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Agenda Item 33: Aviation safety and air navigation monitoring and analysis

**REMOTELY PILOTED AIRCRAFT SYSTEMS (RPAS) AND ACCESS
TO THE BRAZILIAN AIRSPACE**

(Presented by Brazil)

EXECUTIVE SUMMARY

The following paper presents the development of the Brazilian rules for RPAS activity and the projects involved in the improvement of this new aeronautical segment which has been carried out by DECEA.

<i>Strategic Objectives:</i>	This working paper relates to the Safety Strategic Objective
<i>Financial implications:</i>	Not applicable
<i>References:</i>	Doc 10019, <i>Manual on Remotely Piloted Aircraft Systems (RPAS)</i> ICA 100-40 – RPAS & Access to the Brazilian Airspace

1. INTRODUCTION

1.1 Unmanned Aircraft Systems (UAS) and Remotely Piloted Aircraft Systems (RPAS) are a new global aviation component that operators, industry and various international organizations are studying in order to promote their full integration into the Airspace.

1.2 Based on amendments to the Annexes to the Chicago Convention and especially on the *Manual on Remotely Piloted Aircraft Systems* (Doc 10019), Brazil developed the DECEA RPAS Committee and the Aeronautical Command Instruction (ICA) 100-40, thus enabling the coordination and regulation of the access of Remotely Piloted Aircraft Systems to the Brazilian airspace and the RPAS ATM Integration Project.

2. RPAS AND BRAZILIAN AIRSPACE ACCESS

2.1 DECEA RPAS Committee

2.1.1 In order to support the development of the newest international aeronautical segment of RPAS in Brazil, maintaining the high level of safety in air navigation, the Brazilian Department of Airspace Control (DECEA) created the RPAS Committee.

2.1.2 DECEA RPAS Committee was implemented by Aeronautical Command Guideline (DCA) 63-4, which governs the RPAS Committee framework. The RPAS Committee is basically formed by DECEA and Brazilian ATS Centers (DECEA Regional Units), and each regional unit has its own internal committee.

2.1.3 DECEA Regional Units (CINDACTA and SRPV-SP) Committees are responsible for analyzing the impact on air navigation of RPAS activity as requested by operators. They provide authorization for segregated operations, and create segregated areas for RPAS operations, when applicable, and respective NOTAM.

2.1.4 DECEA Committee is responsible for: a) supervising the DECEA Regional Units Committees; b) coordinating meetings with all stakeholders (industry, academy, operators etc.) in order to provide ways to improve this aeronautical segment; c) developing the RPAS regulations in Brazil; and d) coordinating the RPAS ATM Integration Project.

2.2 REGULATION

2.2.1 ICA 100-40 main objective is to serve as a guide to allow a complete and safe activity of a Remotely Piloted Aircraft (RPA) in Brazilian airspace and aerodromes, both operationally and technically, although not sharing them with manned aircraft. Such Instruction also has a strong educational appeal, helping to prevent violations, strengthen the safety awareness and regulate all activities involved in RPAS operation.

2.2.2 Generally, RPAS can only access the Brazilian Airspace after the issuance of a special authorization given by the DECEA Regional Unit responsible for the airspace in which this flight will be conducted and according to the terms of such authorization.

2.2.3 Except for extraordinary conditions, as specifically mentioned in ICA 100-40, the use of airspace by RPA will only be authorized by the accommodation of this technology through the creation of

a Special Use Airspace, with well-defined coordinates and volume, duly published in NOTAM, or in test areas as contained in AIP Brazil.

2.2.4 Operational and performance requirements of Communication, Surveillance and Navigation systems for RPAS shall be, as far as possible, equivalent to those established for manned aircraft and according to the class of airspace within which it is intended to operate and compatible with the air traffic service provided.

2.2.5 Each remote pilot can only fly one RPA at a time from a Remote Pilot Station (RPS), being responsible for all phases of flight and there shall not be temporal pilot simultaneity, even at different stations. The remote pilot-in-command is responsible for conducting the RPA flight safely, either under normal conditions or in emergencies.

2.2.6 The operation from shared aerodromes with manned aircraft shall only be allowed, if authorized by the respective aerodrome administrator and local ATS unit (if any), subject to the halting of manned operations on the ground and in the traffic pattern, as: a) Takeoff: from the time of activation of the RPA engines to the exit from the traffic pattern; and b) Landing: from the time of entering the traffic pattern to the full stop of the RPA and engine cut-off.

2.2.7 Except for exceptional circumstances, which should be duly explained in the request by the applicant and considered by the competent authority, VLOS operations shall occur only during the day, therefore, restricting night operations.

2.2.8 Due to unique features, such as varying sizes and configurations and not having crew on board, a few RPA can be engaged to operate in areas and conditions where manned aircraft are not able to fly or approved to operate. These Operations include the interiors of buildings, structures close to the ground or water, and in dangerous areas and hazardous conditions. These features are characterized as extraordinary conditions by ICA 100-40.

2.2.9 The RPA flight operation outside Segregated Airspace without the need to create a Restricted Area and its subsequent publication in NOTAM shall be authorized once all of the following conditions are satisfied:

EXTRAORDINARY CONDITIONS		
CLASS	MTOW 0 – 2Kg	MTOW 2 – 25Kg
TYPE OF OPERATION	VLOS	VLOS
HEIGHT (AGL)	100 ft	400 ft
SPEED	30 kts	60 kts
DISTANCE FROM RPS	300 meters	500 meters
DISTANCE FROM AERODROMES	> 03 NM	> 05 NM
DISTANCE FROM PEOPLE, ANIMALS, BUILDINGS, etc, (meters)	30 meters	30 meters

DAYTIME	SUNRISE UP TO SUNSET	SUNRISE UP TO SUNSET
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2.3 Flights within buildings and enclosed constructions, even partially, including gyms, stadiums and arenas in the open (up to the vertical edge of the side structure) are the sole responsibility of the owner and must be authorized by them, since they are not considered "airspace" under the responsibility of DECEA, not being regulated by this Instruction.

2.4 Given the issues related to the reliability of the steering linkage and the ability to detect and avoid, in principle, the use of Remotely Piloted Aircraft Systems will not be allowed over populated areas or agglomerations of people, except those directly involved in RPAS operation.

2.5 The operation over populated areas may be exceptionally authorized, if:

- a) the C2 Link has been certified as established by ANATEL (National Telecommunications Agency) regulations;
- b) the RPAS (RPA and associated systems) is fully certified (airworthiness certificate, type certificate and others required), according to the regulations established by ANAC;
- c) the pilot is licensed and has valid qualification for operation of the respective RPAS, as established by ANAC regulations;
- d) the Operator is certified under ANAC regulations and has an Operational Safety Management System (SGSO) established under its regulation; and
- e) s Safety Risk Analysis, duly approved by Brazilian Civil Aviation Agency (ANAC), is submitted to the DECEA Regional Unit responsible for airspace where flight is to be conducted. This document should include the analysis of the risks involved, including proper mitigating actions so that these risks become acceptable for safe operation.

3. **RPAS ATM INTEGRATION PROJECT**

3.1 In order to improve the RPAS operations in Brazil, meeting the users' demands and maintaining the highest level of safety, DECEA RPAS Committee developed the RPAS ATM Integration Project. The goal of the RPAS ATM Integration Project is to allow the analysis of RPAS deployment within non-segregated airspace to obtain data related to technical and operational requirements for this activity, maintaining the highest level of aviation safety in the Brazilian airspace.

3.2 DECEA has established a few Operational Letters of Agreement with State Units in order to provide safe RPAS operation, such as the Fire Department, the Brazilian Army and others.

3.3 DECEA RPAS Committee has conducted some tests with the deployment of RPAS at visual nav aids inspection, as PAPI and VASIS.

3.4 Furthermore, DECEA RPAS Committee has coordinated Cooperation Agreements with Brazilian RPAS industry and academic institutes in order to foster this aeronautical segment in Brazil.

4. **CONCLUSION**

4.1 Brazil, aligned with ICAO, is working hard in order to support this new aeronautical segment, maintaining the air navigation safety as paramount. And Doc 10019 is considered a "living" document, ICA 100-40 also does not intend to exhaust the subject, given that some of the aforementioned issues are under study around the world. At the moment, its purpose is, together with other national agencies, such as ANAC and ANATEL, to enable its operation in the country within the high safety standards already in place, a hallmark of the Brazilian Airspace Control System .

4.2 DECEA RPAS Committee has studied and conducted activities to provide DECEA with data that enables the development of rules and operational procedures aiming to provide flexibility for RPAS users to access Brazilian airspace with the highest level of safety.

4.3 In this context, DECEA is available to exchange data and studies on RPAS with other ANSP in order to develop the remotely piloted aeronautical segment.

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