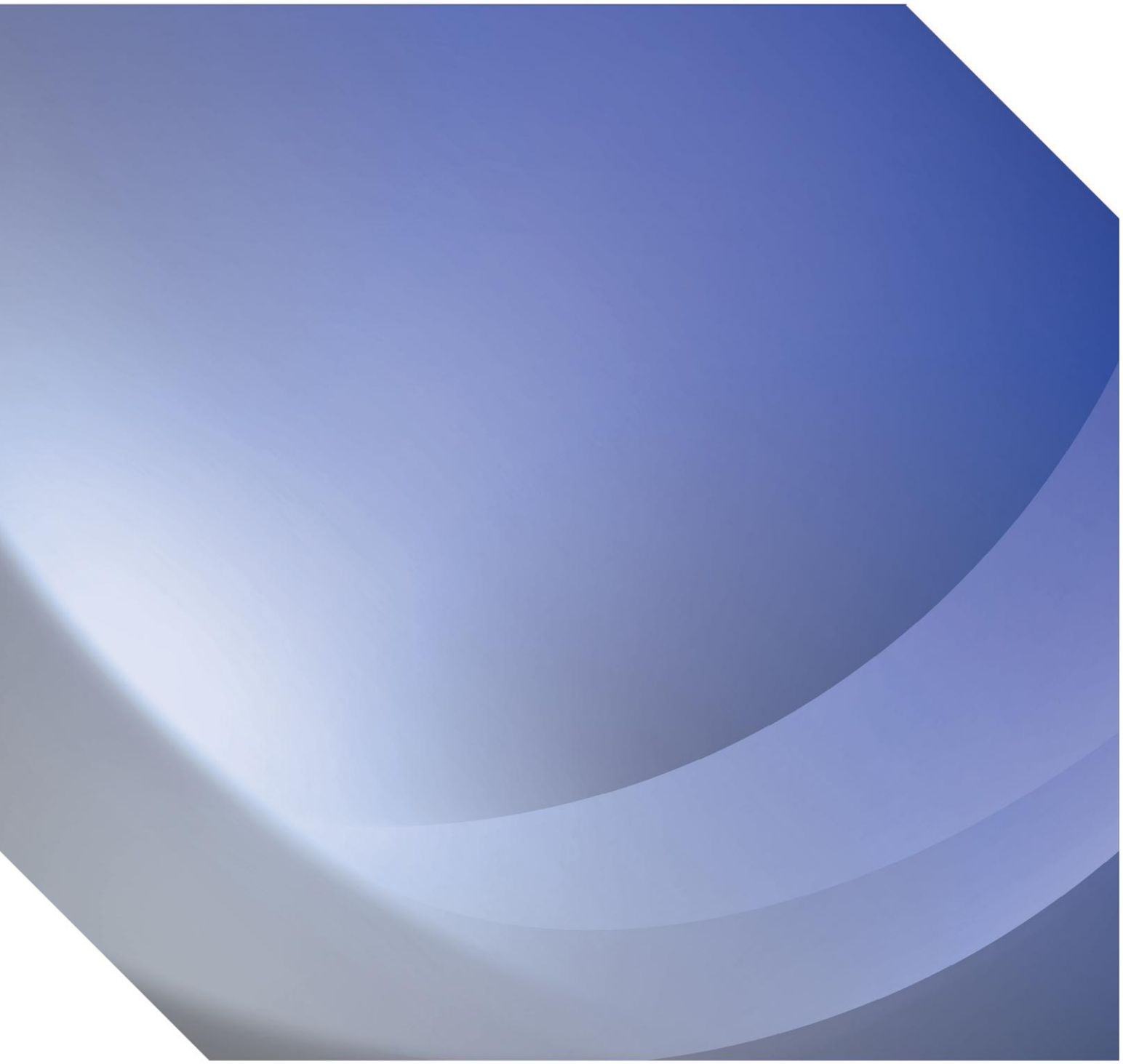
The Second UK State Consultation on a Harmonised Transition Altitude (TA):

Consultation Overview

CAP 1349



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Foreword

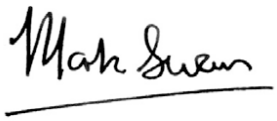
A harmonised Transition Altitude (TA) across the UK at a higher level, along with the rollout of Performance Based Navigation (PBN) procedures, has long been acknowledged as a cornerstone of the Future Airspace Strategy and an enabler for projects such as the London Airspace Management Programme (LAMP) to realise their maximum operational potential.

The UK CAA has worked in close collaboration with both NATS and the Ministry of Defence since the first TA Consultation in 2012 in developing a Concept of Operations (CONOPs) and supporting assurance papers. Internationally it has enjoyed a close working relationship with the Irish Aviation Authority in developing a harmonised, higher TA for an across Functional Airspace Block (FAB) deployment. We have also collaborated closely with CAA Norway in its plans for a harmonised, higher TA. Whist EASA's work on a Harmonised European Transition Altitude did not conclude in any specific recommendations, the UK's work on TA will inform much of the planned guidance material to Member States.

This second TA Consultation focuses on obtaining industry feedback on the CAA's draft CONOPs and its supporting assurance papers. It is not a consultation on whether the UK should harmonise its TA at a higher level; that was completed in 2012. Feedback from industry stakeholders will be used to refine the draft CONOPs, its assurance papers and to inform implementation planning.

Deployment of a new TA has always been intrinsically linked to the deployment of modernised airspace structures, to both maximise their efficiencies and limit some of the negative impacts on Radio Telephony (R/T) that might be incurred during major airspace changes. It is important that the draft TA CONOPs is fully refined before the long process of airspace re-design work commences in earnest; hence this second TA Consultation on the CONOPs itself.

Your contribution to this work is extremely important to us and will provide a measure of both assurance and challenge that we are on the right track. I look forward to your points of view.



Mark Swan Group Director, Safety & Airspace Regulation
October 2015

1 Introduction

The UK CAA undertook a consultation during 2012 to ascertain aviation stakeholders' feedback on the principle of raising the UK's various Transition Altitude (TA) values to a harmonised value, both inside and outside of Controlled Airspace. The consultation concluded that two thirds of respondents favoured a change from the current mix of Transition Altitudes to a harmonised value; 18,000ft amsl was agreed as the target value.

Since then, working in partnership, NATS, MOD, and the UK CAA (the TA Project Team) have undertaken a programme of work to develop a draft Concept of Operations (CONOPs) for a harmonised TA of 18,000ft amsl, which is the focus of this second UK CAA consultation.

The purpose of this second UK CAA consultation is to garner feedback from aviation stakeholders on the proposed CONOPs and supporting documentation to ensure that they are robust, representative of the operational environment and reflective of industry feedback. It does not cover the content of the 2012 consultation, nor does it ask if stakeholders favour a change to the TA as this was completed within the first consultation.

The purpose of this document is to provide an overview of the various elements of the consultation documentation and to ask aviation stakeholders to respond to this consultation in order to provide the State with feedback which enables a decision to be made on the way forward.

The Concept of Operations (CONOPs) is the main document being consulted upon during this consultation process. It is offered as a complete and interacting package underpinned by the supporting documentation and it should therefore be read in conjunction with these other documents. The document set consists of:

- the CONOPs;
- the State Safety Assurance Report; and,
- the Final Safety Report on the Nominal Vertical Separation Minima (VSM) concept

It should be noted that stakeholder validation of the CONOPs as a whole will not be inferred as validation of specific elements of the document for selected implementation.

2 Managing the consultation

This consultation is mainly aimed at the aviation industry and it is intended that the process will be managed on-line.

The main consultation documentation, including a list of Commonly Asked Questions & Answers about the State TA Project, will be published on the TA Consultation webpage. The list of Commonly Asked Questions will be updated if necessary on a fortnightly basis throughout the consultation as new queries are raised by consultees and the State feels that there is value in promulgating the answer to the question more widely. It should be noted that the Commonly Asked Questions & Answers are separate to the list of Questions for Industry Stakeholders. In order to ensure that all stakeholders are presented with the same questions to respond to, the on-line list of questions for stakeholders will NOT be changed once the consultation has started unless errors are detected in the content or the way the question is written.

Stakeholder responses will not normally be acknowledged, although stakeholders may be contacted for clarification of their queries if this is considered necessary. Stakeholders are therefore requested to review the Commonly Asked Questions & Answers to check whether or not an answer is available before submitting a query.

The consultation will run from 23rd November 2015 until 24th February 2016 inclusive and the findings will be published in an Aviation Stakeholder Consultation Feedback Report which will be placed on the TA Consultation website in Spring 2016.

The minimum lead in time from a decision to implementation would be approximately two and a half years; however a decision will not be made on the start time for this implementation period until the feedback from the consultation process has been assessed and the Aviation Stakeholder Consultation Feedback Report issued. The CONOPs and other TA documentation have been written on the assumption that an 18,000ft TA will be implemented during the European Commission's Regulatory Period 2 (RP2), which extends until the end of 2019.

Stakeholders are invited to:

- Read the on-line TA document set as described above;
- Review the list of Commonly Asked Questions if there is anything in the document set which is not clear to you; and,
- Provide responses to the Questions for Industry Stakeholders, giving as much relevant information as possible to inform the State decision on a higher TA

- Stakeholders may respond to the consultation by any of the following methods:
  - Utilising the on-line survey tool on the TA Consultation webpage on the CAA website, https://www.surveymonkey.com/r/transitionaltitude.

    This is the preferred method of responding. *Stakeholders should note that documentation must be completed in one attempt as the on-line tool is not capable of saving data to enable a response to be completed later. It is therefore recommended that stakeholders read the questions and prepare answers in advance of filling in the on-line form.*
  - Sending an email to TAconsultation@caa.co.uk.
  - Writing to: UK State TA Consultation, CAA House, 45-59 Kingsway, London WC2B 6TE.

All responses must be received by the closing time and date of the consultation, 1600 on Wednesday 24th February 2016.

It should be noted the email account at: TAconsultation@caa.co.uk will only be available for the period of consultation.

3 FAB TA statement

The UK and Ireland Functional Airspace Block (FAB) has been pursuing the common goal of a harmonised TA for several years. The National Supervisory Authorities (NSAs) and the Air Navigation Service Providers (ANSPs) of both countries, along with the MOD and the Irish Air Corps, have reached a consensus on how they would like to proceed and have therefore issued the following statement:

"This statement is agreed by the UK and Ireland NSAs that all parties will continue to co-operate fully on the development and implementation of a harmonised TA of 18,000ft at a date in the future.

The successful completion of a Concept of Operations (CONOPs) and underpinning safety work, considered necessary to address the technical issues associated with a harmonised TA of 18,000ft, means that both States are ready for consultation.

On the 23rd November 2015 consultations will commence in accordance with national and EU Legislation for SES Regulations."

4 The European position

The European Aviation Safety Agency (EASA) established a Harmonised European TA (HETA) Rulemaking Group, the aim of which was to determine which of the options under consideration for a raised TA at a European level was most appropriate. The HETA Group determined that there should be no EASA regulatory intervention. These findings have been presented to the European Commission and they will proceed to the Single European Skies (SES) Committee for ratification at their discretion.

The UK, Ireland and the Isle of Man have therefore announced their intent to implement a TA of 18,000ft 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 the timescales for consultation and implementation are yet to be confirmed. These changes will be implemented despite the fact that other neighbouring States have decided not to change their TAs at present. EASA and EUROCONTROL are both aware of these plans.

5 Consultation safety brief / rationale

The introduction of a significantly raised TA in the UK's Flight Information Regions is a large-scale project which will directly affect all UK airspace users and air traffic service providers. Consequently, the State TA Safety Committee, which operates within the governance framework of the UK TA Project, ensures that an appropriate approach to safety is taken within the project, and that the proposed concept of operations has robust supporting safety assurance. A State Safety Assurance Report, which is included in the Public Consultation package, was developed in collaboration with all project partners and reflects the findings from project meetings and activities to date. This will be updated to reflect post-consultation activity and, in due course, its structure will be advocated as a basis for localised implementation safety analysis.

6 The CAA's TA Business Engagement Assessment process

The Business Engagement Assessment (BEA) is a new form of impact assessment introduced by the CAA in April 2015. Whereas the full Impact Assessment is used for changes to legislation, the BEA is designed for assessing changes in CAA policy that affect stakeholders. As such, it is an internal CAA process and the CAA has made a commitment to carry out a BEA whenever a policy change is expected to have a significant effect on stakeholders (internal and external). The TA project falls under this guideline as it does not require a legislative change to the Air Navigation Order (ANO) and thus a BEA is sufficient and there is no requirement for a Regulatory Impact Assessment.

Contrary to what the name suggests, it is important for the BEA to evaluate the impacts on all stakeholders and not just businesses but it can be thought of as an element of a Stakeholder Engagement Assessment. A BEA for the TA Project is being developed through the project teams to support the 2nd UK State Consultation process. Whilst in harmony with this process, as a 'living' document, the BEA remains separate to the consultation document pack and there is no intent or

requirement to broaden its distribution until after the Aviation Stakeholder Consultation Feedback Report is concluded.

The TA BEA will aim to follow a structured process to consider the cost benefits of a harmonisation of TA to stakeholders, engaging with those likely to be affected prior to any decision being made. It will be used to help inform TA policy by assessing and presenting the likely costs and benefits and the associated risks of TA policy, process or practice changes that might have a significant impact on internal or external business. By doing this the CAA can:

- Demonstrate that it has considered alternative ways to achieve its desired regulatory goal whilst minimising costs to those impacted.
- Demonstrate that the impact on internal and external stakeholders of changes in regulatory activities is proportional to the TA Project goal.
- Identify areas where burdens lie or have been reduced as a result of a change in policy, process or practice.

Subject to the statement at Annex A relating to Instrument Flight Procedure plate change requirements, the current proposed policy is that the costs of TA harmonisation will be met by aviation stakeholders where they fall. The TA BEA will inform the response should this costing policy be challenged during state consultation.

The BEA will pose a number of questions to the 2nd UK State Consultation stakeholders with the intent of further identifying and recognising the benefits of the TA Project as well as allowing stakeholders to assess and inform the project team of potential costs and benefits of implementation and post implementation, both financial and, if applicable, environmental.

As a work in progress, the BEA will be updated and refreshed to reflect the findings of the

Consultation Feedback Report to ensure that it remains relevant to supporting implementation of a harmonised TA.

Consultation concept documents

7 TA CONOPS v5.2 (with v11 charts)

- The Joint Concept of Operations for Inside and Outside of Controlled Airspace has been published on the CAA website and linked here.

8 State Safety Assurance Report

- The State Safety Assurance Report has been published on the CAA website and linked here.

9 Nominal Vertical Separation Minima (VSM) Final Safety Report

- The Nominal Vertical Separation Minima Safety Report has been published on the CAA website and linked here.

ANNEX A

Statement relating to Instrument Flight Procedure (IFP) Plate Change Requirements brought about by the Transition Altitude Project

The Transition Altitude (TA) project involves raising and harmonising the TA throughout the UK to an altitude of 18,000ft. As part of this project there will be a requirement to amend a significant number of charts, including all SID/STAR/IAP charts and ATC SMAC, to reflect the new TA.

This process will involve individual units reviewing all such AIP charts to assess the level of change required for each chart. It will also involve changing the transition altitude data in the text of the AD 2.17 section of the AIP related to each aerodrome. In many instances, particularly for most SID charts where there are no associated Instrument Flight Procedure (IFP) design level restrictions, this may simply involve the amendment of the local TA annotation at the top of the chart. On some charts, including STAR charts, the background levels on the chart and the advisory levels for planning purposes may also need to change from Flight Levels to altitudes to reflect the new TA. The service provider who manages the procedure will need to advise if these advisory levels can be routinely converted from a Flight Level to an altitude.

In these instances a ‘regularisation’ of charts and AIP text is considered the most proportionate approach and individual units should refer all requested chart and text changes to the TA Project team before forwarding them to AIS. AIS will be requested to make an administrative change to the chart and text of the AD 2.17 section with no payment required from the chart owner.

For charts where the procedure involves IFP design level restrictions, such as SIDs which end at a Flight Level, the IFP will need to be reviewed by an Approved Procedure Designer to ensure that the gradient is still correct. In these instances the normal scheme of charges will apply.

ANNEX B

Depictions of aircraft altitudes on surveillance displays - Radar Data Processing System (RDPS)

General

A potential safety risk associated with the proposed Transitional Altitude (TA) change is that depictions of aircraft altitudes on ATS surveillance displays may differ from altitudes actually being flown. Such variations may arise as a result of differences between the altimeter setting selected in an aircraft and the altimeter setting programmed into an ATS provider's Radar Data Processing System (RDPS). These may adversely impact upon controller workload, potentially resulting in confusion and possibly leading to airborne conflict.

Current Situation

CAP 670 'Air Traffic Services Safety Requirements' Part C Section 3 'Display of QNH' paragraphs SUR11.18 to SUR11.21 requires that:

- The display shall be capable of displaying QNH values.
- QNH value input mechanisms shall be identified.
- Manual entry and changes to this value shall be validated by double entry.
- When it is possible to change the QNH value automatically, the equipment shall require the change to be drawn to the controller's attention and confirmed on all other displays.

ANSPs may choose to define a surveillance QNH conversion area within the Radar Data Processing System for the purposes of managing the processing of raw SSR Mode C information transmitted from an aircraft transponder. Within such areas, the SSR Mode C information from flights operating beneath the TA is converted to an altitude above mean sea level using the pressure value applicable to the airspace within which the aircraft is flying.

Currently, Area Control Centres will depict an aircraft's vertical position by reference to 1013.2 hPa[1] both above and below the TA. Approach Radar units depict aircraft

[1] The 'Standard Pressure'. With this set, an aircraft altimeter indicates Pressure Altitude (Flight Level), and is used by all aircraft operating above the TA to provide a common datum for vertical measurement. The Standard Pressure is equivalent to the air pressure at mean sea level in the 'International Standard Atmosphere'(ISA). The ISA is based on the following values of pressure, density, and temperature at mean sea level each of which decreases with increase in height:

vertical position in accordance with their unit procedures, in practice through use of their aerodrome QNH. A TA of 3000ft results in aircraft at and above 3000ft being depicted with reference to 1013.2 hPa. Controllers use conversions and take account of the effect of 2 pressure data being depicted - one above and one below the TA. It is understood that military Approach Radar units typically select 1013.2 hPa as the depiction datum for all flights and make mental corrections for the depiction of aircraft flown using a QNH or QFE below the TA.

The introduction of an 18,000ft TA and associated ASR QNHs generates new options and potential issues to be considered to ensure safe and efficient implementation. Clarity of the issues is required in order to inform the development of CAA policy and guidance to industry (through amendment to CAP670) to allow ATS providers to apply the most appropriate local solution.

Impacts of TA Change upon RDPS Depictions

A raised TA results in increased volumes of airspace within which altitudes apply. Use of ASR QNH raises questions regarding the most appropriate datum Approach Radar units will use to depict surveillance pressure altitudes.

Options

The CAA considers it necessary for individual ATS providers to determine an appropriate course of action regarding which altimeter setting value is selected for local RDPS use. Several options have been identified to date:

- **Option 1 – Aerodrome QNH** It is necessary for units to manage the difference between aerodrome and ASR QNH and also the difference between aerodrome QNH and the Standard Pressure on those occasions when providing ATS to aircraft above 18,000 ft and below the Divisional Flight Level[2]. This will be influenced by the volume of inbound/outbound traffic, local traffic density and distance from the source of the aerodrome QNH. The use of aerodrome QNH permits continued use of the aerodrome ATC Surveillance Minimum Altitude Charts[3]

- Pressure of 1013.25 hPa
- Temperature of +15°C
- Density of 1,225 gm/m^3.

(see http://www.skybrary.aero/index.php/Altimeter_Pressure_Settings and http://www.skybrary.aero/index.php/International_Standard_Atmosphere)

[2] FL195 as established by Regulation (EC) No 730/2006 of 11 May 2006 on airspace classification and access of flights operated under visual flight rules above flight level 195

[3] See CAP 777 'ATC Surveillance Minimum Altitude Charts in UK Airspace - Policy and Design Criteria'

and eases workload for ATCOs regarding the issuance of instructions regarding terrain separation, the avoidance of airspace reservations and calculation of vertical separation between traffic displayed on the RDPS.

- **Option 2 – ASR QNH** Where the majority of air traffic provided with ATS would operate on an ASR QNH, it may be more appropriate to apply the ASR QNH as the RDPS datum. This would facilitate assessment of vertical separation between aircraft that are likely to be operating on an ASR QNH value. It would also be advantageous for units currently using the Standard Pressure as their RDPS datum in assessing vertical separations between aircraft as it is likely that the variance between the Aerodrome and ASR QNHs is less than that between the Aerodrome QNH and the Standard Pressure. This would reduce the ATCO's workload in calculating the associated differential. However, subject to the capabilities of the RDPS, for units whose operating areas span several ASRs, the use of an ASR QNH as the RDPS datum may prove problematic. The requirement to calculate the aircraft's actual vertical separation from terrain and airspace reservations within the Surveillance Minimum Altitude Area[4] means that use of an ASR QNH as RDPS datum would increase ATCO's workload.
- **Option 3 – Standard Pressure** A common setting can apply at all units but presents significant burdens at local unit level in terms of monitoring SSR level values against safety altitudes, clearance altitudes and mental workload in calculating differences between aerodrome and ASR QNHs and the Standard Pressure. With two exceptions (both military), it is not anticipated that any approach radar unit will be required to utilise the Standard Pressure as, with a raised TA of 18,000 ft, they could no longer be expected to issue instructions to aircraft operating above the TA.
- **Option 4 – No RDPS Datum Value Entered** Non-selection of an RDPS datum is believed to result in an RDPS defaulting to the Standard Pressure. This is expected to result in high workload as ATCOs attempt to determine appropriate altitudes to avoid terrain and airspace reservations and to ensure aircraft separation.

Inappropriate RDPS Depictions and Appropriate Mitigations

Inappropriate RDPS datum selection could contribute to losses of separation, mid-air collision or controlled flight into terrain, however this risk exists today. Existing mitigations to address this risk are:

- Unit operating procedures.

[4] CAP 777 defines the Surveillance Minimum Altitude Area as an area in the vicinity of an aerodrome, in which the minimum safe levels allocated by a controller vectoring IFR flights with Primary and/or Secondary Surveillance radar equipment have been predetermined.

- Regulatory oversight and approvals process.

Industry Comment

Industry is invited to provide comment on the following:

- The current variations of RDPS depictions.
- The validity of the identified options.
- The risk of inappropriate RDPS depictions with identification of appropriate mitigations to be delivered.

Industry is additionally invited to propose additional options with supporting rationale.

RDPS manufacturers are invited to comment upon current and potential future functionality associated with multiple ASR areas within an ATS unit's area of responsibility.

ANNEX C

TA stakeholder engagement activities summary

Introduction and Overview

The UK State Transition Altitude Project has conducted a number of engagement visits during the run up to consultation. This annex provides an executive summary of the feedback obtained to date.

The engagement process criteria was to ensure that every UK boundary international ANSP/NSA was engaged, as well as a representative sample of UK airport ANSPs that operate within CAS, in Class G airspace, or a mixture of both, including representatives of commercial, recreational and other types of aircraft operations.

The aim of these engagement activities was to present the developing UK State CONOPs to the audience and seek feedback as to its viability for their operations in such areas as technology, ATC procedures, interface arrangements etc.

The engagement activities were also utilised by the UK State Transition Altitude Project to outline the State's consultation period that would be combined with an impact assessment request (now renamed as a Business Engagement Assessment by the State).

Summary of Pre-Consultation Findings

International:

For Denmark and the Netherlands, the UK areas of ATS delegation in the North Sea require a pragmatic solution to be developed looking towards the implementation of the change that balances the needs of the MOD and Class G/offshore helicopter users with the needs of the civil ANSPs of adjacent States which have no current drivers to consider a change to their transition altitudes.

Domestic:

The main concern for the airports was around the cost of the change taking account of the potential need to update Radar Data Processing Systems (RDPS), Instrument Flight Procedures (IFP), documentation sets, MATS Part 2, training etc., which is recognised by the State and hence its development of the Business Engagement Assessment as part of State consultation.

The main feedback message was for the State to promulgate the change, including its UK AIP and MATS Part 1 changes, at least eighteen months before operational

introduction in order that each unit can follow its Safety Management System (SMS) to ensure safe delivery on the States' chosen implementation date.

MOD:

The MOD has always maintained that there are minimal benefits to be achieved by the raising of the TA to 18,000ft, whilst its costs would be significant. Having assisted in the development of the CONOPs, the MOD believes that, whilst it would be able to accommodate a raised TA, concerns remain about the increase in complexity to Airborne Surveillance & Command System (ASACS) and Area operations and in particular controller workload centred around Class G operations, as a result of the introduction of ASRs and the pressure differentials associated with intersecting boundaries. This issue is further compounded by the increases in controller workload brought about by phraseology requirements. These issues combined have the potential to remove the capacity of military controllers to:

a) respond to co-ordination requests where the aircraft under their control have not requested a Deconfliction Service; and,

b) continue to provide such services to Commercial Air Traffic (CAT) operating within Class G airspace.

ANNEX D:

Concepts for the Management of the Interfaces between Aerodrome and ASR QNHs for the UK's harmonised TA CONOPs

Executive Summary

The UK CAA requires all UK ANSPs to provide safety assurance that aircraft will be separated in accordance with ICAO, EASA and UK regulatory requirements.

Within the proposed Altimeter Setting Regions (ASRs), there will be occasions when notable pressure differences exist between the aerodrome QNH and the ASR QNH depending on the airport's geographical position in relation to the Nominated Altimeter Setting Aerodrome or Station (NASAS) (see Met Office Data at Appendix A).

Within this document, solutions are proposed by the joint Project to manage the aerodrome/ASR interface and all ANSPs are invited to respond on each proposal, outlining the rationale for their comment and to clearly indicate their preferred methodology.

Overview

The Transition Altitude (TA) project involves the raising of the current UK TA of 3,000ft/5,000ft/6,000ft up to a harmonised level of 18,000ft. As part of this project there will be a requirement to develop procedures to ensure that aircraft operating within controlled airspace below the TA are on the appropriate ASR or Aerodrome QNH pressure, unless the ANSPs are operating in compliance with the CAA's proposed Nominal Vertical Separation Minima Policy (Nominal VSM).

Problem statement

Within ASRs, there can be notable QNH pressure differences between the aerodrome QNH and the ASR QNH depending on the airport's geographical position in relation to the NASAS. The Met Office Data at Appendix A provides a detailed comparison of the QNH of major aerodromes within the proposed ASRs to the QNH of the proposed ASR NASAS.

The State Safety Assurance Report on the TA Project indicates that further work will be required on the interfaces between en route/Terminal Manoeuvring Area (TMA) and airport ANSPs who operate within continuous controlled airspace to provide

evidence that continued safe operations are assured; specific challenges exist when there is a significant difference in the altimeter settings in use.

CONOPS v5.2 (para5.7) states:

The promulgated ASR QNH will be the altimeter setting value used to define the upper and lower boundaries of en route Controlled Airspace (CAS) below the TA including TMAs and some Control Areas (CTAs)[5]; however, the upper and lower boundaries of Control Zones (CTRs) and CTAs associated with an aerodrome will be based on the aerodrome QNH of the controlling authority[6]. CAS bases in adjacent FIRs will remain unchanged[7]. Details will be promulgated in the UK Aeronautical Information Publication (UK AIP)[8].

Proposal

One concept that has been proposed by the joint Project for ensuring safe separation at these interfaces could be the adoption of concepts currently termed within the Project as a Defined Aerodrome Altitude (DAA) and a Lowest Aerodrome Safe Altitude (LASA):

- DAA - the maximum level at which an airport (or group of airports) can operate under an airport QNH. This aerodrome QNH could be defined:

  (a) as per CONOPS v5.2 (para 5.7);

  (b) entirely within the aerodrome ATZ, its CTR/CTA or a volume or airspace as agreed between ANSPs;

  (c)*as a collective QNH across aerodromes and aerodrome group*ings; or,

  (d) as another level that is best suited for the operation (similar to existing aerodrome QNH/QNE management procedures)

- LASA - Lowest Aerodrome Safe Altitude that the TMA/en route Area Control Centre (ACC) can operate at above the DAA to ensure a minimum of 1000ft separation is maintained against aerodrome QNH in all of the instances above.

It is envisaged that this concept could form the basis of a letter of agreement between en route/Terminal Manoeuvring Area (TMA) and airport ANSPs and as such would be subject to normal unit SMS processes and CAA oversight.

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[5] 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.

[6] This includes Solent CTA, which is based on Southampton QNH.

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

[8] The CAA is considering the current CTA naming and the need to regularise any variances.

Consultation Requirement

The joint Project accepts that these options are not exhaustive and consultees are invited to provide feedback on the options proposed above and to provide further options for the Project Team to consider. In developing alternative options, ANSPs should consider inter alia, cockpit workload resulting from the timing of altimeter setting changes, the proposed nominal Vertical Separation Minima concept, local airspace and the nature of their interaction with other ANSPs.

It is important to note that formal work on these proposals would commence during the implementation stage of the TA Project as part of formalising arrangements between the en route/Terminal Manoeuvring Area (TMA) and airport ANSPs and as such would be subject to normal unit SMS processes and CAA oversight.

Glossary

ACC	Area Control Centre	ASR	Altimeter Setting Region
ANSP	Air Navigation Service Provider	CAA	Civil Aviation Authority
CONOPs	Concept of Operations	DAA	Defined Aerodrome Altitude
FAS PRPB	Future Airspace Strategy Policy and Regulatory Programme Board	FAQs	Frequently Asked Questions
EASA	European Aviation Safety Agency	ICAO	International Civil Aviation Organisation
IFP's	Instrument Flight Procedures	LAMP	London Airspace Management Programme
LASA	Lowest Available Safe Altitude	MOPs	Method of Operations
NASAS	Nominated Altimeter Setting Aerodrome or Station	NERL	NATS en route Limited
NTCA	Northern Terminal Control Area	PANS Ops	Procedures for Air Navigation Service Provider Operations
QNE	Standard Atmospheric Pressure	QNH	Pressure above mean sea level
SID	Standard Instrument Departure	SOPs	Standard Operation Procedure
TA	Transition Altitude	TMA	Terminal Manoeuvring Area
VSM	Vertical Separation Minima		

Appendix A

MET OFFICE DATA

Airfield	ASR	Max diff (hPa)	Mean diff (hPa)	Std dev (hPa)	2 x Std dev (hPa)	Diff ≤1hPa (%)	Diff >1hPa (%)	Diff ≤2hPa (%)	Diff >2hPa (%)	Diff ≤3hPa (%)	Diff >3hPa (%)	Diff >4hPa (%)	Diff >5hPa (%)	Diff ≤6hPa (%)	Diff >6hPa (%)
Gatwick	London	2.22	0.46	0.35	0.7	91.98	8.02	99.96	0.04	100	0	0	0	100	0
London City	London	2.22	0.31	0.25	0.5	98.44	1.56	99.99	0.01	100	0	0	0	100	0
Northolt	London	0.69	0.14	0.10	0.21	100	0	100	0	100	0	0	0	100	0
Farnborough	London	1.79	0.28	0.22	0.44	99.12	0.88	100	0	100	0	0	0	100	0
Blackbushe	London	2.13	0.29	0.24	0.48	98.53	1.47	99.97	0.03	100	0	0	0	100	0
Fairoaks	London	1.0	0.14	0.11	0.22	100	0	100	0	100	0	0	0	100	0
Biggin Hill	London	1.55	0.26	0.21	0.41	99.43	0.57	100	0	100	0	0	0	100	0
Luton	London	2.82	0.56	0.42	0.85	85.73	14.27	99.3	0.7	100	0	0	0	100	0
Stansted	London	3.16	0.56	0.43	0.86	85.76	14.24	99.22	0.78	99.99	0.01	0	0	100	0
Birmingham	London	8.06	1.54	1.24	2.48	41.54	58.46	70.62	29.38	87.39	12.61	4.86	1.56	99.4	0.6
East Midlands	Potter	9.91	1.92	1.48	2.95	32.73	67.27	60.15	39.85	78.95	21.05	9.64	4.06	97.9	2.1
Southampton	London	4.26	0.71	0.56	1.12	75.47	24.53	96.65	3.35	99.75	0.25	0.01	0	100	0
Liverpool	Potter	2.19	0.34	0.29	0.58	96.58	3.42	99.99	0.01	100	0	0	0	100	0
Leeds	Potter	6.1	1.04	0.81	1.62	56.73	43.27	87.9	12.1	97.27	2.73	0.56	0.06	99.99	0.01
Warton	Potter	3.87	0.61	0.52	1.05	80.24	19.76	96.84	2.16	99.92	0.08	0	0	100	0
Blackpool	Potter	4.2	0.71	0.61	1.21	74.93	25.07	95.73	4.27	99.57	0.43	0.03	0	100	0
Birmingham	Potter	6.48	1.03	0.85	1.69	57.59	42.41	86.84	13.16	96.96	3.04	0.5	0.08	99.99	0.01
East Midlands	Potter	4.8	0.79	0.67	1.33	69.63	30.37	94.21	5.79	99.02	0.98	0.11	0	100	0
Prestwick	Kelvin	3.91	0.58	0.46	0.92	83.66	16.34	97.96	1.04	99.94	0.06	0	0	100	0
Edinburgh	Kelvin	3.89	0.71	0.57	1.13	74.49	25.51	97.04	2.96	99.72	0.28	0	0	100	0
Belfast	Kelvin	12.28	1.75	1.41	2.82	37.07	62.93	64.89	35.11	82.83	17.17	6.98	2.97	98.05	1.95
Aldergrove	Kelvin	12.09	1.77	1.4	2.81	36.23	63.77	64.32	35.68	82.85	17.15	6.95	2.97	98.13	1.87
Bristol	Avon	2.70	0.38	0.32	0.65	95.28	4.72	99.79	0.21	100	0	0	0	100	0
Exeter	Avon	3.68	0.78	0.6	1.19	70.26	29.74	95.7	4.3	99.68	0.32	0	0	100	0
St. Athan	Avon	0.83	0.12	0.1	0.19	100	0	100	0	100	0	0	0	100	0
Swansea	Avon	2.85	0.45	0.41	0.81	90.26	9.74	99.2	0.8	100	0	0	0	100	0

Notes

1 Data from the Met Office's North Atlantic & Europe (NAE) limited area forecast model were extracted from the archive for the 5-year study period from October 2006 to September 2011 inclusive. Occasional archive storage failures have resulted in isolated instances of missing model data including 1-15 October 2006 and 1-12 December 2006. In total, 169 model analysis data files were missing during the 5-year study period, out of a total theoretical availability of 7304, giving a data availability of 97.7%.

2 The data herein represent model mean sea level pressure at analysis time for all four runs of the model per day (00, 06, 12 & 18Z). The data are not based on METAR from the NASAS.

3 The columns highlighted in blue were calculated by the author, based upon the Met Office data, and represent the percentage of occasions within the data set where the aerodrome QNH was less than or equal to 1hPa, 2hPa and 3hPa of the NASAS value.