Twenty-Second Meeting of the AFI Planning and Implementation Regional Group (APIRG/22)
(Accra, Ghana, 29 July – 2 August 2019)

Agenda Item 4: Other Air Navigation Issues

4.4 Initiatives by States and Industry

REMOTELY PILOTED AIRCRAFT SYSTEMS INTERGRATION PROGRAM

(Presented by South Africa.)

SUMMARY

This paper details the status of RPAS accommodation and integration within South Africa. The paper will also identify key focus areas of RPAS management based on ICAO SARPS, in the context of Unmanned Aircraft Systems Traffic Management (UTM) as well as Anti Drone Systems. Discussions will further, highlight the current South African RPAS regulatory framework on drones/RPAS/UAS traffic management within non-segregated airspace.

Action by the Meeting:

The Meeting is invited to:

a) take note of the information and activities regarding RPAS management;
b) take note of the expectations of UTM implementation;
c) recognise the work of South Africa in formulating and promulgating RPAS regulations;
d) request ICAO to action guidance material for States on seamless RPAS integration into non-segregated airspace;
e) urge all States to actively participate in RPAS integration activities and assist those states who require guidance.
f) request that ICAO consider the duplication caused by the abbreviation UTM.

Strategic Objectives	Safety, Air Navigation Capacity and Efficiency

1. INTRODUCTION

1.1 The commercial applications and opportunities for Unmanned Aircraft System (UAS) operations at lower altitudes has seen an increased demand for airspace services across various sectors from inspection, survey, security monitoring, package delivery and movie production.

1.2 This soaring industry as well as enabling technologies present instant opportunities where positive business cases for an operating model that allows for these operations within the regulatory, operational, and technical environment otherwise known as the current Air Traffic Management System (ATMS).

1.3 UAS operational needs and expected benefits are driving public and private stakeholder partnerships, led by the Air Traffic and Navigation Services (ATNS) and the South African Civil Aviation Authority (SACAA) to either develop new or refine existing RPAS regulations and to also consider alternate means of RPAS management for South Africa.

1.4 This vision for UAS operations creates a common platform to realize innovative solutions through public-private partnerships and the leveraging of both ATM and RPAS technologies in support of the emerging UAS opportunities whilst ensuring a safe, secure and efficient ATMS for all users during all phases of flight.

1.5 South Arica as a contracting ICAO State is currently researching viable alternatives in the form of UTM or Anti Drone Systems in addition to an already existing regulatory framework, to ensure that RPAS accommodation and end state integration into controlled airspace is managed and implemented in accordance with the ICAO guidelines in a safe and efficient manner.

2. DISCUSSION

2.1. ICAO AND RPAS MANAGEMENT (ICAO DOC 10019)

2.1.1 ICAO defines the principles of ATM related integration and makes clear that the operational and equipage requirements of RPAS will be governed, as per manned aviation, by the class of airspace in which they will be operating and that RPAS operations should conform to the existing airspace requirements which include communications, navigation and surveillance requirements as well as separation standards.

2.1.2 ICAO also recognizes that whilst some RPAS may eventually integrate seamlessly into segregated airspace and be managed co-operatively with minimal or no impact to existing manned aviation from a safety and efficiency perspective, many RPAS may not.

2.1.3 South Africa seeks to ensure that in its obligatory mandate as an ICAO Contracting State that the fundamental ICAO guiding principles of seamless integration into the various airspace classes of intended operation is maintained by utilizing the respective mechanisms such as UTM and/or Anti Drone Systems to create an equitable and safe ATM system for all airspace users.

2.2 UTM AND ANTI DRONE SYSTEMS

2.2.1 Unmanned Aircraft Systems Traffic Management (UTM) has been identified as a possible enabler to allow for RPAS integration into the ATM system and is intended as a drone/RPAS/UAS traffic management system envisioned to be managed by a UTM Service Supplier that interfaces with the current ATM system in terms of data exchange.

2.2.2 UTM users and operators manage themselves in one or a network of UTM systems and rely on a data exchange protocol to utilise ATM related information within the UTM. Best practice is that ATC does not control UAS traffic in the UTM however the ANSP/Regulator is granted access to the UTM in real time and the respective database for monitoring, investigative and technology enhancement purposes.

2.2.3 UTM is intended as a safe space to facilitate the maturing of RPAS technology in order that the ICAO requirements to seamlessly integrate into controlled airspace are complied with, however whilst UTM may assist in providing a structured RPAS management system to allow for RPAS technology to evolve in a safe and efficient manner, said UTM will not adequately address the risk and threat presented by airspace infringements at major manned airports especially from non-co-operative UAS.

2.2.4 Anti-Drone Technology is a possible solution which seeks to address the threat to manned commercial operations and is a relatively new technology within the civilian environment which represents a significant capital expense that requires quantification against an acceptable level of risk to the existing ATM system and its users.

2.2.5 Certain Anti-Drone Systems function on the premise of radio frequency (RF) detection and by identifying the RF link, that seeks to intercept the link with the intention of deconflicting the RPA from other known users, manned or unmanned.

2.2.6 These systems may also determine the point of control as well as the RPAS operator/pilot position, which may result in enhanced enforcement, and apprehension of airspace violators thus proving a significant deterrent when referenced against the recent Gatwick Airport scenario.

2.3 RPAS REGULATIONS, ATM SERVICE PROVISON AND INDUSTRY COLLABORATION

2.3.1 RPAS management in South Africa is currently clearly defined according to the SA-CAR's and SA-CATS as per Part 101 which seeks to provide a structured regulatory framework for RPAS operations within the State and further details specific requirements for accommodating RPAS operations within manned non-segregated airspace under Flexible Use of Airspace (FUA) as administered by the Central Airspace Management Unit (CAMU), according to clearly defined regulations that may only be exempted by the South African Civil Aviation Authority (SACAA).

2.3.2 South Africa is currently in the process of RPAS operational risk analysis and developing a standardised set of emergency and contingency procedures for ATC in the unlikely event of severe RPAS controlled airspace infringements that may pose a threat/risk to the current ATM system.

2.3.3 The current functional FUA process as is administered by CAMU is intended to ensure equitable access to both the ATM system and non-segregated airspace by UAS operators who are compliant with Part101 that which is based on the ICAO SARPS as well as recommendations on RPAS integration and accommodation on the class of intended airspace operations.

2.3.4 Part 101 is intended as a dynamic set of regulations which is continuously evolving based on RPAS user requirements and lends its effectiveness to compliance by co-operative RPAS/UAS operators.

2.3.5 RPAS integration activities are receiving a multi-facetted approach regarding industry liaison and facilitation of regulatory reform as well as engagement and consultation on the most appropriate form of UAS management for South Africa.

2.3.6 The ATM/CNS Implementation Committee which is a state sanctioned forum established with the intention of ensuring that the ATM system remains in a robust state is one such vehicle that is facilitating industry discussions.

2.3.7 The recently established SARIF is a further initiative which seeks to provide a collaborative approach to RPAS management by facilitating multi-disciplinary and inter-governmental participation on RPAS management.

2.4 CONCLUSION

2.4.1 South Africa continues to work with its RPAS stakeholders to examine ways of further supporting initiatives that seek to facilitate a seamless State sanctioned RPAS integration

programme which supports the ICAO guiding principles and does not negatively impact on existing co-operative operators within the current ATM system.

2.4.2 The meeting is requested to agree to and support the actions as detailed in the Executive Summary above.

2.4.3 South Africa would like to highlight to the meeting and ICAO of the duplication of the abbreviation UTM which refers to Unmanned Aircraft System Traffic Management within the context of this Working Paper as well as UTM which refers to Universal Transverse Mercator (Mapping/projection).

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) take note of the information and activities regarding RPAS management;
b) take note of the expectations of UTM implementation;
c) recognize the work of South Africa in formulating and promulgating RPAS regulations;
d) request ICAO to action guidance material for States on seamless RPAS integration into non-segregated airspace;
e) urge all States to actively participate in RPAS integration activities and assist those states who require guidance;
f) request that ICAO consider the duplication caused by the abbreviation UTM.

-END-