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**AIC**
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# USE OF CONTROLLER-PILOT DATA LINK COMMUNICATIONS (CPDLC) IN THE BRAZILIAN CONTINENTAL AIRSPACE

*Period of validity: from 02 APR 2020 TO PERM*

## 1 PRELIMINARY ARRANGEMENTS

### 1.1 PURPOSE

This Aeronautical Information Circular (AIC) is intended to provide the basic information regarding the implementation of Controller-Pilot Data Link Communications (CPDLC) in the Brazilian continental airspace.

### 1.2 SCOPE

This Circular applies to all persons responsible for the operation of the CPDLC, as well as SISCEAB users, as appropriate.

### 1.3 CONCEPTS

ATC CLEARANCE - Permission for an aircraft to operate under conditions specified by an ATC unit.

CONTROLLER-PILOT DATA LINK COMMUNICATION - A means of communication between controller and pilot, using data link for ATC communications.

DATA LINK COMMUNICATION - Transmission and reception of information by means of digitally modulated signals.

FANS 1/A - Future air navigation systems as defined by EUROCAE ED-100A / RTCA DO-258A, or earlier standards that have defined FANS 1/A capability.

NOTE: FANS 1/A generally means that the aircraft data link system, ATS unit ground system and communication service provision meet the standard. In certain cases, a specific reference is made to a particular type of FANS 1/A aircraft as follows:

(a) FANS 1/A+ means that the aircraft fully complies with Revision A of the standard and includes the message latency monitor; and

b) FANS 1/A ADS-C means that the aircraft complies with the ADS-C application, but does not include the CPDLC application.

AIR TRAFFIC SERVICES - Generic expression which applies, depending on the case, to flight information, alert, air traffic advisory and air traffic control services (area control, approach control or aerodrome control).

**1.4** ABBREVIATIONS

| | |
|---|---|
| ATC | Air Traffic Control |
| ATM | Air Traffic Flow Management |
| ATS | Air Traffic Service |
| CGNA | Air Navigation Management Center |
| CINDACTA | Integrated Center for Air Defense and Air Traffic Control |
| CISCEA | Airspace Control System Implementation Commission |
| CNS/ATM | Communications, Navigation and Surveillance/Air Traffic Management |
| CPDLC | Controller-Pilot Data Link Communication |
| DECEA | Department of Airspace Control |
| DTCEATM-RJ | Airspace Control Detachment and Rio de Janeiro Telematics |
| FANS | Future Air Navigation System |
| FIR | Flight Information Region |
| FL | Flight Level |
| FMS | Flight Management System |
| ICEA | Airspace Control Institute |
| ICAO | International Civil Aviation Organization |
| OM | Military Organization |
| PIRG | Regional Planning and Implementation Groups |
| SATCOM | Satellite Communication |
| SISCEAB | Brazilian Airspace Control System |
| TMA | Terminal Control Area |
| VDL | VHF per Data Link |

## 2 INTRODUCTION

### **2.1** BACKGROUND

The aviation system is rapidly evolving to solve problems of volume and complexity that are growing at an exponential level, not only in Brazil, but around the world.

In the early 1980s, the ICAO Council, of which Brazil is a member, recognized that the existing form of provision of Air Traffic Services (ATS) and the structure of the air

navigation system in general would be limiting aviation growth, and inhibiting the implementation of improvements in safety, efficiency and regularity of air operations.

At the 10th Air Navigation Conference, held in September 1991, it was recommended that ICAO should develop a global plan that would allow the planning and implementation of future CNS/ATM systems through PIRG. In this regard, ICAO has developed Document 9750 for the CNS/ATM Systems (GANP - Global Air Navigation Capacity and Efficiency Plan).

Subsequently, it was considered that technology was not an end in itself and that a complete concept for an integrated Global ATM System based on clearly established operational requirements would be required. The Global ATM Operational Concept, prepared by ICAO in response to the above needs, was approved in 2003 by the 11th Air Navigation Conference and published as Document 9854 AN/458.

The new CNS technologies and the aforementioned Global ATM Operational Concept bring about significant changes in the traditional way of providing air navigation services. The implementation of new processes and technologies for the safety and efficiency of air operations requires consideration of additional knowledge required by users and operators.

**2.2** CONTINENTAL CPDLC

CPDLC is the means of communication between air traffic controllers and pilots via data link for ATS communications. The CPDLC includes a series of textual messages for issuing clearances, and providing information and making requests that correspond to the standard phraseology used in radiotelephony.

NOTE: Standardized CPDLC message elements and free text messages are described in a specific DECEA Publication (MCA 100-13).

Currently, Controller-Pilot Data Link Communication (CPDLC) is employed at the Atlântico FIR, as the primary means for communications. DECEA, in order to follow the philosophy of implementation of new technologies, as proposed by ICAO, established the LANDELL Project for the operationalization of Controller-Pilot Data Link Communication (CPDLC) in the Brazilian continental airspace of operational interest as an additional means to voice communications, VHF. The main objectives of this initiative are:

a) To enable the improvement of the safety performance level by mitigating misunderstanding problems due to noise, interference, language barriers, among others;

b) To improve the efficiency of the air-ground communications system by employing CPDLC as an additional means of voice communications;

c) To reduce workload by enabling increased airspace capacity through automating actions and preformatted messages;

d) To enable the loading of en-route clearance information via CPDLC messages directly into the FMS, minimizing the potential for data entry errors during ATC clearance; and

e) To enable the development of modern concepts such as those associated with Trajectory Based Operations (TBO) and 4D Trajectories (4DT).

The expected benefits from this implementation are significant and the user is expected to be able to provide a more efficient and modern air traffic service. The initial use of CPDLC in continental airspace will be restricted to routine situations that do not require prompt action in the provision of air traffic services. Any situation requiring prompt response from either party shall be by VHF.

### **2.3** TECHNICAL ASPECTS OF DATA LINK SERVICES

CPDLC in the Brazilian continental airspace will be provided through a terrestrial communications infrastructure operated by SITA On Air (SITA), limited by Data Link FANS 1/A and FANS 1/A+ Systems. It will be primarily contingent upon the realization of air-ground communications through VDLm2 stations throughout the airspace under Brazilian aeronautical jurisdiction above FL245.

In this context, in order to participate in this new operational scenario and access the resulting benefits, aircraft will need to be properly equipped with Data Link avionics and the CPDLC FANS 1/A or FANS 1/A+ application.

## **3 THE LANDELL PROJECT**

The LANDELL Project was structured as a multidisciplinary team consisting of air traffic controllers, ATM specialists, communications experts, engineers, systems analysts and DECEA operational safety risk management specialists, as well as representatives of the aeronautical community.

### **3.1** CPDLC CONTINENTAL IMPLEMENTATION IN BRAZIL

SCENARIO OF APPLICATION

CPDLC will be deployed in mixed airspace, i.e., aircraft traffic with and without Data Link/CPDLC capability. Thus, fleet qualification will not be immediately required as an indispensable factor for flights in the respective airspaces. There is no CPDLC mandate.

The initial operation of the CPDLC is expected to begin in June 2021, in sectors 1, 2, 3, 4, 5, 6, 9 and 10 of the Recife FIR, and in the Belém Region of the Amazônica FIR, starting from FL310, as shown in Figure 1 - Initial Scenario of the Continental CPDLC Application, as they present airspace, aircraft equipment and communication network features that would facilitate its adoption. Figure 1 - Initial Scenario of the Continental CPDLC Application 1

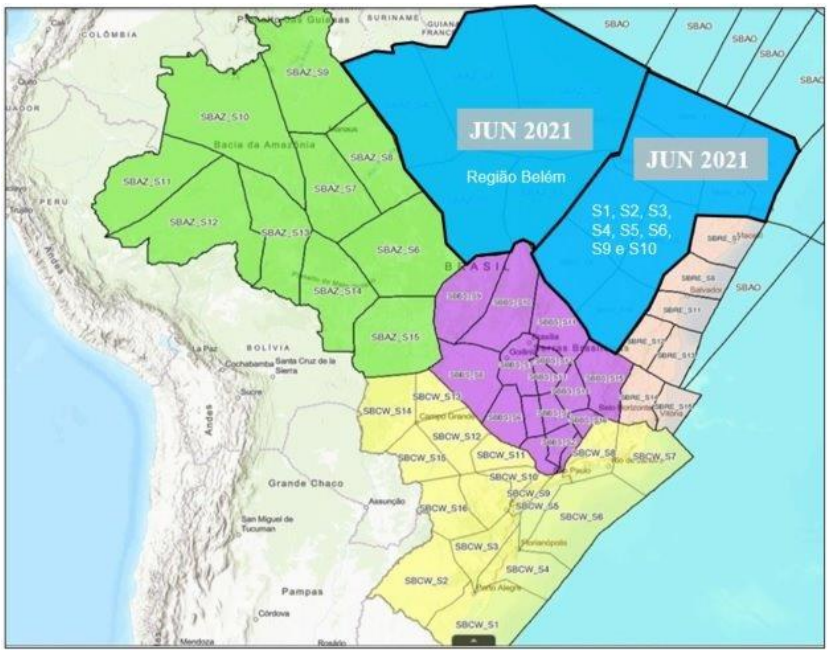
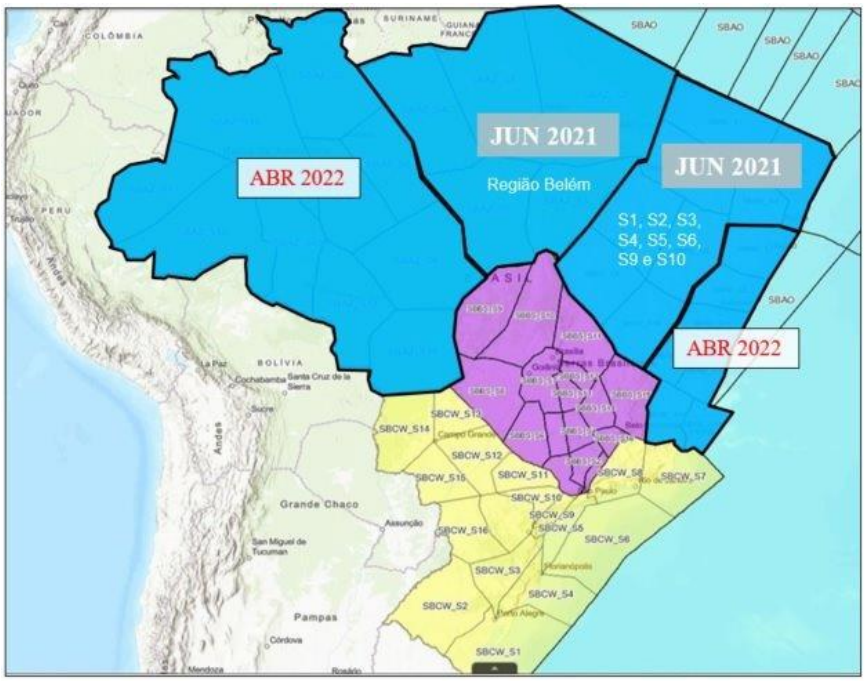



Figure 1 - Initial Scenario of the Continental CPDLC Application 1

Subsequently, operationalization will expand to other sectors of the Amazon FIR and Recife FIR, as shown in Figure 2.




2 - CPDLC application scenario, with coverage across the Amazon FIR

Subsequently, the use of CPDLC will be expanded to other areas, according to the identified operational demand, in accordance with the plan presented in Figure 3.

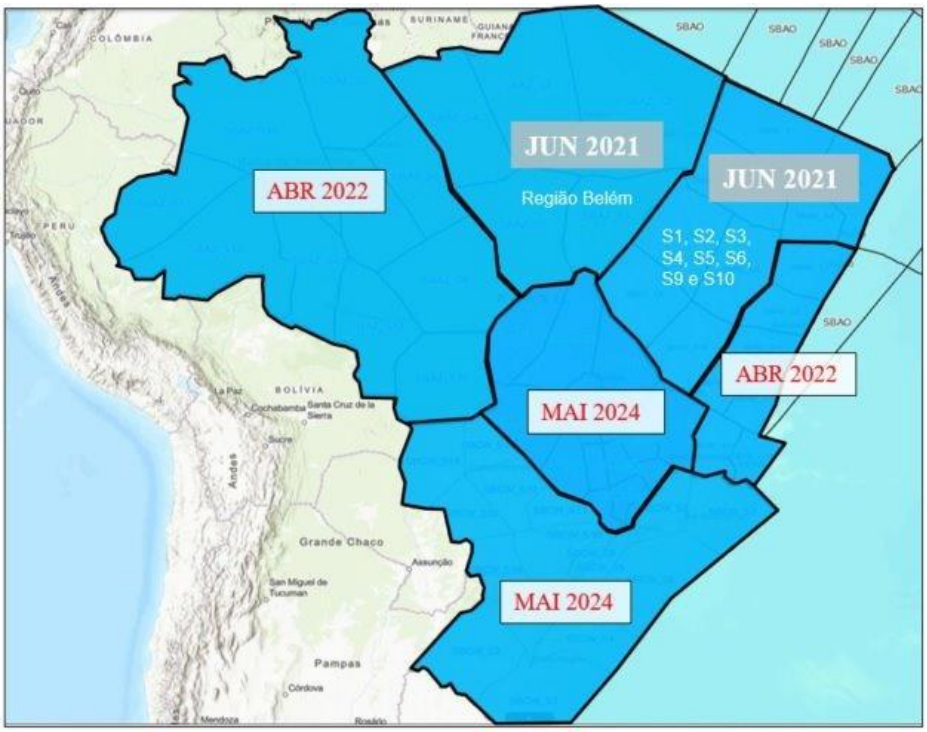



Figure 3 - Scenario of CPDLC application in the Brazilian continental area

## 4 FINAL ARRANGEMENTS

Procedures related to the use of Continental CPDLC and the progress of application of the tool in different portions of airspace will be timely informed to SISCEAB users through relevant additional publications.

DECEA provides a communication channel for you to send questions, suggestions, comments, criticisms, praise and error notifications through the Citizen Service Center at the following address: http://servicos.decea.gov.br/sac/index.cfm, by selecting the CONTATO (“Contact”) option in the Área (“Area”) menu.

This AIC shall enter into force on the date of its publication, repealing, on this date, AIC A16/19 published on 02 JAN 2020.

Cases not provided for in this Circular shall be settled by the Head of DECEA’s Subdepartment.