**DRONE ENABLE, UNMANNED AIRCRAFT SYSTEMS (UAS) INDUSTRY
(DRONE ENABLE 2022) SYMPOSIUM**

**International Civil Aviation Organization
Unmanned Aircraft System Traffic Management (UTM)
Request for Information[1]**

1.   **BACKGROUND**

For the past four years, after receiving requests from Member States that the International Civil Aviation Organization (ICAO) serve as the global civil aviation facilitator to assist with the challenge of integrating unmanned aircraft systems (UAS) into the aviation regulatory framework, ICAO has hosted global UAS symposia (DRONE ENABLEs) to solicit the most up-to-date information on the topic of UAS traffic management (UTM). The aim of these activities has been to synthesize relevant information gleaned from an annual Request for Information (RFI), and utilize this information to provide a globally harmonized, common framework to support the development and deployment of UTM systems and facilitate the increased integration of unmanned aircraft (UA).

To ensure sound technical approaches were used for drafting the framework, broad industry, academic and scientific community research and development initiatives were solicited as well as any national implementation activities from which lessons could be learned.

At the inaugural DRONE ENABLE, held in Montréal in September 2017, States, industry and academia submitted responses which addressed UTM foundational components including registration systems that supported remote identification and tracking; communications systems for control and management of the UA and tracking of all UA within the UTM area; as well as geofencing-like systems to prevent UA operation in sensitive/security areas and restricted/danger areas such as near aerodromes.

DRONE ENABLE/2, held in Chengdu, China in September 2018, had a theme of "*UTM to ATM – Transitioning from Segregation to Integration*" and focused on solutions for enabling the integration of UTM and air traffic management (ATM) systems. This included the challenges of defining the boundaries between ATM and UTM systems and examining the key information that needs to be exchanged between UTM and ATM systems to facilitate the transition between these two systems.

DRONE ENABLE/3, held in Montréal, Canada in November 2019, had a theme of "*Facilitating Future Innovation*" and focused on specific challenges of developing a UTM system. These included an effective means of assessing risks for a proposed UTM system; and an approval/certification process of potential UTM Service Providers (USS) based on the criticality of services provided, addressing separation and deconfliction requirements within the UTM system as well as a means to assure that contingency/emergency situations would not result in greater levels of risks.

---

[1] This is a request for information (RFI) only and does not constitute a commitment, implied or otherwise, that ICAO will recommend any particular action on this matter. Further, ICAO will not be responsible for any cost incurred in furnishing this information.

DRONE ENABLE 2021, held virtually in April 2021, had a theme of "*Addressing Tomorrow's Challenges Today*" and focussed on challenges related to the introduction of unmanned aircraft systems (UAS) and UAS traffic management (UTM). This included the ICAO UTM framework which provides a path forward for the safe integration of UAS. The framework assisted States with developing the required regulatory framework and guidance material to ensure a safe, efficient and effective UTM system.

As work progresses, critical gaps in the UTM framework continue to be identified. To help address these gaps, ICAO is again engaging States, industry, academia and other interested stakeholders to collaborate on and provide solutions in support of the development of a safe and efficient UTM capability.

It should be noted that this activity is separate but complementary to ICAO's ongoing work to build a complete regulatory framework to support international operations for remotely piloted aircraft in controlled airspace and at controlled aerodromes.

2.   PROBLEM STATEMENT

As UTM systems continue to mature and more systems are being developed and deployed, it is important to capture lessons learned and best practices relating to various aspects of these capabilities. Collecting and recording this type of information will assist in the continued improvement of systems and processes as well as ensuring the harmonized, safe and effective implementation of UTM systems globally.

As such, the DRONE ENABLE 2022 problem statements will focus on the following: collating the experiences and best practices from the deployment and implementation of existing UTM Systems or Services; and determining how UTM related data will be effectively managed to support safe operations within a UTM environment. Each of these topics brings key issues and considerations to the forefront and are addressed in more detail below.

3.   REQUEST FOR INFORMATION

As the development of UTM advances, there remains a need to focus on the next evolution of the ability for UA to safely integrate into a finite airspace structure. The primary requirement remains the ability to facilitate such integration without negatively impacting the safety or efficiency of manned aviation operations or the safety of persons and property on the ground, taking into account security, environmental impacts and equitable access for all airspace users.

To enable States, regulators and industry to continue to advance the development of UTM systems, the issues below are being showcased. It is requested that submissions propose practical solutions, successful research and development activities and/or best practices - existing or proposed. The types of questions that should be considered in each submission are provided below with the associated problem statement. Submissions will be evaluated based on how well they have addressed one or other problem statement.

a)   **Experiences and Best Practices from the Deployment/Implementation of UTM Systems or Services**. As UTM systems and services continue to mature and act as an enabler for unmanned aircraft operations, including beyond visual line-of-sight (BVLOS) activities, it is important to direct attention towards successful UTM deployments and implementations in order to determine what worked, what could be improved, and to consolidate the experiences gained, lessons learned and best practices developed.

- Based on the type of deployments (local, regional, national, centralized, federated, controlled/uncontrolled airspace, etc.) and actual implementation experience: detail the coordination conducted, the key stakeholders/authorities involved and the specific roles and responsibilities of each.

- How are deployments being rolled out and are there any dependencies that impact the progress of the rollout? What maturity level has the deployment/implementation attained?

- Which services are currently being provided (or expected in the near term), which are longer-term aspirations? What criteria influenced the choice of UTM systems/services being provided?

  (*Note* – reference the UTM services listed in the ICAO UTM Framework, Edition 3 for a list of potential services).

- With regards to deployments and implementations, what worked, what didn't work and what lessons were learned?

- Describe best practices developed/realized with regards to:

  a) UTM deployment/implementation;

  b) provision of various services; or

  c) interoperability or integration with existing air traffic management services.

b) **Data Requirements**. In order for UTM to support safe multiple UAS operations within and beyond visual line-of-sight, data related to weather, 3D structures, other aircraft, etc. must be made available. Describe the type of data needed to support safe operations, how that data is collected, maintained current, shared with operators, and whether standards for certain types of data are needed in terms of data quality (e.g. integrity, reliability, continuity and availability), security and resilience.

- What data is already being used to support safe UAS operations?

- UAS operation at low altitude will require new types or quality of data (e.g. weather or obstacle data). Describe what type of data would be needed to safely operate, with what precision and accuracy, and what would be the relationship to existing aeronautical data requirements? Who should provide the data so that it can be trusted?

- What data should be regulated/standardized and why? How is data quality, reliance and security maintained? What role do different stakeholders have in evaluating, validating and accepting data sources?

- Provide best practices related to data sources, collection, dissemination and usage.

- For certain data (e.g. weather, obstacle information, etc.), one could expect that the standards that exist today for conventional aviation, in terms of delivery, update rate, data management and overall maintenance, may not be adequate. How should this information be managed to meet the needs of UAS operations?

Solutions to the RFI will serve to strengthen the ICAO UTM framework, providing a path forward for the safe integration of UAS. Furthermore, this information will assist States with developing the required regulatory framework and guidance material to ensure a safe, efficient and effective UTM system.

4. SUBMISSIONS

Submissions should address one of the above problem statements. If the intent is to address more than one problem statement, individual RFIs must be submitted, addressing each proposal separately. **By submitting an RFI response, submitters represent that they are prepared to travel at their own expense to Montréal, Canada to deliver their presentation during the DRONE ENABLE 2022 Symposium.** Submissions for additional topics will not be considered at this time.

Submissions must:

- describe at a high level, solutions that can be implemented by all States;

- allow for flexible implementation (e.g. dimensions of airspace) on a national basis while adhering to a common framework;

- take into consideration the operational environment within which the proposed solution would operate;

- not exceed **2000 words**, the word count function of MS-Word will be used to determine the number of words in the document;

- be written in English;

- be provided as a readable/writable **MS-Word document**; and

- be received by ICAO at DRONEENABLE@icao.int not later than **15 July 2022**.

All submissions will be reviewed. Submitters of those proposals that are considered to best address the problem statement will be offered an opportunity to present their information at DRONE ENABLE 2022 to be held from 14 to 16 November 2022. Extensive discussion of all presentations should be anticipated with the possibility that some aspects of several submissions could be supported by the Symposium audience and considered for incorporation into ICAO UAS guidance material.

Please note that costs associated with travel and accommodations will be borne by the presenter.

— END —