

# **BRASIL**

**MINISTRY OF DEFENSE – AIR FORCE COMMAND**

**DEPARTMENT OF AIRSPACE CONTROL**

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## **OPERATIONALIZATION OF CPDLC TO PROVIDE ATS IN BRAZILIAN CONTINENTAL AIRSPACE – LANDELL PROJECT**

*Validity period: from 15 JUL 2021 to 24 MAR 2022*

### **1 PRELIMINARY ARRANGEMENTS**

#### **1.1 PURPOSE**

This Aeronautical Information Circular aims to promulgate the main information related to the operationalization of the Controller-Pilot Data Link Communication (CPDLC) in the Brazilian airspace.

The information set forth in this Circular refers to the normative provisions contained in the specific publications of DECEA (MCA 100-23, of January 4, 2021) and in AIP Brazil, part ENR 3.5, chapter 4 - Special requirements and procedures for operation (ADS -C/CPDLC) of aircraft in the Brazilian FIR.

#### **1.2 SCOPE**

This AIC is applicable to all responsible by CPDLC operation, as well as to SISCEAB users, as applicable.

#### **1.3 ABBREVIATIONS**

4DT	4D Trajectory
ACARS	Aircraft Communication Addressing and Reporting System
ADS-C	Automatic Dependent Surveillance - Contract
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
ATS	Air Traffic Service
CPDLC	Controller Pilot Data Link Communications
DECEA	Department of Airspace Control
FANS	Future Air Navigation System

FIR	Flight Information Region
FL	Flight Level
FMS	Flight Management System
ICAO	International Civil Aviation Organization
SATCOM	Satellite Communication
SISCEAB	Brazilian Airspace Control System
TBO	Trajectory Based Operation
VDL	VHF Data Link
VHF	Very High Frequency

## **1.4 CONCEPTS**

### **1.4.1 ATC CLEARANCE**

Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

### **1.4.2 CONTROLLER-PILOT DATA LINK COMMUNICATIONS**

A means of communication between controller and pilot, using data link for ATC communications.

### **1.4.3 DATA LINK COMMUNICATIONS**

Digital air/ground communications between aircraft and ground systems.

### **1.4.4 FANS 1/A**

Initial Future Air Navigation System as defined by EUROCAE ED-100A/ RTCA DO-258A, or previous standards that defined the FANS 1/A capacity.

**NOTE:** FANS 1/A generally means the aircraft's data link system, the ATS unit ground system and the communication service provision agree with the standards. In certain cases, a specific reference to a particular FANS 1/A aircraft is made, as follows:

- a) FANS 1/A+ means the aircraft is completely in accordance with standards Revision A, but includes message latency monitor; and
- b) FANS 1/A ADS-C means the aircraft is in accordance with ADS-C application but does not includes CPDLC application.

### **1.4.5 AIR TRAFFIC SERVICES**

A generic term meaning variously, depending on the case, to flight information service, alerting service, air traffic advisory service and air traffic control service (area control service, approach control service or aerodrome control service).

## **2 INTRODUCTION TO LANDELL PROJECT**

**2.1** With the objective of operationalizing the CPDLC in the Brazilian continental airspace, the Landell Project was created in 2013, structured as a multidisciplinary team composed of air traffic controllers, ATM specialists, communications specialists, engineers, systems analysts, and operational safety risk management specialists that are members of DECEA and with the participation of the Brazilian aeronautical industry and users of the Brazilian airspace.

**2.2** Currently, the CPDLC is used in Brazil at Atlantic FIR as the primary means of communication. DECEA, following the philosophy of implementing new technologies to better provide the ATS, and as proposed by the ICAO, established the Landell Project for the operationalization of the CPDLC in Brazilian continental airspace as an additional means to voice communications. The main objectives of this initiative are:

- a) Improving the safety performance level by mitigation of lack of understanding problems due to noise, interference, linguistic barrier, among others;
- b) Improve the air-ground communication system efficiency;
- c) Reduce the workload of pilot and air traffic controllers, by automating actions and messages exchanged, thus increasing the airspace capacity;
- d) Allow the loading of route authorization information by CPDLC messages directly into the FMS, minimizing the potential for data entry errors when issuing ATC clearance; and
- e) Enable the implementation of modern concepts, such as those associated with Trajectory Based Operations (TBO) and 4D Trajectory.

**2.3** The expected benefits from this implementation are significant and the expectation is that the users will be able to count on the provision of a more efficient and modern air traffic service. However, it is important to emphasize that initially the 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.

## **3 IMPLEMENTATION DATE**

**3.1** The use of CPDLC for the provision of ATS in the selected airspaces will be made available from **09 SEP 2021**.

**3.2** The operationalization of the CPDLC will be carried out in phases to allow ATCO and flight crews gradually adapt to the system. In this sense, less busy times were chosen, increasingly increasing the duration of the operation.

**3.3** The operationalization phases will be the following:

- a) Phase 1: from 2000Z to 0200Z;
- b) Phase 2: from 1800Z to 0600Z; and
- c) Phase 3: no time restriction.

3.4 There will be no differences in operational or technical features between the Phases and all CPDLC messages in MCA 100-23 will apply.

## 4 APPLICATION SCENARIO

4.1 It should be noted that, initially, DECEA will not mandate CPDLC use in the continental airspace. Thus, it will be used in the Brazilian continental airspace in a mixed environment, that is, in sectors where ATS will be provided both for aircraft capable and aircraft not capable of using CPDLC.

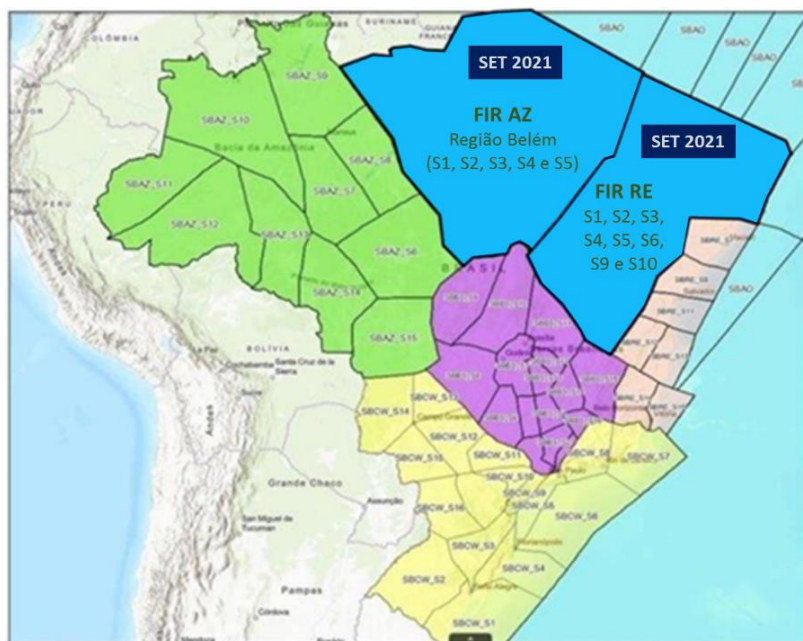


Figure 1 – Initial scenario of CPDLC application in continental airspace

4.2 However, given the expected operational gains with the beginning of the CPDLC operationalization for the ATS provision in the selected airspaces, mentioned on item **Erro! Fonte de referência não encontrada.** of this Circular, DECEA strongly encourages the fleet upgrade, specially of aircraft that use these airspaces.

4.3 Since the primary communication means in the selected airspaces will be VHF, with CPDLC as a complementary means, the separation minima applicable will remain unchanged. Nonetheless, bigger separation minima may be applied, at the ATS unit discretion, if the air traffic so requires.

4.4 The initial operation of CPDLC in the continental airspace will be applied in Sectors 1, 2,3,4,5, 6, 9 and 10 of Recife FIR and in Belem Region (Sectors 1 throw 5) of Amazon FIR, as shown in Figure 1, from FL250 (inclusive).

**4.5** The CPDLC expansion to the other sectors of the Amazon and Recife FIR, as well the operationalization of the Brasilia FIR and Curitiba FIR is in the planning phase, with the following planned start up dates:

- a) FIR RE: ABR 2022;
- b) FIR AZ: DEZ 2022;
- c) FIR BS: DEZ 2023; e
- d) FIR CT: DEZ 2024.

**NOTE:** Since the projects are still in the planning phase, the dates above informed may be changed, at the discretion of DECEA. Once defined, these will be published in due course.

## **5 USE OF THE CPDLC WITH SURVEILLANCE SYSTEMS AND OTHER COMMUNICATION SYSTEMS**

**5.1** The CPDLC will only be deployed in the Brazilian continental airspace if an ATS surveillance system is available. In case of surveillance contact loss with an aircraft, it will receive the provision of ATS through voice communication, but the CPDLC connection **will not** be interrupted.

**5.2** The CPDLC will be applied as a complementary means to the voice communication and its use will be restricted to routine situations that do not require prompt action in the provision of air traffic services. Any situation demanding prompt responses from either party shall be communicated via VHF.

**NOTE 1:** The CPDLC shall not be used for vectoring.

**NOTE 2:** For urgencies or emergencies situations, the voice communication shall be used. However, depending on the situation, CPDLC may be used.

**5.3** When attempts to establish VHF communication with a specific aircraft prove unsuccessful, CPDLC shall continue to be used to issue clearances, information, traffic instructions and as a tool to re-establish bilateral voice communication without prejudice to the possible adoption of additional measures provided for in the rules in force of DECEA resulting from the characterization of an air-ground voice communication failure event.

**5.4** The initial contact in sector changes shall always be done via voice, to check VHF communication. After the initial contact, CPDLC communication shall be maintained, unless ATC instructs otherwise.

**5.5** In the continental airspace, ADS-C connection is not required, as there is coverage of the ATS surveillance system. Aircraft operators must instruct their flight crews, in accordance with their operational standards, regarding the maintenance or disconnection of the ADS-C in that airspace.

## **6 LOGON PROCEDURES**

**6.1** The CPDLC logon shall be done:

- a) Aircraft departing from aerodrome within FIR with CPDLC service: before departing; or
- b) Aircraft entering FIR with CPDLC service: at least 10 minutes before and at most 25 minutes before entering the FIR.

## 7 FLIGHT PLAN

**7.1** In compliance with the established in MCA 100-11, considering the provided in 9.1 and 9.2 of this Circular and with the view to make possible the effective use of the CPDLC in the Brazilian continental airspace, for purposes of filling item 10 of the flight plan, regarding DATA LINK equipment and capabilities, codes J3, J4, J5, J6 or J7 may be used.

**7.2** Special attention shall be given to the aircraft identification and registration mark to be filled out in items 7 and 18 of the flight plan. Discrepancies in the filled information in the flight plan with those of the aircraft that will effectively perform the flight will result in **automatic logon rejection**.

## 8 FLIGHT CREW OPERATIONAL PROCEDURES

**8.1** One of the premises of the Landell Project is that the communications via CPDLC do not exceed a time that makes it difficult to coordinate or take early actions to maintain separation between aircraft flight in the continental airspace.

**8.2** In this way, it is essential flight crews to be aware of the uplink messages sent by ATS units and respond to them as quick as possible.

**8.3** If an uplink message requires further analysis to be answered, the flight crew shall send a STANDBY message, completing the information with the appropriate message after analysis. For instance:

- a) The ATC unit, to consult the shortest time or position when a determined flight level can be accepted, will send a message UM148: WHEN CAN YOU ACCEPT (FL350).
- b) The flight crew, needing a further analysis to respond to the request, shall forward the message UM1: STANDBY.
- c) After analysis, the flight crew shall forward the response to the request, for instance: UM67: WE CAN ACCEPT (FL350) AT TIME (2200).

## 9 TECHNICAL ASPECTS OF THE CPDLC

**9.1** The CPDLC in the Brazilian continental airspace will be provided by means of a terrestrial communicated infrastructure operated by the Company SITA On Air, through the ACARS network by Data Link Systems FANS 1/A and FANS 1/A+. It will be conditioned to the performance of the air-ground communication via VDLm2, VDLm0/A and SATCOM subnetworks in all the airspace under Brazilian aeronautical jurisdiction above FL250, inclusive.

**9.2** In this context, to participate in this new operational scenario and to obtain the benefits arising, the aircraft shall be properly capacitated with Data Link avionics and the CPDLC FANS 1/A or FANS 1/A+ application.

## **10 FINAL ARRANGEMENTS**

**10.1** The procedures related to the use of the Continental CPDLC and the progression of the tool's application in the different portions of the Brazilian airspace will be opportunely disclosed to the SISCEAB users through relevant additional publications.

**10.2** This AIC enters into force on 15 JUL 2021.

**10.3** DECEA provides a communication channel for sending doubts, suggestions, comments, criticisms, compliments and notifications of errors through the Citizen Assistance Service at the electronic address: <http://servicos.decea.gov.br/sac/index.cfm> by selecting the CONTACT option from the Area menu.

**10.4** Cases not provided for in this Circular will be resolved by the Head of the Operations Subdepartment of DECEA.