



Introduction

- 1 In 2013, ICAO adopted a proposal by the European Air Navigation Planning Group to amend the method of determining the transition level¹. The purpose of the proposal was to ensure that the transition level was “located at least 300 m (1 000 ft) above the transition altitude, to permit the transition altitude and the transition level to be used concurrently in cruising flight, with vertical separation ensured”. The current method of determining the transition level published within the MATS Part 1 and the FISO Manual does not ensure vertical separation of 1 000 ft between the transition altitude and the transition level.
- 2 The CAA proposed to the ATC Procedures Working Group (ATCPWG) in October 15 (via correspondence) a revised method of determining the transition level which included the adoption of:
 - a. the Standard Pressure Setting of 1013.25 hPa as defined in ICAO Doc 7488 Manual of the Standard Atmosphere and the EASA Certification Specification – Definitions; and,
 - b. a value of 27.3 ft per hPa derived from a linear correction which is applied to corrected barometric altitudes and confirmed as being utilised in aircraft and ATM systems.
- 3 The CAA sought responses from members of the group by 4 December 15 to the following questions:
 - a. Do you agree with the proposal to adopt 1013.25 hPa and 27.3 ft per hPa as the basis of the means to calculate the transition level?
 - b. What period of notice do you consider will be required to implement this amendment? In providing your answer, please give consideration to any changes that may be required to equipment, documentation and training of personnel.

First Consultation Period – 23 October 2015 to 4 December 2015

- 4 Responses received from members were supportive of the change introduced by ICAO but highlighted the following issues:
 - a. The proposed table for determining the transition level included intermediate flight levels (FL) which appeared to be inconsistent with the removal of quadrantal cruising levels.
 - b. The use of 1013.25 hPa and 27.3 ft as the units of measurement for calculation of the transition level creates a change in a number of the ‘bands’ of QNH altimeter settings. What is driving the change in units of measurement when the currently used values have not been shown to result in a safety concern?
 - c. The use of 1013.25 hPa in preference to 1013 could ‘force’ an inefficient use of airspace through the loss of a level. For example, with a transition altitude of 3 000 ft, the transition level would be FL 40 utilising a value of 1013 hPa but would be FL45 utilising a value of 1013.25 hPa; thus the minimum useable IFR cruising level would be FL50. In determining the transition level, ANSPs would be required to ‘round-up’ 993 ft to the next nearest whole thousand feet as a result of the difference of 7 ft between 1013 hPa and 1013.25 hPa. However, PANS-ATM 5.3.2 specifies that the vertical

¹ ICAO Doc 7030/5 (Serial No.: EUR/NAT_S 12/13 – EUR 6-3) dated 25 April 2013.

separation minimum (VSM) shall be a nominal 300 m (1 000 ft) below FL 290, with 300 m equating to 984.3 ft. One stakeholder specifically highlighted the lack of safety impact associated with a 'reduction' in separation of 7 ft and the linkages between this and the nominal VSM concept proposed by the State TA Project².

- 5 Responses received to question 3b from stakeholders indicated that a period of 6-months 'lead-in' time would be required to enable ANSPs to implement the revised method of determining the transition level. However, please refer to later text in paragraph 8c.
- 6 One stakeholder highlighted concerns regarding the inclusion of the transition level on ATIS and its provision via RTF by ATCOs; however, this is not directly related to the proposal made to the ATCPWG. The CAA will consider the issues raised in due course and are likely to raise these for discussion at a subsequent formal meeting of the ATCPWG.
- 7 The CAA response to these comments was sent to members on 28 January 2016 and stated that:
 - a. The CAA agreed to apply a 6-month period for implementation following the final publication of the appropriate MATS Part 1 and FISO Manual technical content and would include the material within AIP ENR 1.7 Altimeter Setting Procedures. However, please refer to later text in paragraph 8c.
 - b. The CAA agreed that the inclusion of intermediate FLs appeared to be superfluous but stated that as the table represented the transition level, it may be confusing for ATS personnel and pilots to retain the transition level 'label', whilst 'artificially' amending the level to reflect what would, in effect, be a minimum useable IFR cruising level. As a result, the CAA requested that members consider the following proposals:
 - (1) An additional column could be added to the table of transition levels which would detail the minimum useable IFR cruising level (see Annex A); or,
 - (2) The table of transition levels could be amended to delete the intermediate FLs, with an additional note to explain the derivation of the levels.
 - c. The CAA agreed that there had been no evidence of a safety risk from using units of measurement other than 1013.25 hPa and 27.3 ft per hPa. However, the CAA stated that 1013.25 hPa is the standard value for sea level atmospheric pressure³ and 27.3 ft per hPa has been confirmed as the value used within both aircraft and ground based surveillance systems. Whilst 'older' or 'simpler' aircraft may require the pilot to manually set the altimeter sub-scale setting to the Standard Pressure Setting (SPS) – and it is likely that pilots would thus set 1013 hPa – in modern aircraft the setting of the SPS is automated and uses the 'full' value. Consequently, it would not be appropriate for the CAA to continue to promulgate values that are known to be inaccurate and to be at odds with those values programmed into the ATM system. However, the CAA acknowledged the potential operational impacts that the adoption of these values may have and proposed a number of options that would permit some latitude to ANSPs as follows.
 - (1) Through the work of EASA's RMG.0464 Part ATS, the UK CAA has highlighted its belief that the text related to the determination of the transition level should read:

² <http://publicapps.caa.co.uk/modalapplication.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=7023>

³ ICAO Doc 7488 Manual of the ICAO Standard Atmosphere.

*The transition level shall be located at least a **nominal** 300 m (1000 ft) above the transition altitude to permit the transition altitude and the transition level to be used concurrently in cruising flight, with vertical separation ensured.*

Which would align the text with that of PANS-ATM 5.3.2 relating to VSM and thus provide a degree of flexibility as described in paragraph 4c above.

- (2) Pending the outcome of the State Consultation on the TA Project, the CAA will seek to approve the nominal VSM concept in so far as it acknowledges the 'nominal' nature of the VSM of 300m (1000 ft).
- (3) Where ANSPs determine that there would be an operational impact associated with the adoption of 1013.25 hPa and/or 27.3 ft per hPa, the CAA could permit ANSPs to develop an alternative means of compliance to determine the transition level. The CAA requested that WG members consider the following proposed text for MATS Part 1 (CAP 493) Section 1 Chapter 7 paragraph 5B which would facilitate this approach:

Transition level is the lowest Flight Level available for use above the transition altitude. Except where an alternative means of calculating the transition level is detailed within MATS Part 2, the transition level may be determined from the table in Appendix A as follows:

- (1) *Within controlled airspace by the controlling authority and it will normally be based on the QNH of the major aerodrome;*
- (2) *Outside controlled airspace by the Aerodrome Operator and based on the aerodrome QNH.*

Second Consultation Period – 28 January 2016 to 26 February 2016

8 Responses received from members indicated that:

- a. The preferred table of transition levels to be included within the MATS Part 1 and FISO Manual was that included at Annex A detailing the minimum useable IFR cruising level alongside the transition level.
- b. The proposed text for MATS Part 1 (CAP 493) Section 1 Chapter 7 paragraph 5B proposed in paragraph 7c(3) above was supported.
- c. The implementation timeline previously advised could no longer be supported due to planned changes within industry and that implementation would not be feasible before March 2017.

Final Response from CAA

9 The CAA will seek to publish SIs to MATS Part 1 (CAP 493) and the FISO Manual (CAP 797) on the revised method of determining the transition level on 28 April 2016. These SIs will include the following text – which represents a minor change to that previously advised in order to better reflect the content of the ICAO State Letter – and the table in Annex A to this document.

Transition level is the lowest Flight Level available for use above the transition altitude and shall be located at least a nominal 1000 ft above the transition altitude to permit the transition altitude and the transition level to be used concurrently in cruising flight, with vertical separation ensured. Except where an alternative means of calculating the

transition level is detailed within MATS Part 2, the transition level may be determined from the table in Appendix A as follows:

- (1) Within controlled airspace by the controlling authority and it will normally be based on the QNH of the major aerodrome;*
- (2) Outside controlled airspace by the Aerodrome Operator and based on the aerodrome QNH.*

- 10 Following consultation with industry, the SIs will become effective on 25 May 2017.
- 11 The CAA is able to confirm that, at the time of writing, EASA had accepted the UK's argument detailed within paragraph 7c(1) above and that the italicised text would be included as a Technical Requirement within the draft 'Part-ATS'.

Determining Transition Level

Aerodrome QNH (hectopascals)	Transition Altitude (feet)							
	3,000		4,000		5,000		6,000	
	Flight Level	Minimum IFR cruising level	Flight Level	Minimum IFR cruising level	Flight Level	Minimum IFR cruising level	Flight Level	Minimum IFR cruising level
1060 1050	30	30	40	40	50	50	60	60
1049 1032	35	40	45	50	55	60	65	70
1031 1014	40	40	50	50	60	60	70	70
1013 995	45	50	55	60	65	70	75	80
994 977	50	50	60	60	70	70	80	80
976 959	55	60	65	70	75	80	85	90
958 940	60	60	70	70	80	80	90	90

Note:

These Transition Levels have been calculated utilising the following values:

- a. The Standard Pressure Setting of 1013.25 hPa as defined in ICAO Doc 7488 Manual of the ICAO Standard Atmosphere and the EASA Certification Specification – Definitions.
- b. A value of 27.3 ft per hPa derived from a linear correction which is applied to corrected barometric altitudes and confirmed as being utilised in aircraft and ATM systems