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 6: ATM Coordination (Meetings, Route Development, Contingency Planning)

ADS-C CDP PROGRESS IN FUKUOKA FIR

(Presented by Japan)

SUMMARY

This paper presents the progress report for the Automatic Dependent Surveillance-Contract (ADS-C) Climb Descend Procedure (CDP) in the Pacific Ocean airspace of the Fukuoka Flight Information Region (FIR).

1. INTRODUCTION

1.1 The Automatic Dependent Surveillance-Contract (ADS-C) Climb Descend Procedure (CDP) is designed to improve Air Traffic Service (ATS) to properly equipped aircraft. ADS-C CDP allows Oceanic Air Traffic Controllers (ATC) to approve an altitude change request when other standard separations (e.g., ADS-C distance-based 30 NM longitudinal separation minima) do not allow for a climb or descent through the altitude of a blocking aircraft.

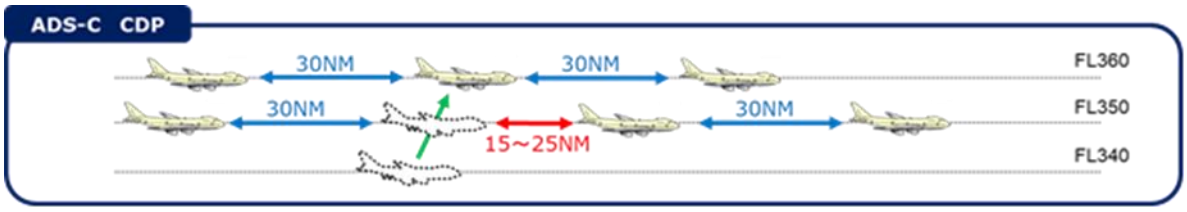

Figure 1: Example of adopting ADS-C CDP

1.2 In the long-term vision for the future air traffic systems of Japan, which is named "Collaborative Actions for Renovation of Air Traffic Systems (CARATS)," the Japan Civil Aviation Bureau (JCAB) established the implementation plan of ADS-C CDP in accordance with the Global Air Navigation Plan (GANP) of the International Civil Aviation Organization (ICAO), in 2015.

1.3 ADS-C CDP has been implemented in the Pacific Ocean airspace of Fukuoka FIR since 9 September 2021 as a trial after starting the operation of the Trajectorized Oceanic Traffic Data Processing System (TOPS), a new Oceanic Air Traffic Control system of JCAB, and conducting safety assessment whose members were JCAB headquarters, Fukuoka ATMC which provides ATC service in the airspace, aircraft operators and a research institution. The detailed information of the ADS-C CDP introduction in Fukuoka FIR is described on IP/07 at the ninth meeting of Air Traffic Management (ATM/SG/9) in November 2021.

2. DISCUSSION

2.1 **Table 1** shows a summary of data that Air Traffic Controllers (ATC) attempted to change an aircraft altitude by adopting ADS-C CDP from 9 September 2021 to 31 August 2022. A total of 386 flights were approved for altitude change by adopting ADS-C CDP for the period. On the other hand, 25 flights were unable to change altitude due to three following reasons.

- The requesting altitude was the same as the blocking aircraft's altitude.
- The distance between the preceding aircraft and the following aircraft did not meet longitudinal separation standards, 15 NM or 25 NM.
- The Mach number of following aircraft was more than Mach 0.02 faster than the preceding aircraft's Mach.

	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Total
Approved	22	44	35	23	25	24	47	38	26	46	28	28	386
Unable	8	3	3	1	2	4	0	3	0	0	1	0	25
Error	2	1	2	1	1	0	1	2	0	1	1	0	12
Total	32	48	40	25	28	28	48	43	26	47	30	28	423

Table 1: Table 1: Number and result of flight tried to adopt ADS-C CDP

2.2 Besides, 12 flights were not approved for altitude change as TOPS showed an error due to the following reasons.

- The latest ADS-C report could not be received precisely from requesting/blocking aircraft.
- TOPS calculated and estimated that the altitude change would not be able to complete within the airspace where Fukuoka ATMC has the responsibility.
- A part of the ADS-C CDP functions of TOPS was freezing and time out.

2.3 **Table 2** shows monthly data of aircraft pairs of requesting aircraft and blocking aircraft for the period, and **Figure 2** shows a monthly trend of aircraft pairs of requesting aircraft and blocking aircraft.

Requesting /Blocking	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Total
PBCS /PBCS	10	14	5	7	9	10	22	25	17	22	14	10	165
PBCS /Non-PBCS	6	11	14	7	7	6	13	8	6	10	4	11	103
Non-PBCS /PBCS	5	15	11	8	5	7	10	4	2	10	9	7	93
Non-PBCS /Non-PBCS	1	4	5	1	4	1	2	1	1	4	1	0	25
Total	22	44	35	23	25	24	47	38	26	46	28	28	386

Table 2: Monthly data of aircraft pairs of requesting aircraft and blocking aircraft

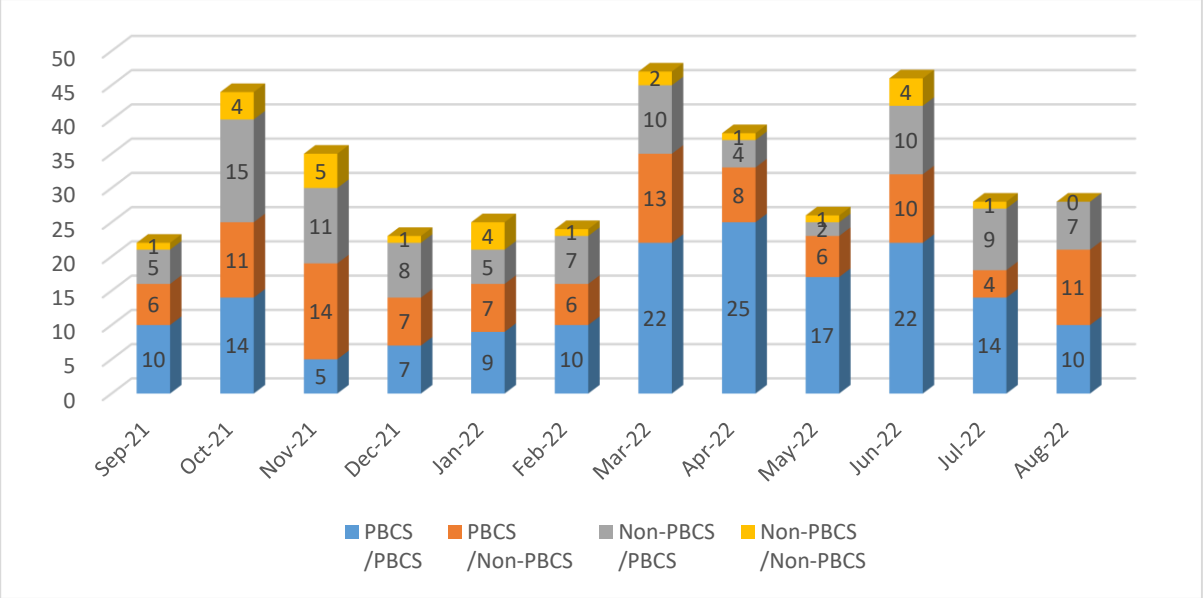

Figure 2: Monthly trend of aircraft pairs of requesting aircraft and blocking aircraft

2.4 The number of flights in some months decreased, and two major reasons were identified. First is the existence of weather areas. ADS-C CDP is not allowed while requesting aircraft or blocking aircraft is deviating.

2.5 The second reason is due to temporary airspace restrictions. If airspace restrictions are established and alternative routes are designed temporarily, ADS-C CDP would hardly be applied to the aircraft flying on the alternative routes because most alternative routes have middle to high angle turns.

2.6 Additionally, according to **Table 2** and **Figure 2**, it is shown that implementing ADS-C CDP in the airspace allows not only PBCS approved aircraft, but also non-PBCS approved aircraft to have more opportunities to fly at their preferred altitude. However, please note that JCAB encourages aircraft operators flying in the Pacific Ocean airspace to obtain PBCS approval/authorization.

2.7 **Figure 3** shows the area map that is described the number of flights which were adopted ADS-C CDP. The North Pacific (NOPAC) routes were the most applied area.

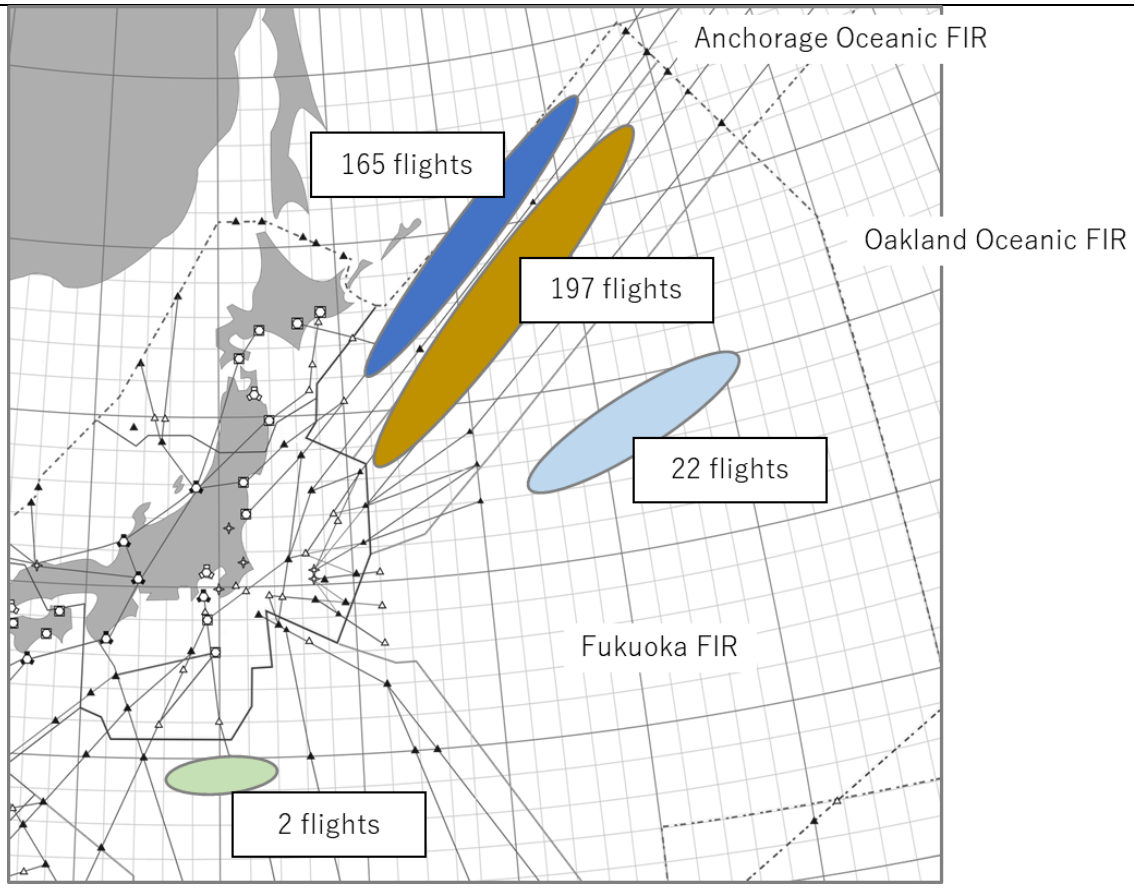

Figure 3: Area map ADS-C CDP was adopted

2.8 Significant operational and technical issues in the trial operation have not been identified as of September 2022. JCAB has a plan to transfer from trial operation to official operation of ADS-C CDP after collecting and analyzing more than 500 sample data and conducting the safety assessment of the trial phase among relevant members.

2.9 JCAB is willing to share our knowledge and experience with States and ATS providers in the Asia Pacific region if they are interested in the implementation of ADS-C CDP that allows aircraft to take more effective altitudes and provides more efficient operations to aircraft operators.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

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