

Consideration Status for the Expansion of Unmanned Aircraft Systems BVLOS Operations and Participation Report from the 2022 FAA Drone Symposium

Yoshihiro Fujimaki, Senior Research Fellow, Japan International Transport and Tourism Institute,
USA

1. Consideration for the Expansion of Unmanned Aircraft Systems BVLOS Operations

1.1 Background of Consideration

In the United States, consideration for expanding Beyond Visual Line Of Sight (BVLOS) operations began after standards for operating Unmanned Aircraft Systems (UAS) over people and standards for remote IDs were published in January of last year (2021). Specifically, in June of last year, the UAS BVLOS Operations Aviation Rulemaking Committee (BVLOS ARC) was established with many experts from related industries participating in discussions on reviewing regulations to scale BVLOS operations. The BVLOS ARC initially planned to compile the report by the end of last year, but it took time to foster a common understanding and consolidate opinions among the approximately 90 reviewing members, who had vastly different positions and backgrounds. As a result, the report was published in March 2022.¹

The BVLOS ARC review was conducted in two phases. In the first phase, members were divided into the following three Working Groups (WG) which categorize the current state of BVLOS operations and issues for expanding them.

- WG1.1: Community Interest in Safety, Environment and Security
- WG1.2: Market Drivers
- WG1.3: Regulatory Challenges

In the second phase, the members were similarly divided into the following five WGs to formulate a Risk Framework and make recommendations for rules that enable BVLOS

operations without relying on regulatory exemption procedures.

- WG2.1 : Air and Ground Risk
- WG2.2 : Aircraft and Systems
- WG2.3 : Third Party Services
- WG2.4 : Operator Qualifications
- WG2.5 : Automated Flight Rules

The BVLOS ARC report contains specific proposed modifications to existing regulatory text and is approximately 400 pages long. For this reason, an overview will be introduced in the next section, and the details will be explained separately.

1.2 Summary of the BVLOS ARC Report

Regulations concerning the operation of UAS in the United States were enacted by the Federal Aviation Administration (FAA) as Part 107 of the Federal Aviation Regulations in 2016. As mentioned above, the standards for operations over people were published last year, but the fact that BVLOS operations must be individually approved remains unchanged; this is the biggest obstacle to the expansion of BVLOS operations.

In response to this situation, BVLOS ARC aimed at making recommendations for performance-based regulatory requirements to standardize BVLOS operations so they could be safe, scalable, economical, and environmentally friendly, without the active involvement of air traffic control agencies.

One of the major recommendations was that the FAA

should first establish a consistent Acceptable Level of Risk (ALR) for all types of operations performed by UAS, and operators should be given the flexibility to meet the ALR through qualitative or quantitative methods, or a combination of both.

Next, they recommend amending right of way rules to accommodate UAS at low altitudes of 400 feet (approximately 120 meters) or less. Proposals for this amendment include allowing automation for see-and-avoid responsibilities, as well as changing the priority of right of way with UAS, depending on whether manned aircrafts have equipment such as ADS-B to broadcast their position.

In addition, they recommend extending the Remote Pilot certification under the rules of Part 107 to cover matters related to Extended Visual Line of Sight (EVLOS) flights and shielded flights. They also recommend creating a new Remote Pilot certification to cover BVLOS flights beyond the scope of the Remote Pilot certification established in Part 107.

ARC also recommends that the FAA develop a new BVLOS Rule that includes a process for UAS certification for aircraft with kinetic energy up to 800,000 ft-lbs (1.085 MJ).

Finally, they recommend that the FAA adopt a regulatory scheme that allows certification of third-party services used to support UAS BVLOS operations, without mandating their usage. In addition, the report enumerates future issues related to BVLOS but beyond the scope of the BVLOS ARC, as well as issues beyond the authority of the FAA. The resolution of these issues is considered necessary to provide a complete framework for action and policy towards the safe and widespread adoption of UAS BVLOS operations.

2. 2022 FAA Drone Symposium Participation Report

2.1 Overview of the Symposium

The FAA Drone Symposium, co-sponsored by the United States FAA and the Association for Unmanned Vehicle Systems International (AUVSI), is an event that has been held annually since 2016. It had been called the FAA UAS Symposium in years past, but from this year the name was

changed to the FAA Drone Symposium.

This year's symposium, which was its 7th recurrence and the 1st held in person in three years, convened on April 28th at the Orange County Convention Center in Orlando, Florida.²



At this year's event, a panel discussion was held on the themes of international initiatives, efforts by service providers involved in the UAS operations, reports from BVLOS ARC review members, further utilization of UAS, and integration of UAS into airspace. Talking points from every session on each of these themes will be described below.

2.2 Session on International Initiatives

In a session on international initiatives, the International Civil Aviation Organization (ICAO) presented that while currently the highest priority is being given to developing regulations for Remotely Piloted Aircraft Systems (RPAS) for international flights under Instrument Flight Rules (IFR), member countries are also requesting for regulation considerations of smaller UAS. It was explained that the role of the ICAO is being deliberated regarding Urban Air Mobility (UAM) based on their developmental progress.

In addition, an international standards organization, ASTM International, coordinated with various countries, including Europe and the United States, regarding remote ID standards that enable remote identification of UAS in flights. They stated that it will be sufficient to refer to only one standard in UAS development, announcing the signing of cooperation agreements between their and other international standardization bodies, such as ISO and EUROCAE, and that they are coordinating their activities.

According to EASA, the European aviation authority, they enacted regulations on UAS in 2019 and have enforced them from December 2020, including in the Open category (low risk category; does not require approval for operation) and Specific category (category requiring individual risk assessment and approval for operation). In addition, the first draft rules for UAS in the remaining Certified category (high risk category; requires operator approval, aircraft certification, and pilot license) are scheduled to be published in May, and guidance materials of U-Space regulations, which will be enforced in January 2023, have already been published. It was further introduced that in regards to UAM, not only safety, but noise, security, and privacy are being considered, and safety requirements for individual development projects are being discussed jointly with the FAA.

2.3 Session on Efforts by UAS Service Suppliers

In a session on service supplier efforts for UAS operations, the Thales Group explained that they'd received an FAA exemption and are conducting demonstration experiments in North Dakota combining Automatic Dependent Surveillance-Broadcast (ADS-B) functions that transmit aircraft position information based on satellite positioning systems, visual sensors, and so on, emphasizing the necessity of utilizing multiple different technologies rather than just one.

Furthermore, Airspace Link, in relation to the FAA's Low Altitude Authorization and Notification Capability (LAANC), disclosed that they provide several additional services to recreational and commercial UAS, emphasizing that it is difficult for UAS operators to have such accommodations individually, and also introduced that they are conducting demonstrations on UAS operations that cross the border between the United States and Canada.

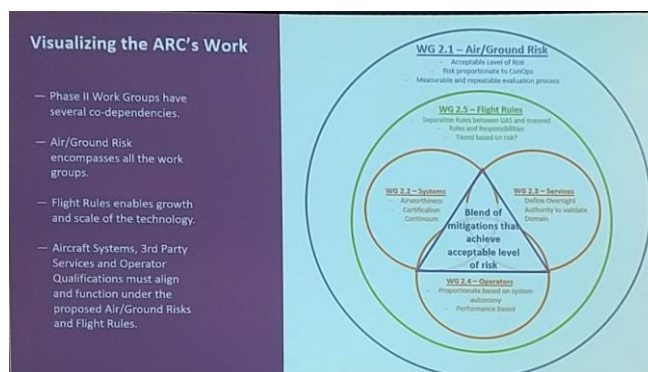
Raytheon asserted that there is a need for further automation of control operations, along with noting that public acceptance of UAS operations have increased compared to a decade ago.

The FAA emphasized that the perspective of cyber security will become even more important in the future with respect to these industry efforts.

2.4 Session on the Report from BVLOS ARC Review Members

In the session from the contributors of the BVLOS ARC report, a speaker from the FAA shared the scope of consideration of the BVLOS ARC: the inspection of long-distance and linear infrastructure, data collection by industrial aviation, delivery of small packages, and precision agricultural operations. However, it was explained again that aircraft that transport crew and passengers and operations actively managed by air traffic control organizations were not included. It was then emphasized that, for the time being, the work will focus on formulating rules for BVLOS operations at low altitudes of 500 feet or less.

Next, from the BVLOS ARC industry side, a co-moderator explained that the review was divided into two phases in which everything was conducted remotely. After reaching a basic understanding among the study members during the first phase, in the second phase all members examined specific deliverables. They showed that the 5 WGs described in Section 1.1 of the report were interrelated in the analysis in the second phase, so they were arranged with the following diagram in mind.



Furthermore, due to the large number of ARC members, it was explained that although the report contained some content that was not agreed upon by all members, a general consensus was reached.

They shared that the BVLOS ARC discussed whether or not the provision of services by third parties should be mandatory, as in Europe, but that they had reached the conclusion that it would not be justified at this point. They additionally explained that: the ALR was based on

general aviation, no feedback has yet been received from foreign authorities on the proposed right of way rule, industry standards should be utilized for airframe certification, a limit should be set on the number of aircraft that can be flown per pilot according to the level of operational automation, and different rules for dangerous goods than those for manned aircraft should be adopted because the amounts of those that can be transported by UAS is small.

2.5 Session on Further Utilization of UAS

In the session on the further utilization of UAS, the Drone Racing League (DRL), which holds races using UAS, gave an explanation about adequate safety measures, such as installing protective nets and restricting access to race courses. They also introduced educational events—such as drone design, which will be held so that young generations will be interested in this field through these kinds of sports.

In addition, the FAA announced a policy to expand the scope of the Partnership for Safety Plan (PSP), which has already been put into practice with seven companies including DRL, and implement it as an Integration Partnership Agreement (IPA) in the future. Furthermore, while sharing issues and solutions with the Department of Defense, the National Aeronautics and Space Administration (NASA), the Department of Commerce, etc., and conducting data collection surveys for rulemaking, similar information is being shared with aviation authorities in Israel, South Korea, Spain, Australia, New Zealand, Japan, the United Kingdom, Canada, and others, emphasizing the importance of cooperation over technology.

AUVSI, which co-hosts this symposium, presented that the association collects and shares lessons learned from manufacturers and operators of large and small UAS, and communicates them to the FAA and Congress as a consensus opinion of the industry as much as possible. It was also explained that efforts were being made not only at the federal level, but also at the state and local levels. In addition, it was introduced that the Know Before You Fly program—an educational campaign for first-time users of recreational and commercial UAS—is being carried out in cooperation with the FAA, the Academy of Model

Aeronautics (AMA) and other groups, and more advanced trainings are also being carried out.

2.6 Session on Integrating UAS into Airspace

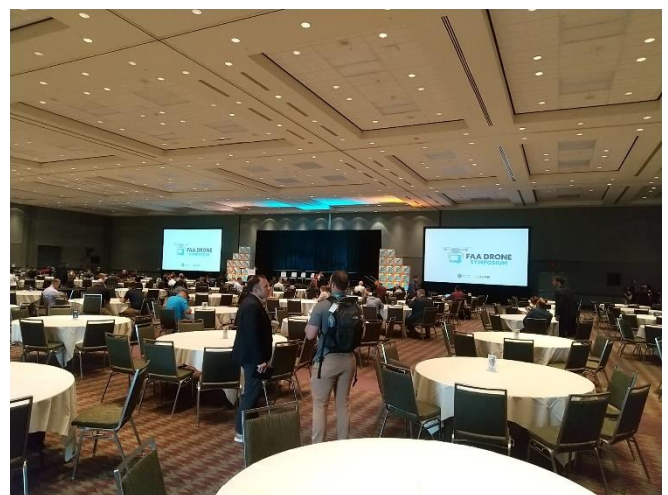
In the session on integrating UAS into airspace, the FAA explained that high-altitude airspace above 60,000 feet is expected to be utilized in the future, and that the challenge is how to allow manned aircraft and unmanned aircraft to coexist in low-altitude airspace below 400 feet. In addition, regarding the UAS Facility Map set around the airport, the grid has been refined from 1 square mile to 0.5 square mile, and it was shared that the Special Governmental Interest (SGI) process is being applied to quickly operate UAS for public use at altitudes higher than this map.

Furthermore, in the current situation where UAS are being operated without careful attention, the necessity of all relevant parties, including the FAA, to work together in order to gain public understanding of UAS operations was emphasized.

Operations by FedEx at Memphis International Airport, and an aircraft detection and avoidance system using cameras by IRIS automation were introduced as specific examples of complex operations using UAS.

2.7 General Impressions from the Symposium

As described in Section 2.1, this year's symposium was held in person, and because remote participation was not an option, the number of participants was about 450—less than half of the previous year's.



Regarding this change in format, the FAA explained that it would focus more on the operation of commercial UAS

than before, and seems that the decreased number of participants had already been factored in. In addition, it's thought that other events such as Drone Safety Awareness Week will be used to cover public awareness of UAS for the general public.

Since the event concluded without any problems, next year's symposium and those thereafter are expected to continue in the same format, with improvements based on the feedback of this year's participants.

References

1) FAA, UAS BVLOS ARC Final Report

https://www.faa.gov/regulations_policies/rulemaking/committees/documents/index.cfm/document/information/documentID/5424

2) FAA, 2022 FAA Drone Symposium

<https://faauas.auvsi.net/home>