



International Civil Aviation Organization

**The Sixth Meeting of the APANPIRG ATM Sub-Group
(ATM/SG/6)**

Hong Kong, China, 30 July – 03 August 2018

Agenda Item 5: ATM Coordination (Meetings, Route Development, Contingency Planning)

ASIA/PACIFIC UNMANNED AIRCRAFT SYSTEMS TASK FORCE OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents outcomes from the Second Meeting of the Asia/Pacific Unmanned Aircraft Systems Task Force.

1. INTRODUCTION

1.1 The Second Meeting of the Asia/Pacific Unmanned Aircraft Systems (UAS) Task Force (APUAS/TF/2) was held in Bangkok, Thailand from 05 to 08 March 2018. The meeting included a mini-seminar providing industry information on Automatic Dependent Surveillance – Broadcast (ADS-B) transmitters for small UAS.

1.2 The objective of the Task Force, as defined in its Terms of Reference (TOR) approved by the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was to develop guidance material supporting an Asia/Pacific Seamless ATM Plan element: B1-UAS. This element is expected to incorporate Aviation System Block Upgrade (ASBU) BI-RPAS (Remotely Piloted Aircraft Systems) but in addition, to include regional expectations for the regulation and safe operation of small UAS within non-segregated airspace from an ATM perspective by November 2019, for consideration by the ATM/SG and APANPIRG.

1.3 Developments in UAS applications, and in work being undertaken at the global level, have resulted in a proposal by APUAS/TF to re-scope its work.

2. DISCUSSION

Related Meeting Outcomes

2.1 The Secretariat provided information on related meeting outcomes including:

- the 27th Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/27), Bangkok, Thailand, 05 to 08 September 2016;
- the 2nd High Level Safety Conference 2015 (HLSC 2015), Montréal, Canada, 02 to 05 February 2015;
- the 39th Session of the Assembly of ICAO, Montréal, Canada, from 27 September to 06 October 2016;
- the 5th Meeting of the Air Traffic Management Sub-Group of APANPIRG (ATM/SG/5), Bangkok, Thailand, 31 July to 04 August 2017;

- the 28th Meeting of APANPIRG (APANPIRG/28), Bangkok, Thailand, 11 to 14 September 2017; and
- the 2nd Remotely Piloted Aircraft Systems Symposium (RPAS/2), together with the Unmanned Aircraft Systems Symposium (DRONE ENABLE), Montréal, Canada, from 19 to 23 September 2017.

2.2 Discussion of the outcomes of APANPIRG/27, and of the HLSC 2015 and the 39th Session of the Assembly provided some context on the reasons for the formation of APUAS/TF, and of the outcomes from subsequent high level meetings that would have an impact on the future work of the Task Force. Additional information provided by ICAO Headquarters relating to the current status of work on RPAS, the planned RPAS/3 and DRONE ENABLE/2 symposiums was also shared with the meeting (**Attachment A**).

2.3 The meeting discussed *Conclusion RASG-APAC 7/2 – Regulation of Small Unmanned Aircraft in Hong Kong, China*, which requested ICAO to coordinate with the International Organization for Standardization (ISO) on matters related to UAS. The matter has been referred to ICAO Headquarters for clarification.

2.4 Meeting participants were invited to respond to the Request for Information included in the State Letter announcing the RPAS/3 and DRONE ENABLE/2 symposiums (Chengdu, China, 10 to 14 September 2018, **Attachment A**), and to indicate their interest in moderating a session or sessions at DRONE ENABLE/2. The Chair emphasized that in addition to regulators and Air Navigation Service Providers (ANSPs), industry was strongly encouraged to provide input. ATM/SG/6 participants are requested to ensure their State is represented at the symposiums, particularly DRONE ENABLE/2, in order to share knowledge on global developments in the management of UAS.

Re-Scoping the Work of APUAS/TF

2.5 The APUAS/TF/2 meeting was presented with a proposal for a further revision of the Terms of Reference (TOR) of APUAS/TF, responding to the outcomes of other related meetings and further information provided by ICAO Headquarters.

2.6 Noting that the outcomes of HLSC 2015, the 39th Session of the Assembly of ICAO, and the RPAS/2 and DRONE ENABLE symposiums had led to the commencement of a global effort to be conducted under the UAS Advisory Group (UAS-AG) in three streams of UAS Traffic Management (UTM), the meeting agreed to amend the APUAS/TF TOR (**Attachment B**, with changes marked, and **Attachment C**, in clean copy) to:

- extend the scope to consider all UAS that were not considered within the scope of the RPAS Panel;
- remove reference to systems, communications and surveillance that would now be included in three streams of work being undertaken by the UAS-AG;
- clarify the applicability of regulatory guidance to be developed under the TOR;
- broaden the scope of regulatory guidance for education processes to include ANSPs and other stakeholders;
- coordinate the methods of safety data collection and analysis with the Asia/Pacific Regional Aviation Safety Group (RASG-APAC); and
- coordinate regulatory guidance developed by APUAS/TF with similar bodies in other ICAO Regions and with UAS-AG.

2.7 The meeting agreed to the following Draft Decision:

Draft Decision APUAS/TF/2-1: Revised APUAS/TF Terms of Reference		
What:	That, recognizing the scope of work on Unmanned Aircraft Systems (UAS), and particularly UAS Traffic Management (UTM) Systems being undertaken at the global level by the UAS Advisory Group, the revised APUAS/TF Terms of Reference at Attachment B .	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why:	To revise the scope of work of APUAS/TF, recognizing the work now being undertaken at the global level	Follow-up: ☐ Required from States
When:	3-Aug-18	Status: Draft to be adopted by Subgroup
Who:	☒ Sub groups ☐ APAC States ☐ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

ISO/TC 20/SC 16 UAS Standard Development Roadmap

2.8 The International Organization for Standardization (ISO) provided information on ISO 21384-1 *Aerospace – Unmanned Aircraft Systems*, intended to define a systematic approach to UAS standard development. Through ISO, industry and government experts were developing a set of UAS standards based on a layered document system. While ISO standards were voluntary, they could be referred to as a strong basis for regulation and public policy. The structure of the UAS standard system being developed by ISO is shown in **Figure 1**.

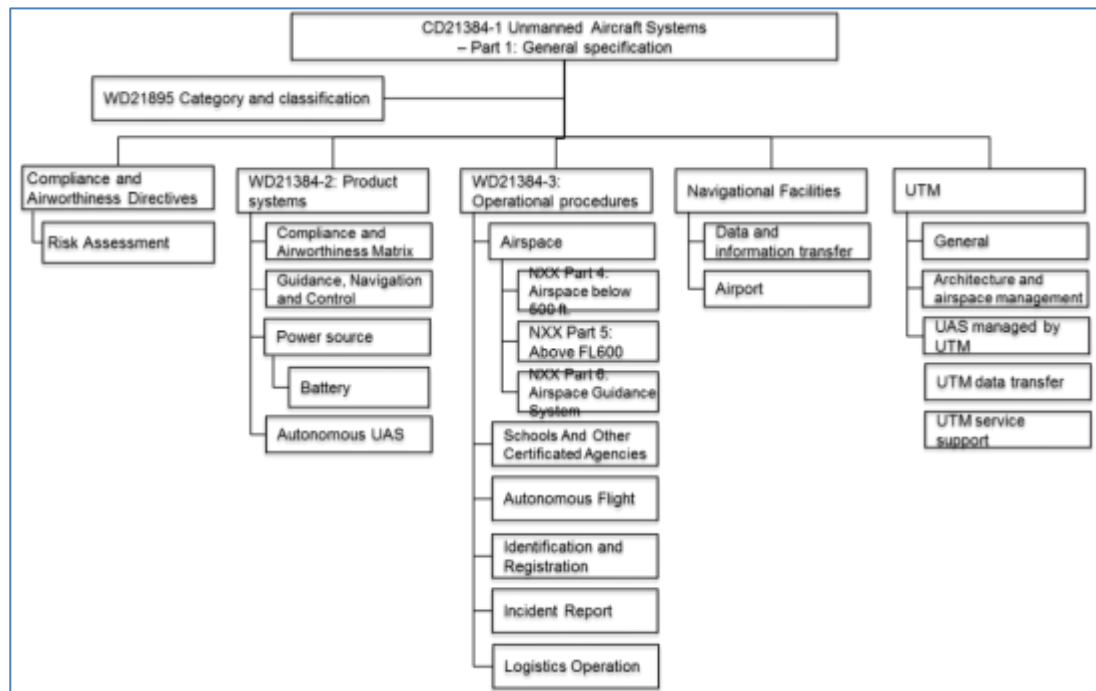


Figure 1: ISO UAS Standard System - Structure

2.9 The meeting noted that the structure did not include consideration of operations in airspace that was between 500ft and FL600.

2.10 It was noted that there would need to be further coordination between ICAO, other specialist groups and ISO in the development of globally harmonized guidance for UAS operations.

2.11 Meeting participants were invited to provide feedback on the ISO UAS Standard System Structure to the ISO SC16 Secretary by 7 April 2018.

ISO/TC 20/SC 16 UAS Standard Development on UTM

2.12 ISO presented a draft international standards development plan for UTM, which was being developed with the goal of harmonization with the ICAO ATM concept. The scope of the work was standardization of UTM architecture and procedures applying to multiple types of commercial applications in common airspace below 150m. Possible future work was standardization in airspace at or above 150m, overlapping with manned aircraft operations. The work included consideration of the interface between UTM and ATM.

2.13 **Figure 2** outlines the draft ISO Publication Plan for UTM Standard Systems.

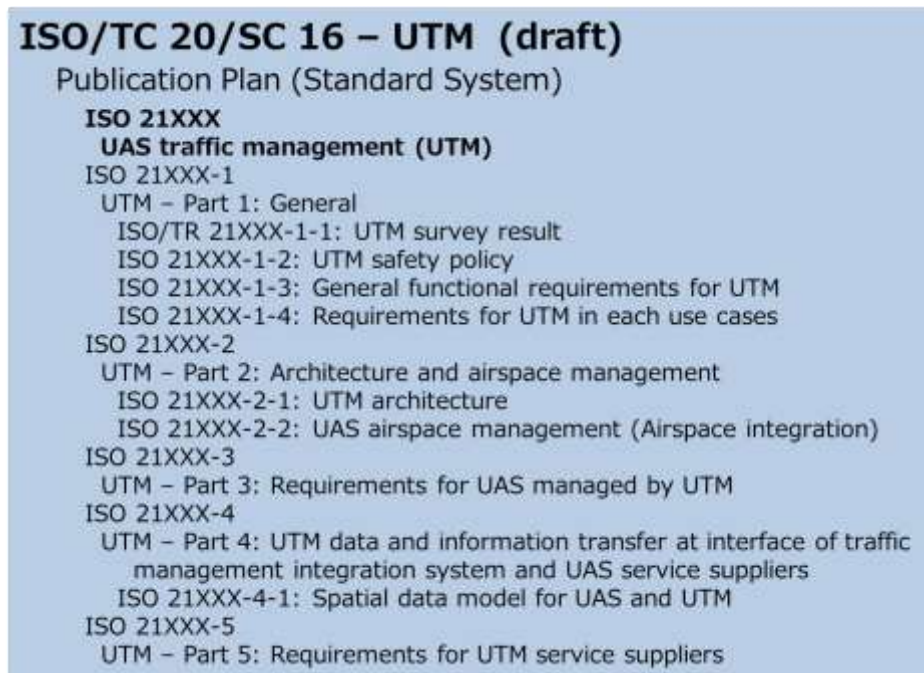


Figure 2: ISO UTM Standard System Publication Plan

2.14 Meeting participants were invited to provide feedback on the Publication Plan to the Secretary of ISO SC16 by 7 April 2018.

2.15 The meeting noted ISO's planning work on UAS traffic management, and that the work should be kept in line with the work of the UAS-AG.

2.16 ICAO noted the cost-sensitive nature of the UAS that the APUAS/TF was concerned with. ICAO did not have a clear understanding of the role of ISO with regard to the new area of 'operational standards', as there was a concern that ISO standards in this area might impose extra costs (that might reduce the likelihood of public compliance) and impose extra requirements for parts of the aviation system that were already regulated, such as ANSPs. ISO reminded the meeting that a primary purpose of ISO standards was to reduce costs.

IATA Activities and Strategy Relating to Unmanned Aircraft Systems

2.17 IATA provided an update on the production by the Safety and Flight Operations (SFO) division of a strategy document designed as a reference point to steer the strategic direction of IATA's work in the area of UAS. The meeting was informed of the main focus areas for the strategy document which included a range of safety, standards development, security, human factors, environmental, economic, technology and UAS application considerations.

Japan UTM Project Update (SP/6)

2.18 Information was presented on the Japan UTM project, which was working towards a large scale UTM system deployment. The presentation included a UTM problem statement, noting the differences from manned aviation in that there were no airworthiness standards for UAS, procedures for management of UAS were in early stages of development, only short periods of training were used for UAS operators, and ATC did not necessarily have visibility of 'drone' UAS. The problem statement recognized the significant numbers of UAS, the ease of availability due to low cost of acquisition, and the overlap between aviation regulation and regulation by other authorities such as the civil police.

2.19 The information provided also recognized the risks of UAS operations in the manned aviation environment, core functionalities of a UTM system for authorities and operators, and the need for a phased approach in implementing UTM systems.

Civil UAS Traffic Management Status in China

2.20 The meeting was provided with a brief overview of civil UAS traffic management status in China, including the top-level design and implementation plan of traffic management for civil UAS. Focusing on the light civil UAS operating at low altitude in segregated airspaces, the paper also provided information on the progress of the procedures of traffic management and the introduction to the technical support system on trial in China.

2.21 The meeting was informed that China had conducted a test flight of a fixed-wing cargo UAS, and an autonomous UAS capable of carrying two passengers had been invented by one Chinese Company.

Update on the FAA's UAS Integration Efforts

2.22 As requested by APUAS/TF (Task List item 1/1, USA provided an update on the activities being conducted by the Federal Aviation Administration (FAA) to integrate UAS into the USA's national airspace system (NAS). The information included a regulatory update, discussion on partnering with industry, and the activities of aviation rulemaking committees.

2.23 In response to a query, USA informed the meeting that the online registration process for UAs included steps that also served to educate the public. It was noted that the requirement for a valid credit card to pay the nominal fee for registration provided a means to assist in the validation of the applicant's identity.

Regulation of Unmanned Aircraft Systems in Hong Kong, China

2.24 The meeting was informed of the proposal for new regulations on UAS in Hong Kong China. Information was provided on the establishment of a UAS registration system, risk-based classification of UAS operations, training and assessment requirements, Drone Maps for UAS operators, prescribing insurance requirements for UAS, and indoor operations of UAS. Hong Kong, China was taking into consideration the views of the public and best practices by other aviation

authorities to put forward a regulatory proposal for UAs that suited the local environment and circumstances, with due regard to the unique local circumstances.

2.25 In discussion the meeting noted that categorization of UAS operations presented a challenge. While SARPS relating to the operation of RPAS that operated in the manned aviation environment under the instrument flight rules (IFR) were being developed by the RPAS Panel for inclusion in Annexes to the Convention on International Civil Aviation, no SARPS were being developed for other UAS operations which were increasingly expected to also include UA weighing 25kg or more.

2.26 It was noted that the categorization of UAS operations developed by Hong Kong, China included consideration of the velocity of the UAS.

2.27 The meeting also noted that each Administration would have different regulatory overlap between aviation regulation and other laws/regulations relating to public safety, privacy, etc.

Principles Arising from the IFALPA Position on Unmanned Aircraft Systems

2.28 The meeting was provided with a summary of outcomes from the 2017 Annual Conference of the International Federation of Airline Pilots' Associations (IFALPA) in relation to UAS, and a Secretariat proposal to include the outcomes in principles for the development of Regional guidance material.

2.29 IFALPA had made 19 position statements in its Position Paper on UAS Operations.

2.30 The meeting noted a number of cases where further consideration of the principles proposed was needed (principles based on positions 1, 3, 4, 6, and 8). The proposed principles would be incorporated among the suite of principles identified by APUAS/TF/1 that were being rationalized for inclusion in Regional guidance material and eventual reflection in regulatory guidance for UAS operations.

2.31 With regard to the IFALPA position that in-depth research into the severity of the impact of collisions between small UA and manned aircraft was urgently needed, it was noted that some research in this area had been done by China, the Czech Republic and the United Kingdom, and possibly other States or organizations. It was agreed that opportunities to share any such research should be explored.

2.32 IFALPA informed the meeting that a position paper on UAS security had been produced. The position paper would be summarized for presentation to APUAS/TF/3.

Reserved Airspace for Routine Small UAS Operation

2.33 Indonesia presented information on the proposed provision of reserved airspace especially for the operation of small UAS on regular or scheduled bases, with the purpose of facilitating the management and supervision of UAS, maintaining safety, accommodating the increasing needs of UAS operators and improving the effectiveness of regulation of UAS operations. The principle of Flexible Use of Airspace (FUA) was applied to the airspace reserved for UAS.

2.34 While noting that the main focus of APUAS/TF was the integration of UAS operations in non-segregated airspace, it was also noted that in some cases the use of non-segregated airspace for UAS operations could result in resource-intensive workload associated with authorizations for individual cases.

2.35 Indonesia also informed the meeting that consultation with the general aviation sector

and the military was achieved through a task force established to examine and propose new regulations.

Criteria for Establishing No-Drone Zones around Airports

2.36 India provided information on No Drone Zones (NDZ) established around airports to protect approach and take-off paths of operational runways and also other critical airspace in the proximity. It was observed that the dimensions of NDZ varied significantly from State to State. This variation may be due to the absence of a standard methodology to define the NDZ or the safety margin considered in the process. India proposed standard criteria for establishing NDZs around airports and proposed a methodology to achieve this objective.

2.37 In discussing India's proposal, the meeting noted that some States may declare certain airspace to strictly exclude UAS, while others may use similar criteria and methodology to determine the level of authorization needed for UAS operations. The example given was from the USA, where criteria were established to determine whether the UAS operation needed authorization from the local ATC facility.

2.38 The meeting agreed that the criteria and methodology used by India for establishing no-drone zones, and that used by the USA to determine the need for a further level of local authorization of UAS operations, should be included in Regional guidance material as examples of authorization processes.

Draft Regulatory Guidance for the Operation of Small Unmanned Aircraft Systems

2.39 The meeting was presented with draft regulatory guidance for the operation of small UAS for the Asia/Pacific Region. The draft regulatory guidance was drawn from the regulations of some Asia/Pacific Administrations and was mainly focused on UAS operations, noting that there were also some regulations that may need to apply at the manufacturing stage or at the point of sale.

2.40 The regulatory guidance, when finalized, would eventually form the core content of the *Asia/Pacific Regional Guidance for the Regulation and Safe Operation of UAS within National Airspace*.

2.41 To support further work by the APUAS/TF Small Working Group (APUAS/TF/SWG) on the regulatory guidance material the Chair provided a template for a Table of Contents for State Regulations for UAS, which was being developed by the Joint Authorities for Rulemaking on Unmanned Systems (JARUS¹). The TOC was utilized to define tasks for the APUAS/TF/SWG, as described in **Table 1**:

2.42 The meeting noted that the number of articles and their titles would be subject to change as the guidance material developed, and that articles in the TOC that were not yet addressed in Table 1 either were dependent on Article 3 Categories of UA Operations, or would be addressed at a later stage.

¹ JARUS is a group of experts from the national aviation authorities and regional aviation safety organizations, formed for the purpose of recommending a single set of technical, safety and operational requirements for the certification and safe integration of UAS into airspace and at aerodromes.

Article	Article Title	Assigned to
1	Subject Matter and Scope	Chair and Secretary
2	Definitions	Chair and Secretary
3	Categories of UA Operations	Chair and Secretary
4	Principles for UA Operations	Secretary
5	Registration and Identification	CANSO
8	Operations of Large Model Aircraft	Chair to coordinate
10	Safety-Critical Services	India
15	Contingency Procedures	IATA
16	Applicability	Chair
17	Entry into Force and Application	Chair

Table 1: Assignment of SWG Tasks to Develop Regulatory Guidance

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) note the *Third Remotely Piloted Aircraft Systems* and *Second DRONE ENABLE* symposiums;
- c) Note the global outcomes on UAS, and agree to the **Draft Decision APUAS/TF/2-1 – Revised APUAS/TF Terms of Reference**;
- d) Note the APAC Regional regulatory guidance material under development; and
- e) discuss any relevant matters as appropriate.

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Международная
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国际民用
航空组织

Tel.: +1 514-954-8219 ext. 6190

22 February 2018

Ref.: AN 13/66-18/26

Subject: Third Global Remotely Piloted Aircraft Systems (RPAS/3) Symposium and Second DRONE ENABLE, Unmanned Aircraft Systems (UAS) Industry (DRONE ENABLE/2) Symposium - Request for Information (RFI), Chengdu, China, 10 to 14 September 2018

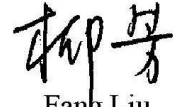
Action required: a) plan for attendance;
b) disseminate this letter as requested in paragraph 5; and
c) respond to the request for information (RFI)

Sir/Madam,

1. I have the honour to invite you to participate in ICAO's Third Global Remotely Piloted Aircraft Systems (RPAS/3) Symposium and DRONE ENABLE, ICAO's Second Unmanned Aircraft Systems Industry (DRONE ENABLE/2) Symposium convened from 10 to 14 September 2018 in Chengdu, China. The theme of RPAS/3 is *from accommodation to integration* and of DRONE ENABLE/2, *UTM to ATM – transitioning from segregation to integration*.
2. These two symposia will bring together key stakeholders from industry, academia, government and international organizations in the unmanned aviation sector to exchange research, best practices, lessons learned and respective challenges. Attention will be given to complex issues, such as categorization for RPAS operations as well as unmanned aircraft system traffic management (UTM) which need to be addressed collectively in order to facilitate RPAS and UAS integration into the global aviation system.
3. These events will provide a unique opportunity to assess the status of regulations currently used in various parts of the world, with a view to fostering the emergence of a comprehensive and harmonized regulatory framework to support both RPAS and UAS activities.
4. The Government of China will host additional events, along with an industry exhibit, in parallel with the ICAO symposia. These events will provide networking opportunities, showcase the breadth of existing technologies, ongoing research and development, as well as commercial and non-commercial activities in this rapidly evolving sector of the aviation industry.

5. As all these activities will address subjects of interest to a wide-ranging audience, you are requested to disseminate this information to any organization in your State that may be interested in participating. DRONE ENABLE/2 speakers will be selected from submissions in response to the attached UTM request for information (RFI). All relevant information concerning both events is contained in their respective attachments to this State letter. Any queries regarding the symposia may be forwarded to RPASEvents@icao.int. The symposia will be held in English and Chinese.

Accept, Sir/Madam, the assurances of my highest consideration.



Fang Liu
Secretary General

Enclosures:

- A — RPAS/3 Intended Outcomes
- B — DRONE ENABLE/2 Request for Information

ATTACHMENT A to State letter AN 13/66-18/26

**THIRD GLOBAL REMOTELY PILOTED AIRCRAFT
SYSTEMS (RPAS/3) SYMPOSIUM**

INTENDED OUTCOMES

1. INTRODUCTION AND OBJECTIVES

The Third Global Remotely Piloted Aircraft Systems (RPAS/3) Symposium will provide an understanding of ICAO's work regarding the development of the RPAS regulatory framework. This is a unique opportunity for States, international organizations, industry and stakeholders at large, to learn about the development process of ICAO Standards and Recommended Practices (SARPs). These SARPs provide the global harmonization needed to support States in their development and implementation of national unmanned aviation regulatory schemes.

The existing operational environment, where unmanned aviation is advancing at unprecedented speed, as well as methods to categorize unmanned aircraft in order to appropriately regulate their operations will be discussed and explored.

Discussions will focus attention on several regulatory aspects, including remote pilot licensing, operations and operator certification, airworthiness, and their related technical aspects, which will facilitate the transition from accommodation of remotely piloted aircraft (RPA) in airspace to their routine integration into the air traffic management system.

The roles and responsibilities of regulators, air navigation service providers, operators and industry at large will be discussed in order to ensure the safe conduct of operations.

RPAS/3 will also showcase the emerging RPAS technologies as well as their potential capabilities in order to help the audience understand how these cutting-edge technologies are propelling rapid changes to the landscape of the aviation industry.

2. INTENDED OUTCOMES FOR RPAS/3

Participants will leave with an understanding of:

- a) the status of the ICAO RPAS regulatory framework;
- b) categorization of unmanned aircraft (UA);
- c) the challenges and risks associated with transitioning from accommodation to integration;
- d) the roles and responsibilities for conducting safe operations from the viewpoint of different stakeholders;
- e) the benefits obtained when States implement harmonized regulations; and
- f) emerging RPAS technologies and their impact on the existing well-established manned aviation system.

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ATTACHMENT B to State letter AN 13/66-18/26

**SECOND DRONE ENABLE, UNMANNED AIRCRAFT SYSTEMS (UAS) INDUSTRY
(DRONE ENABLE/2) SYMPOSIUM**

**International Civil Aviation Organization
Unmanned Aircraft System Traffic Management (UTM)
Request for Information¹**

1. BACKGROUND

In April of 2017, after receiving requests from Member States that ICAO serve as the global civil aviation facilitator to assist with the challenge of unmanned aircraft systems (UAS), ICAO took a bold step into the world of UTM by issuing an RFI covering the core boundaries of UTM. The goal was to synthesize the best practices gleaned from the RFI submissions into a globally harmonized, common framework to support integration of unmanned aircraft into national airspace.

To ensure sound technical approaches were used for constructing such a framework, broad industry, academic and science community research and development initiatives were solicited as well as any national implementations from which lessons could be learned. States, industry and academia showed significant interest in the RFI, submitting a total of 76 responses that addressed UTM foundational components including registration systems that allowed remote identification and tracking; communications systems for control and management of the unmanned aircraft (UA) and tracking of all unmanned aircraft (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. On 22 to 23 September 2017, the top RFI responses, as judged by ICAO's UAS Advisory Group (UAS-AG) were presented at DRONE ENABLE, ICAO's UAS Industry Symposium. The UAS-AG was tasked with synthesizing the best practices from the submissions and presentations into a globally harmonized, common framework for UTM to support integration of unmanned aircraft into national airspace. However, during the review process of DRONE ENABLE presentations, critical gaps in the UTM solutions were identified. To address these issues, ICAO has decided to again request assistance of States, industry, academia and other interested stakeholders to collaborate on, and provide solutions for, a new UTM problem statement.

This activity is separate from ICAO's ongoing work to build a full regulatory framework for the integration of remotely piloted aircraft systems (RPAS) in accordance with instrument flight rules (IFRs).

2. PROBLEM STATEMENT

Unmanned aircraft are capable of operating in all types of airspace and at all altitudes/levels. The greatest density of unmanned aircraft operations is however, expected to be at low levels and in urban/suburban environments. Manned aircraft may also be operating in these same areas at a relatively low level, and in some cases may include landing or taking off (e.g. helicopters conducting police, news or medical flights).

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.

B-2

In some cases, air traffic management (ATM²) may be provided above the local obstacle level (perhaps several hundred feet above ground level) while in some cases air traffic management is provided down to the surface (e.g. in the vicinity of an aerodromes). UTM would likely be implemented from the surface up to the base of the ATM system in some areas, whereas in others the UTM and ATM systems may overlap or coexist in the same airspace.

There will be scenarios where manned and unmanned aircraft will be required to cross the demarcation line between ATM and UTM; while in other situations they will only operate in close proximity to the line. In both scenarios, an aircraft being monitored by one system (UTM or ATM) may be at increased risk of becoming a hazard to another aircraft being monitored by the other system. Additional challenges are anticipated given that the ATM system is primarily a human-in-the-loop system while it is expected that most UTM systems will be largely automated.

In recognition of the hazards aircraft pose to each other when operating in the two separate systems, ATM and UTM, essential information must be exchanged and alerts provided to all parties (i.e. air traffic controllers (ATM system), pilots, remote pilots and the UTM system) on a real-time basis.

3. REQUEST FOR INFORMATION

As the development of UTM moves forward, there needs to be a focus on the next evolution of the ability for aircraft (both manned and unmanned) to safely and efficiently transition between any future UTM system and the concurrent ATM systems. The primary requirement is to ensure safe integration, without negatively impacting manned aviation and the safety of persons and property on the ground, taking into account security and equal accessibility for all airspace users.

Understanding the boundaries and the transition phases of these systems, how they interact and how best to exchange essential information will enable States, regulators and industry to continue to advance this global industry while preserving safety of all airspace users.

Submissions should propose practical solutions for describing the ATM/UTM boundaries, transition between the boundaries, what constitutes “essential information” and the capabilities needed by each system to allow for secure and efficient operations. The following are the types of question that should be considered in your submission:

- what sensors or equipment are required on board aircraft to provide the essential information and/or facilitate the exchange of such information;
- what functionality/capability is required in the UTM and ATM systems to facilitate real-time/near real-time decision making;
- how will alerts be provided to the persons or automation systems that will be required to take action to avoid collision? How to provide these alerts within such time as to allow the aircraft to remain well clear of each other (i.e. so that collision avoidance manoeuvres are not required); and
- what is required in the UTM and ATM systems to ensure the solution to an initial traffic situation will not create a follow-on traffic situation?

² Air traffic management (ATM): The dynamic, integrated management of air traffic and airspace (including air traffic services, airspace management and air traffic flow management) — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

B-3

Solutions to the RFI will serve to strengthen not only the UTM framework currently under development, but will also further the global discussion toward a common agreement on a path forward for the safe integration of UAS. Furthermore, this information will assist State regulators with developing the required regulatory framework and guidance material to ensure a safe, efficient and effective UTM system.

4. SUBMISSIONS

Submissions may address part or all of the above problem statement. **By submitting an RFI response, submitters represent that they are prepared to travel to Chengdu, China to deliver their presentation.** Submissions for additional topics will not be considered at this time.

Submissions must:

- describe at a high level a solution 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;
- define infrastructure requirements and provide a recommendation on how these can be achieved;
- 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 **30 April 2018**.

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/2, ICAO's UAS Industry Symposium to be held on 13 to 14 September 2018 in Chengdu, China. Costs associated with travel to, and accommodations in, China will be borne by the presenter. 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.

— END —

Terms of Reference

Asia/Pacific Unmanned Aircraft Systems Task Force (APUAS/TF)

Objectives: the objective of the APUAS/TF will be to develop guidance material that supports an Asia/Pacific Seamless ATM Plan element: B1-UAS. This element is expected to incorporate Aviation System Block Upgrade (ASBU) BI-RPAS (Remotely Piloted Aircraft Systems) but in addition, to include regional expectations for the regulation and safe operation of UAS (other than RPAS that fall within the scope of the ICAO RPAS Panel¹) within non-segregated airspace from an ATM perspective by November 2019, for consideration by the ATM/SG and APANPIRG. The guidance material for small UAS (generally 25kg or less) may include, *inter alia*:

- ~~reference to systems designed to ensure a commensurate safety against obstacles, protected airspace, aircraft and non-involved people;~~
- ~~communication and surveillance systems for Air Traffic Services (ATS) that allow the effective management of safety risks in controlled and uncontrolled airspace; and~~
- guidance on elements to be considered for inclusion in model regulations that manage the manufacturing, sale and for the:
 - operation of UAS; and
 - technical or performance requirements of UAS; and that
 - may be applied at the point of manufacture or sale of UAS;
- ~~education processes to provide educate all UAS users operators or potential users operators, regulators and air navigation service providers and other stakeholders with information on appropriate UAS operations regulations and their application;~~
- ~~recommended methods of safety data collection and analysis for UAS incidents;~~
- recommended methods of safety data collection and analysis for UAS accidents and incidents, developed in coordination with the Asia/Pacific Regional Aviation Safety Group (RASG-APAC);
- ~~integration~~ alignment of regulations for small UAS with existing regulations for model aircraft;
- Consideration of regulations relating to small UAS operation both within and beyond visual line of sight;
- Safety assessments for small UAS operations; and

¹ The ICAO RPAS Panel is developing Standards and Recommended Practices for RPAS that generally operate within the National Airspace Systems in the same way as manned aircraft, for inclusion in Annexes to the Convention on International Civil Aviation.

- Coordination with the UAS-AG, and JARUS, or other appropriate specialist body bodies.

To facilitate global harmonization the regulatory guidance developed by APUAS/TF should be shared with similar bodies in other ICAO Regions, and with UAS-AG through the ICAO Secretariat.

The APUAS/TF should report its progress with an interim update at the ATM/SG/5 (2017) and ATM/SG/6 (2018) and ATM/SG/7 (2019).

Meetings: the APUAS/TF will normally meet at least once a year, but twice a year when agreed by the APUAS/TF if required.

Membership:

The APUAS/TF membership will be formed by Asia/Pacific States/Administrations and International Organizations. Other non-Asia/Pacific States, and organizations involved in UAS manufacturing, regulation and operations may join the APUAS/TF at the invitation of the ICAO Regional Office.

Reporting: the APUAS/TF reports to the ATM/SG. The ATM/SG will coordinate with the RASMAG, CNS/SG, and the APRAST/RASG as appropriate before consideration by APANPIRG.

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Terms of Reference

Asia/Pacific Unmanned Aircraft Systems Task Force (APUAS/TF)

Objectives: the objective of the APUAS/TF will be to develop guidance material that supports an Asia/Pacific Seamless ATM Plan element: B1-UAS. This element is expected to incorporate Aviation System Block Upgrade (ASBU) BI-RPAS (Remotely Piloted Aircraft Systems) but in addition, to include regional expectations for the regulation and safe operation of UAS (other than RPAS that fall within the scope of the ICAO RPAS Panel¹) within non-segregated airspace from an ATM perspective by November 2019, for consideration by the ATM/SG and APANPIRG. The guidance material for UAS may include, *inter alia*:

- guidance on elements to be considered for inclusion in regulations for the:
 - operation of UAS; and
 - technical or performance requirements of UAS; and that
 - may be applied at the point sale of UAS;
- processes to educate all UAS operators or potential operators, air navigation service providers and other stakeholders on UAS regulations and their application;
- recommended methods of safety data collection and analysis for UAS accidents and incidents, developed in coordination with the Asia/Pacific Regional Aviation Safety Group (RASG-APAC);
- alignment of regulations for UAS with existing regulations for model aircraft;
- Consideration of regulations relating to UAS operation both within and beyond visual line of sight;
- Safety assessments for UAS operations; and
- Coordination with the UAS-AG, JARUS or other appropriate specialist bodies.

To facilitate global harmonization the regulatory guidance developed by APUAS/TF should be shared with similar bodies in other ICAO Regions, and with UAS-AG through the ICAO Secretariat.

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