International Civil Aviation Organization

Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG

Singapore, 25 – 29 August 2025

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

REQUIREMENT TO AMEND TRANSITION ALTITUDE ESTABLISHMENT CRITERIA IN PANS-OPS VOLUME III (DOC 8168)

(Presented by Pakistan)

SUMMARY

This paper presents requirement to review the criteria for establishment of transition altitude contained in Section II Chapter 2 of *Procedures for Air Navigation Services – Aircraft Operations* (PANS-OPS, Doc 8168) Volume III – Aircraft Operating Procedures, based on operational benefits being acquired by States using medium level transition altitudes in the Asia/Pacific Region.

Strategic Objectives:

A: Safety – Enhance global civil aviation safety

B: Air Navigation Capacity and Efficiency – Increase the capacity and improve the efficiency of the global aviation system

1. INTRODUCTION

1.1 Procedures for Air Navigation Services (PANS) are approved by the Council and are recommended to Contracting States for worldwide application. The implementation of procedures is the responsibility of Contracting States; however, the provision of Annex 15 related to the publication requires States to publish lists of significant differences between their procedures and the related ICAO procedures in their Aeronautical Information Publications (AIPs).

1.2 The provisions relevant to criteria for establishment of transition altitude contained in PANS-OPS Volume III Section II Chapter 2 require that a transition altitude shall normally be specified for each aerodrome by the State. The provisions also require that the height above the aerodrome of the transition altitude shall be **as low as possible** but normally not less than 900 m (3000 ft).

1.3 The current provisions containing criteria for establishment of transition altitudes in PANS-OPS Volume III were incorporated in decade of 1960's. The advancement in technologies and operating procedures have necessitated major shift where number of States do not consider it in the fitment of safety to establish transition altitude **as low as possible** as required under the provisions of PANS-OPS. Any procedure which more than half of the member States in the region do not consider viable for implementation therefore needs review for its consistency. It may therefore be appropriate if the criteria are reviewed by ICAO so that States should be able to implement relevant provision in their national framework.

2. DISCUSSION

2.1 A number of factors have remained under deliberation during last two decades in the global aviation industry on the criteria for establishment of transition altitude. Few aspects are highlighted again in subsequent paras for consideration.

Terrain Clearance

2.2 The altimeter corrections required to determine the true altitude from which the pilot can determine actual height above terrain can be complex enough and time consuming therefore error prone and can be incorrectly applied. This could lead to a loss of pilot situation awareness resulting in a collision with terrain. In airspace where transition altitudes have been established at relatively low altitudes and terrain clearance is a factor, there can be a significant safety risk. However, if the aircraft operated on the local QNH to a comparatively higher Transition Altitude. the risk of a terrain proximity due to an uncorrected pressure differential error could be eliminated.

Airspace Management

2.3 Different philosophies are being used for setting the transition level by different Sates. Few States have established the provision where transition level is determined by ATC based on the current QNH while majority of States uses fixed Transition Level above the transition altitude so as to ensure minimum vertical separation between Transition Level and Transition Altitude for all QNH values. A low Transition Altitude (3000 ft) in this scenario results in blocking of airspace within transition layer which is vital for airspace management and Air Traffic Control especially in busy terminal control areas. Favorable arguments have also been made by various ATS forums on raising the transition altitude to a medium level (8000 ft – 10000 ft) or high level (16000 ft – 18000 ft).

Efficiency of Terminal Procedures

2.4 Performance-based Navigation (PBN) is being implemented worldwide to take advantage of associated benefits and to comply with ICAO Assembly Resolution A37/11. Terminal procedures using PBN concept, if appropriately designed, can lead to significant benefits in terms of safety and efficiency of aircraft operations including the benefits from Continuous Climb Operations (CCO)/ Continuous Descent Operations (CDO) implementation. However, the lower Transition Altitude established around aerodromes did not allow real optimization of vertical profile because of significant variation of transition layer width. This becomes more complex where a conflict between arrival and departure has to be managed in PBN airspace designing close to aerodrome.

Harmonization

2.5 Harmonization of transition altitude is required under the relevant provision of PANS-OPS Volume III at national or regional level to the extent possible and within regions as well with agreements. A number of countries have therefore adopted the approach of harmonized Transition Altitude not only at aerodromes inside its territory rather over its entire airspace. Several studies have also been conducted in European Civil Aviation Conference (ECAC) area, which have emphasized the need for Harmonized European Transition Altitude for entire Europe. In States where terrain height is low and uniform, a common low Transition Altitude may be practicable. For States like Pakistan where significant differences exist in the aerodrome elevation for its aerodromes, it becomes impracticable to harmonize the Transition Altitude if it has to be kept as low as 3000 ft above the aerodrome.

Cockpit Workload

2.6 Besides the harmonization, pilot forums are of general opinion that any transition altitude below 5000 ft above aerodrome requires changing altimeter settings during critical departure and approach phases of flight. It results in an extra burden on the cockpit workload without any advantage or benefit.

Current Status

2.7 A study of the Asia/Pacific Region has been made in this context. Within Asia/Pacific Region, more than half of member States are also using Transition Altitude which falls in the medium level (above 8000 ft), significantly higher than 3000 ft above aerodromes thus giving preference to harmonization rather than the PANS-OPS provision to keep Transition Altitudes lower close to 3000 ft.

Conclusion

2.8 According to the PANS-OPS criteria, transition altitudes are required to be **as low as possible,** generally 3000 ft above aerodrome elevation. However, from the practical perspectives, numbers of constraints have been observed in application of this criteria. The use of medium level transition altitude by more than 20 States within Asia/Pacific Region supports the thought presented in this paper that a review of ICAO criteria established in the decade of 1960's is real need of time.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) deliberate on the possible application of existing criteria;

c) consider referring the matter to ICAO HQ for further deliberation, if considered appropriate; and

d) discuss any relevant matters as appropriate.

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