International Civil Aviation Organization

The Eighth Meeting of the APANPIRG ATM Sub-Group

Video Teleconference, 23 – 27 November 2020

Agenda Item 5: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

INTRODUCTION OF DOMESTIC CPDLC IN JAPAN

(Presented by Japan)

SUMMARY

Japan Civil Aviation Bureau (JCAB) is in the implementation phase of Controller Pilot Data Link Communications (CPDLC) in the domestic En Route environment. This paper presents a brief update on the progress of the implementation.

1. INTRODUCTION

1.1 Controller Pilot Data Link Communications (CPDLC) is a data link application that provides a means of communication between controller and pilot, using data link for air traffic control (ATC) communications. CPDLC messages include clearances, requests, reports, related ATC information and "free-text". Receiving the message will normally take place by display and/or printing of the message. CPDLC overcomes a number of the shortcomings of voice communication, such as voice channel congestion, misunderstanding due to bad voice quality and/or misinterpretation, and corruption of the signal due to simultaneous transmissions.

1.2 Especially, in the domestic airspace, CPDLC allows certain non-urgent ATC messages to be communicated via text message, rather than voice in the domestic airspace. The use of CPDLC messages provides several advantages over traditional voice communications. Text-based messages reduce the margin for error due to a poor voice radio connection and they liberate space on the congested VHF channels for more urgent voice communications.

1.3 CPDLC and Automatic Dependent Surveillance Contract (ADS-C) are available in the airspace over the Pacific Ocean in the Fukuoka Flight Information Region (FIR). For aircraft that has established data link connection, CPDLC is utilized as the primary means of communications, and ADS-C is used for position reporting.

1.4 JCAB will expand its CPDLC operations into domestic airspace where radar surveillance service is available in order to increase ATC capacity and improve its safety.

2. DISCUSSION

Timeline Overview

2.1 JCAB plans to introduce domestic CPDLC operations in December 2021. The implementation will be made in a phased manner such as Initial En Route services and Full En Route services.

Domestic CPDLC service volume

2.2 En Route CPDLC services will be provided in the airspace at or above Flight Level (FL) 335* in Sapporo/Tokyo/Kobe/Fukuoka Area Control Center.

*Note. − Refer to ATM/SG/8, WP/INFORMAL PACIFIC AIR TRAFFIC CONTROL (ATC) COORDINATING GROUP (IPACG) UPDATE, Report on Japan's Airspace Redesign Plan.

Infrastructure

2.3 Data Link Systems: Future Air Navigation System (FANS) 1/A, and/or FANS 1/A+

2.4 Data Link Subnetworks: VDL Mode A, VDL Mode 2, and/or Satellites

En Route Initial Services Messages

2.5 In order to supplement existing voice communications capabilities, non-time-critical messages such as Transfer of Communications (e.g., UM117 CONTACT [ICAO unit name] [frequency]), Stuck Microphone (e.g., UM157 CHECK STUCK MICROPHONE [frequency]) , Beacon Codes (e.g., UM123 SQUAWK [beacon code]), and Preformatted Free Text (e.g., UM169 SURVEILLANCE SERVICE TERMINATED are planned to be used in the initial phase.

2.6 This means that controllers will be able to deliver instructions with a push of a button and without the need to utilize voice frequencies.

En Route Full Services Messages

2.7 Although this plan is still under consideration, after the initial phase, it is expected to include messages in the data link operations, such as Vertical clearances, Speed instructions and Route modifications, and to expand its data link airspace into lower areas/sectors below FL335.

2.8 The operations using En Route Full Service Messages will enable the transmission of complex instructions that can be quickly and correctly loaded into an aircraft's flight management system, upon acceptance by the pilot. This will also help to realize Trajectory-Based Operations.

Publication

2.9 Details of the domestic CPDLC operational procedures in the Fukuoka FIR will be informed by Aeronautical Information Publication (AIP) and/or Aeronautical Information Circular (AIC).

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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