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COMMITTEE A

Agenda Item 5: Emerging issues

5.3: Remotely piloted aircraft system (RPAS)

5.5: Other emerging issues impacting the global air navigation system including unmanned aircraft systems (drones), and supersonic and commercial space operations

**BRAZILIAN REGULATORY EXPERIENCE DEALING WITH
UNMANNED AIRCRAFT SYSTEMS**

(Presented by Brazil)

EXECUTIVE SUMMARY

This paper presents the Brazilian experience in regulating, certifying and authorizing unmanned aircraft operations. Brazilian aviation authorities have been dealing with unmanned aircraft since 2009. The development of specific regulations allowed over 40,000 unmanned aircraft to be registered in less than one year, provided for the creation of a new procedure for assessing airworthiness of unmanned aircraft engaged in medium-risk operations. It also enabled unmanned aircraft users to request and obtain authorization to access Brazilian airspace via an online system.

1. INTRODUCTION

1.1 Unmanned aircraft are a new type of aircraft that presents many new challenges for regulators around the world to enable their operations without compromising safety.

1.2 Brazilian civil aviation authority (National Civil Aviation Agency – ANAC) and aeronautical authority (Department of Airspace Control – DECEA) have been challenged to address this new emerging issue as the demand for the use of unmanned aircraft has experienced a notable rise since 2009.

1.3 New regulations and supporting processes and systems were developed to provide adequate means to deal with this demand.

2. DISCUSSION

History background

2.1 Since 2009, Brazil has received requests for access to Brazilian airspace by unmanned aircraft. At the beginning, handled on a case-by-case, access was allowed after an analysis of the guidelines of each regulatory entity (ANAC, DECEA and the Brazilian telecommunications agency – ANATEL).

2.2 In 2010, ANAC received its first formal demands related to unmanned aircraft users. First, a local company interested in developing unmanned aircraft for civilian use requested an experimental certificate of airworthiness. And then the Federal Police Department requested authorization to operate a large (MTOM over 1,000 kg) unmanned aircraft which has been purchased to be employed primarily in border surveillance operations.

2.3 Brazilian code of aeronautics classifies aircraft in civilian and military, the latter being those from Armed Forces. That means that all other State aircraft in Brazil (including those from the Federal Police Department) fall under responsibility of ANAC.

2.4 As this operation presented many unique features not properly addressed in regulations in place by that time, ANAC established a joint working group with DECEA, ANATEL, the Brazilian Air Force unity responsible for addressing airworthiness of military aircraft (DCTA-IFI) and the Federal Police Department itself to discuss the issue.

2.5 As result of this work, ANAC issued Decision No. 127 on 29 November 2011 that authorized the Federal Police Department to operate unmanned aircraft, establishing the conditions for such operation and creating provisions for the issuance of permits to flight and remote pilot licenses.

2.6 In parallel to this work, ANAC also developed material to provide guidance to any person interested in obtaining an experimental certificate of airworthiness for unmanned aircraft. Supplementary Instruction No. 21-002 Revision A was issued on 5 October 2012.

2.7 In 2013, ANAC and DECEA started working in the development of a new rule specific for enabling unmanned aircraft operations in Brazil. As part of the development of the rule, ANAC promoted two workshops (one in São Paulo in September 2013 and the second one in São José dos Campos in February 2014) to provide an opportunity for interested parties to present their visions on the issue and jointly discuss the development of the rule in an early stage.

2.8 A public consultation on the proposed rule was conducted between 3 September to 2 November 2015 resulting in 277 contributions being sent to ANAC.

2.9 Also in 2015, following the publication of the *Manual on Remotely Piloted Aircraft Systems (RPAS)* (Doc 10019), DECEA published ICA 100-40 (Instruction of the Aeronautics Command). This document defined the rules for access to airspace, making clear the need to follow the guidelines of each regulatory entity, aiming at a safe and controlled access to airspace.

2.10 On 2 May 2017, the ANAC Board of Directors issued Resolution No. 419 which approved Brazilian Special Civil Aviation Regulation (RBAC-E) No. 94 entitled “*General Requirements for Unmanned Aircraft of Civilian Use*” and amended Brazilian Civil Aviation Regulation (RBAC) No. 67 entitled “*Requirements for Issuance of Aeronautical Medical Certificates, Accreditation of Physicians and Clinics and Agreement with Public Entities.*”

RBAC-E No. 94 - Basic concepts

2.11 Some of the key definitions provided in RBAC-E No. 94 section E94.3 are presented below:

- (a) *model aircraft* means any unmanned aircraft for recreation purposes;
- (b) *remotely-piloted aircraft* (RPA) means unmanned aircraft piloted from a remote pilot station for any purpose other than recreational;
- (c) *area distant from third-parties* means an area determined by the operator from a certain horizontal distance from the unmanned aircraft while in operation in which uninvolved and unaccompanied personnel are not subject to unacceptable safety risk. Under no circumstances the distance of the unmanned aircraft may be less than 30 horizontal meters of persons not involved and not consenting to the operation. The 30-meter limit does not need to be observed if there is a mechanical barrier strong enough to isolate and protect uninvolved and non-consenting persons in the event of an accident; and
- (d) *consenting person* means a person whose presence is not indispensable for a successful unmanned aircraft operation to occur but at his/her own will and at his own risk expressly agrees that an unmanned aircraft operates close to him or their legal guardians without observing the criteria of areas distant from third parties.

2.12 The rule classifies RPAS as following:

- (a) Class 1: RPA with maximum take-off weight greater than 150 kg;
- (b) Class 2: RPA with maximum take-off weight greater than 25 kg and less than or equal to 150 kg; and
- (c) Class 3: RPA with maximum take-off weight of 25 kg or less.

2.13 A classification scheme based exclusively on the aircraft maximum take-off weight was adopted in order to facilitate the understanding and implementation of the rule.

Registration

2.14 In order to facilitate the registration of some types of unmanned aircraft, ANAC developed a new dedicated system called SISANT (System for Unmanned Aircraft) which was created in close coordination with the development of new the rule itself, being deployed on the same date the rule was published.

2.15 SISANT enables operators and owners of model aircraft and RPAS Class 3 intended solely for VLOS operations up to 400 feet above ground level (AGL) to inscribe their aircraft through a cost-free and entirely online process. At the end of the process, a certificate of inscription is automatically generated and the inscription number shall be marked in the aircraft.

2.16 Only two months after the release of SISANT, over 13,000 unmanned aircraft (over 5,000 of which for professional use) were already inscribed in the system. Since then, ANAC has

observed a steady rise of around 3,000 aircraft being inscribed each month that amount for a total of over 40,000 unmanned aircraft inscribed in less than one year.

2.17 Other remotely pilot aircraft (those which operate beyond visual line of sight or above 400 feet or have a maximum take-off weight larger than 25 kg) are required to comply with the traditional aviation registration rules. A new category of registration named “R01” was created to facilitate obtaining RPAS-specific data and statistics.

2.18 Unmanned aircraft below 250 grams are not required to be registered/inscribed or marked in any way.

Airworthiness

2.19 Considering operational restrictions established in RBAC-E No. 94, ANAC does not require model aircraft or RPA Class 3 (MTOW below 25 kg) operating exclusively on visual line-of-sight below 400 feet AGL to have any sort of airworthiness approval and are to a certain extent equivalent to category “A” (JARUS terminology) or “open” (EASA terminology in Opinion No. 01/2018).

2.20 All RPAS Class 1 (MTOW above 150 kg) are required to comply with RBAC No. 21 and therefore fall under category “C” (JARUS) or “certified” (EASA).

2.21 ANAC established in RBAC-E No. 94 a new process, which was named “design authorization”, for dealing with aircraft design for operations in category “B” or “specific”.

2.22 The new process is very similar to type certification but offers a more flexible approach for dealing with administrative issues. Furthermore, a more narrow set of technical requirements that have been developed using a more performance-based less-prescriptive approach to facilitate their implementation and not preclude technical solutions.

2.23 ANAC issued material to provide guidance and acceptable means of compliance on both procedural (Supplementary Instruction No. E94-001 Revision A) and technical (Supplementary Instruction No. E94-002 Revision A) issues.

2.24 One of the goals of this new process is to reduce the time necessary for an applicant to obtain a design approval from around three years (type certification for a small manned aircraft) to about six months. This was considered especially important in a market where products are not expected to remain viable and attractive for as long as traditional manned aircraft.

2.25 There have been applications for eight different models of RPAS (including from foreign manufacturers). The first design authorization was issued on 6 June 2018 for RPAS model Arator 5B; developed and manufactured by Xmobots.

2.26 It is important to notice that even though ANAC considered desirable and technically adequate to employ a classification scheme more “risk-oriented” (considering other elements such as maximum speed, operation peculiarities, maximum altitude, etc), this was considered not to be practical at that early stage.

Operations

2.27 The operations are allowed in areas distant from third-parties, which means areas determined by the operator from a certain horizontal distance from the unmanned aircraft while in

operation in which uninvolved and unaccompanied personnel are not subject to unacceptable safety risk. Under no circumstances the distance of the unmanned aircraft may be less than 30 horizontal meters of persons not involved and not consenting to the operation. The 30-meter limit does not need to be observed if there is a mechanical barrier strong enough to isolate and protect uninvolved and non-consenting persons in the event of an accident, which is applicable for a small unmanned aircraft system (UAS).

2.28 The 30-meter limit also doesn't have to be observed in operations of a public institution engaged in security, police, tax and customs inspection, to fight vectors of disease transmission, civil defence and/or firefighting, or of an operator in the service of one of these.

2.29 The autonomous operation of unmanned aircraft is prohibited.

2.30 All operations of unmanned aircraft of non-recreational use above 250 grams maximum take-off weight must be insured against damage to third parties except for operation of aircraft belonging to entities controlled by the State.

2.31 Non-recreational operators also have to provide an operational risk assessment. Means of compliance: IS E94-003A.

Flight crew licensing

2.32 All Class 1 or 2 RPA remote pilots must hold a valid 5th Class Aeronautical Medical Certificate (CMA). The 5th Class CMA was designed based on the 3rd Class CMA specifically for the RPAS operators, but who holds a valid 1st, 2nd, 3rd Class CMA can present it instead.

2.33 All remote pilots engaged in operations above 400 feet above ground level or operating in Class 1 or 2 RPAS operations (above 25kg PMD) must have a license and rating issued or validated by ANAC.

ICA 100-40 - Basic concepts

2.34 ICA 100-40 treats specifically the access to Brazilian airspace by unmanned aircraft in civilian operations.

2.35 In its text, it clarifies the competence of each regulator and defines the classes of the aircraft and the types of operation in the same way as the RBAC-E94.

2.36 In addition to ICA 100-40, Brazil has adopted other Aeronautical Information Circulars in order to guide the access to airspace by using unmanned aircraft for public security, government entities, civilian defense and armed forces.

Registration

2.37 The registration of pilots and aircraft is done by ANAC.

2.38 DECEA has an online system called SARPAS which keeps a database of pilots and unmanned aircraft registered in ANAC.

2.39 All aircraft above 250g has to be registered in ANAC and in DECEA to access Brazilian airspace outside of specified areas to model aircraft operations.

Operations

2.40 Basically, in order to access Brazilian airspace, a pilot must declare his flight intentions in terms of height and distance from airports.

2.41 Some operations are simply reported as long as they are declared in areas that will not impact safety or the development of air navigation.

2.42 Approximately 80per cent of the requested operations are performed up to 100 feet, using Class 3 RPA, at a safe distance from the aerodromes.

2.43 In 2018, Brazil authorized the operation of a drone with 1,250 kg of PMD, which carried out a flight of 5 hours, maintaining the FL130, with block of levels segregated for the aircraft.

Enforcement

2.44 DECEA works together with the public security forces, in order to inhibit unauthorized operations.

2.45 Pilots and contractors have been fined for having carried out operations without obeying the rules.

2.46 In addition, some prison sentences have already been inflicted when pilots are seen operating without observing the planned regulations.

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