

The Second UK State Consultation on a Harmonised Transition Altitude (TA): CONOPS - Joint Concept of Operations for Inside and Outside of Controlled Airspace

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Policy to Introduce a Harmonised Transition Altitude in the London and Scottish Flight Information Regions

Joint Concept of Operations for Inside and Outside of Controlled Airspace

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1 INTRODUCTION

1.1 A harmonised Transition Altitude (TA) of 18,000ft is proposed with the intention of enhancing efficiency, both inside and outside controlled airspace, through standardisation of airspace and altimeter setting procedures. This will provide the foundation for future safety, environmental and economic benefits that will be realised through improvements to the vertical profiles of aircraft arrivals and departures in the London and Scottish Flight Information Regions (FIRs). It also serves as a platform for future airspace and operating concepts through programmes such as Single European Sky (SES), SES Air Traffic Management Research (SESAR), Future Airspace Strategy (FAS) and the UK/Ireland Functional Airspace Block (FAB).

1.2 Information Notice-2014/033 articulated the UK/Ireland FAB position on a higher TA and also the European position at that time. Since the launch of the first UK consultation, the European Aviation Safety Agency (EASA) has conducted an initial consultation on a harmonised TA in line with the European Commission Rulemaking Procedure. The following regulatory options were identified and considered:

- a. Option 1 – Do nothing (i.e. no regulatory intervention).
- b. Option 2 – An Implementing Rule (IR) to implement a harmonised European TA at 18,000ft.
- c. Option 3 – An IR prescribing common criteria for the determination of the TA at or above 10,000ft.

1.3 EASA set up a Harmonised European Transition Altitude (HETA) Rulemaking Group to determine the European position. The HETA Group determined there should be no regulatory intervention, although it felt that EASA should issue guidance to States wishing to change their TAs in the future. In due course it is anticipated that these findings will be ratified by the SES Committee.

1.4 A decision was made by the Future Airspace Strategy Deployment Steering Group in December 2013 to proceed to a second State TA Consultation with a Concept of Operations (CONOPs) developed to support a level of 18,000ft. As the European project timescales did not suit the aspirations of the UK, Ireland and Norway, the three States had to proceed with their plans before the European position was clear. The UK, Ireland and the Isle of Man have therefore announced their intent to implement an 18,000ft TA at the same time and based on the same high level CONOPs. Norway has also indicated its intention to adopt a TA of 18,000ft although their timescales for consultation and implementation are yet to be confirmed.

1.5 Raising the TA presents significant challenges, requiring a mind-set change for pilots and controllers alike, as well as a plethora of software upgrades, chart amendments and training at all levels to be developed. The vast amount of change process necessary imposes human factors and safety issues that must be appropriately mitigated. However, a

long lead in time to implementation should ensure that all such concerns are managed in an appropriate and timely manner.

2 GOVERNANCE

2.1 A joint CAA, NATS and MOD TA Project Team (TAPT) has been established, working in partnership to develop and implement a common TA of 18,000ft across the London and Scottish FIRs. A State TA Safety Committee (TASC), primarily formed of the CAA/NATS/MOD project partners, has been established to ensure that safety is appropriately assured. The TASC operates parallel to, and in cooperation with, the TAPT and both report directly to the TA Steering Group (TASG). The TAPT and TASC will be established for the life of the Project.

2.2 The TASG provides cross-organisation governance arrangements to drive progress and to offer direction, challenge and assurance. The TASG also provides input into the UK-Ireland-Norway TA Oversight Group (UINTAOG) that reports to the FAB Supervisory Committee. The TAPT, TASC, TASG and UINTAOG all have representation from the CAA, NATS and MOD.

3 NOTIFICATION

3.1 The CONOPs describes the high-level characteristics for the proposed harmonised raised TA in the London and Scottish FIRs and should be considered as a baseline for the evaluation of procedures to be used.

4 DEFINITION OF TRANSITION ALTITUDE

4.1 ICAO definition (Doc 8168 Annex 2; Chapter 1): Transition Altitude (TA) - the altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes. The current UK and European interpretation, in operational use in most countries, is that the TA is defined in whole thousands of feet (e.g. 6,000ft and below in the London and Scottish TMAs) and the vertical datum is based on QNH. Above the stated TA, Standard Pressure Setting is used.

5 ALTIMETER SETTING REGIONS

5.1 An element of the TA project is the replacement of the existing Regional Pressure Setting Regions, which currently use a forecast of the lowest pressure, with new Altimeter Setting Regions (ASRs) which will use an actual QNH value. The concept of ASRs has been developed to define regions where, below 18,000ft, a single QNH value per ASR will be defined within the Air Traffic Management (ATM) system for use within en route Controlled Airspace (CAS). Within Class G airspace the use of ASR pressures is recommended for en route flights whenever the use of an airfield datum would be inappropriate. In order to provide a consistent approach to ASR design, a number of principles were established governing their physical and meteorological characteristics.

- a. **Minimum Number of ASRs.** In order to minimise the number of ASRs, the size of the ASRs should be as large as possible in order to be operationally viable within CAS, yet sufficiently small to ensure that the pressure differences within and between ASRs is as low as practicable. This is for two reasons, firstly the magnitude of pressure differences between two locations is a function of distance, i.e. the further apart two locations are, the larger the surface pressure difference is likely to be. The second reason is that the frequency of pressure differences between two locations is a function of distance, i.e. the further apart the two locations are, the greater the likelihood that there will be a difference in pressure.

The Met Office undertook a number of studies to assess these two issues, so the information could be used to establish how large the areas should be before the intra-regional and inter-regional differences became significant. These studies indicated that pressure variances are lower in the south than in the north of the UK, and tended to vary less from east to west than north to south.

Large pressure variations only occurred on a small number of occasions (~2%) usually associated with deep depressions that moved rapidly across the UK. Therefore it was agreed to base the design of the ASRs on data up to the 98th percentile, i.e. ignoring the occasions when large pressure differences occur. Where exceptional variation occurs associated with 2% of observations, these events can be clearly associated with storm features which for the most part preclude or severely restrict flight.

Subsequently the design criteria was set to ensure that, based upon historical data, the variation within each ASR shall not be greater than 15 hPa based on a 98% probability. This design criterion allows suitable calculations to be made that ensure safe overflight of terrain and airspace reservations. (See Sections 7 & 8). Following further investigation, it can be demonstrated that for 99.79% of occasions for all ASRs, and 99.99% of occasions for ASRs over the land, that pressure variation is below 15hPa as measured from the reporting station to all points within the ASR.

- b. **Common Boundaries.** The areas would utilise common vertical and lateral boundaries, irrespective of the classification of airspace, thus avoiding the situation where differing QNH values would exist within each ASR inside and outside CAS. The boundaries would coincide with existing airspace structures where possible.

5.2 Each ASR will have a Nominated Altimeter Setting Aerodrome or Station (NASAS), detailed at Annex B. The QNH will be extracted from the METAR and this value will be promulgated in the routine half-hourly ASR Bulletin. Air Navigation Service Providers (ANSPs) are to disseminate ASR QNH values relevant to their area of operation to controllers for onward and timely dissemination to aircraft operating on an ASR QNH. The selection criteria for each NASAS were:

- a. The distance between NASAS should be no more than 150nm where operationally possible.
- b. The identification of a major aviation hub, thereby minimising the number of altimeter setting changes within the specific ASR.

- c. The ability, where possible, to supply METARs on an H24 basis.
- d. Ideally, to be as centrally located as possible within each ASR in order to reduce the inter-regional differences. However because there are a limited number of aerodromes capable of issuing METARs on an H24 basis some non-centrally located NASAS have been chosen.

5.3 To avoid risk of confusion between pressure settings used for takeoff and landing, and that used within the area, where practicable ASRs have been named independently from the NASAS from which the ASR QNH is derived, based upon principles detailed in the ASR Naming Policy developed by the CAA. For example, the QNH provided by the Newquay NASAS is proposed to be called the Cornish QNH. An ASR QNH bulletin, derived from the METAR process, will be issued by the Civil Aviation Communication Centre (CACC) on a half-hourly basis for promulgation by Aeronautical Fixed Telecommunication Network (AFTN).

5.4 The UK Met Office will routinely provide a back up pressure for each ASR and in the event of a NASAS not issuing a METAR, or should the METAR not contain a valid QNH, a back-up ASR QNH will be issued based upon a predicted QNH¹ for the same location. Additionally, a predicted QNH will be provided for any areas where there is no capability to produce an actual QNH, such as the Donald area north of the Outer Hebrides. Predicted ASR QNH values will be transparent to, and have no impact on the user. Back up arrangements will be established by CACC and the UK Met Office to ensure that the provision of ASR QNH values will be maintained.

5.5 Normally, when an aerodrome QNH is observed to change by 1hPa outside of the METAR cycle, it is a requirement for the aerodrome to update the aerodrome QNH through a Local Special Report (SPECI). However, where this occurs at a NASAS, this will not be promulgated as an ASR bulletin in order to minimise the effect on workload caused by multiple pressure changes. For this reason, the relevant NASAS aerodrome QNH may be different to the ASR QNH. Where a NASAS aerodrome QNH changes by 2hPa within the METAR cycle, an interim ASR bulletin will be issued; this will facilitate the management of altimeter settings for aircraft operating in accordance with QNH tolerance procedures (see Section 9.2). For this reason, the relevant NASAS aerodrome QNH may be different to the ASR QNH.

5.6 When the atmospheric pressure is forecast to change by ≥ 2 hPa in the next METAR cycle, or there is a large pressure gradient forecast (≥ 6 hPa) across an ASR, the ASR QNH bulletin will contain a warning to alert users. Details of procedures to be adopted are defined at paragraphs 7.2, 7.3 and 8.2.

¹ Met Office data shows that for a number of locations across the UK, for the locations verified, 99.2 % or more of forecasts of QNH are within +/- 1.5 hPa of the actual value at up to 3 hours ahead.

5.7 The promulgated ASR QNH will be the altimeter setting value used to define the upper and lower boundaries of en route CAS below the TA including TMAs and some CTAs²; however, the upper and lower boundaries of CTRs and CTAs associated with an aerodrome will be based on the aerodrome QNH of the controlling authority³. CAS bases in adjacent FIRs will remain unchanged⁴. Details will be promulgated in the AIP⁵.

Figure 1 overleaf is a chart showing the proposed ASRs.

² In addition to airways, the CTAs below the TA which will be defined by the ASR QNH are the Clacton, Cotswold, Daventry, North Sea, Severn and Worthing CTAs. The North Sea CTA (2 & 3), is dependent on final arrangements with the Netherlands. Strangford CTA arrangements are to be confirmed.

³ This includes Solent CTA, which is based on Southampton QNH.

⁴ In areas of UK CAS where ATS is delegated to another ANSP, discussions are still ongoing.

⁵ The CAA is considering the current CTA naming and the need to regularise any variances.