



Drone Advisory Committee

7/17/2018 DAC Meeting • Santa Clara, CA

Meeting Minutes

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

Location: Santa Clara Convention Center, Grand Ballroom, Sections G and H – 5001 Great America Pkwy, Santa Clara, CA 95054

For additional information, please view the following appendices:

- A) Meeting eBook
- B) Meeting PowerPoint Presentation
- C) Meeting Attendees
- D) Public Statements

Summary

Acting Drone Advisory Committee (DAC) **Designated Federal Officer (DFO) Carl Burleson** opened the meeting at 9 a.m. on Aug. 17. In his opening remarks, **Burleson**, also the Acting Federal Aviation Administration (FAA) Deputy Administrator, welcomed **Fort Collins, CO Mayor Wade Troxell** as a new DAC member. **Burleson** thanked former **DAC Chairman Brian Krzanich (Intel)**, and described changes to the DAC charter. These changes elevated the DAC to a Federal Advisory Committee and reset the DAC substructure (no DAC subcommittee or tasks groups) and previous discussion topics.

The FAA's **Earl Lawrence** and **Jay Merkle** provided an agency update, which included a description of a more robust integration strategy, the FAA's operations first approach under existing regulations with exemptions, and accelerating operations with a single risk assessment process. **Troxell** suggested that the FAA make public engagement a pillar of the FAA's integration.

Unmanned Aircraft Safety Team (UAST) Co-Chair **Ben Marcus** provided an overview of the UAST's work and safety enhancements, and asked for greater participation and resources from DAC member companies/organizations. The conversation transitioned into a discussion on the scope of FAA enforcement and the need for remote identification (ID).

Lawrence provided an overview of the Unmanned Aircraft Systems (UAS) Implementation Plan and UAS Integration Research Plan. DAC members commented that more collaboration is needed with other agencies, such as the National Transportation Safety Board (NTSB) and Federal Communications Commission (FCC). There might also be a need for a possible DAC substructure, such as a subcommittee, dealing with technical data and developing standards, and the need to repeal section 336.

Lawrence also provided an overview of remote ID and the FAA's potential categories for compliance, stressing that three groups are developing standards before the FAA has released requirements. The DAC's main concern was the lack of acceleration of remote ID requirements



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and unanimously approved the following motion: *With safety first, hasten remote ID as quickly as possible.*

The meeting resulted in the following action items:

- 1) DAC: Think about how you can assist the UAST.
- 2) FAA: Discuss the core UAST data elements with the UAS Integration Pilot Program (IPP) lead participants.
- 3) FAA: Determine if the DAC is the correct home for a technical subgroup.

Host Introduction

Peter Cleveland (Intel) welcomed attendees and thanked members of Intel and the FAA who helped plan the meeting.

Official Statement of the Designated Federal Officer

Burleson read the official statement at 9 a.m.

Approval of the Agenda

The DAC unanimously approved the agenda.

Opening Remarks

Burleson provided opening remarks (as there was no DAC chair at the time of this meeting). He stated that **FAA Acting Administrator Dan Elwell** could not attend, welcomed **Troxell** as a new DAC member, and thanked **Krzanich** for his recent service as the DAC chair. He further described how the DAC charter has changed. Now directly under the FAA, the new charter resets the DAC to just the DAC membership (no DAC subcommittee or tasks groups), and explained the new focus on DAC members providing advice directly to the FAA at DAC meetings. Finally, **Secretary of Transportation Elaine Chao** will announce the new DAC Chair and determine DAC membership in the coming months.

The FAA's Air Traffic Organization (ATO) **Deputy Chief Operating Officer Tim Arel** thanked the local San Jose tower and other ATO personnel for enabling an Intel drone light show the night before.

FAA Assistant Chief Counsel Lorelei Peter explained the roles, responsibilities, and limitations of DAC members and the requirements of the Federal Advisory Committee Act.

FAA Update

Earl Lawrence, Executive Director, FAA's UAS Integration Office and Jay Merkle, Deputy Vice President, Program Management Office, ATO

Briefing



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Lawrence described the current environment of integrating UAS in the National Airspace System (NAS) with industry assisting in facilitating integration. Discussion centered on a collaborative approach and how that affects risk mitigation in multiple areas. The UAS integration strategy has evolved from 2016 to 2018, based on risk. Changes to the strategy were made based on security and privacy concerns and learning about operations and data before defining rules.

From a safety standpoint, the regulatory structure is already in place and outlines current safety mitigations. Using mitigations and exemptions as necessary, the FAA can focus on enabling automation that is supported by industries' advancement and ability to meet goals. For example, the FAA's ATO instituted the Low Altitude Authorization and Notification Capability (LAANC) to provide a tool for air traffic controllers to manage the airspace, enable future operations, and help inform future rules. The FAA also conducts or leverages applied research that is necessary to support the regulatory framework and expanded operations. This allows the FAA to exercise the risk assessment process and determine how these operations will interact in various scenarios. Having more operational data will better inform future rules.

The FAA has developed a Partnerships for Safety program to help build consensus among stakeholders on how to enable operations with a focus on safety. When operations have strong safety cases but encounter other barriers (e.g., noise and privacy concerns), efforts like the IPP, and others, will help in addressing those issues. Of note, the congressionally mandated UAS Executive Committee meets quarterly to share experiences to align activities with the FAA's government partners.

Merkle continued with the presentation and explained that the LAANC nationwide beta roll-out has expanded to 50 locations and 10 sites. The fourth "wave" of expansion was to deploy on July 19, 2018. By September 2018, LAANC will be available at nearly 300 air traffic facilities covering approximately 500 airports. Starting in April 2019, the FAA will begin onboarding new service suppliers in six-month waves. Airspace classes will remain but the FAA will offer new UAS Traffic Management (UTM) services. UAS Service Suppliers (USS) will provide the UTM services directly. A successful UTM system relies on two regulatory pieces: UAS registration and remote ID. Before all data exchanges are operational, research needs to be completed on dynamic restrictions (section 2209) in app format and interoperability standards.

Lawrence added that a National Academy of Sciences (NAoS) Report came to the same conclusion as the Joint Authorities for Rulemaking on Unmanned Systems: Specific Operations Risk Assessment mitigates risk on the operations side in a structured way. The NAOs report notes that a single risk assessment process is necessary to combine all concerns from various areas. There are draft procedures on moving forward in the IPP and other venues.

Discussion



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Greg Agvent (CNN): I need to take a quick time out as an operator. LAANC has been a huge advantage to CNN, thank you FAA. Earl, you said it's important you capture data, how do you capture data?

- **Lawrence:** The FAA captures data through many sources, including the UAST, Aviation Safety Information and Analysis and Sharing (ASIAS) database, test sites input data, IPP, and UAS Implementation Plan, to name a few. How does that interaction happen in these communities? Accident reporting systems - ATO has another system where they gather information. We send out surveys periodically and we have one out right now. We also survey from commercial registration of UAS.
- **Merkle:** ATO safety and mission support organizations are consistently reviewing operations; five to six people engaged daily for LAANC. LAANC does not require the user to provide data.

Troxell: Thank you for the presentation. My question deals with communities. Is there any intention on engaging feedback from citizens more generally?

- **Lawrence:** One of the IPP requirements is to setup a system for obtaining feedback from local citizenry. City, state, county, tribal are all setting up their mechanisms. Resources are a concern, that's why there are only 10 IPP lead participants at this time. There is a severe lack of understanding about what people are allowed to do today.
- **Troxell:** I recommend that you make public engagement a pillar of your policy.

Houston Mills (UPS): Do you see the traditional risk process being used in a single streamlined process.

- **Lawrence:** In my job, it's what level of automation do you have, and what is the risk assessment associated with that. Other hazardous companies that are dealing with hazards are taking that info on how to best apply it to operations.

Marilyn Mora (Reno-Tahoe Airport Authority): Technology is great, but there also needs to be a mindset change with air traffic control making controllers enablers of operators. Thank you ATO.

Matt Zuccaro (Helicopter Association International): In the transition from the original DAC to the chartered DAC, will issues carry over?

- **Burleson:** The information from the last DAC is available to the FAA. If there are issues that this body wants to continue to address, and we can take it on board for this DAC. The FAA was legally required to closeout the last DAC. It's a new start.
- **Zuccaro:** If I understood what you said, you are going to develop regulations based on the structure of current regulations?
- **Lawrence:** We take the base safety goals and use that to guide us in the future. At this point in time, where is the focus on oversight of regulatory control for private recreational use? One of our areas of focus is to have consistent airspace regulations, to make sure the rules are consistent across the board.



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Tim Canoll (Air Line Pilots Association): Great briefing. Excited about the whole approach. The challenge, however, is from a manned perspective. Much of our data points to building this incredibly safe system has been the result of tragedy. The Commercial Aviation Safety Team (CAST) has a lot of information and techniques we have used since its inception. I urge the UAST to model after CAST.

- **Lawrence** Automation will continue, it's not that we are transitioning to un-crewed necessarily, but moving to a crew of 2 for 10 aircraft, for example.

Unmanned Aircraft Safety Team Briefing on Safety Data

Ben Marcus, UAST Co-Chair

Briefing

Co-Chair **Ben Marcus** stated that the mission of the UAST is to bring industry and government together to understand and resolve systemic issues before regulators have to take action. The UAST meets every three to six months and reviews all accidents that occurred between meetings. The UAST is led by one industry and one FAA co-chair, with a Steering Committee that all serve two-year terms.

The UAST brings together data from various sources, allows for the analysis of root causes on common problems, and guides development of interventions to resolve problems. The UAST's data working group determines important information and utilizes third-party groups to process and analyze data. There is also a communications working group that develops safety messages to send to organizations' constituents.

Anonymous reporting provides incentives for operators to report occurrences. Industry must be able to trust the information and be assured that it will only be used for learning and providing necessary mitigations. Safety enhancements are developed by reviewing proposals, receiving updates, and review results. A safety enhancement is scored based on risk and intervention strategies. The UAST received safety related presentations from the NTSB. The development of a future UAST database will require sufficient time to function like the ASIAs database.

The challenges the UAST faces are figuring out how to finance this effort and create an ASIAs like reporting system and how to collect data and incentivize participation to create a large dataset for a systemic look at common risks.

Discussion

Chris Penrose (AT&T): What is the MITRE budget?

- **Ben:** \$2.5 million per year.

Nan Mattai (Rockwell Collins): What are the unique challenges of data?



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- **Marcus:** Certain reasons manufacturers don't want to participate in UAST, such as a lack of tangible benefits. There has been a greater increase in CAST participation because airlines have seen the benefits.

Deborah Flint (Los Angeles World Airports): Airports are extremely interested in sightings of UAS, and therefore would be willing to participate in the UAST.

- **Lawrence:** You can help us with the local law enforcement community. The Department of Homeland Security paid for the California Highway Patrol to come to DC for an aviation rulemaking committee meeting. The FAA sees a lot of desire to participate, but it's hard to get the travel approvals to attend these meetings.
- **Troxell:** I would like to build on this line of thought. Thinking about local more, even UAS has the name "systems" in it. We are in a bubble of systems, we need systems of systems thinking. Moving from a trust us point of view (where we are now), to a more engaged, informed, intentional approach. We need to embrace more systems of systems.

Mora: There is an organization on the National League of Cities that can help get out the public safety message.

Gur Kimchi (Amazon Prime Air): I appreciate the work the UAST is doing. Sharing accident data and a historical context of safety data is needed. We need to create a system of systems. I counted the number of times you said funding for the UAST. To compare the two, how is CAST funded?

- **FAA's Associate Administration for Aviation Safety Ali Bahrami:** CAST membership consists of about 70 operators. Because of the benefits of Safety Management Systems (SMS) and data, CAST has served as a tool for these operators to deal with mitigations. It would be a great opportunity for the UAST to analyze CAST as an example. More leverage and knowledge exists in the industry because CAST is around.

Action Item 1 – DAC: Think about how the you can assist the UAST.

Kimchi: As systems become more autonomous, there is a different set of analyses that need to take place. CAST also has to think about increased autonomy.

- **Marcus:** Airlines have the same types of data, UAS data is extremely varied. MITRE would need one-to-one agreements with companies to determine how data analysis is different for UAS.

Mills: Is there an opportunity to connect the IPP with the UAST?

- **Mattai:** To build on this question, is there is opportunity to define a core data set of elements, that can be used for the IPP, as it is just getting started?
- **Lawrence:** Good idea, the FAA will share UAST data elements with IPP participants.

Action Item 2 - FAA: Discuss the core UAST data elements with the IPP selectees.



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Bahrami: CAST discussed whether we should link CAST members to each safety case.

- **Canoll:** Will an FAA employee serve as a linking member between CAST and the UAST?
- **Bahrami:** It could be a CAST member who serves as this link.
- **Lawrence:** We do have a formal linking member between the CAST and UAST.

Agvent: How can the DAC highlight the UAST?

- **Marcus:** I encourage you to go back to your organizations to heighten the awareness within your companies. The UAST is a critical enabler. We are trying to take action as an industry to improve UAS operations. You can support with: 1) resources and 2) implementing safety enhancements.

Jaz Banga (Airspace Systems): My question is about non-cooperative UAS. There are real life issues we are having right now, such as UAS at a stadium. Federal agents are not reporting to local officers that something is going on. Local officers say the FAA is not at all prosecuting anyone. Is the FAA dealing with the stick side of this?

- **FAA's Deputy Associate Administrator for Security and Hazardous Materials Safety Angela Stubblefield:** That seems like bad information to be honest with you. Enforcement is to identify the operator, which we do. The FAA is working with law enforcement. Is this a situation of education, enforcement? We are taking those actions in every way we can.
- **Banga:** In this case, the Federal authorities have the location and operator. Is there a group in communication with the FAA that is working on this?
- **Stubblefield:** National Security Council has a rules of engagement or use of force group. The FAA also has a law enforcement assistance program where our sole job is to educate local law enforcement. Just because it flies, doesn't mean local laws are applicable. We have webinars every month to educate public safety and law enforcement personnel.

Banga: Can you notify people of penalties for not following these regulations?

- **Marcus:** UAST does not serve as a public outreach for penalties. I'll add, however, that the UAS community has a lot of individual operators. Very difficult for UAST to reach all of those individual operators. In the case of the UAST, how do we engage with each of those operators? How do we encourage them to participate in the system?
- **Banga:** How do you notify a local aircraft if a drone does interfere?

Rich Hanson (Academy of Model Aeronautics): It's not just public safety providers, but also in the prosecutorial area. Push back is at the prosecutorial level. We need to also talk to prosecutors.

Brendan Schulman (DJI): There used to be card that the FAA would send to the deputies to further educate people on the scene.



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- **Lawrence:** We still have those cards, and you can visit faa.gov/uas. Finding things on a government webpage tends to get varying responses. The FAA is used to dealing with a community of 100's of thousands, now it's a couple hundred million. City attorneys usually place this lower on the priority list. Yes, the FAA can provide the information, but local communities don't know where the lines are.

Flint: Airport law enforcement organizations would be interested in this information.

- **Stubblefield:** We do attend conferences of the Airport Law Enforcement Agencies Network and Chiefs of Police organizations. Just about every law enforcement conference has an FAA presentation with it. The FAA is also working on an updated law enforcement assistance guide.

Troxell: I would build a robust engagement strategy. The Conference of Mayors is a very small subset. There is no magic bullet. Building a strategy that deals with how to communicate literally down to the citizen. It's a strategy, very intentional. Communities within communities. The strategy should be very intentional about how we are reaching out.

Mora: A systematic approach is a good idea. Associations are a good place to go.

Banga: How would we change the way we communicate, how do we make this clear?

- **Burleson:** If a plane went down, there would be a large effort to find out why. If you touch on this, how do we get more data and understand what the risks are? The same level of incentives for CAST is coming for the UAST. The FAA is big on SMS. Incentives for traditional users will flow. Having data and discussions can get things done without having to have a regulation.

Bahrani: Two key words: trust and maturity. UAST data providers have to appreciate that it will not be used for enforcement. This will take time, and it won't be easy. We still have to encourage and educate them in the role they play for the safety of the NAS.

Kimchi: Is it acceptable moving forward, there are still unregistered UAS? More concerned about people not knowing they need to participate. Does the FAA feel that it has all the tools to maintain the safety of the NAS?

- **Burleson:** No. Getting to remote ID is very important. Not that we need one set of rules for everyone. We have a framework that varies across different users to manage risk. We are trying to have a framework to manage risk across users in the NAS. Not in a position today to fully address these concerns. The FAA needs data to build the framework. We want drones to be really boring. Similar to how you get on an airplane, you are more concerned about where your bag goes. No one sells life insurance anymore at airports.
- **Lawrence:** Part of the discussion involves those folks not in the framework we are discussing. Remote ID is critical because it identifies everyone who is operating and can show who is broadcasting their position. A lot of people in low-level airspace, now adding millions more. We need the ability to drill with all the operators in that airspace.



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That dirt road in front of your house is now a super-highway. No bicycles on the super highway. Do you build a pedestrian bridge? We need to address the fact that it's a super highway, no longer a dirt road.

Marcus: Please let me know how your company/organization can contribute.

Brian Wynne (AUVSI): Marcus is finishing his term as UAST Co-Chair, please join me in recognizing Marcus (the DAC gave Marcus a round of applause).

The FAA's UAS Implementation Plan and UAS Integration Research Plan **Earl Lawrence, Executive Director, FAA's UAS Integration Office**

Briefing

Lawrence explained that the previous DAC highlighted the UAS Implementation Plan as an area of interest. Under the new DAC structure, the FAA is also introducing the UAS Integration Research Plan. With the complexities of subject areas in a large organization, an integration plan is necessary to ensure everyone is aligned under a singular vision. Specific regulations are not necessarily tied to a five-year timeline (may take longer); however, the FAA identified the areas necessary for full integration. The UAS Implementation Plan is broken down into specific sections with greater detail. The FAA coordinates with many different partners, including the Federal government and international organizations. The Research, Engineering, and Development Advisory Committee (another Federal Advisory Committee similar to the DAC, though it is largely academic) is reviewing the UAS Integration Research Plan.

Discussion

Mattai: Were there any significant changes to this year's update compared to prior years?

- **Lawrence:** The quick answer is yes. Moved more to operations first. Research, operations, then rulemaking.

Mills: Do you see any value in sharing your priorities?

- **Lawrence:** We have taken the feedback from the previous DAC task groups and incorporated this into FAA plans. The FAA is very focused on applied activities.
- **Mills:** Are we aligned with all the plans you have?
- **Lawrence:** Remote ID is the priority; everything hinges of that.

Troxell: On the research side, do any of the aspects relate to the behavioral social sciences?

- **Lawrence:** Behavioral science is technical. We have human factors. The societal impacts is intended to be filled by the IPP.
- **Troxell:** When talk about the public, it sounds like you're saying a bucket of public. The FAA needs to break the bucket up into smaller groups.



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- **Lawrence:** Our outreach and communication plans break that down. For example, firefighting in drone operations is a priority, so we are targeting these areas.

Kimchi: It seems like the research part of these plans is well funded. Is the operational part well funded?

- **Lawrence:** That discussion occurs on an annual basis. For the last couple of appropriations, we have been well funded in both the research and operational areas. The FAA's UAS Integration Office has doubled in size since it was created. We look at LAANC right now, and are looking at it to do more remote ID work. The FAA didn't think of this last year. How do we advance it, do we advance it?
- **Kimchi:** You collaborate with a lot of groups, but the NTSB is not mentioned.
- **Lawrence:** The NTSB is not on the list, but we reach-out to the correct agencies when questions come up, including the NTSB.
- **Kimchi:** You mention standards. There are a few technical standards being developed. Not sure this is in the domain of research.
- **Lawrence:** We have recognized that we need more data and input in the area of IT governance – the rules about how to operate a system. We also have a chief data officer, whom we engage, and a chief research director.
- **Merkle:** It's the FAA's expectation that this community will develop the standards.
- **Lawrence:** We should also state that there is a need to develop standards.

Kimchi: Traffic collision avoidance system technology is a great example. If we come up with different standards, the systems cannot talk to each other. The FAA should point to one set of standards.

- **Merkle:** There is not a great body identified for pulling this community together. Our endorsement of specific standards needs to take different forms. It could be regulatory, or how you might need to organize yourself for a USS, or business rules for operation.
- **Kimchi:** We can assign a subcommittee with engineers to develop these standards.
- **Lawrence:** I am struggling around how the FAA would arrange the engineers to provide advice.
- **Kimchi:** The FAA should create a subgroup focused on engineering tasks.

Action Item 3 – FAA: Determine if the DAC is the correct home for a technical subgroup.

Burleson: Budget questions are always complicated. Whatever money we get, it's good to have the DAC's advice on priorities. I am open to having the DAC think about a technical subgroup to work this.

Lawrence: The FAA sponsored an ANSI roadmap, and we are thinking about more of a steering committee and what the function of the steering committee would be. We need to address the overlaps we see, and only industry can decide what the right standards body is.

- **Merkle:** To illustrate this point, take the USS interface. The FAA cannot be in the middle of the USS interface.



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Kimchi: Making sure the FAA requirements are cultured is critically important. You need standards for interoperability.

Canoll: Looking at all the substantive research, I hope we are not putting any research dollars on transport category UAS.

Mills: You talk about remote ID and tracking and registration, do we need discuss that further as a group, or is it going on legislatively?

- **Lawrence:** It's always on the list. I would rephrase it as a challenge, it changes our plan. The FAA plan right now is based on everyone participating in the system. Beyond visual line of sight (BVLOS) would be rather difficult if it's legal for anyone to pop up along the flight path. We get direction from Congress and the administration. We can say if it reads this way, then here are the impacts. If this way, these are the impacts. Many discussions in the security area right now. We have to address other US Government concerns, and we need to make sure the FAA is supporting their needs.

Banga: Shouldn't the security side be involved with this as well? Security was a prerequisite to UAS. Any chance to involve these folks?

- **Stubblefield:** Security partners are intimately involved in the section 336 conversation. They would like to see a repeal of section 336, which is critical for the FAA in determining how to move forward. From the security perspective, knowing platform and operator are foundational to an adequate framework for security support.

Kimchi: I agree remote ID is the top priority; it is foundational. There is also a question on security and basic security mechanisms. Who doesn't have to implement remote ID?

Burleson: Who are we missing on research?

- **Mattai:** I didn't see the FCC on the list.

Kimchi: With vehicle-to-vehicle standards, there are DOT standards that we can learn from.

Burleson: The FAA was late to the party figuring out how to manage drones. We didn't fully see the implications of this new technology, this new user. The pace of technology change is quite dynamic. Do you have any advice on how to try and not miss the next technology change, given the pace of change? It's a challenge for the FAA to keep up with the pace of change.

Banga: There are a lot of UAS companies. The FAA should setup some areas where you can try anything and everything you want. We need places to practice.

Canoll: The winners and losers are going to make the decisions at the right times. While we have to be reactive in providing a safe and efficient decision, that is where it ends.



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Burgess: The FAA has been slow, but to give credit to the registration rules, the FAA has the right intent to ensure safety. At Wing, we don't know the next technologies. We should focus on performance intent.

Mattai: The FAA should have frequent enough cadences of the research plan, and be agile and adapt as it see things coming.

Mills: The FAA should enable a way to utilize the existing infrastructure so it doesn't inhibit faster and greater flexibility.

- **Lawrence:** So two things. Operations first is the idea, using the existing regulatory structure with exemptions. We can accelerate this with the risk assessment process, which can provide a clear way to analyze the risk an operator introduces into the NAS.

Todd Graetz (BNSF): During the BNSF Pathfinder, there was an existing construct and established rules that required BNSF too make some adjustments to move forward.

Schulman: Part of the trend of safety and mitigations is to find the low hanging fruit pathways to operations. We need a night operations rule. Nighttime operations will save lives. Why is an alley in Manhattan class B airspace? Can we find ways of rethinking? Why do you need an automated process if you are in an alley or under trees with a drone? Is there a way for us to say if you are using something small and safe, we want you to do that operation. The FAA should provide a rules environment that lets you use the built-in technologies more often.

Remote Identification

Earl Lawrence, Executive Director, FAA's UAS Integration Office

Briefing

Lawrence provided an overview of the FAA's actions concerning remote ID: There are three standards bodies trying to set standards; we need to ensure these standards bodies are not duplicating efforts and that they are effective. We are looking at remote ID to assist in facilitating safe movement of drones in the airspace and aligning it with UAS registration. The FAA's intent is to not link registration with weight. If you operate in a LAANC area, you will operate with remote ID. Operating above that, you must comply with air traffic management requirements. Operations under listed regulations require certain approvals that may not be required operating under LAANC.

Lawrence further explained the four proposed categories of remote ID:

1. Location of specified area is identified
2. Location of control station
3. Location of control station and unmanned aircraft
4. Location of control station and a transmitting unmanned aircraft



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Manufacturers' standards are used as primary requirements. Manufacturers affirm that they are compliant with all required regulations. There are current challenges with multiple standards bodies developing standards while regulations are still being developed. Remote ID is key to enable UTM and BVLOS operations. How do we organize while dealing with legal issues to enable these types of operations?

Discussion

Mills: Which standards bodies are there?

- **Lawrence:** ASTM F38, SAE, and others. I think there are competing interest groups that want specific solutions.

Troxell: I have had some experience with the Department of Energy (DOE) as it relates to interoperability. DOE formed an interoperability group. There might be something of more value in interoperability.

- **Lawrence:** I just heard you suggest that everyone waits until the FAA puts a Notice of Proposed Rulemaking (NPRM) out and send out the requirements. The engaged group started with the Aviation Rulemaking Committee, we also have regulatory barriers to how we have the dialogue.
- **Peter:** As the rulemaking process opens, we don't want the FAA separately driving standards.

Penrose: What is the desired timeframe to get to a remote ID solution we can start with?

- **Lawrence:** We have past the ideal timeframe for a solution. We are accelerating our rulemaking efforts as quickly as we can. Mid-next year is the timeframe we are looking at now. We have the standards bodies, and we have people doing BVLOS and retrieving data from their operations.
- **Penrose:** How are we tying off the work being done with the UTM perspective?
- **Lawrence:** We can have our discussions internally. There is a lot of thirst for data and information. There are tools we can use. My number one concern was that there are three bodies trying to do something. I am not sure the three bodies' efforts are effective.

Kimchi: When you create standards, you start with requirements, then standards to satisfy the requirements. You presented a skeleton of requirements. We did this three years ago with *V to V*, it can provide systems talking to each other. The FAA should focus on the requirements. Are existing standards sufficient? Where do we go from here?

- **Lawrence:** That is why I wanted to have this discussion. I'm saying do you want to send people to these meetings. We are not prohibiting operations now, it's just not as open yet. We are doing individual approvals. Is that ok? Is that the strategy for now? It would be operations first for another year or so. The FAA is looking for consensus on the best path forward.



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Hanson: Back when the small UAS rule was being developed, the FAA asked standards bodies to work on standards.

- **Lawrence:** The work that is being done is not at the behest of the FAA. Just because an FAA employee was at a meeting, that was not the FAA declaring that we want the standards. I just want to make sure you understand what an official endorsement or ask is.

Canoll: Two quick things. Are you asking the DAC for help in a decision that the ARC was unable to make?

- **Lawrence:** No. I'll repeat: I'm asking for a discussion among those that send people to these meetings, do you want to send your people to these three bodies.

Agvent: I am also confused. First off, does the NPRM inform the groups or do the groups inform the NPRM. Who is the decider?

- **Lawrence:** In the end, it's the US government who decides. That decision is based on all the input we get. If you are working on something that informs us, it effects what we do. We understand that it is a symbiotic relationship.

Banga: When is time up?

- **Lawrence:** There will be an NPRM, which is defining more. The final is the final rule. The longer you take to provide information to the FAA, the less likely it is to get incorporated.
- **Banga:** What is the minimum viable thing for remote ID?
- **Lawrence:** I cannot answer the question directly because it is one for the public process. Every agency has an interest in UAS.
- **Banga:** We need a 1) unique identifier for the drone, 2) a unique identifier for the pilot, and 3) credentials.

Burgess: Most of the remote ID solutions will likely be used by non-aviation folks. Given that, one of the most helpful features of a remote ID system will be to tell if a UAS is within the rules or not. Is it possible to have a remote ID framework that doesn't have the FAA side of the system?

- **Merkle:** The design option is whether the information resides in the network or is within the FAA. Nothing inherent about airspace authorization. However, there may be other partners who support security missions that would have to define a performance system to retain it. There are options there. There are also archival questions. Security partners say the government has to hold the info. We may need access to vector information. We might have different needs near term for that. Might also have a need for air traffic operations, to be able to query that. There are sets of requirements merging that we need to discuss. In any of these cases, the availability of the information beyond the air navigation service provider, we need to talk about identifying user in an electronic manner, such as law enforcement. How do we authenticate them real time?
- **Burgess:** We might be able to feed requirements back to the FAA. If you require X, then we can produce Y.



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- **Merkle:** It's going to be if you make these decisions, these are the risks/trades; a different choice.

Burleson: The FAA is framing this conversation because we are aware of multiple standards efforts. We also wanted to inform the DAC that we have a rulemaking process, which will be published early next spring. What is the best way forward to advise these multiple efforts?

- **Lawrence:** This is a difficult issue.

Agvent: As one of the few operators in the room right now, we are flying everyday. First person that shows up is law enforcement, who asks: who are you, are you authorized to be here? All drone operations are local. It's the beat cop who needs to know whether to worry about something or not?

Zuccaro: Might be helpful to get briefings by law enforcement.

- **Lawrence:** Does the DAC want to do that?
- **Burleson:** The DAC is setup to provide advice to the FAA. There is a rulemaking in place and we cannot talk much about the rulemaking in this forum.

Kimchi: We need authentication, accounting to be a prerequisite. I think interagency coordination. You shouldn't have to depend on network connectivity. Questions remain about who will use this system.

Schulman: There is a wider world out there and remote ID standards are coming from France and the European Union. You will get passed by others.

- **Lawrence:** The FAA is not saying slow down, you have three groups working the same issue, and we haven't finished defining it.

Hanson: How much harmonization will be on international scale?

- **Schulman:** DJI only wants to do it once. This is an international race! We need one global requirement or standard.
- **Burleson:** It doesn't benefit anyone for having to use different equipment or different standards. We will take back the advice of the DAC that you would like to see the NPRM sooner than later. We have a few rulemaking priorities we are trying to manage.

Lawrence: Hearing that from the DAC is important. The DAC could go to the administration to make it move quicker.

- **Burleson:** It helps when industry makes that point.

Troxell: It sounds like it might be a zoom out in this interoperability architecture. Are there generally values that allow for interplay between a lot of different kinds of technologies? Interplay between the three aspects, too many moving parts? Or will a proprietary architecture become dominant?

- **Burleson:** Your point is taken on interoperability.



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Wynne: Discussion today about barriers to forward progress. Remote ID is a lynchpin for safety and the perception that different Federal agencies have a hand in slowing down the regulatory process. We take whatever opportunity we can at this meeting. Happy to motion to make clear to everyone that the DAC wants to get remote ID done. Other agencies are not in the room that could slow this process down. We don't want to end up having a hard stop later.

Burgess: The DAC is hearing that remote ID is a key issue, but the nuance is we learn so much from operational testing. If we rush to solidify a solution via speculation before we get out and operate, it's incomplete. Let's rush to get that operational data, with the IPP being one of those methods. This is not to say we have an answer before it has been validated.

Schulman: We already incorporated remote ID on DJI products. You can see 70 percent of the total people out there with DJI remote ID. We don't have enough officers to respond to the drones. What do you do when you cannot respond?

Burleson: The FAA has clearly heard the DAC's concerns with remote ID.

Wynne made a motion to approve the following statement, which was seconded: *With safety first, hasten remote ID as quickly as possible* (approved unanimously).

New Business/Agenda Topics

Mills: Are we still working on DAC tenets?

- **Kimchi:** They are meant for the members to help determine recommendations.

Burleson: I heard today that an exchange between the DAC and the IPP selectees would be beneficial.

Closing Remarks

Burleson thanked the DAC members for their participation, meeting participants for attending, and Intel for the hosting the meeting. The next meeting will occur on Oct. 17, 2018 in Washington, D.C.

Adjourn

The meeting ended at 4:15 p.m. Pacific Time.



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Appendix A: Meeting eBook



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Appendix B: Meeting PowerPoint Presentation



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Appendix C: Meeting Attendees

First Name	Last Name	Company/Organization	Attendee Type
1. Peter	Cleveland	Intel	Host
2. Roxanne	Koester	Intel	Host
3. Lisa	Malloy	Intel	Host

First Name	Last Name	Company/Organization	Attendee Type
4. Greg	Agvent	CNN	DAC Member
5. Jaz	Banga	Airspace Systems	DAC Member
6. James	Burgess	Wing	DAC Member
7. Tim	Canoll	ALPA	DAC Member
8. Michael	Chasen	PrecisionHawk	DAC Member
9. Deborah	Flint	LA World Airports	DAC Member
10. Trish	Gilbert	NATCA	DAC Member
11. Todd	Graetz	BNSF	DAC Member
12. Rich	Hanson	AMA	DAC Member
13. Gur	Kimchi	Amazon Prime Air	DAC Member
14. George	Kirov	Harris Corporation	DAC Member
15. Nan	Mattai	Rockwell Collins	DAC Member
16. Houston	Mills	UPS	DAC Member
17. Marily	Mora	Reno Tahoe Airport Authority	DAC Member
18. Chris	Penrose	AT&T	DAC Member
19. Brendan	Schulman	DJI	DAC Member
20. Wade	Troxell	Ft. Collins, CO	DAC Member
21. Brian	Wynne	AUVSI	DAC Member
22. Matt	Zuccaro	Helicopter Assoc. International	DAC Member

First Name	Last Name	Company/Organization	Attendee Type
23. Jugdeep	Aggarwal	US Hang Gliding and Paragliding Association	Guest
24. Mark	Aitken	Akin Gump Law Firm	Guest
25. Michael	Baum	Aviation Code Initiative	Guest
26. Anne	Bechdolt	FedEx Express	Guest
27. Greg	Belaus	AT&T	Guest
28. Lee	Brown	Landrum & Brown (L&B)	Guest
29. Melanie	Burns	California Department of Corrections	Guest
30. Lorne	Cass	American Airlines	Guest
31. Mike	Cirillo	Airlines for America	Guest
32. Diana	Cooper	Precision Hawk	Guest



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33. Dan	Dalton	Airspace Systems, Inc.	Guest
34. Melvin	Davis	Cavan Solutions	Guest
35. Tom	Devine	Airports Council International	Guest
36. Andrew	Elefant	Kittyhawk	Guest
37. Michael	Hannigan	Landrum and Brown	Guest
38. Raj	Helweg	Air Methods	Guest
39. Robert	Hughes	Northrup Grumman	Guest
40. Sezen	Jones	AirMap	Guest
41. Adrienne	Lindgren	WSP Parsons Brinckerhoff is now WSP	Guest
42. Peter	Lyons	A3 by Airbus	Guest
43. Lisa	Malloy	Intel	Host
44. Ben	Marcus	AirMap	Guest
45. Charles	Marshall	AERWAZE	Guest
46. Margaret	Nagle	Google X	Guest
47. Matthew	Navarrete	Union Pacific Corporation	Guest
48. Jonathan 'Joey'	Neptune	General Atomics	Guest
49. Elizabeth	Pasztor	Boeing	Guest
50. Jason	Quisling	Air Methods	Guest
51. Sasha	Rao	Maynard Cooper & Gale LLP	Guest
52. Mark	Reed	ALPA	Guest
53. Melissa	Rudinger	AOPA	Guest
54. Dean	Schultz	Reno Airport	Guest
55. Stella	Weidner	Boeing	Guest
56. Steve	Weidner	NATCA	Guest
57. Gretchen	West	Commercial Drone Alliance	Guest
58. Joshua	Ziering	Kittyhawk	Guest
59. Peter	Cleveland	Intel	Host

First Name	Last Name	Agency	Attendee Type
60. Tim	Arel	FAA	Government
61. Ali	Bahrami	FAA	Government
62. Carl	Burleson	FAA	Government
63. Teresa	Denchfield	FAA	Government
64. Collen	Donovan	FAA	Government
65. Tony	Fathabadi	FAA	Government
66. Tony	Fathabadi	FAA	Government
67. Chris	Harm	FAA	Government
68. Robin	Koch	DOT	Government
69. Earl	Lawrence	FAA	Government



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70. Claudio	Manno	FAA	Government
71. Stefanie	McCans	DOT	Government
72. Rachel	Mencias	DOT	Government
73. Jay	Merkle	FAA	Government
74. Barney	Owens	DoD	Government
75. Lorelei	Peter	FAA	Government
76. Genevieve	Sapir	DOT	Government
77. Angela	Stubblefield	FAA	Government
78. Damon	Walker	DOT	Government



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Appendix D: Public Statements