



**Twenty First Meeting of the Africa-Indian Ocean Planning and Implementation Regional  
Group (APIRG/21)  
(Nairobi, Kenya, 9 – 11 October 2017)**

**Agenda Item 5: Regional Air Navigation deficiencies**

**5.2. Industry initiatives and other air navigation matters**

**CHALLENGES WITH RPAS OPERATIONS IN THE ATM ENVIRONMENT**

*[Presented by ASECNA]*

**SUMMARY**

The purpose of this working paper is to highlight the challenges of introducing remotely piloted (RPA) aircraft into the ATM environment. It presents the experience of ASECNA in the management of these aircraft and proposes some solutions for their management under acceptable safety conditions, in the absence of a mature normative and regulatory framework.

**Actions by the meeting:**

The meeting is invited to :

- a) Note the need, in the absence of a mature regulatory and regulatory framework for civilian RPAS operations, to take accommodation measures to minimize the safety risk associated with RPAS operations, in particular by:
  - Capacity-building of States, with the support of ICAO Regional Offices, for the establishment of **minimum** regulation and procedures in AFI States;
  - The issuance of a special authorization for each RPAS operation, based on a risk assessment and which should ensure an acceptable level of safety, taking into account in particular the communication issues between the different components of the RPAS, communication with the ATC , the detection and avoidance of "normal" traffic and the management of contingency situations;
  - The development and introduction of training modules on RPAS, in the training programs of schools, with the support of the AATO;
  - The establishment of a mechanism for mutual assistance between regulatory authorities at the regional level by designating "champions";
- b) Recommend to States to strengthen civil-military cooperation, particularly where there are operations involving the RPAS.

*Strategic Objectives*

This Working Paper is related to Strategic Objectives: A

References:

Art 8, Chicago convention;  
Annex 2  
Doc 10019, RPAS manual  
State letter Ref/AN13/55-17/38 du 20 mars 2017

## 1. INTRODUCTION

1.1. Operations of remotely piloted aircraft (RPAs) and drones have undergone considerable development in recent years, both in the civilian and military fields. This strong activity is linked to the fact that vehicles offer an impressive catalog of services in the fields of surveillance, transport, detection, protection of infrastructures, research, aerial photography, blood distribution , military combat etc ...

1.2. Annex 2 to the Chicago Convention on International Civil Aviation defines the concept of remotely piloted aircraft (RPA) as "an unmanned aircraft driven from a remote control station". The Remotely piloted Aircraft System (RPAS) is defined as the combination of:

- the remotely piloted aircraft;
- Associated remotely piloting station or stations;
- the necessary command and control links (C2 Link);
- any other component specified in the approved type design;

1.3. The fact that these larger aircraft have no pilot on board is a real challenge to integrate them into the current ATM environment with rules governing the management of piloted aircraft ;

1.4. The operations of drones (usually unmanned aircraft with a mass of less than 25 kg) by people who know very little about the rules and procedures governing aviation becomes an increasingly important safety risk for the “normal” aviation;

1.5. The airspaces and aerodromes managed by ASECNA in its member states are also experiencing increased demand for RPAS operations. In addition to aerial photography, this strong demand concerns military operations in the context of international operations in the context of conflicts and the fight against terrorism; This makes the situation more complex, in a region where civil-military coordination remains a challenge;

1.6. There is increasing pressure to integrate these aircraft into non-segregated airspaces in order to maximize their benefits, but major constraints remain to be overcome to ensure the safety of piloted aircraft; which is, in fact, the most important issue.

## 2. DISCUSSIONS

### 2.1. Regulation framework

2.1.1. The ICAO normative framework, arrangements and guidance for current RPAS operations are mainly contained in Annex 2 to the Chicago Convention, the RPAS manual (Doc 10019), and a Toolkit on the RPAS , on ICAO website;

2.1.2. It is established that the framework for RPAS operations requires the revision of all annexes to the ICAO Convention, with the exception of Annex 5;

2.1.3. The guidance developed by ICAO, in particular Doc10019, is insufficiently known to civil aviation professionals;

2.1.4. Most of the states do not have a regulatory framework or guidance for RPAS operations, and as a result, there are rarely procedures at the level of air navigation service providers to oversee these operations.

## **2.2. Technical and operational constrains**

2.2.1. The lack of training of ATCOs on the RPAS concept, the performance of these aircraft and the RPAS management procedures;

2.2.2. The concern of maintaining bilateral communications between the pilot station and the ATC, of quality conform to the required communication performance (RCP);

2.2.3. Management of emergency situations, in particular in the event of loss of communication between the pilot station and the RPAS;

2.2.4. RPAS operators are unfamiliar with the civil aviation environment, since in general there is no certification or license;

## **2.3. Experience of ASECNA for RPAS military operations**

2.3.1. Some Member States of ASECNA register areas with significant activity of RPAS for military use. Remotely pilot stations are installed at some of the relevant aerodromes;

2.3.2. The evolution of these aircraft in the CTR and even the TMA, before joining the segregated airspace, constitutes a risk for the safety of the piloted aircraft and some safety events were recorded in 2015 and 2016 including an AIRPROX. They are mostly related to technical communication and detection defects or technical breakdowns on the runway at the level of one of the components of the RPAS;

2.3.3. The strengthening of civil-military coordination at these sites has enabled the set-up of procedures for the establishment of bilateral (VHF and telephone) communication between the remotely pilot stations and the ATC, activation of the SSR transponders outside the segregated airspace, monitoring of ATC frequencies even in the area of operation;

## **2.4. Experience of ASECNA for RAPS general aviation operations**

2.4.1. Requests for the use of RAPS for civil purposes are made for low-level operations, typically around 300 to 500 ft, in VLOS (visual line of sight) and radio line of sight (RLOS). These operations are authorized for days and under VMC conditions;

2.4.2. In the absence of regulation, in some cases a protocol is signed between the operator of the RPAS, the ATC and the Civil Aviation Authority, to define the conditions under which the operation must be performed;

2.4.3. Sometimes special authorizations are issued by the military authorities, even if the operation meets civilian needs, as some aviation authorities are reluctant to authorize such operations in the absence of a regulatory framework.

2.4.4. In all cases, the sectors of evolution in altitude and azimuth are allocated to them during the mission devolved to them and published in the form of NOTAM.

## **3. CONCLUSION**

3.1. The integration of RPASs in the ATM environment is a challenge that the international aviation community faces over the next few years in view of the strong demand for this new family of aircraft and potentially important socio-economic impact.

3.2. In order to achieve this, the RPAS system must be able to operate in a mixed airspace, identical to the aircraft piloted, whether in IFR or VFR. It must have a limited impact on other

airspace users and must be in compliance with ATM and CNS regulations depending on the class of airspace in which it operates.

3.3. Pending the establishment of the ICAO standard-setting framework and guidance, an accommodation strategy should be adopted by creating the minimum conditions to ensure an acceptable level of safety.

3.4. In the case of unmanned military aircraft operations , they require more civil-military coordination, particularly on the African continent, where military operations are most often international and multi-national;

#### **4. ACTION BY THE MEETING**

##### **The meeting is invited to:**

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  - Capacity-building of States, with the support of ICAO Regional Offices, for the establishment of minimum regulation and procedures in AFI States;
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**END.**