REQUEST FOR INFORMATION

DRONE ENABLE 2023 SYMPOSIUM

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

1. BACKGROUND

In the course of the past five years, the International Civil Aviation Organization (ICAO) has received requests from Member States that it serve as the global civil aviation facilitator to assist with the challenge of integrating unmanned aircraft systems (UAS) into the aviation regulatory framework. In this context, ICAO has hosted global UAS symposia (DRONE ENABLE) to solicit up-to-date information on the topic of UAS traffic management (UTM). The objective of the annual Request for Information (RFI) has been to synthesize relevant information gleaned from the submissions, 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 that sound technical approaches were used for drafting the framework, broad industry, academic and scientific community research and development initiatives were solicited as well as national implementation activities from which relevant 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 UA within the UTM area; as well as geofencing-like systems to prevent UA operation in sensitive, restricted or dangerous areas such as near aerodromes.

DRONE ENABLE/2, held in Chengdu, China in September 2018, had the 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 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 (USP) 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.

DRONE ENABLE 2021, held virtually in April 2021, had the theme of "*Addressing Tomorrow's Challenges Today*" and focused on UTM system performance requirements and implementing UTM in the aerodrome environment.

[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 providing this information.

DRONE ENABLE 2022, held in Montréal, Canada in November 2022, had the theme of *"Learning from the Past for a Better Future"* and focused on 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.

The outcomes from each of the DRONE ENABLE symposia are integrated into the *Unmanned Aircraft Systems Traffic Management (UTM) – A Common Framework with Core Principles for Global Harmonization.*

2. PROBLEM STATEMENT

As new types of operations are being introduced in areas where civil aviation operations have not commonly been conducted (e.g. low-level urban and rural), identification of new communications, navigation and surveillance (CNS) capabilities will be required to enable such operations. The CNS infrastructure used by conventional aviation was not designed to provide services in those areas and by introducing new types of operations, the aviation community will have to identify, in particular, what CNS infrastructure will be required, what performance it will need to meet, how it will operate, frequency spectrum requirements for that, and by whom it will be provided. Consideration will also need to be given to any new spectrum requirements for the new CNS infrastructure.

The rapid growth of unmanned aviation in the last two decades was made possible by the significant technological developments made across many industries, including hardware and software. Adding to these developments are new types of propulsion systems and new, highly automated aircraft that require minimal intervention, whether by an on-board or remote pilot. These changes are leading to what is referred to as "advanced air mobility" (AAM) which is aiming to transform the mobility scheme in cities, other urban/semi urban areas and between such areas. AAM, as an ecosystem, relies on electric vertical take-off and landing (eVTOL) aircraft carrying passengers, cargo and mail initially for short and medium distances, from aerodromes and other operating sites. It might include aerial work, mostly employing smaller UA. Some of those operations are expected to cross international borders. AAM also brings new infrastructure requirements, including for CNS and operating sites. It raises questions on the role of the pilot/remote pilot in the context of increasing levels of automation and autonomy, as well as how to achieve integration of unmanned and manned aviation in that respect. Another emerging issue is how to address fundamental prerequisites such as flight rules.

The DRONE ENABLE 2023 problem statements focus on the following two areas: CNS solutions to enable operations in new, low-level areas; and identification of critical elements of AAM as well as key priorities for which global solutions will be sought. These topics are addressed in more detail in the following section.

3. REQUEST FOR INFORMATION

To enable States, regulators and industry to continue to advance the development of CNS capabilities in the UTM environment as well as to start the assessment of global requirements for AAM, the topics below are being highlighted. It is requested that submissions propose practical solutions, successful research and development activities and/or best practices – whether 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 the other problem statement.

Topic 1: What solutions are needed or are being developed to address CNS requirements in low-level airspace?

Current CNS infrastructure was not designed to provide coverage in urban environments or in most low level areas other than in the proximity of aerodromes. Many UA are intended to be operated at low level (typically below 1000 ft. above ground level), whether conducting delivery operations or aerial work. Consideration will need to be given to technologies to fulfil the CNS requirements for UTM systems in these areas, whether existing or new. Consideration will also need to be given to identification of suitably protected frequency spectrum for use by CNS applications in a UTM environment, associated with manned or unmanned aviation.

- What CNS technologies will be able to provide the services needed in urban and/or low-level airspace?

- CNS performance requirements (i.e. integrity, availability, accuracy, reliability) will need to be established – to what values?

- What mitigation measures would need to be implemented by the various stakeholders in the event of a loss of CNS services?

- What potential solutions are available to address the challenge of limited spectrum availability to support new CNS capabilities, including "vehicle-to-vehicle" (V2V) communications and electronic conspicuity (e-conspicuity) functions?

Topic 2: Critical elements of AAM requiring global interoperability and harmonization.

Concepts for AAM ecosystems are being developed in several regions and under various national or regional regulatory regimes, with and by, States and industry. Through these efforts, challenges and priorities for implementation are starting to be identified. Although it is recognized that AAM ecosystems will be designed to solve local and regional needs and interests, there may be issues requiring consideration at the global level. Interoperability of systems and capabilities is often presented as an enabler to the deployment of AAM operations in multiple locations, as the use of similar requirements can avoid duplicative or divergent solutions, while fostering trust and acceptance.

When responding, please focus on globally applicable considerations.

- What are the elements of the AAM ecosystem that may require global solutions, and why?

- Which elements of the regulatory framework can be addressed locally or regionally as opposed to those requiring global approaches, in order to support safe, secure and efficient AAM operations?

- What are the benefits of having globally harmonized frameworks?

- Which stakeholders, particularly those outside of the traditional aviation community, should be involved in efforts towards further global standardization of AAM?

- What are the key issues that States and industry need ICAO to address in the next 3-5 and 6-10 years to support AAM operations?

4. SUBMISSIONS

Submissions should address only one of the above problem statements. If the intent is to address both problem statements, individual submissions must be provided, 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 2023 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 no later than **19 May 2023**.

All submissions will be reviewed. Only those submitters whose proposal(s) best address the problem statement will be offered an opportunity to present their information at DRONE ENABLE 2023 to be held from 5 to 7 December. 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 referred to in future UTM related guidance material or as material for ICAO's AAM activities.

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

— END —