THE GUILD OF AIR PILOTS AND AIR NAVIGATORS

Position paper on Transition Altitude Policy

The case for a uniform and higher transition altitude in European airspace

Introduction

This paper considers the situation concerning the currently huge number of different definitions of Transition Altitude (TA) in Europe. This has created a complexity which is detrimental to both airspace safety and airspace efficiency and is inappropriate to the performance modern aircraft. One of the few error-prone flight management actions which cannot be automated is the changing of pressure altimeter subscales between QNH and 1013 hPa and this action currently occurs widely at relatively low altitudes in relation to modern aircraft performance where flight crew workload is high and such errors are more likely. In busy airspace, the risk-bearing consequences of such errors are also particularly serious. The construction of efficient departure and arrival routes is also hindered by this avoidable complexity.

1 Regulatory Framework and How It Has Been Applied

1.1 The current situation has arisen largely because ICAO SARPs and associated guidance material deal in prescriptive terms only with minimum transition altitudes for individual aerodromes and offer only options for a simpler solution even within States, which in Europe are already accepted as no longer an appropriate unit for strategic aspects of air traffic management. Current ICAO PANS-OPS Flight Procedures in Doc 8168 Volume 1 state that *"the height above the aerodrome for the transition altitude shall be as low as possible but normally not less than 900 m (3000 ft)"*.

1.2 In much of Europe, this has resulted in hundreds of independently-determined transition altitudes, the majority in the range 3000 ft to 6000 ft. In some European States, the specified TA varies between flight status (VFR/IFR) or between different runways at the same aerodrome, which is outwith ICAO compliance. In others, of which the UK is a notable example, advantage has not been taken of the encouragement provided in Doc 8168 to establish a common transition altitude for *"all the aerodromes of (a) State"* and there has so far been no sign of a move towards a single TA for the whole ICAP EUR Region, which option is envisaged in Doc 8168 subject to the necessary agreements being made.

1.3 There are no substantive references on what specific airspace use issues might guide the determination of TAs in ICAO PANS-ATM Doc 4444 but (subject to a reference back to Doc 8168) the ATS Planning Manual Doc 9426 states (in Part II, Chapter 1) that:

"The selection of a transition altitude will be governed by the following factors:

a) the amount of traffic operating in the lower airspace;

b) the types and performance categories of aircraft;

c) the ratio of level flights to those climbing and descending in the same airspace;

d) the terrain configuration;

e) the departure and arrival procedures including noise abatement procedures;

f) variation in the route distances involved and thus variation in cruising levels required;

g) the rate of change in barometric pressures and the range of fluctuation along air traffic services (ATS) routes within a certain area;

h) the infrastructure for the provision of area QNH; and

i) the existence of other aerodromes in the vicinity."

2 The General Principles Which Should Apply

2.1 It is recognised that at some point in the future aircraft altitudes are likely to be determined by geometric rather than barometric means, thus rendering the concept of transition irrelevant, but that this is likely to be some time ahead. GAPAN therefore believes that there are powerful arguments in terms of both ATM safety and the efficient utilisation of airspace which favour, as an interim solution, a uniform Transition Altitude (TA) over as large an area as possible. GAPAN would like to see a single TA implemented for the whole of the European Region[1].

2.2 Moving to a uniform TA would in any event mean the adoption of an altitude which would be much higher than presently applies in most European airspace, especially some of its busiest. The maximum ATM safety and efficiency benefits would be achieved by a selected altitude of 20,000 feet. It is accepted that a considerable improvement over the present situation would be achieved by increases to a lower uniform level but 20,000 feet would remove issues relating to minimum safe altitude which would otherwise remain. It is also recognised that the adoption of a 20,000 feet TA would invite a review of the currently agreed ECAC DFL (Division Flight level) of FL 195 but it is this not considered that this current definition of DFL should, in itself, be seen as favouring a lower TA than 20,000 feet.

2.3 It is considered that the experience of high TAs elsewhere in the world[2] shows that the ATM challenge created by operating a much larger volume of mainly short range traffic on QNH would not outweigh the benefits of the much higher TA advocated.

2.4 There are no provisions in current ICAO SARPS which preclude a uniform high level European TA and that supporting guidance for the creation of such regional TAs already exists. GAPAN is aware that some European States are already considering the implementation of a common and higher TA either nationally or within an already-implemented or intended FAB (Functional Airspace Block), but believes that a wider regional solution would be preferable and need not be unduly delayed.

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[1] An appropriate spatial definition for a common European TA is likely to be the almost synonymous grouping of States which have ECAC Membership and are also within the ICAO EUR Region. Currently the only significant absentees from ECAC Membership are Belarus and the Russian Federation.

[2] The best known common cross border TA is the long established one for USA/Canada at 18,000ft. More usually CTA are still national. Typically - but not always - these CTAs are wholly or partially predicated on the height of terrain. A few random examples of current national CTAs include Australia at 10,000 ft., New Zealand at 11,000 ft., Japan at 14,000ft, Papua New Guinea at 20,000ft., Philippines at 11,000ft., Nepal 13,500ft and Kuwait at 13,000ft.

3 Airspace Safety Benefits

It is important that the change between QNH and 1013 hPa and vice versa is achieved at the specified altitude, so that separation from both other traffic and terrain are maintained. A uniform TA of 20,000 feet would deliver the following safety benefits:

3.1 The need to maintain awareness of QNH during intermediate climb and descent over terrain for which the MSA exceeds the TA is effectively removed.[3]

3.2 The en route emergency descent case in Europe in areas of high terrain would be simplified.

3.3 An altitude of 20,000 feet would coincide with one of the established standard points for Flight Crew climb/descent 'checks' in air carrier operations.[4]

3.4 At higher altitudes, flight crew are less busy than is the case nearer the ground and so less likely to make errors in resetting altimeter subscales.[5]

3.5 All un-pressurised aircraft and much civil and military turboprop traffic will operate entirely below 20,000 feet but will still, in most cases, need to make no more altimeter sub scale changes than currently and those made will be relatively small compared to the potentially large changes which are currently liable to occur at TA (climbing) or Transition Level (descending) with greater consequences if not correctly accomplished[6].

4 Airspace Efficiency Benefits

A uniform TA of 20,000 feet would deliver the following efficiency benefits:

4.1 The process of transition at low levels and the need for a transition layer which is usually more than 1000 ft 'wastes' what can be busy airspace. Having a 20,000 feet TA allows the 'wasted space' to occur at an altitude where there is much less potential demand for it.[7]

4.2 Both the appropriate regionalisation of QNH and the common TA above the cruise level of much un-pressurised aircraft and many short range turboprop flights would deliver considerable lateral ATM System simplification in support of the wider objectives of the SES goal.

4.3 A higher transition altitude would permit 'High Performance Aircraft SIDs' in addition to the 'normal SIDS

5 Formulation of GAPAN Policies

GAPAN membership embraces both professional and leisure aviators and the large professional membership includes both military and civil constituents. All GAPAN policies are based, as far as possible, upon the consensus view of these various interested parties. As such, whilst Policies are often

[3] Since the highest parts of the Caucasus Mountains along the border between the Russian Federation and Georgia reach 18510 feet amsl, a 20,000 ft TA may not always satisfy terrain clearance requirements in that local area.
[4] It is acknowledged that the same benefit would apply to a common TA of 10000 ft
[5] To a certain extent, this benefit would apply to any TA of 10,000 feet or greater
[6] The realisation of this benefit requires that a simplified structure of regional QNHs based upon principal airports is adopted without regards to national boundaries and such that traffic utilising en route levels above TA can use a single QNH for each climb and descent through the airspace below TA.
[7] It is acknowledged that a significant element of this benefit would be realised by any common TA of 10,000 feet or greater.

likely to reflect any official views that may exist on the issues they deal with, they should not be seen as doing so in any formal way, or even at all.

6 The Views of Other Interested Parties

GAPAN notes that its Policy on this matter is in accordance with objectives which are similar to those of many other stakeholders who all support the introduction of a higher and uniform TA for Europe, or at the very least a significant part of it, including EUROCONTROL, IFALPA / ECA and IFATCA and that, at worst, some stakeholders are neutral to the prospect of change rather than against it, provided that implementation takes appropriate account of their particular interests.

7 References

7.1 The ATC perspective

http://www.eurocontrol.int/airspace/gallery/content/public/documents/ATM_procedures/CTA_ATC_Perspective.pdf

7.2 The Flight Deck Perspective

http://www.eurocontrol.int/airspace/gallery/content/public/documents/ATM_procedures/Flt_Deck_Perspective.pdf

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