



WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

Agenda Item 5: Emerging issues

5.2: Operations below 1000 feet

UNMANNED TRAFFIC MANAGEMENT AND AUTONOMOUS OPERATIONS

(Presented by Brazil)

EXECUTIVE SUMMARY

Nowadays, the appeal of the use of remotely piloted aircraft systems, or drones, is evident as an equipment to deliver goods in an agile way in many cities of the world.

The development method designed to provide, at least, an airspace control in this unmanned aerial environment, mostly below 400ft, has been named unmanned aircraft systems traffic management (UTM). Many UTM presentations show the possibility to make use of autonomous capacities to pave the way for this kind of airspace control system.

However, the *Manual on Remotely Piloted Aircraft Systems (RPAS)* (Doc 10019), describes that autonomous operations are not within the scope of the manual, and have excluded this kind of discussion from the Remotely Piloted Aircraft Systems Panel (RPASP) scope, and the unmanned market moves towards a wider use of some automation level.

Brazil is concerned about this demand in the near future, since it will require, at least, a high-level approach for its regulation, yet it is not currently being discussed by RPAS experts.

Action: The Conference is invited to agree to the recommendations in paragraph 3.4

1. INTRODUCTION

1.1 The *Manual on Remotely Piloted Aircraft Systems (RPAS)* (Doc 10019), establishes that an autonomous operation is an operation during which a remotely piloted aircraft is operating without pilot intervention in the management of the flight.

1.2 In section 1.5.2.b, Doc 10019 restricts the scope to exclude “autonomous aircraft and their operations ...” Lost link operations, by definition, are operating without pilot intervention (i.e., pilot out of the loop, section 2.13). Therefore, based on the descriptions stated in section 2.1 and the restriction addressed in this item, lost link operations are excluded from the RPAS Panel (RPASP) scope.

1.3 The unmanned aircraft systems (UAS) market appeals to promote the increase of VLL (verylowlevel) drone operations, in a limited space with other users and especially over cities, which stresses the need to discuss and decide on a reasonable way to provide organized and systematic UAS traffic management (UTM).

1.4 In order to provide a safe and orderly system of management for this demand, some air navigation services providers (ANSPs) and research and development institutions have conceived an operational as well as technical concept named UTM.

1.5 In accordance with the Global UTM Association concept, UTM is essential to enable the accelerated development and use of civilian UAS applications and will support UAS ranging from those with minimal avionics capability to those that are highly capable and/or autonomous.

1.6 The wide variety of drone operations features provides a challenge to current ATM and air traffic flow management (ATFM) to handle the drone operational application. In addition, the foreseen traffic density of drones is far beyond the capabilities of ATM systems in use, which were never designed to handle many situations of dense heterogeneous traffic with widely varying performance characteristics.

1.7 The UTM system could be developed using autonomy characteristics that include self-configuration, self-optimization and self-protection. As a consequence, many UTM concepts and studies on this issue revealed the need of some UAS autonomous level in order to provide management capabilities of this new aerial environment.

1.8 Some initiatives have been conducted by the States in order to develop this capability, as the “U-Space”, introduced by the European Commission, which will make denser traffic from automated UAS operations over longer distances possible, including over cities, therefore enabling a UAS service market.

2. DISCUSSION

2.1 By analysing the UTM stakeholders, it is noticed that most of them are national players, complying with the drone feature to operate in much more confined regions, constituting a domestic State issue.

2.2 However, the UTM autonomous operation could occur near an international airport, which could impact the airport operation in case of some emergency or a non-expected UAS behaviour, as it could occur in a transnational operation in regions where there are closer neighbouring States.

2.3 In addition, an equivocated UTM implementation could impact the national ATM systems, such as causing the misuse of transponder equipment or automatic dependent surveillance — broadcast (ADS-B), which could lead to a congestion in the surveillance interface.

2.4 Indeed, in the near future, ATM systems will be concerned with the large number of UAS flying, in an autonomous way, around air navigation routes and executing approach or departure procedures at international airports.

2.5 Differently from what was aforementioned in item 1.2, it could be considered important for ICAO to implement some SARPs in order to provide guidelines and standardize the use of UTM by Member States.

2.6 It is important to point out that the small UAS (SUAS) issues, initially treated as a domestic matter, such as UTM, were discussed by ICAO RPAS experts to provide the development of the Small Unmanned Aircraft Systems-Advisory Group (SUAS-AG). In this opportunity, it must be highlighted that such group made an exceptional work to provide the States with the best practices to implement rules on SUAS operations.

3. CONCLUSION

3.1 The UAS market appeals the States to implement a technical and operational environment to improve the use of UAS capabilities to a wide range of unmanned services.

3.2 To provide an orderly and coordinated environment for this purpose, the UTM concept has been developed, revealing the need of autonomous capabilities for the operations.

3.3 However, autonomous operations, which could impact the international airport operations, are not within the scope of discussion by ICAO RPAS experts.

3.4 By considering the information above, the Conference is invited to agree to the following recommendations:

That the Conference:

- a) evaluate the possibility of constituting a study group or an advisory group to discuss issues regarding unmanned aircraft systems traffic management (UTM) autonomous operations;
- b) recommend all interested States to share the knowledge obtained from UTM or autonomous operations initiatives;
- c) request ICAO to provide Standards and Recommended Practices (SARPs) or “best practices” related to UTM autonomous operations to harmonize the initiatives amongst the signatory States; and
- d) request the ICAO Regional Offices to actively cooperate with the States at the Regional Level *from development to implementation* of future UTM.

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