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WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

Agenda Item 3: Enhancing the global air navigation system
3.5: Other ATM issues

IMPLEMENTATION OF CPDLC IN A CONTINENTAL AIRSPACE FOR ATS PROVISION

(Presented by Brazil)

EXECUTIVE SUMMARY

This paper presents the challenges found during the DECEA LANDELL Project for the future implementation of air traffic services (ATS) provision with controller-pilot data link communications (CPDLC) in a continental airspace.

Action: The Conference is invited to:

a) review and comment the information presented;

b) request ICAO to develop guidance material about determination of horizontal separation minima for ATS provided with the use of CPDLC over VDL; and

c) request ICAO to develop guidance material about implementation of ATS provision in a continental airspace with the use of CPDLC over VDL.

1. INTRODUCTION

1.1 The 5th edition of the *Global Air Navigation Plan* (GANP, Doc 9750) introduced the aviation system block upgrade (ASBU), a global framework developed primarily to ensure the maintenance and enhancement of aviation safety, the harmonization between air traffic management (ATM) improvement programmes throughout the world, and the removal of barriers to future aviation efficiency and environmental gains.

1.2 The ASBU approach put together aircraft and ground-based operational objectives with avionics, data link and ATM systems requirements to provide industrywide guidance to operators, equipment manufacturers and air navigation services provider (ANSPs) on which way to go to develop the aviation industry seamlessly.

1.3 In addressing both ANSP, operators and industry needs, this methodology allows the achievement of an interoperable global system through national and regional implementation plans, in a collaborative and coordinated manner.

1.4 As set forth in the GANP, one of the enablers of aviation evolution is data link based applications either air-to-ground or ground-to-ground. ATS interfacility data communications (AIDC), four dimensional trajectory data link (4DTRAD), data link taxi (D-Taxi), system-wide information management (SWIM) are some examples of applications which are going to bring significant benefits to the industry in the next years.

1.5 To adhere to GANP, and get ready for trajectory-based operations (TBO) and other applications based on data link, the Department of Airspace Control (DECEA) has launched the LANDELL project, named after the Brazilian scientist and inventor, father Roberto Landell de Moura, whose objective is to operationalize CPDLC as an air-ground communication mean to provide ATS in specific sectors of the flight information region (FIR)-Recife and FIR-Amazonico, at first, and, later, to enable the introduction of other data link-based applications in national airspace.

1.6 Brazil, as a signatory of the *Convention on International Civil Aviation* (Doc 7300) , tries to comply with ICAO Standards and Recommended Practices (SARPs) and its guidance material, but, during the development of LANDELL project, the specialist team have found some regulatory gaps in ICAO documentation, which led them to search for solutions, both abroad and internally-developed.

1.7 The resolution of the questions raised in this working paper are, first and foremost, fundamental to enable the complete operationalization of all data link applications set in GANP.

2. DISCUSSION

2.1 GANP points out some applications which will be enabled through the implementation of data link solutions, such as VDL Mode 2 (OPFL, TBO, FRTO, ASEP, RSEQ, CDO, SURF, FICE, SWIM) and satellite system, both current and broadband (OPFL, TBO, AMET, ASEP, RSEQ, CDO, FICE, SWIM).

2.2 Furthermore, it was identified by some States that data link communications, specifically CPDLC, can also be used to complement DCPC via VHF and, hence, help increasing airspace safety and capacity. This has led to the implementation of CPDLC to provide ATS in some continental airspace and, thus, have raised the need to adjust the regulatory framework to support such operations.

2.3 Some of the subjects related to the regulatory framework adjustment are separation minima criteria, implementation process, data link minimal technical requirements, technical and operational monitoring systems.

2.4 For instance, when planning a full implementation for provision of ATS with CPDLC, the first question raised is which horizontal separation minima can be applied with this communication technology. Amendment 8 to the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444) (to be implemented on 8 November 2018) will introduce Table 5-2 to item 5.4.1.2, which provides criteria to establish separation minima considering CNS requirements. This table does not provide criteria to CPDLC over VDL. Moreover, the PANS-ATM provides a number of separation methods based on CPDLC, but typically for oceanic airspace.

2.5 The regulatory gap existing in ICAO documents about CPDLC over VDL may lead to a non-uniform global implementation, which conflicts with GANP principle of interoperability and seamless implementation of the ASBU, as a result of States being allowed to develop different standards and requirements.

2.6 Likewise, there is a lack of technical and operational guidance material on how to implement CPDLC continental operations, assisting States on what is needed to be developed before commencing ATS provisions with CPDLC support. Consequently, States may use different features for airspace and air traffic, producing different requirements for operational approval or mandate, which results in increased operational cost for airspace users.

3. CONCLUSION

3.1 It is consistent to say that, as an important technological enabler for GANP applications, data link shall be one of the most addressed subjects by ANSPs around the world in the coming years.

3.2 Thus, ICAO should prioritize efforts to produce both regulatory and guidance material to support States in implementing data link and its applications across the world.

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