International Civil Aviation Organization

Tenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/10) of APANPIRG

Video Teleconference, 17 – 21 October 2022

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

THE PROGRESS OF DOMESTIC CPDLC TRIAL OPERATION IN JAPAN

(Presented by Japan)

SUMMARY

This paper presents the progress of domestic Controller Pilot Data Link Communications (CPDLC) trial operation. Japan Civil Aviation Bureau (JCAB) initiated the trial operation in March 2022.

1. INTRODUCTION

1.1 JCAB introduced domestic CPDLC trial operation with an information paper titled "THE PROGRESS TOWARD TRIAL OPERATION OF DOMESTIC CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC) IN JAPAN" at ATM/SG/9 meeting. As mentioned in the paper, JCAB started a domestic CPDLC trial operation in March 2022.

1.2 CPDLC is already available in the Oceanic airspace in the Fukuoka Flight Information Region (FIR). In the oceanic area, CPDLCs are the primary means of communication for aircraft that have established data link connections. Generally speaking, CPDLC has several advantages, such as reducing human error caused by voice communication and alleviating congested VHF communication.

1.3 JCAB has been currently evaluating the trial operation towards the trial operation.

2. DISCUSSION

2.1 As shown in Figure 1, the applicable altitude in the domestic area is at or above FL335 in Sapporo, Tokyo, and Fukuoka Area Control Centers.

2.2 Domestic CPDLC utilizes VHF datalink or Satelite-based datalink only. (no HF datalinks) Requirements are Data Link Systems: Future Air Navigation System (FANS) 1/A, and/or FANS 1/A+ and Data Link Subnetworks: VDL Mode A, VDL Mode 2, and/or Satellites

2.3 JCAB starts operation from the following items that are not time-critical, and consider expanding the introduction airspace and expanding the application of items while conducting evaluation and verification.

* Free text messages CANNOT be used in domestic data link airspace in principal.

- 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

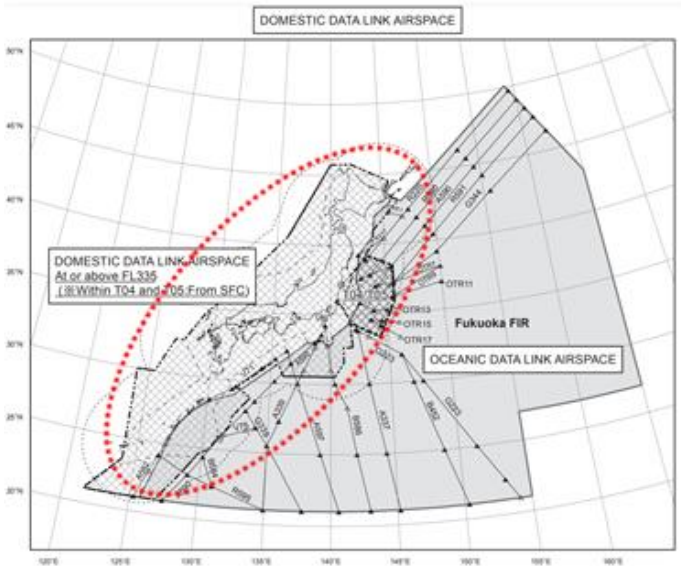

Figure 1. Domestic data-link airspace

2.4 Operational procedures in detail of the domestic CPDLC in the Fukuoka FIR is published by Aeronautical Information Publication Supplement (AIP SUPPLEMENT(AIP SUP 004/22)

2.5 Figure 2 shows the weekly number of aircraft which use domestic CPDLC, categorizing three types; domestic, international (not entering oceanic area), and international (entering oceanic area). Althogh the number of domestic flights using CPDLC is still smaller than that of international flights entering oceanic area, it shows that these domestic flights are gradually increasing.

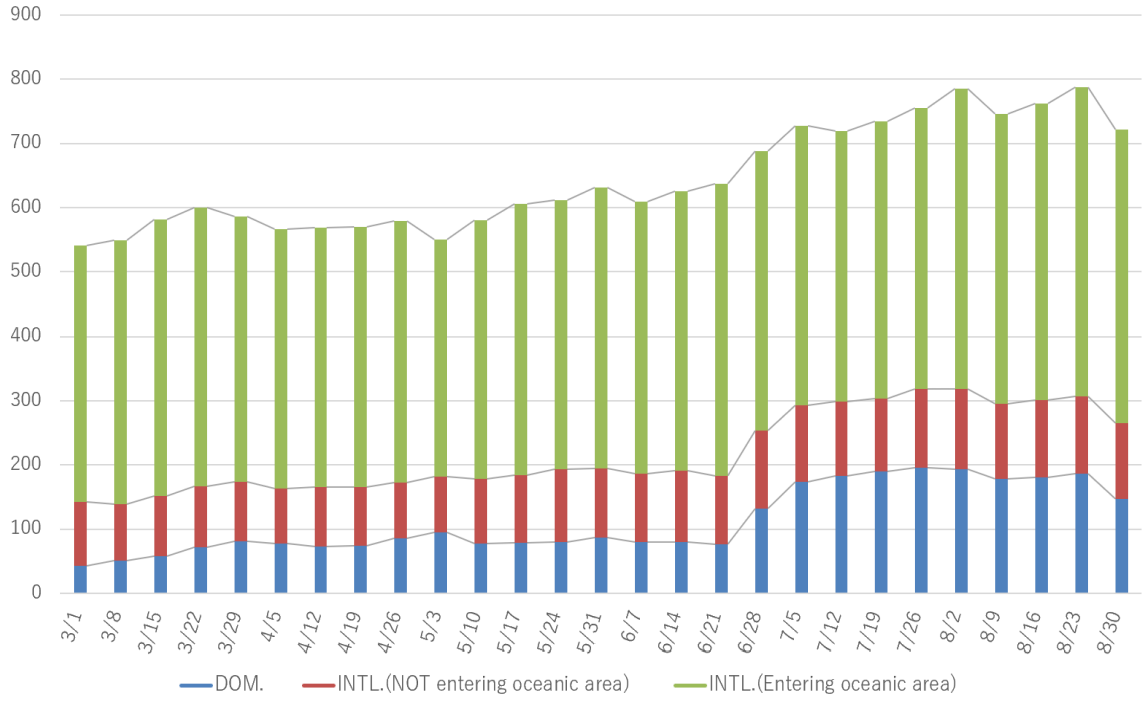

Figure 2. Number of aircraft participating in domestic CPDLC (average per day per week)

2.6 Figure 3 shows the percentage of aircraft which uses domestic CPDLC, categorizing three type; domestic, international (not entering oceanic area), and international (entering the oceanic area). This is the percentage among all aircraft flying in domestic CPDLC operation airspace.

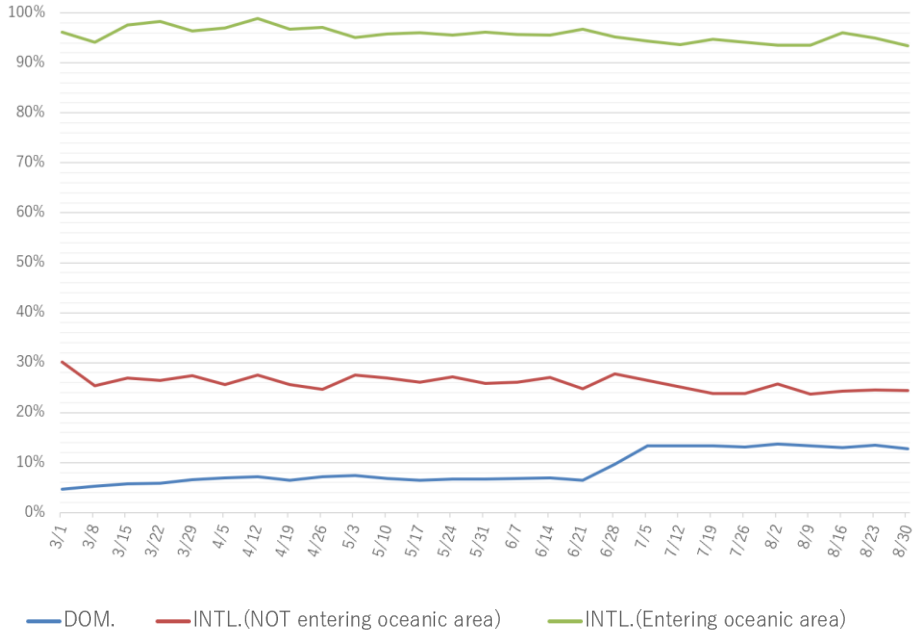

Figure 3. Percentage of aircraft participating in domestic CPDLC

2.7 Figure 4 shows the number of message by message type. There are several message used in the trial operation as shown in 2.3. The chart indicates that "Contact" messages are sent often and also shows that multiple messages are combined and sent all at the same time. It is also observed that messages related to system occupy almost half of all messages.

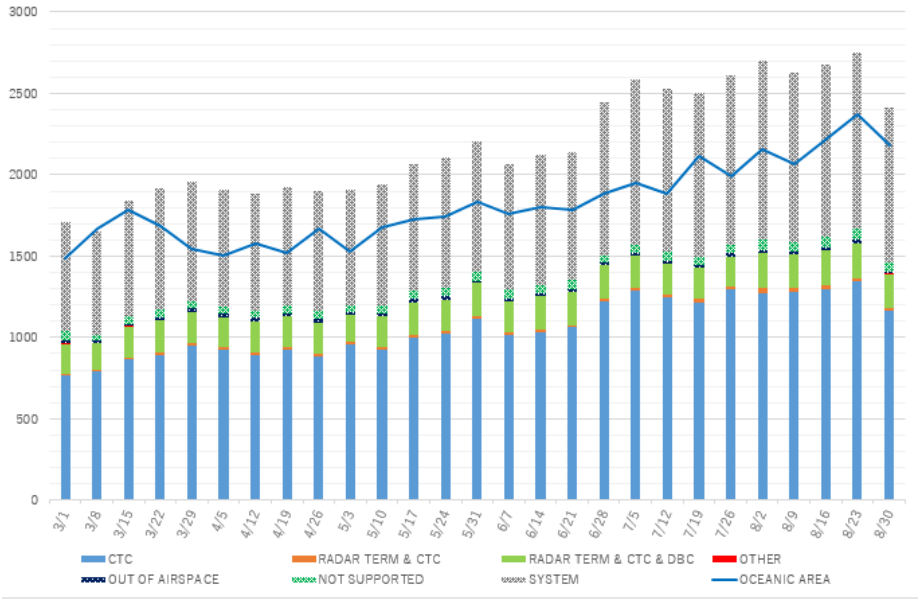

Figure 4. Number of domestic CPDLC uplinks (daily average per week)

2.8 JCAB is collecting data and continuing to analyze and evaluate it from communication performance and ATC operational perspective. This trial has been ongoing since March. Now, JCAB is considering to move to the actual operation with expanding apprication.

3. ACTION BY THE MEETING

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

…….