air Force Base in Arizona after graduating from the U.S. Air Force Academy with a Bachelor of Science degree in International Affairs. Lieutenant Colonel Elwell retired from military service as a Command Pilot with more than 6,000 hours combined civilian and military flight time in the U.S. Air Force and U.S. Air Force Reserve, including combat service during Operation Desert Storm.



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

10/17/2019 DAC Meeting • Washington, DC

Meeting Minutes

Time: 9:00 a.m. to 4:00 p.m. Eastern Time

Location: National Transportation Safety Board Boardroom and Conference Center,
420 10th St SW, Washington, DC 20594

For additional information, please view the Meeting eBook.

Meeting Summary

Drone Advisory Committee (DAC) Designated Federal Officer (DFO) Dan K. Elwell opened the meeting at 9 a.m. on October 17. Mr. Elwell notified the committee that he would hand over his DFO duties later in the morning to Mr. Jay Merkle, the Executive Director for the FAA Unmanned Aircraft Systems Integration Office, because he had to leave early.

DAC Chairman, Michael Chasen, PrecisionHawk USA, Inc. Chief Executive Officer (CEO), then gave some opening remarks before inviting each of the Task Groups to present their recommendations.

Mr. Gabriel Cox, Drone System Architect, Intel Corporation, presented the first Task Group's recommendations on Remote Identification (ID), on behalf of Mr. Steve Ucci who could not attend. The group endorsed the ASTM Remote ID (RID) standard as the equipage basis for a voluntary program and advised that the FAA should add a regulatory "overlay" and Minimal Operational Performance Standard (MOPS) on top of the ASTM standard as part of regulatory implementation. They provided several ideas for incentives that the FAA could use with industry and other stakeholders.

Mr. Dan Dalton, Vice President of Operations, Airspace Systems, Inc., presented the second Task Group's findings on UAS Security Issues on behalf of Jaz Banga who was also unable to attend. The Task Group focused on industry-led airframe and operational security measures rather than policy recommendations. Their recommendations mostly focused on the UAS original equipment manufacturers (OEMs) and included employing geofencing, alerts for UAS operators, automated UAS flight performance limitations, and equipage using Automatic Dependent Surveillance-Broadcast (ADS-B) "In" receivers and performance-based detect and avoid (DAA) technology. The group also urged the FAA to make a consolidated, standardized, and updated database that is machine-processable for accessing information about critical infrastructure and Temporary Flight Restrictions (TFRs) issued.

Mr. Brian Wynne, President and CEO, Association for Unmanned Vehicle Systems International then presented the third Task Group's findings on Part 107 Waivers. The Task Group recommended auto-renewals for waivers meeting a specific set of requirements, customer-friendly modifications to the DroneZone, satisfactory waiver approval checklists, a streamlined



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

automated approval process for certain operators, improved transparency on applications, and more training requirements for waiver inspectors.

Mr. Merkle provided an update on the FAA's work on Remote ID, as well as Recreational Flyers (Section 349). Merkle also shared that the FAA expects to publish the Remote ID Notice of Proposed Rulemaking (NPRM) on December 20, which will initiate the public comment period. He stated that the FAA is on schedule to provide the Knowledge Test for recreational flyers by December 2019.

Mr. Joel Szabat, Acting Under Secretary in the Department of Transportation's (DOT) Transportation Policy Office followed Merkle and offered a few remarks on the state of UAS today and the work that the FAA has done in support of full integration. He urged the DAC to continue helping the FAA to improve its processes and innovate solutions.

Mr. Bobby Fraser, then Acting Assistant Administrator in the FAA's Office of Communications, provided an overview of the FAA's first-ever National Drone Safety Awareness Week. Fraser shared some details about what the FAA was doing to support the information campaign and provided the DAC with several ideas on how they could help promote the cause.

Ms. Angela Stubblefield, Deputy Associate Administrator for the FAA's Office of Security and Hazardous Materials Safety, updated the DAC on what the FAA has been doing about UAS Security. She focused on key FAA and interagency activities, especially the pilot program for Remote ID and detection technologies that the agency was charged with creating in the 2018 FAA Reauthorization Act. Stubblefield also discussed the standards for detection and mitigation technologies that the FAA is developing. Finally, she spoke on the Core 30 Concept of Operations (CONOPS), the national response plan for a persistent UAS disruption at the Core 30 airports, and mentioned that it is awaiting approval from the National Security Council.

DAC Chairman Michael Chasen then discussed industry-led topics, including FAA Facility Maps, beyond visual line-of-sight operations, and UAS Traffic Management system.

The meeting concluded with Mr. Merkle reviewing the three new DAC taskings related to the topics raised by the DAC Chairman.

The meeting resulted in the following new DAC taskings:

Tasking #1: Facility Maps (90 Days, beginning on October 17, 2019)

- What are options for better FAA/industry collaboration to update and improve UAS facility map and airspace access for all operators? This tasking will provide ideas and information for creating future facility maps and creating a more dynamic airspace system to accommodate increased traffic, both for UAS and traditional manned aviation.
- Tasking Summary



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Provide information about pain points or areas where they feel UAS operations may be possible either given restrictions or during limited times.
- Consider possibilities for a layered or dynamic approach to allowing operations to areas where drone operations are currently prohibited.
- TASK GROUP LEAD: Marily Mora, President and Chief Executive Officer, Reno-Tahoe Airport Authority

Tasking #2: BVLOS Challenges (90 Days, beginning on October 17, 2019)

- What are the remaining beyond visual line-of-sight (BVLOS) challenges that the DAC sees? Information gained from this tasking will help prioritize FAA resources to meet the requirements of expanded BVLOS operations and can help inform upcoming decisions on what comes after IPP, PSPs, etc. and future FAA work plans.
- TASK GROUP LEAD: Todd Graetz, Director, Technology Services, UAS Program, BNSF Railway

Tasking #3: UTM (90 Days, beginning on October 17, 2019)

- Provide industry comment on the UAS Traffic Management (UTM) Concept of Operations v2.0 and provide industry prioritization of UTM capabilities. The information gained from this tasking will help prioritize resources, work, and investment as FAA, DOT, and industry works together to create UTM capabilities to support future expanded UAS operations.
- TASK GROUP LEAD: David Silver, Vice President for Civil Aviation, Aerospace Industries Association



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Detailed Minutes

Official Statement of the Designated Federal Officer

Elwell read the official statement at 9 a.m.

Approval of the Agenda and Previous Meeting Minutes

The DAC unanimously approved the agenda and meeting minutes from the last DAC meeting held on June 6, 2019.

DFO Opening Remarks

Drone Advisory Committee (DAC) Designated Federal Officer (DFO) and Deputy Administrator Dan K. Elwell thanked the committee for its dedication and hard work in serving on the DAC, especially on the June 6 Taskings. Mr. Elwell gave a quick overview of the Integration Pilot Program's progress over the previous six months and reminded the members about the upcoming first-ever National Drone Safety Awareness Week set for the first week in November. He outlined the DAC Meeting's agenda and reaffirmed that the FAA welcomed hearing perspectives from industry and stakeholders on the DAC Taskings on which several industry representatives would be presenting. He introduced Jay Merkle, the Executive Director for the FAA Unmanned Aircraft Systems Integration Office, as well as other FAA officials, and the DAC Chairman, Michael Chasen. Due to a scheduling conflict, Mr. Elwell explained that he would have to leave early and would hand off DFO duties to Mr. Merkle.

DAC Chair Opening Remarks

Mr. Chasen stated that he has been pleased by the progress the DAC has made over the past few months and was proud that this convocation marked the first time the DAC meeting was livestreamed. He reviewed the five Key Priorities that the DAC had discussed at the June meeting, including Remote ID, beyond visual line-of-sight (BVLOS) operations, counter UAS (CUAS), the waiver process, and public-private partnerships. Additionally, he explained that three Task Groups were established to work on recommendations for the DAC, focusing on issues that need to be solved before full integration of drones is possible. He reminded the participants that after those Task Groups presented their recommendations, the FAA would issue new Taskings, which would also be due within 90 days.

Mr. Chasen then yielded to Mr. Merkle to introduce the first presenter for the first DAC Tasking on Remote ID, Mr. Gabriel Cox. Mr. Cox was substituting for Mr. Steve Ucci, who could not attend due to a weather-related travel delay.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

DAC Tasking #1

Remote Identification (90 Days, beginning on June 6, 2019)

- The Final Rule for Remote ID of UAS is likely up to 24 months away. In the absence of Remote ID of UAS and in consideration of security partners' concerns regarding operations over people and other waived operations under Part 107 in the intervening period, the FAA tasks the DAC to develop recommendations on:
 - 1) What voluntary equipping of Remote ID technologies by UAS manufacturers or operators could occur in the short-term prior to a final rule for Remote ID with the understanding that the requirements finalized in that rule may differ from short-term solutions based on the rulemaking proposal and any comments received during rulemaking?
 - 2) What types of incentives, if any, could be provided by the FAA for operators who voluntarily use UAS equipped in accordance with the recommendations in #1?
 - 3) Are there other drivers that could lead to widespread use of Remote ID prior to the enactment of a Final Rule for Remote ID and finalization of Remote ID requirements?

- The standards referenced by the DAC are:
 - ASTM International:
 - Group F38 (WK27055) - New Practice for UAS Remote ID and Tracking
 - First workgroup meeting in June 2018, currently finalizing the title and scope for the standard
 - SAE International:
 - AIR6388 – Remote Identification and Interrogation of Unmanned Aerial Systems
 - Initiated: March 2017, possibly on hold, pending publication of an NPRM
 - ANSI Consumer Technology Association (CTA):
 - ANSI/CTA-2063 Small Unmanned Aerial Systems Serial Numbers
 - Published April 2017
 - ANSI/CTA-2067 Small Unmanned Aerial Systems – Remote Identification
 - Cancelled October 4, 2018

- TASK GROUP LEAD: Steve Ucci, Senior Deputy Majority Leader, Rhode Island State Assembly



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Recommendation & Discussion for DAC Tasking #1: Remote ID Gabriel Cox (on behalf of Steve Ucci), Drone System Architect, Intel Corporation

Mr. Cox introduced himself and mentioned that he had led one of the two sub-groups (Equipage and Incentives) for this tasking. He also mentioned that he is the Chairman of the ASTM Remote ID Work Group. He then explained the Task Group's approach. While we are awaiting implementation of Remote ID requirements, the group looked at how we can get people to voluntarily adopt Remote ID sooner and what kind of incentives could motivate them. He recalled that the community largely supports the ASTM Remote ID Standards, which specifies performance and protocol requirements. He then explained how the ANSI/CTA developed a serial number format for drones, which the DAC Task Group adopted; the European Commission regulations also use this format. Seeing an error on the displayed PowerPoint, he advised the audience that the F38 Work Group was actually #65041, not #27055.

Mr. Cox then went on to explain more about the equipage requirements recommendations the Task Group gave, which would derive from the ASTM standard. Since the standard itself does not prescribe many specific requirements, the Task Group expects the FAA to add the regulatory overlay with a Minimal Operational Performance Standard (MOPS). The Task Group recommends a minimalistic compliance requirement during the volunteer period, meaning, that if a participant implemented any of the requirements specified in the Remote ID standard using the mechanisms available, they would be considered compliant. Those mechanisms include: Bluetooth 4 or 5, WiFi, and network connection. Whatever mechanism the participant chooses during the volunteer period must function in the area of operation. Furthermore, the participants must support all required fields in the ASTM standard during their implementation. The Task Group anticipates that the FAA will probably develop a more comprehensive MOPS.

Turning to the second issue, Mr. Cox began discussing incentives. As Remote ID changes the field, the Work Group expects that the rules will change and because of that, the FAA should consider a range of incentives. The Task Group considered several options, some of which he recognized could challenge conventional thinking and current FAA approaches. Those options include:

- Contract preferences for federal contracts;
- Part 107 waiver application prioritization;
- Satisfaction of a component for a Part 107 waiver, exemption, or application requirement;
- An online FAA database of manufacturers who have self-declared Remote ID equipage and of the entire self-certified network of Remote ID service providers
- Airspace access to otherwise restricted areas
- Financial rebates in collaboration with Remote ID drone manufacturers or software suppliers to offset the cost of compliance (like the FAA ADS-B rebate)
- Monetary incentive rebate or exemption from registration/permit fees
- Promotion on the FAA website or apps



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Mr. Cox gave examples of how these incentives might work and in what contexts, underlining that Remote ID equipment creates accountability where it did not exist before. Above all, the cost and ease of compliance should be kept at a reasonable level such that operators see that the benefits outweigh the costs of adopting Remote ID. The Task Group also delivered some non-FAA incentives, aimed at industry and other stakeholders, which included:

- Insurance companies: insurance incentive, giving a reduced cost to operators
- State and local governments: additional takeoff and landing locations, and relief from other restrictions
- Other federal agencies: designation of regular or ad hoc locations, dates, and times to allow drone takeoff and landing using Remote ID in locations that are currently restricted
- Industry: recognition with a common logo or slogan

Discussion on Mr. Cox's Presentation

- Bobby Fraser (FAA): Did you give any thought to redundancy of the system, such as with the loss of cellular coverage in an area where you expected to have it?
 - Cox: Under the voluntary requirement, you would have to use a system that you know functions in the area in which you're operating. But you can use one of the network mechanisms that handles spottiness issues well.
- Gur Kimchi (Amazon Prime Air): One of the concerns we discussed early on was how to ensure that disparate systems will interoperate. It doesn't matter which standards you have if you have too many of them. So we should probably include language about the need for interoperability between different systems regardless of the operation to provide guidance to the FAA on how to structure the input. Additionally, I'd like to point out a comment in the text that focuses on concerns about the initial implementation. Some of us have analyzed how this could be done, especially on certain systems that work better, like WiFi, and on integrity of the channel. We could share that data with the FAA so that we can start with a system that is a lot more robust.
 - Cox: So are you saying that we should figure out a way to incentivize voluntary IDs that are federated and that can talk to each other?
 - Kimchi (Amazon Prime Air): That's more of a UTM concept and, for that, it is absolutely the right approach. But what I'm really saying is that the way the recommendation is written now, you could have three different vendors implementing the standard in a compliant way, but their systems don't talk to each other. So the spirit of interoperability is not maintained.
 - Cox: This is where the federal regulatory overlay comes into the picture. And back to the point on UTM: the skeleton of what's going to be the UTM is basically what is required in order to implement network Remote ID. How the various network Remote ID participants communicate with each other and interoperability were some of the biggest topics we tackled in the standard. The FAA could require that, as they do with the Low-Altitude Authorization and Notification Capability (LAANC), vendors interoperate with each other.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Kimchi (Amazon Prime Air): Yes, that would work when you have a network connection, but we want to make sure that you have another construct to use when you don't have a connection that is also interoperable.
- Cox: I understand. The starting mechanisms for dealing with that are the broadcast mechanisms. There's enough detail in the recommendation on how to build a receiver that is compatible with all the broadcast mechanisms.
- Kimchi (Amazon Prime Air): It's more about providing the right high-level requirements that ensure interoperability. And finally, on one other note: many of us participate in developing international standards, like ICAO. I think it's very important that whatever standard or minimal compliance specification is published can be harmonized on an international scale. I expect that the FAA will ensure that we develop a system that can talk to other systems.
- Jay Merkle (FAA): Absolutely, and I compliment ASTM F38 for collaborating with EASA, which is now in a position to adopt the standard that ASTM is publishing for Remote ID. This is the largest piece of international harmonization that we've been able to accomplish to date and we will continue to work with other regulatory and standards bodies on common standards we can all share. The input for these recommendations is so helpful for ensuring interoperability, even though we haven't come out with the NPRM yet. One thing to remember is that F38 built this standard in the absence of the Rule. We can all expect the need to go back and revisit the standard and update it to be consistent with the Rule language.
- Brendan Schulman (DJI): My compliments on the Task Group on this great work. We are all hearing that Remote ID is the key initiative that we need to get done and obviously the forthcoming rulemaking is something we all look forward to but will take time to finalize. So anything we can do to implement these solutions in advance of the rulemaking is a real benefit, not just for the safety and security issues but also those issues that we considered in the original DAC, regarding local concerns about UAS operations. It will provide a means of accountability so that rather than arbitrary, broad restrictions on operations that are sometimes proposed at the local level, we can have accountability. This is a great work product, done in a very short amount of time compared to the earlier work product of the DAC which was also very good, but took a year or two back then. I certainly would encourage every one of my fellow DAC members to vote in favor of this recommendation to go to the FAA.
- Dan Elwell (FAA): Thank you, Brendan. And I know that DJI is doing some ID work in your vehicles, but I'm curious to hear from around the table – show hands or weigh-in verbally – how many are either currently putting some form of ID in their vehicles or plan to in the very near future. [Several hands from industry members went up.] Is there anything in the recommendations for those of you who are doing ID or contemplating ID that give you pause or concern?



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Greg Agvent (CNN): My compliments as well. As an operator, we've focused mostly over the last couple years on the technical enabling. I think almost as challenging of an issue is going to be the editorial portion of it: what is the identification and who is it identified to? I think folks around the table are going to have very different views on that. And I don't know if it's a function of the DAC to come up with recommendations on who gets to see the license plate and what data is actually contained in the license plate but I think that's going to be as important a part as the technical stuff. We've seen and participated in demonstrations. It's not a question anymore of if it can be done. I think the question now is who are we releasing this information to; how is it consumed; and by whom?
- Elwell: Thanks Greg and you just gave me a thought. Since we're being livestreamed, if you would, please identify yourself when you speak.
- Deborah Flint (Los Angeles World Airports): I've said it at the prior meetings that airports like LAX continue to have hundreds of sightings within our airspace and yet, even by collaborating with Air Traffic Control, we've only been able to pinpoint one operator of UAS in our airspace. Remote ID is a fundamental issue and a very an important issue to move on quickly on behalf of airports and aviation safety and security. I did want to ask about the monetary incentive. It certainly makes sense that access is obviously a key and an attractive incentive to use at a certain point of time that will have some diminishing returns and the monetary incentive will play a bigger role perhaps. Can you say more on how the Task Group thought about monetary incentives particularly the limited funding that is in place today and what effect it could have?
 - Cox: We didn't go too deeply into magnitudes of monetary incentives even though we used ADS-B as a kind of a parallel. The magnitude of the cost of adding Remote ID is nothing like what it is for adding ADS-B, which was \$3,000-\$5,000 per aircraft. For Remote ID, even though the retail products aren't out there yet, it would more likely be tens of dollars up hundreds of dollars or something like that for the actual equipment equipage cost. If you're doing network Remote ID, you might have to pay some subscription cost to a cell phone provider or something similar. Fees for registration or testing could potentially be waived so that would be more of a waiver of cost. Those are just some of the ideas we came up with; we didn't really come up with a dollar amount or anything like. In general the financial burden of Remote ID really isn't the biggest burden that we saw, as you did with ADS-B.
 - Flint: Thanks for your perspective. We'll have to address whether they are federal or local offsets that are being thought of here in terms of an incentive for operators.
 - Cox: That's why we saw the strongest incentive actually being permission to fly in places where they are currently not able to fly. So that's the biggest currency that exists right now.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Kimchi (Amazon Prime Air): In our experience, the cost to equip, especially for the ad-hoc layer Wi-Fi is negligible because most of it is software – most all the systems already have Wi-Fi. The cost equipment is really important, not only on the vendor side but also the public sector side, which has to actually get the access to that information. This is where we want to make sure we pick technology that is already available on whatever handset or tool the user already has in their possession. So it's purely a software or service issue as opposed to a situation where you need to get new hardware or equipment.
- Cox: That issue highly influenced the choices that were made – this notion that so many people already have what could be a receiver device without having to purchase a specialized one, considering the limited budgets of many police departments.

Mr. Chasen and Mr. Elwell thanked the Task Group for their recommendations. Since the DAC was running ahead of schedule, Chasen invited DAC Task Group 2 to come up and present instead of going to the scheduled break.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

DAC Tasking #2

Tasking #2: UAS Security Issues (90 Days, beginning on June 6, 2019)

- The FAA tasks the DAC to identify what currently existing or near term technical solutions at the aircraft or operational limitation/capability level could make it less likely that clueless and careless operators could operate UAS in ways that can be perceived as posing a safety or security threat?
- In 90 days, identify what is the universe of actions that IF relevant industry stakeholders agreed to take them, would substantially reduce the likelihood of unintentional threatening behavior.
- TASK GROUP LEAD: Jaz Banga, Co-Founder and Chief Executive Officer, Airspace Systems, Inc.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Recommendation & Discussion for DAC Tasking #2: UAS Security Issues

Dan Dalton (on behalf of Jaz Banga), Vice President of Operations, Airspace Systems, Inc.

Mr. Dalton introduced himself and mentioned that he was speaking on behalf of Mr. Jaz Banga, who could not be present due to a family matter. The Task Group focused on key principles, looking primarily at the careless and clueless operators, and less on criminal operators, as well the perceived security threats in the world of UAS. They also looked at the technical solutions that could be used to diminish security threats. The group, he explained, was able to offer more on the technical capabilities that could be used and less on policy. They also focused on the aircraft and the operational aspects versus the operator. Finally, they looked at reducing unintentional, threatening behavior of some operators.

To explain their key assumptions, Mr. Dalton listed the three central points they worked around: the airspace, the aircraft, and the operator. He explained that their Task Group received input from several sources, especially original equipment manufacturers (OEMs). Dalton noted that issues around air operators was left to the FAA to decide. Referring to earlier discussion in the day, he reiterated that UTM systems will be another important method to address airspace and operational security in the future. Lastly, Dalton explained that the Task Group focused on ensuring that the proposed security improvements also supported the safety goals of the FAA.

The Task Group looked at five core scenarios to develop their recommendations. Mr. Dalton explained what each of these scenarios could look like and the priority for each. These included:

- Scenario 1 - Flight in the vicinity of airports
- Scenario 2 - Flight in the vicinity of Temporary Flight Restrictions (TFR)
- Scenario 3 - Flight in the vicinity of mass gathering events
- Scenario 4 - Flight in the vicinity of other aircraft
- Scenario 5 - Compliant UAS flight near critical infrastructure or sensitive law enforcement or emergency response activity.

Running through these scenarios with various technical solutions helped the group rank their recommendations in terms of the greatest improvement to security with the least amount of cost or effort to implement. Many of these recommendations hinged upon their understanding of the OEMs varying capabilities and motivations. Mr. Dalton noted that this variation leads to a stratified spectrum of implementation and compliance and advised the DAC to look more into this in the future.

In the meantime, the Task Group offered the following recommendations:

1. OEMs should equip their UAS with geofencing capabilities.
2. The federal government should make available a consolidated, standardized, and up-to-date database for critical infrastructure and TFRs issued, which is machine processable.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

3. OEMs should create alerts for UAS operators when their UAS is approaching sensitive flight areas, such as controlled airspace, prohibited flight areas, TFRs, etc.
4. OEMs should voluntarily equip “ADS-B In” receivers on UAS systems (i.e., airframe and/or controller), combined with the notification system in Recommendation 2 above.
 - A follow-on to this would be voluntary equipage of an airborne conflict resolution/collision avoidance capability for the UAS operator.
5. OEMs should explore the voluntarily enablement of automated UAS flight performance limitations – such as altitude limitations, return-to-home features, and decrease in UAS speed or maneuverability – while in or near sensitive flight areas.
6. OEMs should explore the voluntarily development and equipage of UAS with performance-based detect and avoid (DAA) technology, for collision/obstacle avoidance, on the airframe, using acoustic, optical, and/or other sensors, as well as robust DAA algorithms.

Regarding geofencing, Mr. Dalton explained that the Task Group defined it as automated flight limitation for a predefined area – basically, it’s keeping a drone from flying into a restricted place. The Task Group recommended that the goal should be for OEMs to voluntarily standardize the way they do geofencing; but in order for them to do that, the FAA needs to have highly accurate and maintained critical infrastructure maps and TFR maps. He stressed that the industry should lead in figuring out ways to get OEMs to do this themselves; he cited AUVSI’s Trusted Operator Program as an example. Dalton reiterated that the other three recommendations build off of the first since geofencing is the first step.

Per the second recommendation, Mr. Dalton explained that a centralized database run by the federal government is necessary to help OEMs access the required data. Mr. Dalton explained that some of the existing systems have data that is not machine-readable, thus requiring human input, which ultimately slows the process. Commercial Unmanned Aerial Vehicles (UAV) manufacturers need access to automated systems with frequently updated data, like pop-up TFRs. In addition, he noted the benefit of having an API available to enable further automation.

Regarding the third recommendation about an alert system, Mr. Dalton gave a practical example. Since most drones today are operated with a mobile device of some sort or, if they are not, because drone operators often have a mobile device on their person somewhere, the Task Group envisioned having some sort of pop-up come up on the operator’s mobile device screen when they’re approaching a TFR or controlled airspace. Dalton reiterated that this is fairly easy to do and costs very little. In the future, this type of mitigation would be helpful in a multitude of scenarios where the operator may encounter manned aircraft, such as along an approach corridor.

On the fourth recommendation, Mr. Dalton explained how having an “ADS-B In” capability could alert the UAS operator of an approaching aircraft and then in the more distant future, having an airborne collision avoidance system could provide the operator with a recommendation to avoid a conflict with an aircraft.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

For recommendation five, he moved on to sketch out the idea of performance limitations. This would be useful in the scenario where a clueless or careless operator approaches a geofence. Ideally, the drone would then start to slow down, descend, or show some sort of behavior that not only informs the clueless operator that something is not right, but also keeps the drone from going into sensitive areas. In other words, this suggestion supports the idea of enabling a UAS beginner mode around a TFR.

And finally, the ultimate recommendation would be to have DAA. This technology would enable the drone to avoid objects on the ground or in the air, whether or not the operator is aware of those objects.

To contextualize these six recommendations, Mr. Dalton then showed examples of a recent event (Fleet Week in San Francisco) where his company observed, during a TFR, and mapped the drone activity in the vicinity. He explained that, had many of the Task Group's recommended technical solutions been in place at that time, there would have been improved safety and security during the event. Furthermore, even though the TFR alert is available to operators through the B4UFLY app, having updated TFR information available at the OEM level would be optimal for situations such as this.

Continuing on, Mr. Dalton warned that the Task Group had not delved too deeply into what implementation and incentivization might look like, but provided some thoughts about what would need to be considered as the DAC looked at next steps. He also noted that much of the implementation and incentivization would hinge upon Remote ID.

Discussion on Mr. Dalton's Presentation

Mr. Chasen thanked Mr. Dalton and opened the floor for questions and discussion.

- Chris Anderson (3DR): Is the Low-Altitude Authorization and Notification Capability (LAANC) infrastructure an appropriate place to message these notifications?
 - Dalton: Yes, I absolutely think it is.
 - Merkle (FAA): But I would go back to your fundamental point, which is that the TFR information has to be available. So whether it's LAANC or some other API, I think is an implementation detail to be worked out later on. Above all, the point is that OEMs need the TFR information in a machine-readable application program interface.
 - Anderson: As an OEM, we've already implemented LAANC so, I think, if the FAA provides the TFR information, too, it will work as well.

- Agvent (CNN): I have two questions. Was there discussion or consensus within the group of the half-dozen recommendations of which was the highest hurdle? And can geofencing be defeated?



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Dalton: I'll answer the second question first. The answer is yes: especially in these early days, geofencing can be defeated, particularly by a nefarious actor or an operator who is trying to modify their out-of-the-box drone. But to go back to your first question: the Task Group ranked the recommendations in order of easiest and quickest to the more challenging items. That is why you see DAA at the end of the list.
- Captain Joseph DePete (Air Line Pilots Association [ALPA]): I'd just like to state that our members fully support this endeavor and agree that these technical solutions are foundational and will be transformative and the doorway to full integration. And on another point, LAANC is a really great foundational concept, but because of the way it's being used right now (without Remote ID woven in), it's more like a reservation system. But unfortunately, there's nothing FAA's Air Traffic Office can relate to us as pilots when we're in close proximity to the airport. So, again, we're fully supportive of this work and are excited to move this forward, particularly with geofencing, which will really help. It's hard to predict all the things that the bad guys might do, but we have to move toward mitigations. Thank you and great job on this work.
 - Dalton: Thank you; that was a lot of good points. There are always going to be cases where you can't defeat the problem, but we aimed for recommendations that addressed as many as possible. It's important to help operators understand more about what they can and cannot do or should or should not do. Education is obviously a big part of this work. As for reporting unsafe operations, I agree that this is absolutely a concern.
 - Captain DePete: I want to add that, I agree that this is like a second space race and we all have a vested interest in doing this correctly, especially when we think about safety concerns for pilots and passengers who are sharing the airspace with drones. I really appreciate the Task Group's work on this and think the priorities you gave will push us in the right direction.
- Mayor Wade Troxell (National League of Cities; Mayor of Fort Collins, CO): I think we need to broaden our understanding of deconflicting in lower airspace. Additionally, I'd like to suggest that we add children to this category we think of as "careless, clueless, or criminal".
- George Kirov (L3Harris): Great work; it was a very extensive set of recommendations. I was especially interested in recommendations four and six and agree with both of them; we see that it can be useful in Airborne Collision Avoidance Systems. But I wanted to add that I see no need to exclude ground and terrestrial base solutions for both surveillance and DAA. In many areas of congested traffic, ground solutions can add an important dimension to the technology and effectiveness of the system. So we should not exclude one and the other; probably a combination of both will be much more efficient.
 - Dalton: Agreed, and to your point, we see that DAA from the ground will probably be the first thing to happen. This is because the infrastructure already



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

exists in part and because it will probably be much easier to do that from the ground.

- Captain Houston Mills (UPS): Has the Task Group thought about how to do altitude caps for the geofencing? When you think about the clueless and careless, I think about how the first time a child gets a drone, they want to see how high it can go. So I think we should all see if there is a way to potentially geofence a cap to basically segregate it to the greatest extent possible from the ATM until we advance faster. That would probably help us reduce risk faster.
 - Dalton: That's an interesting point. The 400 foot AGL relative floor is a good place to start. The Task Group did not get into that idea of a ceiling at a national airspace level, but I think it's an idea that deserves further investigation.
 - Schulman (DJI): To answer Houston's technical question: yes, you can geofence or limit altitude but there are some challenges because there's no widely available ground measurement tool onboard the drones that are in the market today. But there's a need for flexibility because you're not necessarily measuring the ground, say, if you're in a mountainous terrain. Actually, I have a really great geofencing story. I was in St. Louis a few weeks ago and I walked by the Gateway Arch and noticed on the other side of the field that there were a couple of people with the drone on the ground, ready to take off. And they were scratching their heads, confused as to why it wasn't working. That's because we had geofenced that location. So there was a great first-hand example of that type of mitigation actually making a difference in a real world environment and preventing a security response.

When it comes to TFRs, there are some challenges if you send out a geofence on a temporary basis because you're affecting all the drones that might receive it. If some of those drones are being used by fire and rescue officials, first responders, or news gatherers, we wouldn't want to lock down the functionality of a drone without notice. And to Dan's point, we really do need an easy machine-readable digestible TFR system so we support getting the FAA's help with this so we can better implement those TFRs.

Also, regarding the Fleet Week example, I want to point out that we have to be a little careful with observations because, as we know, drones may be detected over the radio system because they are turned on, but are not actually in flight due to geofence. And sometimes, we also know, sightings are really not drones, but rather birds, bags, and balloons. So I advise that we keep in mind that there should be a balance between geofencing and other mitigations and letting those with authority to fly do so. Maybe the DAC can look at this more in due time.

- Anderson: Brendan, can you say more about your St. Louis story. What was the communication on the screen that explained why they couldn't fly there?



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Schulman: They would have received a message saying that you're in a no-fly zone and you basically need to contact us to fly there. So to continue that story: they scratched their head for a few minutes. Then they gave up, got in their car, and left. Now what's really interesting was that one of them was wearing a Canada T-shirt so it's quite possible that they were tourists. So I think that was a good story. Of course, if they were authorized to be there, we would unlock them and they could go ahead and do their operation.
- Captain DePete: Much of what we're talking about here really revolves around the concept of a safety culture and building this type of a mentality. It may be worth consideration to have a Task Group that is solely dedicated to education and developing that kind of mindset.
 - Merkle: In fact, last week the FAA signed [Order 8040.6, our SRM order for unmanned aircraft system](#), so that's a big step toward developing the safety culture associated UAS. In so far as it is based on international standards, the Specific Operations Risk Assessment (SORA) methodology, and the Joint Authorities for Rulemaking on Unmanned Systems (JARUS), it has the ability to promote safety culture here and also align with developments from around the world. Furthermore, the work that the UAS Safety Team has been doing is moving in that direction. Where possible, if the DAC could encourage that work, it would be very beneficial.
- Kimchi (Amazon Prime Air): This is a great report and I have a few comments. I completely agreed that we need to publish this data in a consumable form. I encourage the FAA to collaborate to make sure not only is the data available but also that it's in the right form and cannot be misused. Regarding the ADS-B comment, I think it's important that the recommendation speaks about ABS-B or an equivalent technical capability. One comment on automated deconfliction: it's easier if you have Remote ID in a sort of modern autopilot. I think we should look more at how to allow collaborative vehicle-to-vehicle deconfliction. Regarding the language around a beginner mode, we should be careful about using that word "beginner" because so many people don't want to think of themselves as beginners and will ignore it. Perhaps we should call it a "safety assured" more or something like that so people won't turn it off so easily.

And switching tracks to a critical question I have, who is responsible for violations, assuming we build all this infrastructure and have Remote ID? I'm thinking particularly about more complex arrangements, such as people who operate on behalf of others using third party equipment, or those flying outside the country of origin etc. I think we should develop some opinions as an industry on how we link the owner/operator responsible, the pilot-in-command, and the equipment manufacturer, etc. I think it's a complex question that demands our attention. Thank you.

- Chasen: You raised a lot of good points on key items that we're going to have to address as we continue to move this discussion forward.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Mr. Chasen thanked the Task Group for their recommendations and announced a 20-minute break, asking the DAC to return to their seats by 10:50 a.m. before continuing with the third Task Group presentation. He reminded the DAC that after that, they would be voting on making these taskings formal recommendations to the FAA, using one motion.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

DAC Tasking #3

Tasking #3: 107 Waivers (90 Days after receipt of framework document from FAA)

- The FAA tasks the DAC to review the framework of the existing 107 waiver process provided by the FAA and develop recommendations on improving this process.
- TASK GROUP LEAD: Brian Wynne, President and Chief Executive Officer, Association for Unmanned Vehicle Systems International



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Recommendation & Discussion for DAC Tasking #3: 107 Waivers

Brian Wynne, President and CEO, Association for Unmanned Vehicle Systems International (AUVSI)

Mr. Michael Chasen welcomed the DAC back from the break and introduced Mr. Brian Wynne to present the third Task Group's recommendations. The group looked at ways to improve the waiver process under Part 107, given the regulatory strictures around it. Mr. Wynne noted that it's not a scalable process and is not meant to be; he also put forth that the path to extended operations inevitably leads to more regulation, considering these limitations.

Mr. Wynne then explained the approach the Task Group took, first by surveying the FAA and then by surveying the industry. They began with a briefing on Part 107 application processing from a subset of FAA and from there, developed a questionnaire on the processing. This was then sent to a larger group at the FAA. Simultaneously, they created a survey for industry members. Through this research, the Task Group was able to gain clarity on the FAA's perspective in how it handles applications, how its analysts are trained, and what guide materials they use. The group also looked at the current denial and appeals process, as well as the assessment criteria for operator competency. For the industry survey, for which they collected 632 total responses, they focused on the operator's understanding of the process and the criteria for the application. To determine the operator's experience, they relied on technical feedback and advice from the FAA regarding application results. They also analyzed the overall time spent on the application. Respondents anonymously provided comments, and those surveyed represented a mix of approved and rejected applicants. Wynne mentioned that the survey results were included in the group's report.

Using the survey results, the Task Group formulated the following recommendations:

1. Expiring waivers should auto-renew unless there is a compliance issue or change in regulations, thereby reducing administrative burden and limiting re-submissions.
2. The FAA's DroneZone should be modified to allow the operator to update nonconsequential information without having to file an application for an amendment to their waiver.
3. The FAA should create a checklist to inventory appropriate examples of satisfying safety cases for complex waiver approvals, like BVLOS. This could then be used to provide constructive feedback to those applicants that do not meet the required thresholds and direct the applicant to specific examples that would have satisfied the requirement.
4. a.) The FAA should consider a streamlined automated approval for those applicants trained by another operator who has flown under an existing waiver for at least 1 [or X years] year and complies with all waiver requirements; or, an operator who has received a Special Airworthiness Certificate-Experimental Aircraft from a UAS Test Site.
b.) The FAA should consider automated approval for applicants who leverage the work of programs like the Unmanned Aircraft Safety Team (UAST), AUVSI's Trusted



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Operator Program (TOP), and industry standards etc., and give operators credit for undergoing audits, certification and other training beyond Part 107 compliance.

5. The FAA should consider a streamlined process for groups of operators applying for waivers of the same type of operations for a business use case.
6. The FAA should increase transparency and accountability of Part 107 analysts by creating a pathway for applicants to learn who reviewed their application and why it was not approved.
7. The FAA should require Part 107 waiver inspectors to attend a structured program similar to that mandated by AIR-900 Enterprise Operations Division program that provides FAA ASIs and UAS Designated Airworthiness Representatives the background, key policies, and procedures.

For several of the recommendations, Mr. Wynne spoke more in depth about the rationale the Task Group gave, as well as the anticipated benefits they saw. By implementing the first three recommendations, they believed the FAA could clarify the waiver processes and criteria, promote transparency, and increase efficiency. More specifically, regarding the first recommendation, Mr. Wynne explained further that because of the anticipated tsunami of needed renewals that will come due in the next year, the FAA should consider auto-renewal as an option. He pointed out that this solution deals with the larger problem of fixing the scalability of Part 107, encouraging that automation is key here. On to the third recommendation, Wynne urged the FAA to share more about what it is looking for, so applicants don't have to guess each time. He underlined the need for better customer service by citing examples of applicants who reported submitting an application one time and getting it approved, only to submit the same language in another application and have it be rejected.

On the rationale behind the fourth recommendation, Mr. Wynne explained that there was an opportunity for the FAA to promote collaboration and safety practices within industry groups by streamlining approvals in certain instances. He pointed out that the work operators have done with the Test Sites and IPP helped define the good practices and collect the data points the FAA is using for safety cases. Additional testing programs from the industry have also created a tiered group of vetted operators who have gone beyond the minimal required training. Speeding up automated approvals for operators such as these strengthens partnerships between the FAA and industry.

Similarly, for the final three recommendations, the benefits would improve FAA and industry relations by increasing consistency, transparency, and fairness in the waiver process. Mr. Wynne encouraged the FAA to leverage the work that has already been done to develop new means of improving the existing process. At the same time, he cautioned that everyone should be realistic about the limited scalability of the waiver process and again pointed out the need for more specific regulations covering extended operations.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Discussion on Mr. Wynne's Presentation

Mr. Chasen thanked Mr. Wynne and the Task Group for their recommendations. He echoed Wynne's thoughts on the need for more regulation in the next few years and the increasingly important place the Part 107 waiver process has in the lead up to that time, especially as more businesses seek to innovate with drones. Chasen then opened the floor for questions and discussion.

- Anderson (3DR): My understanding was that the FAA is trying to move away from waivers and exemptions and move toward longer term, more transparent rules. If so, aren't automatic renewals just preventing this transition? Perhaps this is a question for Jay Merkle.
 - Merkle (FAA): Yes, you're right. But in the meantime, as we move toward rulemaking that does away with the need for exemptions and waivers, we do want to enable operations so we can learn what needs to go into the rules. There are other opportunities for approving operations within the current regulatory framework that we could maybe take advantage of that possibly better align with the complex operations of beyond visual line-of-sight than 107, which was created as a Visual Line-of-Sight rule with what was a 333 exemption and is now a 44807 exemption. What we're seeing through all the operations is that there probably is a need to start moving more of the community to other parts of the regulatory framework. We saw the two very history-making exemptions that happened this year – one with Wing, one with UPS Flight Forward – and we learned a lot from that about how to manipulate other parts of our regulatory framework as well but that being said these are good. So we shouldn't ignore this topic and just wait for something better that will come in the future.
 - Captain Mills (UPS): Thanks to this Task Group as well for your great work, especially for the 90-day timeframe. I wanted to echo Jay that I think there's an opportunity to leverage some of the learnings that we've had from the IPP program. The FAA has demonstrated the ability to run really fast and work with operators to move things forward so I think this could work with regards to the waiver process, too.
- Thomas Karol (National Association of Mutual Insurance Companies): I was a member of this Task Group and want to compliment Brian on his great leadership. And to illustrate a practical example on recommendation #5 (streamlined process for groups of operators in the same type of business), I'll share that we have 1,400 property casualty insurance companies that use drones, mostly to review roofs before and after damage. But they need exemptions for operating over people. If we could better advise our members on what they have to do to get this type of exemption rather than burdening the FAA with 1,400 different exemptions, it would be a tremendous benefit both to the FAA and to us.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Captain DePete (ALPA): That brings up the issue of the number of exemptions and the lack of transparency that follows. I understand that we're learning along the way and that the aim is towards an established regulatory process that we all abide by. Putting concerns about competition aside as we look ahead, if we had a little bit more transparency into how and why the exemptions are granted, companies and industry groups wouldn't need hundreds of exemptions. Essentially, this supports the idea of performance-based standards.
- Merkle: Thank you, Joe. Just a point of clarification: The 107 are waivers. And we have provided examples of successful waivers on our website to try to be more transparent and provide that kind of information. The exemptions against 135 are a slightly different activity. We've received feedback from the community that it is somewhat easier to deal with an exemption because with that, you're taking things away from the Part versus a waiver where you're asking someone to demonstrate they can safely operate but you don't provide them with the objectives. So that's one of the challenges we see with the two methodologies.
- Anderson: Would the FAA consider posting examples of unsuccessful waiver applications, perhaps anonymized as well, and explaining why they were rejected?
- Merkle: We would, if the DAC recommended that.
- Senior Corporal Mark Colborn (Dallas Police Department): What I found interesting about the survey was that most of the respondents were very happy with the controlled airspace authorization process. So my question is there going to be any consideration anytime soon to extending LAANC to those who have night waivers?
 - Merkle: I would have to defer to my colleagues in the Air Traffic Organization as to where that is in their prioritization. I know they work with the cadre of service suppliers to do that public-private partnership work, so I would recommend addressing it through that office.
- Schulman (DJI): My compliments to this Task Group, especially on reaching out to the smaller and medium operators out there, from which we could benefit to hear more. These suggestions would certainly help cut down the FAA's workload, since many of the applicants are from these smaller operators. On social media and small business forums, we're seeing those small businesses struggling to understand what they need to know to have successful applications. This might be the most useful and actionable recommendation we've heard today so I hope we can see it actually put and realize the benefits of small UAS across the country.
- Merkle: One final comment since we mentioned the [website page where we provide information on waivers](#) and since we also have [webinars on applications for waivers](#), we'll provide links to both of those in the public record that we send out.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Mr. Chasen thanked all three of the Task Groups for their recommendations and proceeded to formally recommend their input to the FAA. He made a motion to approve each of the Task Group's recommendations in turn. Each motion was seconded and unanimously approved.

Merkle thanked everyone and stated that the FAA would provide feedback on the three sets of recommendations at the January 2020 DAC meeting. Chasen and Merkle agreed to push forward with another presentation since the DAC was still running ahead of schedule.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

FAA Update: Remote Identification

Jay Merkle, Executive Director, FAA's UAS Integration Office

Mr. Merkle reminded the DAC that the FAA is still in the process of the review of the Notice of Proposed Rulemaking so he could not go into the details of what's actually in the Rule.

Currently, the Rule is under review in the Office of Information and Regulatory Affairs at the White House's Office of Management and Budget. Remote ID, as discussed earlier in the day, is necessary for enabling more complex operations, addressing safety and security concerns, and laying the foundation for UTM. It's also the key to unlocking safety, as well as security and defense functions, especially for BVLOS operations. The FAA has begun working on a Remote ID implementation plan to start to put together all the components so that we can ensure we move fast on this Rule when it's ready.

Mr. Merkle gave more background information about the Rule's formation and current status. He explained how the ASTM standard on Remote ID will likely be a potential means of compliance, and added that it includes broadcast and network. The industry assisted in drafting the standard and the ballot was sent out on September 16, due to come back in 30 days. With only a few negative comments to adjudicate, Merkle expected it to be published by the planned November 2019 timeframe. Regarding the ASTM Remote ID conceptual overview, Merkle advised the DAC to look not just at the aircraft but also at the role of the control station as an important communicator of Remote ID, particularly in the network mode.

Regarding next steps, Mr. Merkle announced that the FAA expects to publish the Rule on December 20, which will initiate the public comment period. The FAA anticipates a number of comments to come in because there has been significant progress in the industry since the development of the Rule. Merkle also foresaw the need later on for an update to the standard for the Rule.

Discussion on Mr. Merkle's Presentation

- Kimchi (Amazon Prime Air): I'll make the same comment I made before that there's a need for high-level requirement which is potentially outside the Rule but describes what the rule should address, which is interoperability. Are these requirements clear enough at this point that able to do the work?
 - Merkle: Without being able to speak on what's in the Rule, I can say that the FAA's philosophy on UAS Traffic Management (UTM) is that it has to be a federated, interoperable system. So your concern is directly in line with the FAA's objectives for implementing UTM.
 - Kimchi: Is there a mechanism by which the requirements can be shared ahead of time to make sure we're all aligned in specifically the areas that are trying to be addressed by the Rule and which areas are not addressed by it?
 - Merkle: In some scenarios, you would see industrial standards sequentially informing a rule later in time, but because we've been moving in parallel with the



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

development of this rule, we will have to catch up at the end. I can't say much more on that, however.

- Flint (Los Angeles World Airports): I just want to call out a reference to the Blue Ribbon Task Force report where we identified that part of Remote ID is ensuring that airports, local jurisdictions, and federal agencies all have a shared but very specific and time-sensitive responsibility to engage and take action via some sort of response mechanism. I hope that is something that is going to be addressed either through the NPRM or quickly thereafter.
 - Merkle: This afternoon there will be an update on the federal efforts in terms of UAS security.

Mr. Merkle then suggested that he could go ahead and give the FAA update on Section 349 and recreational flyers. Chasen approved the agenda change.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

FAA Update: Recreational Flyers (Section 349)

Jay Merkle, Executive Director, FAA's UAS Integration Office

Mr. Merkle reviewed the history of the FAA's activities in the past year. He highlighted, using a chart, two significant accomplishments since the DAC's last meeting: the expansion of the LAANC application to include recreational users and the request for information (RFI) on the Knowledge Test. The FAA is reviewing the RFI now and is on schedule to provide that knowledge test by December. He also mentioned that the FAA is working on the national policy on recreational users in both controlled and uncontrolled airspace.

Additionally, Mr. Merkle stated that the DroneZone had also been updated and that a new Advisory Circular (91-57C) was underway, which will define a community-based organization. With this, the FAA is approaching the end of the work that remained for implementing 349. In closing, Merkle remarked that the FAA is on schedule to complete those tasks.

Mr. Chasen dismissed the DAC for lunch and requested that everyone return at 1:10 p.m.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Department of Transportation (DOT) Update

Joel Szabat, Acting Under Secretary, DOT's Transportation Policy Office

Mr. Merkle welcomed back the DAC and introduced Mr. Joel Szabat.

On behalf of the Department of Transportation, Mr. Szabat thanked the DAC for all their hard work, naming UAS as one of the department's top priorities. He mentioned that Transportation Secretary Elaine Chao has been working with the FAA Administrator Steve Dixon and Deputy Administrator Dan Elwell to pursue the safe integration of UAS into the national airspace. Mr. Szabat noted that Secretary Chao and Deputy Secretary Steven Bradbury wished to have been present for the DAC, and shared that he was pleased to serve in their stead.

Mr. Szabat briefly reviewed the DOT's work on UAS and on safely enabling innovation, while also addressing public concerns about safety, security, and privacy. He reaffirmed the department's appreciation for the DAC, noting how valuable its recommendations will be for enabling more operations. Safety for every operation of every aircraft is the DOT's first priority, even as operations become more complex or potentially risky. He urged the DAC to continue helping the FAA to improve its processes, innovate solutions, inform the public about how to safely operate drones, and maintain the security of operations. The transformational nature of drone technology, he added, is difficult for government regulatory agencies, making the need for an industry-led advisory committee all the more important.

Touching on the importance of collaboration more broadly, Mr. Szabat spoke on the Integration Pilot Program (IPP). This program works with state, local, and aviation industry partners and helps to gather new data, create new partnerships, and actively collaborate with communities to find ways to improve FAA processes for enabling UAS operations through lessons learned. Szabat then reviewed some of the IPP's successes from its Lead Participants from around the country and how the benefits realized by enabling more operations reach will reach throughout the economy.

Thanking the DAC again, Szabat closed by stating that the safe integration of UAS is truly an historic undertaking and the committee plays a crucial part in the story. On behalf of the DOT, he said leadership looked forward to reviewing the DAC recommendations. He ended by sharing candidly some anecdotes about his encounters with drone entrepreneurs, and sketched out the challenges he sees ahead for all stakeholders. Finally, Szabat charged the DAC to continue in its charge to help solve the most difficult of those challenges.

Discussion on Mr. Szabat's Presentation

- Captain Mills (UPS): The IPP has been very successful and with the three-year process coming to a close, can you elaborate on what's next? Do you see an extension of the existing IPP and an expansion for others to participate?



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Szabat: I can say that there will be a follow-up because the IPP was a success but what we don't want to do is to duplicate what we've already done so we're incorporating the lessons learned and in conjunction with the FAA we will be rolling out a follow-up.
- Mayor Troxell (National League of Cities; Mayor of Fort Collins, CO): I think one of the things that needs to happen in the follow-on is having engagement and maybe a working group for deconfliction. I'd also like to encourage more conversations to address issues such as privacy, accountability, safety, and security.
 - Szabat: Thank you; you make a salient point. One of the biggest challenges that we're grappling with is the line between local control and national standards when it comes to drone use. I believe that it's better to have local communities at the table to begin with. Regarding your suggestion for a working group, while I think it has merit, I will defer to Jay Merkle and Dan Elwell and the folks at the FAA who actually have to run the mechanism of the process. Your concern, though, is valid and it's something we absolutely have to tackle if we're going to have a successful integration of drones into airspace.
 - Troxell: Thank you and I'll add that we also have to think about the highly complex contextual situations where we see drones in our communities. I gave an example earlier of a park opening where children were running after a drone – one with a 15-minute battery life – and it couldn't land while the children were underneath it. So, it's not just about regulating and control drones in the airspace; it's also about how drones show up in our communities on a daily basis.
 - Szabat: Agreed; and one thing we know is that the situations vary widely from local community to local community so we need to have a system in place that is not one-size-fits-all, but rather allows for local governments to tailor their regulations to the needs of the community. That's an important outcome we're looking for.
- Schulman (DJI): Thank you for your update. We've seen how important it is to get the new framework right on the recreational operations including the knowledge testing and I know the FAA is working to make sure that that test covers the safety rules that are necessary to fly, while ensuring that they are not a substantial impediment to enterprising and beginner flyers who are still getting to know the technology. And with respect to the concern you mentioned about privacy, I'd think the cases of drones being used for good far outweighs the edge case of misuse. To date, DJI counts 292 people who have been rescued using drone technology, including the six-year-old boy in the news this week who was lost in a cornfield in the middle of a cold Minnesota night. He was rescued by a volunteer drone pilot using a drone with a thermal camera. The benefits are greater than the hypothetical risks of misuse, which, of course, will be remedied particularly when there's Remote ID. At that point, you can use an existing privacy statute and the voluntary Remote ID coming soon, per the DAC's recommendations, and still foster innovation in the flying community.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Szabat: Thank you for those observations. The U.S. Department of Transportation, the Federal Aviation Administration, and the overall administration all agree with you that the benefits far outweigh the negative uses. Having said that, as a regulatory agency, part of our job is to be prepared for any eventuality. Ensuring the safety and security of everyone as we integrate drones is one of the most difficult challenges we face. But it is not insurmountable.

After Mr. Szabat spoke, Mr. Chasen welcomed then Acting Assistant Administrator Bobby Fraser from the FAA's Office of Communications to speak on National Drone Safety Awareness Week.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

FAA Update: National Drone Safety Awareness Week

Bobby Fraser, then Acting Assistant Administrator, FAA's Office of Communications

Mr. Fraser expressed his excitement to share about some of the work coming out of the FAA Office of Communications, as well as some news about Drone Safety Week. He briefed the DAC on the role his office has in helping to educate the public about drone safety, as well as the Integration Pilot Program, through digital content, social media, webinars, and videos. They reach audiences on multiple platforms and have generated 16 million impressions through drone-related content.

Turning to speak on National Drone Safety Awareness Week, Mr. Fraser pointed out the sets of Drone Safety Week stickers available at the DAC tables. He reminded them that the inaugural awareness event would be held on November 4-10 and noted the supporting partners, the Know Before You Fly team and the UAS Safety Team. He explained that this educational initiative is an opportunity for the drone community to help educate the public and highlight how key sectors are using drones. The week-long campaign is also an opportunity to engage with students and teachers about using drones in STEM classes.

The focus of each day during the week is as follows:

- Monday: Public Safety
- Tuesday: Business Focus – photography, real estate, insurance
- Wednesday: Business Focus – infrastructure and agriculture
- Thursday: Business Focus – package delivery
- Friday: Education and STEM
- Saturday and Sunday: Recreational Flyers

Mr. Fraser then shared several ideas on how the DAC members could help promote the cause. Describing what the FAA had already done in this effort, Fraser mentioned the email campaign that had gone out to half a million stakeholders for each focus areas, as well as downloadable graphics and the Stakeholder Playbook, which advises users on how to engage with their local communities.

In closing, Mr. Fraser encouraged DAC members to visit the faa.gov/UAS website, follow the FAA on social media, and to use #DroneWeek in their online posts so the FAA could amplify their efforts. He thanked the DAC for their time and also for Mayor Troxell's support, who had shared his plan to make a Drone Safety Week proclamation for Fort Collins.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

FAA Update: UAS Security

Angela Stubblefield, then Deputy Associate Administrator, FAA's Office of Security and Hazardous Materials Safety (ASH)

Chasen then introduced Angela Stubblefield, the Deputy Associate Administrator of the FAA's Office of Security and Hazardous Materials Safety, to give the update on UAS Security.

Ms. Stubblefield greeted the DAC and gave special thanks to Task Group 2 for their work. Following on her briefing at the June DAC meeting, Stubblefield reminded the group that by taking a holistic look, we can see the full spectrum of prevention and deterrence for unauthorized operations. To that end, the FAA has engaged with interagency and industry partners over the past year.

In the 2018 FAA Reauthorization Act, Section 372, Ms. Stubblefield recalled the directive to take on a pilot program for Remote ID and detection technologies, and look for ways to increase the FAA's investigation into unauthorized drone operations. Regarding detection, her office focused on finding out what is already being used by government agencies, as well as by critical infrastructure owners, to detect and hopefully identify operators of unauthorized drones. For those interested in gaining that airspace awareness, she also sees an opportunity for promote safety outreach. For the FAA, partnering with those who are pursuing detection technologies also offers the possibility of data-sharing, which could help operating them to develop investigations and either education and/or enforcement actions. They have begun partnering with a variety of stakeholders who own or run different types of venues in which detection technology is being used.

Recently, they worked with the Albuquerque International Balloon Fiesta, which takes place annually over an 8-day period. The FAA worked with the Albuquerque Police Department, the event sponsor, and a number of other local folks who were using a detection system over the event. There were 20 TFR violators; and eight operators were identified in that case. They worked with the Albuquerque PD to locate the operator and get those unauthorized drones out of the sky, giving the FAA the opportunity for outreach. Ms. Stubblefield stated that the FAA will be looking for additional venues in the near term to engage and extract appropriate information on how to potentially identify operators and proceed with education and enforcement.

Moving on to discuss Section 383 of the Act, Ms. Stubblefield spoke on how the FAA could perhaps host some of that testing. She added that Congress gave the FAA additional authorities and relief from some of the legal statutes that can constrain the use of certain detection systems and mitigation technologies. This means that the FAA will be able at least to evaluate systems in the airport environment. The FAA is developing the timelines and milestones for this next phase of the pilot program.

Additionally, the FAA is charged with developing the standards for detection and mitigation technologies to be used in the National Airspace System. To do this, the FAA will convene an



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Aviation Rulemaking Committee to come up with a plan for enabling the use of these technologies, which it is already using alongside the four federal partners who have that authority. One goal will be to ensure that these technologies don't present an interference or an obstruction in the airport environment and that the operational response plans are risk-based and are proportionate. While this work is under development, the FAA is working with its interagency partners to devise how to implement the pilot program testing and evaluation activity.

The third and final topic that Ms. Stubblefield presented on was the Core 30 Concept of Operations (CONOPS), which is the national response plan for a persistent UAS disruption at the Core 30 airports. At issue, right now, is the fact that no one has the authority in a steady state to provide counter UAS protection at airports. So there is a need to use existing authorities in the airport environment to address that risk as quickly and capably as possible. Stubblefield reminded the DAC that the CONOPS is in the final steps of approval within the National Security Council, after all the partner agencies had a chance to weigh in. While it is waiting for final approval the FAA and TSA have been working very closely with airport sponsors to start the dialogue for what those tactical response plans will look like in the core 30. This include the point where you determine the UAS is a persistent threat and need to invoke the assistance of the federal government and then also what unified command will look like and who the involved stakeholders should be.

Discussion on Ms. Stubblefield's Presentation

- Captain Mills (UPS): Thank you for the update. Could you expand more on the CONOPS and whether this is something that could be duplicated in other areas for other communities? Is there a plan to expand it to other areas as well?
 - Stubblefield: Right now, in terms of the federal agencies that have authority and capability, we don't have a lot deployed out there so there is a volume issue. We wanted to focus first on those airports that, if disrupted would have the biggest impact across the system. But as we develop tactical response plans, lessons learned, and templates, those things can absolutely be duplicated for other airports. We also have to look at CONOPS as part of the continuum of dealing with UAS risks in the airport environment.
- Mayor Troxell (National League of Cities; Mayor of Fort Collins, CO): In terms of interagency cooperation, are you also engaging research universities?
 - Stubblefield: Absolutely, we are. We are leveraging the work of our federal partners who are looking at these technologies in one form or another, specifically, DOD, DHS, DOJ, and DOE. And there are certainly educational institutions involved in that work, too.
- Kimchi (Amazon Prime Air): I would like to point out that usually people will go to where it is easiest to do what they want, where there is the least amount of capability to detect and mitigate, so understanding how to apply these technologies in the private



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

sector, too, is important. If there's a standard, then I think we should all be able to eventually use the same set of standards. On another note, on the statistic that 98% of the time nothing is done when there is a sighting: it's not clear to me that 98% of the time the thing seen was actually a drone. We know that many times these turn out to be a plastic bag or something else. So how do we get to the point where we actually know the true baseline for the sightings?

On operators who are permitted to operate counter UAS systems. I assume there will have to be a requirement on how they connect with UTM and support Remote ID, is that right? We need to verify them, separating the good operators from the bad, and only then allowing them to take action. It's important that we be extremely disciplined in how we do it.

Finally, you had mentioned testing an anti-GPS system, for example, which is actually not legal. So I think you need the right regulatory support and to anticipate side effects. So what will the training requirement be for this? Thank you; I know this is an incredibly difficult topic.

- Stubblefield: Thank you. So I'd like address all three points. We have struggled with how to validate sightings. Remote identification will help with that. I will make one point though about the statistics on the unvalidated sightings that we're seeing: year over year from 2016 to 2018, there has been an increase of sightings every year but that increase has been 50% less every year. That attests to the education and outreach we're doing is working. Those reports are coming to use mostly from pilots, and when we have Remote ID, we'll have much better validation.

On your second point, as we think about UTM and talk with our national security partners about what that construct looks like, it's about getting all of that data together so you can make an informed decision. With Remote ID and LAANC, we'll see this become more like a layering of data.

On your third point, I agree with you. My Air Traffic Organization colleagues are most intimately involved with this activity. The four federal departments I mentioned earlier regarding CONOPS are starting at the very beginning with defining "threat", what constitutes a threat, etc. That is part of what we do in getting to the place where they can actually turn the system on and go operational. The kind of authority to use those type of systems requires that the operator is well-trained, has good tactics techniques and procedures, as well as rules of engagement. The FAA is trying to support this level of coordination, but we cannot connect with every law enforcement agency in the country. So as we continue to think about whether and which additional entities should have the authority to use mitigation tools, training standardization needs to be part of the conversation.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Chasen: In light of the time, we can only take one more question before we take a break.
- Marily Mora (Reno-Tahoe Airport Authority): Thank you, Angela. The detection and mitigation issue is paramount for airports and fast-tracking those standards for detection equipment is really important to us. On the question about CONOPS being focused on the Core 30 airports: I don't think there's anything preventing airports from going ahead and developing a plan in concert with a Federal Security Director.
 - Stubblefield: You're absolutely right and we encourage airports to be thinking about that under your Part 139 and 1542 requirements so you can address safety and security hazards by developing those operational response plans with your local stakeholders at the airport. We hope that the work we're doing will support that work so that each airport doesn't have to reinvent the wheel for themselves. Thank you.

Mr. Chasen thanked Ms. Stubblefield for her presentation and dismissed the DAC for a 15-minute break to reconvene at 2:40 p.m. for the presentations on the industry-led technical topics.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Industry-Led Technical Topics

Michael Chasen, DAC Chair

Mr. Chasen welcomed the DAC members back and began the final section of the meeting. He remarked on the importance of livestreaming the meeting to increase transparency and promote discussion on drone-related topics among even more stakeholders.

Mr. Chasen then turned to the industry-led topics and explained the format for the following discussion and how it would tie into the next set of DAC taskings. After introducing each topic, Chasen explained that he pause for a brief discussion on before going ahead and assigning the new, related Task Group who would have 90 days to prepare their recommendations to the committee.

Recap on FAA Facility Maps

Introducing the first topic, Mr. Chasen provided a quick overview of what the FAA Facility Maps are and how they are used. These maps show the maximum altitude around airports where the FAA may authorize Part 107 operations without additional safety analysis. Drone operators rely on these maps to understand whether they are likely to get approval to fly drones near airports. He remarked that drone operators have noticed pain points with these maps (like where the altitude restrictions don't match the actual risks) and the demand for airspace access is only increasing. Chasen clarified that the related DAC Tasking would focus on identifying how industry and FAA can collaborate to improve these maps and safe airspace access.

Before moving to set up the Task Group, Mr. Chasen first opened the floor to the DAC to see if they had or needed any overarching directions or clarifications on what the Task Group should be sure to address.

Discussion on the FAA Facility Maps

- Kimchi (Amazon Prime Air): I assume that the long-term idea is for all the data to be provided for the UTM data provider interface. But right now, there is an assumption that the FAA has to be the curator for this entire set of data. So I think one important thing to clarify is how this relates to the UTM topic and the federated data providers underneath the UTM. Likewise, how do you discover which data layers are important for a specific population?
 - Chasen: Thank you. We'll go ahead and add to this Task Group the management of and access to this data, as well as who actually owns the data, who needs to provide it, etc.
- Rich Hanson (Academy of Model Aeronautics): Just to make sure we're on the same page, are we talking about what is also referred to as the LAANC grids?



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Merkle (FAA): Yes, the UAS Facility Maps are the underlying data structure that supports the LAANC application and some people might call them that. But officially, they're the UAS Facility Maps. They're available online and are used by the UTM Service Suppliers (USS). And to go back to Gurs' comment to clarify the difference between two kinds of maps here: these maps are not intended to be the sole data source for UTM and I think Gurs' question may be for something broader. What we've heard from the community that uses these maps and how they'd like for us to improve the maps, specifically to support automatic authorizations versus more generic information which could include aeronautical information, GIS information, TFRs, NOTAMs, and a wide range of similar data. In a mature UTM, you would have access multiple providers who would have access to all that in a machine-readable format. Essentially, these are two different things.
- Mariah Scott (Skyward): Is this only looking at the facility map, not other information that might be included or is it about expanding the coverage of that?
 - Chasen: Yes, I want to make sure that the committee groups have a streamlined focus so that it's not too open here.

Recap on BVLOS

Mr. Chasen then turned to present on the next topic: beyond visual line-of-sight. He recalled that the FAA had initiated research focused on solving BVLOS challenges more than a year before Part 107 was in place. Under the Pathfinder Program, partners BNSF and PrecisionHawk conducted research for three years and received the first BVLOS waivers in 2016. Today, BVLOS research efforts continue under the UAS Integration Pilot Program. There are been over 50 BVLOS waivers approved, however, a BVLOS rule is still a few years away. Chasen advised the DAC that it needs to focus its efforts to position FAA to create policy and regulations for BVLOS. And to do that, the DAC should identify what challenges remain, and how best to address them moving forward.

Mr. Chasen acknowledged that this topic involves not only policy, but also a lot of technology. He opened it to the committee for any thoughts about what this Task Group needs to specifically focus on regarding BVLOS operations.

Discussion on BVLOS

- Anderson (3DR): Do you think they should include one-to-many operations – that is, breaking the one-to-one ratio?
 - Chasen: I think that's something that can be addressed. We'll put that down for the Task Group to look at.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

- Kimchi (Amazon Prime Air): I think that's maybe a parallel topic and if we agree that it's important then we should prioritize it. However, I have two observations. I think there's work that we spoke earlier on around defining the technical standards for vehicle-to-vehicle collaborative deconfliction – this is “low-hanging fruit”, building on top of Remote ID. NASA has already demonstrated doing automated deconfliction and it is very inexpensive to implement. What I think is important, though, is to have much better clarity on how “well-clear” relates to vehicle-to-vehicle deconfliction because it really depends on different entities interacting with a drone. A heftier topic that we need to pick up and address is the known collaborative commercial pilot equivalent performance specification and how it relates to “well-clear” for sensor-based detection.
 - Chasen: Thank you; we'll make sure those items are on the agenda.
- Schulman (DJI): I think there's a real opportunity here to try to do something about operations that are only hyper technically BVLOS, but are not actually posing an added risk. One example is when you're on top of a bridge and you need the drone to inspect the underside; technically, it's BVLOS, but it's right underneath and there's no other air traffic even possible to be there, so I don't think that's the risk that the BVLOS restriction is intended to address
 - Merkle: This is a great conversation and it's exactly why, as the DFO, we value advice from the DAC. The breadth of topics that were brought up, both from the regulatory and the airspace management operations side, are all questions that we need advice on. We all have limited resources so it's helpful to hear what you think the priorities are in terms of solving BVLOS. And I think Gur made a good point that it's everything from DAA to how that works with “well-clear”. Is it a priority to start looking at the intersection of some of these safety cases between safety mitigation trade-offs and “well-clear” and DAA intersecting with airspace integration.
- Captain Mills (UPS): We should look at this issue in different segments. So of course that includes what capabilities the aircraft needs to effectively mitigate risk. But we perhaps should also consider the operational control piece like Brendan Schulman brought up.
- Lorne Cass (American Airlines): Agreed. When we expand drone operations with BVLOS and they become really commercialized there's an opportunity to make sure that we do consider the tenets of operational control for the future.
- Mayor Troxell (National League of Cities; Mayor of Fort Collins, CO): I'll raise that broader issue of deconfliction at low altitudes and suggest that we think not only about the operator, but also try to understand the context in which they are flying since there will be conflicts that need to be addressed.
- Bob Brock (Kansas Department of Transportation): One of the things I'd like us to think about in this Task Group is to consider contextual models where it might be permissible



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

to do things instead of in a one-size-fits-all regulatory schema. We should consider how different, interim solutions work for urban and rural environments.

- Chris Penrose (AT&T): I would echo this. Defining use cases will help shape a lot of this work.
- Kimchi: I fully support this. The target level of safety formulas that FAA is using is probably a preferred way in that it isn't mission-specific. If the FAA now has to pick up the work to make the mission permissions. If everybody is using the same model then it is much easier to get permission to fly.
- Kirov (L3Harris): In my corner of the world, we see this is the biggest impediment to massive investments by the aerospace industry. The key issue is standards if you want to open up the investments and we know a lot of good work is being done at the standards development organizations right now and that a lot of work is going to be coming out soon in the next few months. We should have more clarity from FAA on a policy point-of-view regarding how the interaction of these standards with technology will enable BVLOS. I agree with Gur and would add to the DAA discussion that Command and Control and spectrum issues are important. That means the FCC has to somehow be a part of that work.
 - Kimchi: I agree for the most part. Command and control is important, but where you implement it is unique and distinct to each platform. Command is important for us but it's not safety critical so I suggest that we leave the flexibility for different equipment manufacturers to place the technology where they see fit.
- Chasen: I think these are some great items and we'll make sure all these get listed for the Task Group to dive into and report back to this group.

Recap on Unmanned Traffic Management

Mr. Chasen then turned to present on the next topic: Unmanned Traffic Management. UTM will be required for widespread BVLOS operations in complex airspace. He provided background on how NASA pioneered UTM research years ago, working alongside many industry stakeholders. Many industry players have developed and tested components of UTM, including Remote ID, which is an early building block. The FAA released a UTM Concept of Operations in 2018, which laid out a framework and vision for UTM deployment. The FAA is asking the DAC to identify priorities for UTM development and deployment so that it can make a plan for safely rolling out UTM. The FAA would also like to hear where we should be focusing our efforts on the standards (including but not limited to those coming out of ASTM on UTM). Chasen then asked the committee for ideas on what this Task Group needs to consider.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Discussion on Unmanned Traffic Management

- Kimchi (Amazon Prime Air): I think the topic of discovery and who is actually in the Federal Register is incredibly important. Just because it's possible to have a federal architecture doesn't mean that everybody actually can be a certified operator in that so there's a follow-on issue of how do you remain in compliance as an operator. Furthermore, I think it's very important on the control side that you do not give a permanent blanket permission to operate, if you need to eject someone from the system. There's probably some NASA tasking data, especially on the ATM research group and simulation that we can learn from. They know how to run large-scale simulations right and I think they're ready to do that work but they're waiting for the tasking from the FAA.
 - Chasen: Thank you. We'll make sure that gets included.
- Captain Mills (UPS): Ultimately what you want in a UTM is something that's going to be sustainable. So I think the Task Group should look at the financial aspect – how are you going to pay for it and how do you make it something that everyone is going to participate in?
 - Kimchi: If I remember correctly, a previous version of the DAC a year-and-a-half ago did some of this work. Could we start by taking a look at that and seeing what data is missing?
- Chasen: While many of the issues being raised are certainly good ones, I think we need to reign in the discussion a little. As a reminder, when we are putting together these Task Groups, it's not to talk about the blue sky opportunities. It's about figuring out what we need to take the next actionable step with that next set of policies. So with some ideas that come up during the discussion, we'll put a pin in them for now.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

New Business/Agenda Topics/Review Taskings

Jay Merkle, Acting DFO, Executive Director, FAA's UAS Integration Office

Michael Chasen, DAC Chair

Mr. Michael Chasen opened the last agenda item and handed it over to Jay Merkle, as the Acting DFO. Mr. Merkle summarized the DAC taskings one-by-one and Chasen, in turn, asked for motions to recommend each group's chair. The DAC Chair also asked for a motion to adopt the proposed Task Groups. Each motion was seconded and unanimously approved. Some DAC members expressed interest in sharing ideas for future DAC Task Groups. Chasen appointed the following: Marily Mora as the chair for the FAA Facility Maps group; Todd Graetz as the chair of the BVLOS Task Group; and David Silver as the chair of the Unmanned Traffic Management Task Group. Chasen instructed anyone on the DAC interested in joining the Task Groups to email him and Diana Cooper (PrecisionHawk). Each Task Group will have 90 days to deliver their work to the DAC. For the third Tasking on UTM, Merkle clarified that the version of the UTM Concept of Operations that is available is version 1.0, not 2.0. He stated that the FAA expects version 2.0 to be out by the end of 2019 and advised the DAC that, if it is available while the Task Group is doing their work, they should use it.

Discussion

- Mayor Troxell (National League of Cities; Mayor of Fort Collins, CO): I would like to propose a task force on deconflicting low-altitude airspace.
 - Merkle: We would like to talk with you afterwards and get your ideas on exactly what that would look like and then we'll get back to the DAC on a potential new task next time.
 - Kimchi (Amazon Prime Air): When we say "deconfliction" at least in the technical context, we usually mean something slightly different than what I think you are referring to. But in some discussion on related items at previous DAC meetings, we were unable to come to some conclusion so I think it deserves another attempt.
 - Chasen: Agreed, let's touch base after this meeting for some potential discussion.
 - Schulman (DJI): I would advise that we not ignore the very thorough research that the DAC did on this topic in the past. I wouldn't want us to try to redo the work that's already been done and delivered to the FAA.
 - Chasen: Point taken, although I don't want to shut down any potential discussion. We can look to see if the past research still makes sense for this committee to either update or address again. Thank you, Brendan.

- Matthew Zuccaro (Helicopter Association International): I just want to bring up the fact that legislators continue to bring up bills about airspace rights, segregation of the airspace, and whether the FAA should control low-level altitude airspace. It's something that you're going to have to deal with. I think these voices should be heard because



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

everybody has a place at the table, we all have a stake in this. But no one besides the FAA should be writing regulations and providing surveillance and oversight.

- Merkle: Thank you. As a reminder to the entire DAC, ideas may be shared but it is the job of the DFO to task the DAC.
- Kimchi: I think the topic of how we demonstrate fully interoperability – that these technical standards and performance standards actually ready to be operationalized – is really important. Someone has to take a leadership position on this. It can be industry, a standard body, or the FAA tasking NASA, but we need to have continuity in the domain.
- Cass (American Airlines): I do think will be helpful for the group maybe to get a better understanding of the safety management system that the FAA has employed successfully over the years. Perhaps at the next meeting, somebody could come in and talk about that.
 - Merkle: I would love to come back and talk about FAA Order 8040.6 on safety risk management for UAS. We would be happy to put that on the agenda next time.

Closing Remarks

Mr. Merkle thanked the DAC members for their time and hard work, especially with the Task Group recommendations. He stated that the FAA would carefully look at those recommendations and provide feedback at the next DAC meeting. Mr. Merkle also thanked Mr. Chasen for his leadership. Chasen also expressed his appreciation for the group's work and adjourned the meeting.

Adjourn

The meeting ended at 4:00 p.m. Eastern Time.



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Appendix A: Meeting Attendees

First Name	Last Name	Organization	Attendee Type
Michael	Chasen	Chief Executive Officer, PrecisionHawk USA, Inc.	DAC Chair
Greg	Agvent	Senior Director of National News Technology, CNN	DAC Member
Chris	Anderson	Chief Executive Officer, 3DR	DAC Member
Bob	Brock	Director of Aviation and UAS, Kansas Department of Transportation	DAC Member
James	Burgess	Chief Executive Officer, Wing (an Alphabet company)	DAC Member
Lorne	Cass	Vice President, Operations / Industry Affairs, American Airlines (AA)	DAC Member
Mark	Colborn	Senior Corporal, Dallas Police Department	DAC Member
Joseph	DePete	President, Air Line Pilots Association	DAC Member
Deborah	Flint	Chief Executive Director, Los Angeles World Airports	DAC Member
Trish	Gilbert	Executive Vice President, National Air Traffic Controllers Association	DAC Member
Todd	Graetz	Director, Technology Services, UAS Program, BNSF Railway	DAC Member
David	Greene	Bureau of Aeronautics Director, Wisconsin Department of Transportation	DAC Member
Rich	Hanson	President, Academy of Model Aeronautics	DAC Member
Thomas	Karol	General Counsel, National Association of Mutual Insurance Companies	DAC Member
Gur	Kimchi	Co-Founder and Vice President, Amazon Prime Air	DAC Member
George	Kirov	Vice President and General Manager, Commercial UAS Solutions, L3Harris Technologies	DAC Member
Michael	Leo	Captain, New York City Fire Department	DAC Member
Houston	Mills	Vice President, Flight Operations and Safety, United Parcel Service (UPS)	DAC Member
Marily	Mora	President and CEO, Reno-Tahoe Airport Authority	DAC Member



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Christopher	Penrose	Senior Vice President of Emerging Devices, President of Internet of Things, AT&T	DAC Member
Robie	Samanta Roy	Vice President of Technology, Lockheed Martin Corporation	DAC Member
Brendan	Schulman	Vice President of Policy and Legal Affairs, DJI Technology	DAC Member
Mariah	Scott	President, Skyward (a Verizon company)	DAC Member
David	Silver	Vice President for Civil Aviation, Aerospace Industries Association	DAC Member
Michael	Sinnott	Vice President Product Development and Strategy, Boeing Commercial Airplanes	DAC Member
Wade	Troxell	Mayor of Fort Collins, CO, and the National League of Cities	DAC Member
Brian	Wynne	President and CEO, Association for Unmanned Vehicle Systems International	DAC Member
Matthew	Zuccaro	President and Chief Executive Officer, Helicopter Association International	DAC Member
Dan	Elwell	DAC Designated Federal Officer, FAA Deputy Administrator	Government
Jay	Merkle	Executive Director, FAA UAS Integration Office	Government
Kristin	Alsop	FAA	Government
Erik	Amend	FAA	Government
Tim	Arel	FAA	Government
Chris	Brown	FAA	Government
Paul	Campbell	FAA	Government
Larry	Cowles	FAA	Government
Bill	Crozier	FAA	Government
Teresa	Denchfield	FAA	Government
Bailey	Edwards	FAA	Government
Liz	Forro	FAA	Government
Mary	Foreman	FAA	Government
Bobby	Fraser	FAA	Government
Arjun	Garg	FAA	Government
Joshua	Holtzman	FAA	Government
Kate	Howard	FAA	Government
Nyarre	Hudson	FAA	Government
Tiffany	Jackson	FAA	Government



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Tammy	Jones	FAA	Government
Cassandra	Jordan	FAA	Government
Winsome	Lenfert	FAA	Government
Allison	LePage	FAA	Government
Peter	Lewis	FAA	Government
Lirio	Liu	FAA	Government
Landon	Long	FAA	Government
Claudio	Manno	FAA	Government
Julie	Marks	FAA	Government
Michael	McCrabb	FAA	Government
Joe	Morra	FAA	Government
Arun	Murthi	FAA	Government
Jessica	Orquina	FAA	Government
Lorelei	Peter	FAA	Government
Genevieve	Sapir	U.S. Department of Transportation	Government
Jeannie	Shiffer	FAA	Government
Angela	Stubblefield	FAA	Government
Gretchen	Tressler	FAA	Government
Adrienne	Vanek	FAA	Government
John	Coffey	National Oceanic and Atmospheric Administration	Government Observer
Gzim	Ocakoglu	European Union Delegation to the United States	Government Observer
Brian	Soper	National Transportation Safety Board	Government Observer
Mark	Aitken	DJI Technology Inc.	Observer
Brandon	Allen	International Association of Fire Chiefs	Observer
Boron	Appelboim	Amazon	Observer
Justin	Barkowski	American Association of Airport Executives	Observer
Stacey	Bechdolt	The Moak Group	Observer
Darby	Becker	GE Aviation	Observer
Chris	Brown	Consultant	Observer
Shawn	Bullard	Duetto Group	Observer
Jonathan	Capriel	Washington Business Journal	Observer
Sean	Cassidy	Amazon Prime Air	Observer
Rachael	Chambers	National League of Cities	Observer
Drew	Colliate	Association for Unmanned Vehicle Systems International	Observer



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Christopher John	Cooper	Aircraft Owners and Pilots Association	Observer
Diana	Cooper	PrecisionHawk	Observer
Gabriel	Cox	Intel Corporation	Observer
Anastasia	Crist	Class G, Inc.	Observer
Joseph	d'Hedouville	Vigilent-Inc.	Observer
Jonathan Harris	Daniels	Praxis Aerospace Concepts International, Inc.	Observer
Joe	Darden	Iridium	Observer
James Lawrence	Davis	uAvionix Corporation	Observer
Jeff	Dygert	AT&T	Observer
Robert J.	Ehrich	Slipstream Strategies	Observer
Lisa	Ellman	Hogan Lovells US, LLP	Observer
Matt	Fanelli	Skyward, a Verizon company	Observer
Max	Fenkell	Unmanned and Emerging Aviation Technologies	Observer
Ian	Gansler	O'Neill and Associates	Observer
Dean E.	Griffith	Jones Day	Observer
Karan	Hofmann	RTCA, Inc.	Observer
Chris	Julius	American Airlines	Observer
Randy	Kenogy	Air Line Pilots Association International	Observer
Philip	Kenul	ASTM F38 Committee	Observer
Bob	Lamond, Jr.	AeroSolutions	Observer
Maureen	McLaughlin	Iridium	Observer
Terry	McVenes	RTCA, Inc.	Observer
David	Messina	FPVFC	Observer
Jeff	Mort	Los Angeles World Airports	Observer
Margaret	Nagle	Wing (an Alphabet company)	Observer
Mitch	Narins	Strategic Synergies, LLC	Observer
Aaron	Pierce	Pierce Aerospace	Observer
Jenny Charlotte	Rancourt	Association for Unmanned Vehicle Systems International	Observer
Elizabeth Lynn	Ray	BNSF	Observer
Mark	Reed	Air Line Pilots Association International	Observer
Paul Joseph	Rossi	Nine Ten Drones, LLC	Observer
Jacob	Ruytenbeek	AirMap, Inc.	Observer



Drone Advisory Committee

10/17/2019 DAC Meeting • Washington, DC

Matthew	Satterly	AirMap, Inc.	Observer
Ken	Stewart	AirXos	Observer
Michel	Susai	Independent Observer	Observer
Anne	Swanson	Wilkinson Barker Knauer, LLP	Observer
Clifford Charles	Sweatte	Akin Gump Strauss Hauer & Feld LLP	Observer
Frank	Taylor	National Agricultural Aviation Association	Observer
Ryan	Terry	Lockheed Martin Corporation	Observer
John	Thomas	Kasowitz Benson Torres LLP	Observer
Justin	Towles	Akin Gump Strauss Hauer & Feld LLP	Observer
Stella	Weidner	The Boeing Company	Observer
Steve	Weidner	National Air Traffic Controllers Association	Observer
Raymond	Young	NY UAS Test Site	Observer
Brian	Garrett-Glaser	Avionics International	Press
Catherine	Jackson	Dispatcher	Press
Jeff	Rose	Sinclair Broadcast Group	Press



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

Written Public Comments Submitted Since Last DAC Meeting



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page:

www.faa.gov/uas/programs_partnerships/drone_advisory_committee/

Comment on Proposed drone Remote ID.

For safety and security of drone Owners & Pilots, the drone should only transmit a unique FAA assigned Remote ID in an encrypted format to ensure only FAA, Federal Law Enforcement, and Federal Agencies involved in Security can access unique Remote ID.

Public should NOT be able to determine drone Owner or Pilot from unique Remote ID. Access to database listing Owner or Pilots, Name, Address, FAA License #, etc, should be restricted to FAA and FAA authorized Federal Agencies.

A drone manufactures recently demonstrated App Free to General Public to use which provides Identification information. ID information which publicly can be traced back to Owner & Pilot's name and address. App as planned for release is a serious safety and security risk, along with violation of privacy. The manufactures App also provides detailed flight information well beyond scope of what FAA has proposed, such as Pilot's actual GPS coordinates.

The App as is would allow for public Doxing of Pilots or Owners, leading to them being easily Harassed. The App would also allow criminals to target a Pilot for personal robbery (vehicle, drone, camera, smartphone, tablet, laptop) while flying. Devious criminals could monitor the Pilot to know when Pilot was away from home flying; to take time to rob their home.

I am asking FAA to ensure drone identification information is limited to unique Remote ID, that only FAA and FAA authorized Federal agencies can turn into Owner / Pilot information.

Thank you.



Drone Advisory Committee

February 27, 2020 DAC Meeting • Washington, DC

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page:

www.faa.gov/uas/programs_partnerships/drone_advisory_committee/

I was reading the proposed new rule about tracking of drones. I have a safety concern with the proposed change of having your flight info simultaneously uploaded to the net. On most drones you have your device in set with airplane mode turned on. This is to limit outside interference from other signals. If you have this turned on during flight to upload over the net you are running a major safety risk. It will allow easy interference from outside sources and potentially cause the drone to behave erratically. This can cause loss of control and potentially crashes or flyaways. The second part to the rule where it would limit you to 400 feet of distance if you choose to upload later is unfair. That's because firstly the unsafe practice of trying to fly and have your transmission downloaded at the same time. It's also not fair to people that live in rural areas. There are many places where I live that within 2 miles outside of town there is not cell service for upto a 30 mile area. Therefore people are being penalized for not being in a area of the country that doesn't have the capability to do this available to them. I and other pilots feel that you will be drive legal law abiding recreational pilots to break the law. People can not afford the cost to retrofit there drones or can not afford to pay for a new drone with these capabilities. Therefore people will be forced to either give up a recreational activity that for many is there only escape from the stressful world we live in or they will just not comply and be breaking the law. All of this because a very small amount of pilots aren't following basic safety rules. I hope that some of my points can bring to light some flaws in this proposed rule. Thank you for the opportunity for public comment.

Chad Schulze