

The Second UK State Consultation on a Harmonised Transition Altitude (TA) of 18,000ft in the London and Scottish Flight Information Regions - Aviation Stakeholder Consultation Feedback Report

CAP 1417



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Reference documents and revision history

Reference documents

Joint Concept of Operations for Inside and Outside of Controlled Airspace (CONOPs)	www.caa.co.uk/CAP1349P7
State Safety Assurance Report (SSAR)	www.caa.co.uk/CAP1349P8
Nominal Vertical Separation Minima Safety Report	www.caa.co.uk/CAP1349P9

Revision history

Issue 1

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Chapter 1

Executive summary

Progressing the 18,000ft Transition Altitude (TA) to this stage has involved considerable liaison with aviation professionals within the United Kingdom (UK) and overseas. The UK, Republic of Ireland and Norway formed a Transition Altitude Oversight Group, (UINTAOG), to ensure a consistent approach, to identify common issues and to develop compatible procedures to implement an 18,000ft TA; additionally there was significant UK and Irish participation in the EASA Harmonised European Transition Altitude (HETA) Rulemaking Group as well as consultation with agencies further afield. The UK and Ireland's second consultation relating to the future implementation of a harmonised, Functional Airspace Block (FAB) Transition Altitude (TA) of 18,000ft concludes with this Consultation Response Document. This consultation focused on a proposed Concept of Operations (CONOPs) and supporting documents; the consultation on the principle of moving to an 18,000ft TA was covered in 2012.

The UK project has worked on the principle that an 18,000ft TA's primary benefit lies in enabling a new systemised airspace design to fully realise its potential by removing the loss of levels around the current 6,000ft TA (5,000ft around Manchester) from Terminal Manoeuvring Areas (TMA). An 18,000ft TA facilitates airspace design through interlocking Standard Instrument Departures, Standard Arrival Routes, Holds, Arrival Transitions and Instrument Approach Procedures, including those with vertical guidance, without the need to incorporate buffers to allow for the differences in the manual re-setting of aircraft altimeters. It will also facilitate the design of more Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO) in the airspace below 18,000ft.

NATS' London Airspace Management Programme (LAMP) was intended to be the first large scale systemised airspace design requiring the key enabler of an 18,000ft TA; however, external factors mean that NATS is not able to progress the redesign of the Southeast's airspace until Regulatory Period 3 (RP3), (2020 to the end of 2024). As raising the TA to 18,000ft in isolation provides no quantifiable safety

improvement to the NATS operation, NATS feels that a change should only be implemented ahead of, and closely aligned with, LAMP implementation to fully realise the benefits to airlines from the substantial outlay involved.

The CAA recognises the significant financial implications associated with the implementation of a higher TA. The Transition Altitude Project Team (TAPT) worked to gain a full understanding of these costs and to identify possible mitigations, such as a regulatory approval to amend local TA annotations on Instrument Procedure Charts where there is no interaction with the current or future TA. The consultation shows that there are few direct benefits of a raised TA for ANSPs, and the main burden of cost is likely to fall on them. Therefore, with the exception of NATS, other ANSPs have generally not supported a raised TA.

The purpose of introducing a raised TA has always been to enable more efficient use of airspace to realise potential savings for aircraft operators in terms of lower fuel bills and lower emissions. Therefore, a higher harmonised TA needs to be assessed in the context of efficiency, rather than solely on increased costs to stakeholders. This would be done on the basis that the project is able to deliver overall benefits to the customers that outweigh ANSPs' investments. This applies throughout the UK and Ireland FAB and therefore, a coordinated, joint approach was adopted to address procedures.

The CAA will continue to develop and maintain a Business Engagement Assessment, (BEA), to fully understand the associated costs. It will consider the BEA findings from the overall State perspective, balancing the costs against benefits to the UK's entire aviation industry. The CAA will want to ensure that the project delivers overall benefits to users, thus making the investment, particularly by ANSPs, worthwhile. The BEA will be published in advance of implementation once the effects on the industry are fully known.

The UK Ministry of Defence (MOD) anticipates considerable costs whilst receiving no benefit to its operations as a result of a raised TA. It acknowledged that these issues do not prevent the implementation of an 18,000ft TA, although the availability of services to commercial aviation or the ability to co-ordinate may be reduced to contend with any increased controller workload. The MOD recognises the benefits of

a raised TA within the lower airspace and airfield environment, but identifies significant dis-benefits associated with its en-route task.

The GA community is largely in favour of an 18,000ft TA as the simplified procedures provide better awareness of proximity to terrain and they help to avoid infringing CAS or other airspace reservations. For commercial pilots and aircraft operators, the benefits will mainly be realised if the TA change leads to more efficient arrival and departure routes being designed, although pilots also state that it could improve safety by reducing workload and the number of level busts.

The CONOPs and supporting project documentation have been developed considerably since the first consultation, with many of the issues identified being resolved to a satisfactory degree for this stage of the project. However, there are still issues which would need to be addressed before an 18,000ft TA can move into an implementation phase.

The CAA confirms its commitment to a harmonised TA across the UK, and its intent remains to implement an 18,000ft TA at the earliest opportunity. However, in view of the fact that NATS will delay the systemised airspace structure which relies on an 18,000ft TA until RP3, the CAA concludes that implementation of an 18,000ft TA will need to be moved to RP3. As stated by NATS, it should also be implemented shortly before, and in conjunction with, major systemised airspace change in order to benefit from the substantial outlay that a raised TA will involve.

In view of this delay, a third, proportionate, TA consultation will likely be required prior to implementation to address any issues or changes which may have occurred in the interim; the full scope of such a consultation has not yet been determined. This delay will also give time for all stakeholders to better assess the effects of an 18,000ft TA on their operations, whilst giving the TA project and major ANSPs sufficient time to address the issues identified by this consultation.

The UK's TA project will now move into a period of 'care and maintenance' during which time the CONOPs, new ATC Tools that potentially mitigate some of the areas for development identified by this consultation will be reviewed. At an appropriate point, ahead of any planned systemised airspace implementation requiring the higher TA, the project will move out of 'care and maintenance' to undertake a refresh

of the CONOPs, followed by proportionate consultation, before moving the project to an implementation footing.

Chapter 2

Introduction

This document provides feedback to aviation stakeholders who participated in the second consultation on the policy to harmonise the Transition Altitude (TA) both inside and outside controlled airspace (CAS) in the London and Scottish Flight Information Regions (FIRs) at 18,000 ft¹. The feedback provided focuses on the analysis of the comments received and the key themes identified by stakeholders. The consultation commenced on 23 November 2015 and closed on 24 February 2016. The purpose of this report is to inform industry of the outcomes of the consultations and of the proposed way forward.

The UK CAA previously 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. That 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 (collectively 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.

Rather than providing options for stakeholders to choose within the consultation, this second consultation was based purely on the TA Concept of Operations (CONOPs) and supporting documentation. This documentation was produced by the Transition Altitude Project Team (TAPT) with oversight from the Transition Altitude Steering Group (TASG). 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

¹ There may be some possible exceptions, such as in Delegated Air Traffic Service Airspace where services are provided by another state.

2012 consultation, nor does it ask if stakeholders favour a change to the TA as this was completed within the first consultation.

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 TA Consultations were conducted in both countries concurrently.

UK / Ireland joint regulator statement

Following the successful completion of the consultation in both states, the NSAs agree that they have the foundation of a CONOPs for a TA of 18,000ft for future implementation.

'It 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.'

Chapter 3

Consultation response analysis

Figure 1 below provides an overview of the stakeholder responses received. In terms of this overview, it should be noted that this chart only reflects the number of individual responses to the consultation. Therefore, the size of the 'pie portions' should not be taken to reflect the overall combined opinion of the responders. This is because, whilst some responses reflect the opinions of an individual, several reflect the opinions of an organisation, or in some cases, a number of organisations.

Figure 1: Stakeholder responses received

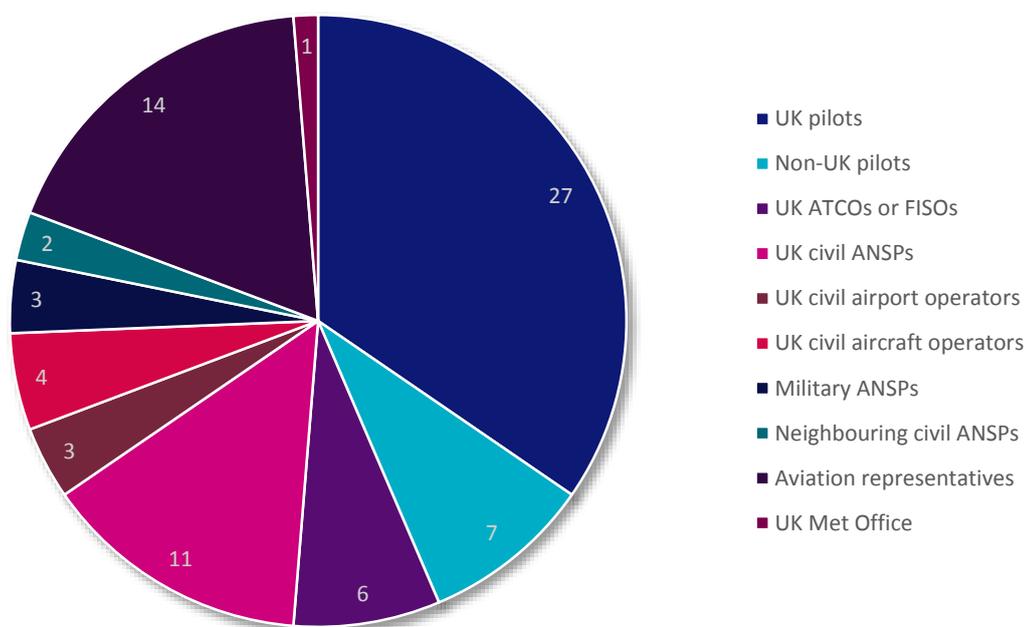


Chart data updated on 27 April 2016

There were 79 responses to the consultation; 63 of these were completed on the consultation website, with the other sixteen providing more generalised comments which were received via the TA Consultation email address. These totals do not match the pie chart above due to multiple submissions from some organisations. 64 per cent of the total responses were from individuals with the rest representing organisations. Overall the response rate was considered satisfactory for the formal consultation.

The numbering of questions in the following section relates to the numbers as utilised on the TA Consultation website. Not all questions/numbers are included here as some relate to personal information, or are otherwise not relevant to the Consultation Feedback process. The number of responses to each question may not reflect the overall number of responses received, as not all questions were answered by all responders; also, it should be noted that some responders answered in more than one category.

Consultation questions to stakeholders

Q1: Having assessed the scope of the changes that the TA will bring, please rate your understanding (or that of your organisation) of the business requirements needed to implement an 18,000ft TA. (BEA 1)

Fully understand requirements and detailed evaluation complete	21
Fully understand requirements and making good progress on detailed evaluation	9
Have a good understanding of requirements and have started detailed evaluation	10
Have a broad overview but have not progressed to detailed evaluation	40

GATCO main comments: GATCO believes that the likely scale of training required to bring the ATCO workforce up to speed cannot be underestimated. GATCO is concerned that the CONOPs does not contain enough information for all aerodrome ANSPs to be able to make a thorough assessment of the impact on their operations, including consideration of the required procedures between adjacent units. GATCO has noted that unless capacity is decreased, more personnel are likely to be needed to tackle the extra workload introduced by increases in RTF loading, and the complexity of calculations required to ensure separation is maintained. The Human Factors impact of aircraft not being displayed on surveillance equipment at whole FLs is also going to require training for. Not necessarily being able to use surveillance data to assure that separation is in place is a significant culture change. GATCO is concerned that the sums required to implement all this staffing and

training may not be available, and that smaller ANSPs may not be able to afford the tools.

BALPA main comments: We have concerns that the business requirements are being put ahead of safety and as has been admitted, there is no enhancement of safety. In all the documentation, there is no evidence that advice or research has been undertaken to investigate how a TA of 18,000ft is operated and managed in the USA and Canada where it has been in operation for decades in airspace that is at least as complex as the UK's with more extremes of weather.

HIAL main comments: Our organisation cannot have a clear understanding of the business requirement until the format for the provision of ASR data is agreed. Where the format (eg XML) can be integrated with AFTN, our business requirement is minimal. However, if XML is not compatible with AFTN and the purchase of an AMHS system is necessary, the business requirement escalates markedly in terms of cost.

BAe Systems Warton comments: At this stage, we do not anticipate any manpower changes, however, there will definitely be an impact with training costs, updates of procedures, instrument approach procedures, training materials and education and awareness training. Considerable thought and effort will be required prior to TA change, to ensure that Warton's wide ranging flight test activities are not adversely affected by TA change.

CAA comments

Encouragingly, feedback from the consultation indicates that 62.5 per cent of the stakeholder group already has at least a broad overview of the TA project.

In early 2015 the CAA conducted an Implementation Workshop to determine the scope and duration of the implementation process. Based on the findings from that workshop, the CAA acknowledges the size of the task in terms of implementing an 18,000ft TA. The CAA would therefore propose a long enough implementation period to enable all stakeholders to assess the effects on their operations in more detail than is possible as part of this consultation. This would include allowing sufficient

time for development and approval of the procedures to be adopted by individual units and between adjacent units.

The CAA recognises that, whilst the CONOPs has reached a reasonable level of maturity, there are still issues which would need to be addressed before implementation of an 18,000ft TA could be considered. Of particular note are those areas where the level of indicative safety risk remains relatively high: the high level of RTF loading and the management of ASR boundary crossings outside CAS; both of which have yet to be satisfactorily resolved by the project.

Getting the project to this stage has involved considerable liaison with aviation professionals both in the UK and abroad. The UK, Ireland and Norway formed an oversight group (the UINTAOG) to progress the issues and procedures which were likely to affect all three countries as they seek to implement an 18,000ft TA. There was also significant UK and Ireland participation in the Harmonised European Transition Altitude (HETA) Rulemaking Group as well as consultation with agencies further afield, including the USA. Whilst there are some comparisons that can be made with operations in the USA, one of the main issues is the small size of the UK which limits the ability to manage its traffic effectively. A system reflecting a US style operation would require the UK to be managed as part of a fully integrated and unified Europe-wide system of ATM, and this is something that Europe is still working towards.

The financial implications of a higher harmonised TA are also significant for certain sectors of the industry, and the CAA would want to ensure that the project delivers overall benefits to the customer, as determined at the State level, which would make the investment, particularly by ANSPs, worthwhile.

It is acknowledged that the format for the provision of ASR data has not yet been clarified and this issue is considered in more detail in Appendix A.

Q2 – Q4: *(Personal details)*

Q5: Are you completing this consultation feedback on behalf of an organisation or as an individual response?

Organisation	32
Individual	38

Q6: ORGANISATIONS: Please select the type of organisation that you work for.

UK Civil ANSP	11
UK Civil Airport Operator	3
UK Aircraft Operator	4
Aviation Representative Organisation (e.g. BGA, Airport Operators Association, GATCO)	12
Neighbour State Civil ANSP	2
Military ANSP	3
UK Met Office	1
PPL Flying School	1
Microlight School	1

Q7: INDIVIDUALS: Please state your role.

UK Pilot (commercial and private)	27
Non UK pilot (commercial and private)	7
UK Air Traffic Controller (ATCO) or Flight Information Service Officer (FISO)	6

Q8: Please select your organisation from the list of Adjacent State Regulators.

(No Adjacent State Regulators responded).

Q9: Please select your organisation from the list of Air Navigation Service Providers.

Avinor, Norway
Isle of Man ATC

Q10: AVIATION ORGANISATION REPRESENTATIVE: Please select your organisation.

UK Aircraft Owners and Pilots Association (AOPA)	3
General Aviation Alliance (GAA)	1
PPL/IR Europe	1
British Gliding Association (BGA)	1
Guild of Air Traffic Control Officers (GATCO)	1
Prospect ATCOs Branch	1
British Airline Pilots Association (BALPA)	1
IATA	1
FASVIG	1

Q11: What type of ANSP is your organisation?

En-route	1
Airport	8

Q12: UK AIRPORT ANSPs: Please select your organisation from the list of airports.

NATS
Coventry Airport
Shoreham Airport
Birmingham Airport
Birmingham, East Midlands & Leeds Airports (joint submission)
Humberside Airport
Exeter Airport
BAe Systems, Warton
Highlands & Islands Airports (HIAL): HIAL operate as ANSP for 11 Airports: Sumburgh, Kirkwall, Wick, Inverness, Dundee, Stornoway, Benbecula, Barra, Campbeltown, Islay and Tiree.
Northern Development & Deployment Group (NDDG): NDDG has provided a joint submission which represents the interests of Manchester, East Midlands, Liverpool John Lennon, Doncaster Robin Hood, Durham Tees Valley, Birmingham, Leeds Bradford International and Newcastle International Airports.

Q13: UK AIRPORT OPERATORS: Please select your organisation from the list of airports.

Bournemouth Airport
Humberside Airport
London Heathrow Airport

Q14: In the period following the TA change, what are the forecast benefits to your organisation of any changes required as a consequence of a change in the TA? (BEA 3)

(Individual responses to this question are analysed in the Key Themes document at Annex A, serial no.14).

Q15: In the period up to the TA change, what is the forecast cost to your organisation of any changes required as a consequence of a change in the TA? (BEA 2)²

No financial cost	26
Less than £5,000	3
£5,000 - £10,000	0
£10,000 - £20,000	0
£20,000 - £50,000	0
£50,000 - £100,000	4
£100,000 - £250,000	1
£250,000 - £500,000	1
More than £500,000	3

CAA comment

As anticipated, the consultation has shown that costs mainly fall on ANSPs, with the largest ANSPs, such as NATS and the MOD, anticipating the highest costs. The GA community generally feels that there is little or no cost to affect their operations.

² Costs are analysed in greater detail in the Key Themes document at Appendix A, serial no. 9.

Q16: What on-going costs do you or your organisation anticipate after implementation? This includes costs associated with airspace redesign brought about by a change in the TA. (BEA 4)³

	Costs year 2	Costs year 2	Costs years 3-6
No financial cost	23	27	28
Less than £5,000	8	4	3
£5,000 - £10,000	3	2	2
£10,000 - £20,000	0	0	0
£20,000 - £50,000	0	1	1
£50,000 - £100,000	0	0	0
£100,000 - £250,000	1	0	0
£250,000 - £500,000	0	0	0
More than £500,000	1	1	1

General comments: As neighbour State ANSPs, Isle of Man ATC has stated that further changes regarding the acquisition of QNH data may be required if the proposal to cease distribution via AFTN takes effect, whilst Avinor anticipates a onetime cost to amend documentation.

CAA comments

Although there is a slight reduction in ongoing costs over time, there is still the perception amongst a number of ANSPs that costs will continue to be constant over a number of years. Although the CAA recognises that initial costs are likely to be high, it would need to have a better understanding of why ANSPs believe that ongoing costs would remain high in subsequent years.

Airports with Instrument Flight Procedures (IFPs) which need to be amended, generally believe that they would gain no benefit from a raised TA.

³ Costs are analysed in greater detail in the Key Themes document at Appendix A, serial no. 9.

Q17: What future benefit(s) do you or your organisation anticipate after implementation as a consequence of a change in the TA? This includes any benefits realised through the redesign of airspace to enable improved vertical profiles of aircraft arrivals and departures. (BEA 5)

(Individual responses to this question are analysed in the Key Themes document at Appendix A, serial no.14.)

Q18: What is the forecast cost to you or your organisation for changes as a consequence of a change to the TA? (BEA 6)⁴

	Costs year 2	Costs year 2	Costs years 3-6
No financial cost	28	31	32
Less than £5,000	5	4	3
£5,000 - £10,000	1	0	0
£10,000 - £20,000	1	1	1
£20,000 - £50,000	0	0	0
£50,000 - £100,000	1	0	0
£100,000 - £250,000	10	0	0
£250,000 - £500,000	1	0	0
More than £500,000	0	1	1

General comments: Eastern Airways felt that their Year 1 costs would be £250,000-£500,000 with the costs for subsequent years being more than £500,000. The airline felt that whilst the cost of implementation for them as an operator isn't significant, the impact on their operation could be massive, especially if military controllers are unable to offer deconfliction services due to the perceived additional workload imposed on them. Costs are based on the assumption that all scheduled services are forced into flying in controlled airspace with longer routings and more congestion on trunk routes. A detailed breakdown of costs is provided.

⁴ Costs are analysed in greater detail in the Key Themes document at Appendix A, serial no. 9.

CAA comment

The GA community generally believes that the costs to their operations will be minimal, with updated charts probably being their main requirement. From the aircraft operator perspective, with the exception of Eastern Airways, the only dependent costs anticipated would be incurred by the production of training and briefing material for the pilots. Changes to charting and navigation data would be accomplished as part of normal processes.

CAA Conclusion: As part of the requirement to introduce a more systemised airspace structure, the CAA should engage with commercial operators before an 18,000ft TA is implemented so that any issues can be better understood and managed.

Q19: Do you or your organisation agree or disagree with the proposed procedures associated with the expected magnitude and frequency of pressure differentials at ASR boundaries within the UK and the methodology prescribed to manage such differences? (GEN 11.1)⁵

Agree	24
Disagree	7
Not applicable	13

General comments: BAe Systems Warton does not support a raised TA, particularly one of 18,000ft; however, it recognises that if the State wishes to pursue a revised TA, the proposed procedures for managing ASR boundary differentials seem to be the best way of managing a difficult situation.

Eastern Airways agrees with the procedures devised, although they perceive them as introducing significant additional complexity for no benefit to their operations, especially in Class G airspace.

⁵ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 15.

Q20: Do you or your organisation agree or disagree with the proposed management of Class G international FIR boundary crossings? (GEN 11.2)

General comments: The GA community is quite concerned at the lack of clear procedures for this element of the CONOPs and GATCO has stressed the importance of boundary procedures being developed to be efficient and safe without being dictated by one ANSP to another based upon resources available to each. GATCO also believes that the procedure for managing interactions crossing, and close to, ASR and FIR boundaries should be standardised nationally; i.e. should be a MATS Part 1 level requirement, not a local unit instruction.

One response was hopeful that agreement would be reached within an acceptable timescale on a common European TA in order to mitigate what is likely to be a difficult transition between the TA levels at the boundary. Unfortunately, it can be confirmed that this is now unlikely as EASA has concluded that it would not be worthwhile to enforce a harmonised TA on the industry.

CAA comment

A representative group of Class G airspace users was consulted regarding Class G boundary crossings during a CAA safety workshop. The group stated that, whilst they had some concerns regarding the nature of the interface at the FIR boundary with adjacent states operating the system of intermediate VFR cruising levels, they had no concerns regarding the risk of traffic conflict at the FIR boundary. A great deal of liaison has taken place with all the UK's adjacent NSAs and ANSPs, particularly with Ireland and Norway as part of the UINTAOG. However, it was not possible to resolve this issue before the results of this consultation were collated. The CAA accepts that further work is required with neighbouring ANSPs to ensure that boundary procedures outside CAS are workable in each instance.

CAA conclusion: Before implementation, the UK TA project will need to engage further with neighbouring ANSPs to ensure that all boundary procedures, including delegation of ATS in the North Sea, are fully agreed and workable.

Q21: What is your position or the position of your organisation on the flight crew cockpit workload under the proposed Concept of Operations (CONOPs)? (GEN 20)⁶

Reduced cockpit workload	9
No significant change	14
Acceptable increase in cockpit workload	8
Unacceptable increase in cockpit workload	2
Not applicable	9

Q22: With reference to the issues described in paragraphs 26 to 30 of the Nominal Vertical Separation Minima Safety Report; does your organisation believe that a raised TA would result in reduced airspace containment for its Instrument Flight Procedures? (GEN 22)

Yes	5
No	6
Not yet fully assessed	15
Not applicable	19

General comments: NATS notes that aerodrome SID procedures are predicated on the airport QNH and not the ASR QNH. There is no PANS-OPS procedure for where the pilot on a SID should change from Aerodrome QNH to ASR QNH. Therefore the ANSP cannot guarantee an aircraft remains within nominal VSM parameters at all times.

HIAL notes that the Assurance Report appears to suggest that surveillance is a requirement for nominal separation. They ask if this is the case or can non-surveillance ATC Units utilise the nominal separation rule; perhaps outside of ASR management.

⁶ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 1.

CAA comment

For the initial stages of implementation of the nominal VSM concept, the CAA had stated that surveillance based ATS with either SSR Mode C or Mode S would be a pre-requisite in order to act as mitigation against level bust, altimeter setting error etc. However, the CAA has acknowledged that as the concept is refined, it may be possible to extend the use of nominal VSM more widely and that there may be scope to include use of the proposed altimeter setting change procedure in the nominal VSM safety report in a non-surveillance environment.

Q23: Do you or your organisation agree or disagree with the proposed positions of the Altimeter Setting Region (ASR) boundary lines? (GEN 8)⁷

Agree	34
Disagree	5
Not applicable	5

General comments: GATCO believes that the design introduces more complexity and more risk at and close to the ASR boundaries. It believes that units in these areas will be operating on multiple altimeter settings, resulting in increased workload. GATCO is concerned about the potential impact of complexity of operations on units at and close to ASR boundaries, especially smaller ones with lower staffing numbers. It also notes the possibility of the need to change ASR boundary positions in future due to changes of traffic flows and densities.

Whilst some GA responses state that the ASRs are too small and that there are too many of them, the BGA believes that they are too large and too complex.

⁷ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 15.

Q24: Do you or your organisation agree or disagree with the proposed names of the Altimeter Setting Regions (ASRs)? (GEN 9)⁸

Agree	31
Disagree	6
Not applicable	6

CAA comment

Amongst those who disagreed with the proposed names of the ASRs, several alternative suggestions were put forward. Stakeholders will not necessarily be aware of the restrictions on the TA Project Team when choosing possible names for the ASRs, nonetheless, all suggestions have been forwarded to the Team for their consideration.

Q25: Which of the proposed methods of communicating Altimeter Setting Region (ASR) data best suits your operation? (GEN 10.1)⁹

The RPS data provisioned by the FOUK70 Met Office bulletin via the Aeronautical Fixed Telecommunications Network (AFTN) will be discontinued in the future. However, for a short period of time post the ASR bulletin introduction the FOUK70 will be revised or modified to provision ASR data	3
The ASR bulletin will be provisioned by an Extensible Markup Language (XML) message over the Aeronautical Message Handling System (AMHS)	2
The ASR bulletin (map, pressures and warnings, etc) will be available via a web based XML service over the Internet	21
Not applicable	16

⁸ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 16.

⁹ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 17.

CAA comment

At the start of the TA Consultation, the CAA recognised that the likely final method of communicating ASR data was not known. Nonetheless, it was felt appropriate to ask stakeholders about their preferences in an effort to gauge the general opinion of those likely to be most affected by the change.

Q26: With reference to the Altimeter Setting Region (ASR) bulletin format, what will be the impact to your operation in terms of cost? (GEN 10.2)^{10,11}

	Costs year 1	Costs year 2	Costs years 3-6
No financial cost	21	24	25
Less than £5,000	5	6	5
£5,000 - £10,000	5	2	2
£10,000 - £20,000	0	1	1
£20,000 - £50,000	1	0	0
£50,000 - £100,000	2	0	0
£100,000 - £250,000	9	1	1
£250,000 - £500,000	0	0	0
More than £500,000	0	0	0

General comments: HIAL has stated that if the format for ASR provision is not compatible with their current AFTN system, their costs are likely to be substantial. Other ANSPs have also let it be known that their costs could be considerably higher than suggested if they are forced to change the way they receive ASR data.

¹⁰ See ICAO Annex Update Annex 3 amendment 77 for digital data references & ICAO Doc 10003 for iWXXM.

¹¹ Bulletin format costs are analysed in greater detail in the Key Themes document at Appendix A, serial no. 18.

CAA comment

An important consideration for all ANSPs is that AFTN will not be supported by BT after 2018, so there is a driver to move away from this legacy protocol. This change is outside of any new procedures introduced as part of the TA project. Additionally there is a move to using technologies that will enable the aviation industry to make use of greater levels of data richness i.e. Data Exchange models.

Q27: With reference to the Altimeter Setting Region (ASR) bulletin format, how long would it take to implement this within your organisation? (GEN 10.3)¹²

3 to 6 months	19
6 to 9 months	1
9 to 12 months	4
12 to 18 months	2
18 to 24 months	3
If greater than 24 months please specify	0

General comment: Whilst BAe Systems Warton has stated a nine to twelve month implementation period for its preferred option of a revised FOUK70, it has also stated that the option of an XML message over the AMHS would take 18-24 months to implement.

Q28: Is a review of the CTA naming policy a worthwhile project for the State to pursue? (GEN 12)

Very worthwhile	12
Worthwhile	10
Not worthwhile	7
Not sure	9

¹² This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 19.

CAA comment

There are mixed views among a varied stakeholder group on whether or not the State should review the CTA naming policy. 59 per cent consider it worthwhile or very worthwhile, 19 per cent consider it not worthwhile and 22 per cent are not sure.

CAA conclusion: Based on the feedback, there is enough evidence for the CAA to initiate the process of scoping out such a change to make the CTA naming policy more user friendly.

Q29: Do you or your organisation agree or disagree with the proposed management of the interfaces between airfield QNH and ASR QNH or between airport and en-route airspace connectivity? (GEN 14)¹³

Agree	28
Disagree	5
Not applicable	5

Q30: Do you or your organisation agree or disagree with the proposed move to the common European method of the use of actual pressures every 30 minutes? (GEN 15)

Agree	35
Disagree	2
Not applicable	1

General comments: There is broad support for the change to actual pressures issued every 30 minutes, particularly amongst GA pilots. However, whilst the MOD is content with the concept of 30 minute promulgation of actual pressures, such promulgation is only valid when its aircraft are talking to a service provider that can

¹³ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 20.

update this information. As such, when an aircraft is not in direct contact with an ATS provider, the MOD does not believe that any method of distribution that needs verbal prompts meets the level of safety assurance it requires. The MOD will therefore continue to provide its pilots with forecast QNHs for their autonomous low level flight operations.

One response noted that there could be a significant pressure change over a 30 minute period, however the CONOPs already allows for this as pilots will be updated. The IATA and Virgin Atlantic responses took the opposite stance, pointing out that during stable pressure situations the time between readings could be extended to an hour, which apparently works well in the USA.

Eastern Airways disagrees with this proposal. The airline recognises that whilst the size of change in QNH will be lower, the frequency of change is likely to be higher. The company feels that it is the number of changes and the controller/pilot time on the RT which will contribute to the high workload and associated risk.

HIAL is concerned that controller workload at non-surveillance ATC Units may increase in terms of additional planning of procedural separations associated with actual pressures over that of forecasts.

BAe Systems Warton agrees with the proposed move to actual pressures every thirty minutes, subject to a satisfactory and cost effective method of distribution of actual pressures and a successful mitigation of additional area controller workload and RTF loading as a result of such changes.

CAA conclusion: Given the nature of the MOD's operations which can preclude the provision of a regularly updated atmospheric pressure setting, they have decided to pursue the introduction of a 'Low Flying Pressure' to mitigate the specific risks associated with their autonomous low flying operations. That notwithstanding, in view of the overall support for this proposal from most stakeholders, it is concluded that the UK should move to the common European method of the use of actual pressures every 30 minutes as part of a harmonised, raised TA. Consideration could also be given to this procedure being set up as a separate project to be implemented at an earlier stage.

Q31: Do you or your organisation agree or disagree with the proposed method of ensuring terrain and obstacle clearance whilst using either an Altimeter Setting Region (ASR) or airfield derived pressure datum? (GEN 16)¹⁴

Agree	32
Disagree	2
Not applicable	4

General comments: There is broad support for the proposed method of ensuring terrain and obstacle clearance, particularly amongst the GA community, however, the MOD disagrees with this proposal in relation to autonomous flight within Class G airspace. This is because, when an aircraft is not in direct contact with an ATS provider, the MOD does not believe that any method of distribution that needs verbal prompts meets the level of safety assurance it requires. The MOD will therefore continue to provide its pilots with forecast QNHs for their autonomous low level flight operations.

Q32: Do you or your organisation agree or disagree with the proposed methodology to ensure the safe underflight or overflight of airspace reservations (such as danger areas) in Class G airspace)? (GEN 17)¹⁵

Agree	31
Disagree	1
Not applicable	6

Q33: If there was room for improvement of RTF phraseology within the UK, what would you or your organisation propose? (GEN18)

(Individual responses to this question are analysed in the Key themes document at Appendix A, serial no. 23).

¹⁴ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 21.

¹⁵ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 22.

Q34: How would you like this difference to be shown on the charts? (GEN 13)

(Individual responses to this question are analysed in the Key themes document at Appendix A, serial no. 24).

Q35: Do you or your organisation agree or disagree with the proposed management of the UK's 18,000ft TA and the Class C DFL 195? (GEN 19)

Agree	23
Disagree	0
Not applicable	13

General comment: MOD analysis indicates that there is an issue regarding the provision of UK FIS within active TRAs (FL195-FL245) as a result of a raised TA of 18,000ft. This issue is introduced by virtue of Mode C/S conversion for aircraft operating at an altitude against those operating above at Flight Levels, and the requirement to assess the vertical distance between them. In conjunction with the CAA and NATS, the MOD would like to conduct a review UK FIS, as provided within active TRAs, as part of the implementation process.

CAA comment

Whilst one comment recognises the restriction to operators who naturally utilise this level band, amongst those to whom this procedure is relevant, there is overwhelming agreement that this is an appropriate method of addressing this issue.

CAA conclusion: In view of the overall support for this proposal, it is concluded that the procedures in the CONOPs for management of the UK's 18,000ft TA and the Class C DFL 195 are acceptably safe. As part of the implementation process, the MOD, CAA and NATS should review UK FIS as provided within active TRAs.

Q36: Do you or your organisation agree or disagree with the proposed Nominal Vertical Separation Minima concept? (GEN 21)¹⁶

Agree	23
Disagree	2
Not applicable	12

Q37: Bearing in mind your financial plans or the financial plans of your organisation, when would you or your organisation prefer a raised TA to be implemented? (GEN 23)¹⁷

2016 – 2020	23
2021-2022	4
2023-2024	1
2025-2026	5

CAA comment

Those whose costs are not affected, particularly the GA community, would prefer the TA change as soon as possible, whereas those who will largely be responsible for the costs, such as the ANSPs, have a greater need for a structured implementation.

¹⁶ This issue is analysed in greater detail in the Key Themes document at Appendix A, serial no. 25.

¹⁷ This issue is analysed in greater detail in the Key Themes document at Appendix A; it has been included under serial no. 14: Forecast & future benefits/

Q38: From the time that the CAA announces its decision to implement an 18,000ft TA, how many months would you or your organisation require to implement the changes necessary? (GEN 24)

3 to 6 months	22
6 to 9 months	2
9 to 12 months	3
12 to 18 months	1
18 to 24 months	4
Greater than 24 months (please give details)	3

CAA comment

Whilst the number of responses would seem to favour implementation as soon as possible, there is clear delineation between those whose costs are not affected and those who will largely be responsible for the costs, such as ANSPs. The GA community, and to some extent the aircraft operators, would like to see the change made as soon as possible. However the larger ANSPs, notably NATS, have always stated their requirement for a significant 'lead in' time once the decision to raise the TA has been made. The responses show that, the larger the ANSP, the longer the implementation time required.

CAA conclusion: The time period from the CAA announcement to implementation of an 18,000ft TA will have to accommodate those who need the longest time to prepare. Therefore this timescale is likely to be greater than 24 months; the exact timescale will become clearer once an implementation plan is in place.

Q39: If you would like to provide any additional feedback please enter your comments below (maximum 2000 characters) or email them to taconsultation@caa.co.uk.

Chapter 4

Statistical analysis

Figure 2 below summarises the responses of stakeholders in regard to introduction of a harmonised TA of 18,000ft. In terms of this summary, it should be noted that this chart only reflects the number of individual responses to the consultation. Therefore, the size of the 'pie portions' should **not** be taken to reflect the overall combined opinion of the responders. This is because, whilst some responses reflect the opinions of an individual, several reflect the opinions of an organisation, or in some cases, a number of organisations.

For Figures 2 and 3 below, it should also be noted that the responses recorded can only give an idea of the support or otherwise for the proposal. This is because responses may include both positive and negative feedback regarding different elements of the proposal. Figures 2 and 3 therefore provide a subjective opinion of the overall feedback for each responder.

Figure 2: Summary of responses

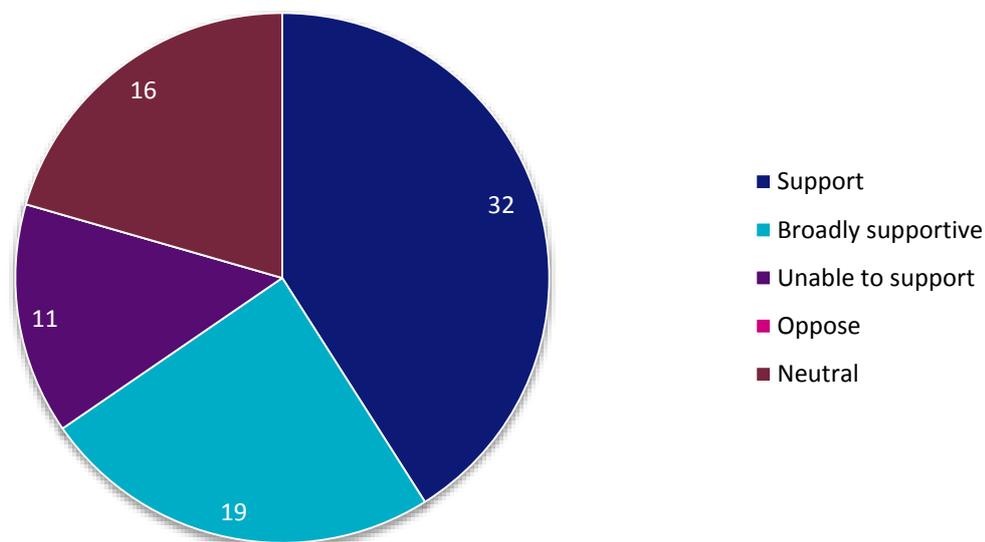


Chart data updated on 27 April 2016

Figure 3 below shows the breakdown of responses received in respect to the views expressed by groups and individuals. In terms of this summary, it should be noted that this graph only reflects the number of individual responses to the consultation; no extra weighting has been applied.

Figure 3: Responses by view

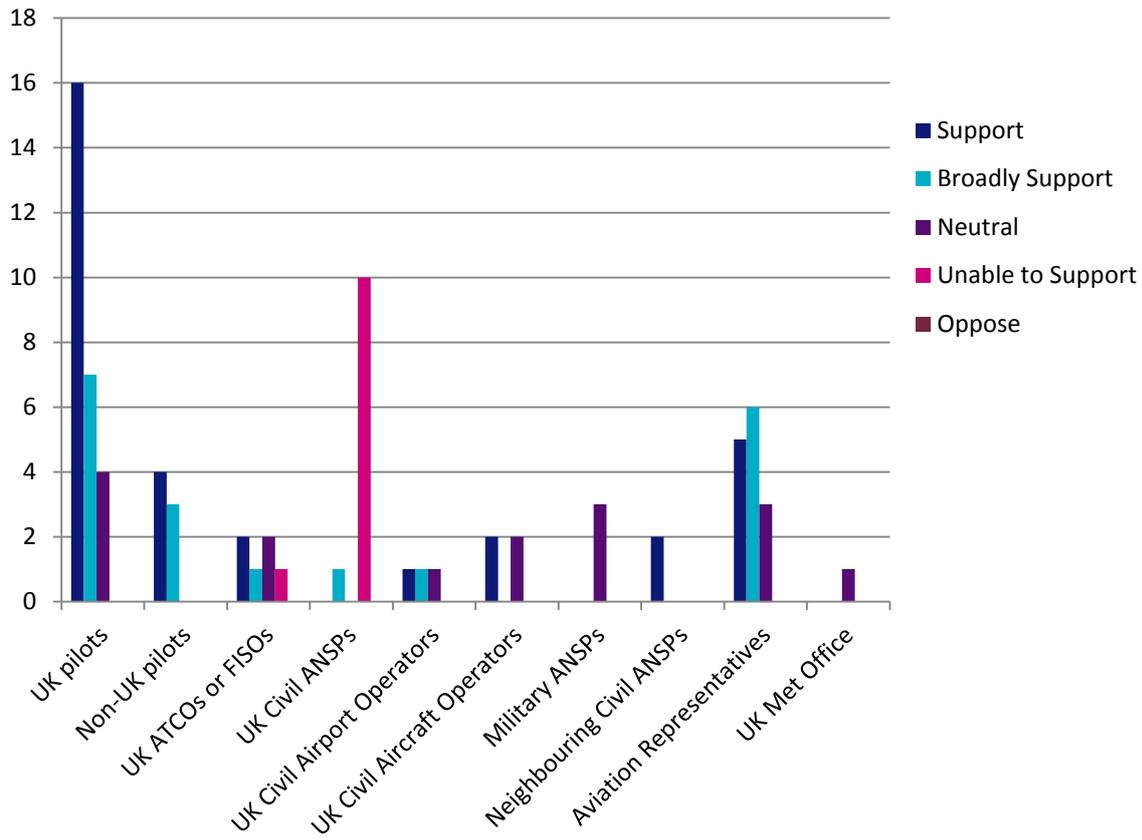


Chart data updated on 27 April 2016

Chapter 5

Key themes

In examining the responses received from stakeholders a number of key themes emerged. By and large any issues identified were not unexpected. The key themes along with explanatory notes and CAA comment is at Appendix A.

Chapter 6

Final safety report

Responses received from stakeholders indicate broad support for the conclusions reached within the State Safety Assurance Report. Responses can therefore be considered to have provided positive validation for the safety argument in a number of key areas, particularly regarding the ASR design and elements of the proposed State airspace, flight crew and ATC procedures. Whilst most stakeholders agree with the proposals, a number of responders stated that the proposed solutions to ensure terrain clearance and safe under or overflight of airspace reservations appear complex. Concern also exists over RTF loading and ATCO workload, particularly regarding the 'pressure management task' at ASR boundaries.

As such, and as highlighted in the State Safety Assurance Report, any decision to progress with the implementation of a harmonised and raised TA will require further work to identify and develop additional mitigations to these safety risks, alongside a confidence in their ability to be delivered within acceptable timescales.

Chapter 7

General conclusions

The second UK TA consultation builds on the work carried out during the first consultation in 2012. The CONOPs and supporting project documentation have been developed considerably since the first consultation, with many of the issues identified being resolved to a satisfactory degree for this stage of the project.

However, there are still issues which would need to be addressed before an 18,000ft TA can be implemented. Of particular note are those areas where the level of indicative safety risk remains relatively high, i.e. the high level of RTF loading and the management of ASR boundary crossings outside CAS; both of which have yet to be satisfactorily resolved by the project as part of any ongoing work towards implementation.

The external factors affecting NATS' operations mean that it is not able to progress the redesign of the southeast's airspace, for which a raised TA of 18,000ft is a key enabler, within Regulatory Period 2 (RP2), i.e. up until the end of 2019. This is particularly relevant in the context that raising the TA to 18,000ft in isolation, without a revised airspace design, provides 0 per cent potential quantifiable safety improvement to NATS' operations. NATS has stated that it has delayed further elements of the LAMP project until RP3 and it therefore feels that a raised TA should only be implemented ahead of, and closely aligned to LAMP implementation in order to fully realise the benefits to airlines from the substantial outlay that a raised TA will involve. From a NATS perspective, a synchronised implementation date of 2023/2024 respectively for both projects is optimal.

Whilst the MOD has stated that it anticipates considerable costs whilst receiving no benefit to its operations as a result of a raised TA, it has acknowledged that these issues would not prevent the MOD from implementing a TA of 18,000ft, although the availability of services to commercial aviation or the ability to co-ordinate may be reduced in order to contend with any increased controller workload.

For commercial pilots and aircraft operators, the benefits will mainly be realised if the TA change leads to more efficient arrival and departure routes being designed, although pilots also state that it could improve safety by reducing workload and the number of level busts.

The GA community is largely in favour of an 18,000ft TA as the proposed procedures give them better awareness of their proximity to terrain and help them to avoid infringing CAS or other airspace reservations. Additionally, a raised TA would impose very few costs on the GA community's operations.

The CAA confirms its commitment to a harmonised TA across the UK, both inside and outside CAS and it remains the CAA's intention to implement an 18,000ft TA at the earliest opportunity. However, in view of the fact that NATS will not now deliver the systemised airspace structure which relies on an 18,000ft TA within the RP2 timescale, the CAA's conclusion is that implementation of an 18,000ft TA will need to be moved from RP2 to RP3; i.e. from 2020 onwards. As stated by NATS, it should also be implemented shortly before, and in conjunction with major systemised airspace change in order to benefit from the substantial outlay that a raised TA will involve. In view of this delay, a third proportionate TA consultation will be required in the lead up to implementation to address any issues or changes which may have occurred in the interim, although the full scope of such a consultation has not yet been determined.

The delay will also give time for all stakeholders to better assess the effects of an 18,000ft TA on their operations, whilst giving the TA project and major ANSPs sufficient time to address any outstanding issues.

Further specific conclusions have been incorporated into the Key Themes document at Appendix A.

Chapter 8

Next steps

Significant work has been undertaken by a broad cross section of the UK and Republic of Ireland's aviation stakeholders. All have worked collaboratively in a transparent and engaged manner, giving and accepting constructive comment and challenge in order that a comprehensive, first CONOPs for an 18,000ft TA could be produced.

It is important that this effort is recognised but more importantly the fruits of it, the TA CONOPs, are consolidated and maintained ahead of the eventual requirement to implement the higher, harmonised TA of 18,000ft. This higher TA will in turn enable new highly systemised airspace designs and allows those designs to fully realise their operating potential; which at the State level provides the maximum benefit.

On conclusion of this consultation the TA Steering Group, TA Project Team and TA Safety Committee will be amalgamated into a smaller focused team; the constituents of which will likely still include representatives from these teams.

The UK's TA project will then move into a period of 'care and maintenance' during which time the CONOPs, new ATC Tools that potentially mitigate some of the R/T increases and the areas for development identified by this consultation will be kept under review by the new team. This will continue until such time as implementation of a systemised airspace requiring an 18,000ft TA is required in line with the Future Air Strategy's deployment. At an appropriate juncture ahead of any planned systemised airspace implementation requiring the higher TA of 18,000ft, the project will move out of 'care and maintenance' to undertake a refresh of the CONOPs, followed by proportionate consultation', before moving the TA project onto an implementation footing.

During the 'care and maintenance' period it is envisaged that the smaller team will meet at approximately 6 month intervals until the end of 2019 (end of RP2), it is likely that reconstitution of the larger teams will need to occur at least 24 months prior to

the required implementation of an 18,000ft TA, which in itself is likely to be 12 to 18 months prior to a new systemised airspace design.

Appendix A

Key themes raised during consultation on the policy to introduce a harmonised transition altitude of 18,000 ft in the London and Scottish Flight Information Regions

Serial	Key theme	Explanatory note	Comment
1	Flight crew cockpit workload	Individual or organisational viewpoint on the flight crew cockpit workload under the proposed CONOPs.	<p>Of the responders to whom this question applied, 27% thought that cockpit workload would be reduced, 45% felt there would be no significant change, 24% thought that there would be an acceptable increase in cockpit workload and 3% (one person) felt that the cockpit workload increase would be unacceptable.</p> <p>A British Airways pilot pointed out that as BA pilots are used to flying in a wide variety of airspace environments, he believes the change could be accommodated simply by the provision of appropriate briefing material. Another commercial pilot stated that SOPs would be changed accordingly and would become the norm, and that once the transition to a TA of 18,000ft is implemented there should be few issues thereafter. He did however recognise that different procedures in different European States will still pose problems.</p> <p>BAe Systems Warton believes that an 18,000ft TA will mean increased workload to those pilots engaged in test flying.</p>

			<p>Eastern Airways believes that the proposal will lead to an unacceptable increase in cockpit workload. The company states that: “A Jetstream 41 crew flying between England and Aberdeen would ordinarily see three changes in altimeter setting per flight. This could double under the proposed changes, increasing the likelihood of a level bust, especially as you cannot change the altimeter subscale in level flight without treating the subscale change as a change in altitude.”</p> <p><i>CAA comment</i></p> <p><i>Whilst high RTF loading is a recognised issue for the harmonised TA project, any increase in cockpit workload is considered by most responders to be manageable. Further development of the project will also take account of any options to improve cockpit procedures; for instance, by the use of Datalink for non-critical instructions.</i></p> <p>CAA conclusion</p> <p><i>The TA project will need to undertake further work to address the issue of high RTF loading before implementation of an 18,000ft TA.</i></p>
2	Controller workload	Individual or organisational viewpoint on the controller	<p>The MOD states that the increases to controller workload must be mitigated to ensure that risks to MOD flying operations remain As Low As Reasonably Practicable (ALARP). Throughout the TA project the MOD has been concerned about the increase in complexity that the proposal introduces to the en-route ATS</p>

		<p>workload under the proposed CONOPs.</p>	<p>and ASACS environments. Such concerns are centred on the introduction of ASRs and the pressure differentials encountered at ASR boundaries, along with the associated increases in controller workload brought about by managing such differentials. This issue, combined with increases in phraseology, will reduce the capacity of Military controllers operating within this environment to provide the same level of service as that offered today. Another risk the MOD has identified is the fact that a controller’s actions could inadvertently lead to aircraft being in close proximity to the ground. This risk is introduced in part by the removal of RPS values, but equally by the degrading validity of actual pressure datum over distance and time from the point of observation. The MOD does accept that the mitigations placed within the State CONOPs are sufficient to remove this risk.</p> <p>Prospect ATCOs’ Branch believes that it is almost certain that workload will increase for ATCOs providing services both inside and outside CAS. Due to the higher TA there will be a greater requirement to pass updated QNH values to more aircraft and to ensure aircraft have the correct QNH set; this could have a safety impact in providing separation between aircraft and the base of controlled airspace, particularly if aircraft are flying on incorrect QNH values due to controller or pilot workload. In particular, workload due to the additional volume and complexity of RT transmissions is expected to be significant and this has somewhat been evidenced in simulations to date. The branch also has concerns for workload and procedures for transiting ASR boundaries, and particularly for</p>
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			<p>aircraft transiting FIR boundaries. The same workload capacity issues highlighted by the responses from the Military would likely be found in civilian units providing services outside CAS. The Branch would urge that a comprehensive review or study be undertaken to ascertain the impact on safety that would result from a reduction in the current UKFIS provision.</p> <p>BAe Systems Warton believes that an 18,000ft TA will mean increased workload for special tasks controllers and for those controllers engaged in the control of aircraft carrying out complex test flying. This could lead to Warton being unable to coordinate aircraft operating under UK FIS. Warton is also concerned that increased workload at the area centres could mean delay in area controllers accepting interactions from Warton for traffic coordination, airspace joining requests, etc.</p> <p><i>CAA comment</i></p> <p><i>The CAA recognises that, whilst the CONOPs has reached a reasonable level of maturity, there are still issues which need to be addressed before an 18,000ft TA can be implemented. The two main issues are the high level of RTF loading and the management of ASR boundary crossings outside CAS, both of which need further work in order to be resolved by the project.</i></p>
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			<p>CAA conclusion</p> <p><i>The TA project will need to undertake further work to address the issues of high RTF loading and the management of ASR boundary crossings outside CAS before implementation of an 18,000ft TA.</i></p>
3	Reduced ATM capacity	Industry perception of a potential reduction in ATM capacity brought about by a harmonised 18,000ft TA.	<p>Mitigations to ensure that risks to MOD flying operations remain As Low As Reasonably Practicable (ALARP) will ultimately reduce the capacity of the MOD to continue to provide the same level of ATS to commercial aviation routing through Class G airspace and the ability of MOD controllers to acquiesce to requests for co-ordination, where MOD aircraft do not require such levels of de-confliction.</p> <p>Humberside Airport and Eastern Airways have concerns around the fact that the military may no longer be able to provide a service to civilian traffic operating in Class G airspace. Humberside states that small regional airports providing a service outside of CAS and the aircraft operators who fly through Class G depend on the military or another ANSP providing such a service. The loss of such service could lead to some routes ceasing to be viable. In Humberside's opinion, this would be the number one reason either not to raise the TA or to place the project on hold pending a review of the consequences of the change on the UK's provision of service within Class G. This should include the impact on regional airports with no connectivity to CAS and on regional airlines that depend on the safety case of service provision when routing through Class G.</p>

			<p><i>CAA comment</i></p> <p><i>While the CAA would anticipate a reduction in service provision over the initial implementation period, any long term effects to the commercial aviation industry as a result of a raised TA would need to be taken into account.</i></p> <p>CAA conclusion</p> <p>As part of the requirement to introduce a more systemised airspace structure, the CAA should engage with commercial operators before an 18,000ft TA is implemented so that any issues can be better understood and managed.</p>
4	Capacity impact during change period	Industry perception of a potential negative impact on ATC capacity during the TA implementation period.	<p>The CAA's State Safety Report concludes that it is undeniable that the implementation of a raised TA and the associated introduction of new ASRs based on 'actual' QNH values will introduce increases in RTF load and mental workload on MOD stakeholders. Overall, it is proposed by the State TA Safety Project that these safety risks can be managed by ANSPs; however, the potential 2nd order safety effects of increases in service refusal to aircraft in Class G airspace and reduced accommodation of coordination requests cannot currently be quantified. These effects are likely to be most pronounced in the immediate transition to a raised TA and are likely to reduce through adaptation and normalisation in time. However, as part of implementation activity, aviation</p>

			<p>stakeholders should collectively address this aspect, in particular to take appropriate steps to mitigate the impact for off route GAT, especially where there are limited or no other routings available.</p> <p><i>See CAA comment and CAA conclusion to previous response.</i></p>
5	Increased airspace complexity	Industry perception on increased airspace complexity brought about by a harmonised 18,000ft TA.	<p>Throughout the TA project the MOD has been concerned about the increase in complexity that the proposal introduces to the en-route ATS and ASACS environments. Such concerns are centred on the introduction of ASRs and the pressure differentials encountered at ASR boundaries, along with the associated increases in controller workload brought about by managing such differentials.</p> <p>Additionally, further concern has been raised in regard to ASACS operations and the use of ASR pressures in total as well as their ability to convert Mode C responses to altitude. These issues would ultimately produce a mis-match in the display of aircraft level depictions between Air Defence and Air traffic Organisations, as well as the pressure datum used when operating within the same Class G en-route environment. Consequently there is a greater risk of controller error caused by misinterpretation of aircraft level data as a result of this proposal.</p>

			<p><i>CAA comment</i></p> <p><i>The CAA recognises that, whilst the CONOPs has reached a reasonable level of maturity, there are still issues which need to be addressed before an 18,000ft TA can be implemented. The two main issues are the high level of RTF loading and the management of ASR boundary crossings outside CAS, both of which need further work in order to be resolved by the project.</i></p> <p>CAA conclusion</p> <p>The TA project will need to undertake further work to address the issues of high RTF loading and the management of ASR boundary crossings outside CAS before implementation of an 18,000ft TA.</p>
6	Losses of separation due to altitude changes	Industry perception of the potential for loss of separation incidents to occur as a direct result of the implementation of	<p>The principal method of separation between IFR and VFR flights in Class G and E airspace (i.e. covering the whole of both the French and Belgian borders at lower levels) is by 500ft level allocations. At the boundary, both IFR and VFR flights will be changing level, both in parallel and in opposite directions, potentially both up and down according to the pilot's preference.</p> <p>VFR traffic often follows airway centrelines in France and Belgium, often under autopilot control. So both IFR and VFR traffic, in both directions, may be tracking a magenta line very accurately. This VFR traffic is uncontrolled and often will not be in contact with ATC. Although IFR traffic in VMC is supposed to see and avoid,</p>

		<p>a harmonised 18,000ft TA.</p>	<p>it is notoriously limited in its ability to do so, and even in its understanding that it should.</p> <p>Only a proportion of the IFR traffic at 18,000ft and below will be equipped with TCAS or TAS. Accordingly, the GAA forecasts an increase in risk of TCAS warnings, AirProx and a very real risk of collision as a result of these level changes, as separation in three dimensions is lost because aircraft are tracking the same line in space and crossing each other's levels.</p> <p>Furthermore, many enroute light aircraft will be flying into and out of neighbouring states at levels above their TA, i.e. at flight levels, but lower than the UK TA where they will be flying at altitudes. Because of the semi-circular rule limiting aircraft to levels or altitudes at 2,000ft spacing, the GAA is concerned that they will sometimes have to change level very significantly. If there are airspace considerations preventing a small climb, a very considerable descent will be required. This will be at its worst on days of very high or low pressure, when the QNH is at its furthest from Standard Pressure Setting. These climbs and descents are annoying and wasteful. (GAA response)</p> <p><i>CAA comment</i></p> <p><i>As part of the TA pre-consultation process, a representative group of Class G airspace users was consulted regarding Class G boundary crossings during a CAA safety workshop. The group stated that, whilst they had some concerns</i></p>
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			<p><i>regarding the nature of the interface at the FIR boundary with adjacent states operating the system of intermediate VFR cruising levels, they had no concerns regarding the risk of traffic conflict at the FIR boundary. Whilst a great deal of liaison has taken place with all the UK's adjacent NSAs and ANSPs, it was not possible to resolve this issue before the results of this consultation were collated.</i></p> <p>CAA conclusion</p> <p><i>Before implementation, the UK TA project will need to engage further with neighbouring ANSPs to ensure that all boundary procedures, including delegation of ATS in the North Sea, are fully agreed and workable.</i></p>
7	Which QNH would be applicable?	Individual or organisational viewpoint on the likely use of particular QNHs in particular circumstances.	<p>The GAA believes that in Class G airspace, the pilots only need to know the QNH of the station they talk to, and this should always be the aerodrome QNH. This should apply whatever service is being received. When not speaking to an ANSP, pilots should continue on the last known setting.</p> <p>CAA comment</p> <p><i>Noted; although this would place a new requirement on Area FISOs to have access to airfield pressures rather than ASR pressures.</i></p>
8	QNH availability to	Individual or organisational viewpoint on the	<p>The MOD does not accept that the use of ASR pressures offers sufficient mitigation for the prevention of Controlled Flight into Terrain (CFIT) for aircrew engaged in autonomous low flying operations within Class G airspace, given the</p>

	aircraft outside CAS	potential availability of QNH values to aircraft operating outside CAS.	<p>requirement for constant updates accompanied with associated warnings to ensure the validity of the ASR datum. As a result, the MOD, in conjunction with the MET Office, has had to take steps to introduce its own Low Flying pressure product to replace the current RPS values to ensure that appropriate mitigation for this risk is achieved.</p> <p><i>CAA comment</i></p> <p><i>Noted.</i></p>
9	Additional costs	Individual or organisational viewpoint on the additional costs on industry brought about by a harmonised 18,000ft TA; both at implementation and into the future.	<p>In their joint response, Birmingham, East Midlands and Leeds Airports recognise the intended benefits to the wider ATM system, and that harmonising the TA at 18,000ft is a key enabler for the airspace modernisation programme proposed under FAS.</p> <p>However, the responders believe that, whilst significant benefits may be realised by the major London airfields and Manchester, the CONOPs will impose direct significant costs, operational impacts and additional resource demand on the ANSPs whilst delivering little or no direct benefit. Furthermore, the responders do not believe that the CONOPs can provide sufficient demonstrable evidence that the proposal is at least risk neutral. Their collective opinion is that, whilst the concept of a harmonised TA at 18,000ft may provide benefit to some airspace users and the wider ATM Network, the costs and risks involved to the responders,</p>

		<p>coupled with the lack of benefits, make this an undesirable proposal that they cannot support in its present form.</p> <p>The Airport Operators and Air Navigation Service Providers that endorse this response (the NDDG) share similar concerns regarding the proposed CONOPs for an 18,000ft TA change. The NDDG members recognise that harmonising the TA at 18,000ft is a key enabler for the airspace modernisation programme being progressed under FAS. In particular, a higher TA will provide future airspace designs with sufficient capacity and levelling options to efficiently de-conflict arrival and departure flows and enable continuous climb operations. The NDDG also recognises the considerable programme of work undertaken by the CAA, NATS and the MoD to produce the CONOPs.</p> <p>However, the NDDG members believe that the TA change will impose direct costs, operational impacts and an additional management burden on the airport operators/ANSPs affected for little direct benefit.</p> <p>“From a safety perspective, the CONOPs does not provide sufficient assurance that TA harmonisation is risk neutral. The combined impact of procedural, technical and phraseology changes that may be required to mitigate the outstanding safety issues is unclear. The interdependencies between TA harmonisation and other major airspace related projects that impact the NDDG airport operators/ANSPs in the same timeframe, including VOR Rationalisation,</p>
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			<p>PBN Implementation and Terminal Airspace Redesigns are not considered. Alternative options, including SIDs to a Flight Level and an interim step to harmonise the TA at 6000ft are also not assessed against the 18,000ft option proposed in the CONOPs.</p> <p>It is therefore the NDDG members' collective opinion that whilst the concept of a harmonised TA at 18,000ft could be beneficial to our airspace users and the wider air transport network, the costs and risks involved make it undesirable and a proposal that we cannot support in its present format.”</p> <p>BAe Systems Warton believes that TA change will result in unwelcome costs to their business in terms of manpower hours, training, equipment and publications. The MOD has stated that costs in excess of £5.6Million will be incurred as a result of the proposal although full costs are as yet unknown. The significant issue of equipment requirements associated with the promulgation and display of the ASR bulletin are of primary concern.</p> <p>For Eastern Airways, whilst the cost of implementation as an operator isn't significant, the impact on their operation could be massive, especially if military controllers are unable to offer deconfliction services due to the perceived additional workload brought about by a raised TA. Their costs assume that all scheduled services are forced to fly in controlled airspace with longer routings and more congestion on trunk routes.</p>
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			<p><i>CAA comments</i></p> <p>The CAA acknowledges that the costs associated with a higher harmonised TA are significant, and it has long recognised that these costs will mainly fall on the ANSPs providing a service. Costs vary according to the size and nature of the ANSP, with operators like NATS and the MOD picking up substantial bills. The stated purpose of introducing a harmonised, raised TA has always been to enable a more efficient use of airspace in order to realise potential savings for aircraft operators in terms of lower fuel bills and lower emissions. This applies across the boundary between the UK and Ireland where a coordinated approach means that TA procedures have been addressed on a joint basis. Therefore, a higher harmonised TA needs to be assessed in the context of these more efficient routes and procedures, rather than solely through the increased costs to stakeholders. This would be done on the basis that the project is able to deliver overall benefits to the customer which outweigh the ANSPs' investments.</p> <p>On the subject of SIDs to a Flight Level; the CAA has conducted several workshops over the years to study the issue, and has concluded that, whilst SIDs to a Flight Level are indeed feasible and permissible where they are designed away from the effects of adjacent procedures, they are very difficult to accommodate in busy TMA airspace where procedures from different airports</p>
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			<p>interact with and affect each other. In view of these findings, the CAA does not intend to conduct any further studies on this issue.</p> <p>CAA conclusion</p> <p><i>A Business Engagement Assessment (BEA) document will be maintained and updated to ensure that it reflects the opinions of stakeholders in terms of the likely effects on their operations regarding costs and/or benefits. This document will be published in advance of implementation once the effects on the industry have been analysed and assessed.</i></p>
10	Beneficiaries should pay a proportion of non-beneficiaries implementation costs	Organisational viewpoint on where and how costs should be applied and/or recovered from those who benefit from a harmonised 18,000ft TA.	<p>Humberside Airport has stated that it believes the beneficiary, rather than the ANSP, should pay.</p> <p>CAA comment</p> <p><i>Although NATS has sought to mitigate its costs relating to an 18,000ft TA, most airports and ANSPs recognise that the burden of cost will fall on them and they are therefore not supportive of the proposal.</i></p> <p>CAA conclusion</p> <p><i>The high cost to ANSPs of implementing an 18,000ft TA is noted. However, the CAA will aim to ensure that the project delivers overall benefits to the</i></p>

			customer, as determined at the State level, which would make the investment, particularly by ANSPs, worthwhile.
11	Equipment modification	Industry perception of the complexity and cost in terms of equipment modification required as a direct consequence of a harmonised 18,000ft TA.	<p>The MOD has stated that additional extra costs will be introduced into ATS system programmes both within the live environment and for training simulators. Additionally, modification of display system will be required to accommodate the promulgation of the ASR bulletin.</p> <p>CAA conclusion</p> <p><i>The financial implications of a higher harmonised TA are significant for certain sectors of the industry, and the CAA would want to ensure that the project delivers overall benefits to the customer, as determined at the State level, which would make the investment, particularly by ANSPs, worthwhile. A Business Engagement Assessment (BEA) document will be maintained and updated to ensure that it reflects the opinions of stakeholders in terms of the likely effects on their operations regarding costs and/or benefits. This document will be published in advance of implementation once the effects on the industry have been analysed and assessed.</i></p>
12	Commonality of converted Mode C readout	Industry perception of the issues arising from the requirement	The MOD recognises the benefits associated with the proposed raised/harmonised TA within the airfield or lower airspace environment. Within this environment recommendations to utilise conversion of an aircraft's Mode C/S based on airfield QNH datum have been accepted, as has the use of airfield QNH

		<p>for ANSPs to have commonality in terms of converted Mode C readouts.</p>	<p>for LARS provision. Furthermore, the use of NVSM concepts, where required, will be considered as will the use of airfield QNH as the primary datum for military aircraft operations in lieu of QFE. Combined, these proposals will greater align military flying to that of civilian practices whilst increasing ATS capacity and enhancing safety.</p> <p>However, concern has been raised in regard to ASACS operations and the use of ASR pressures in total as well as their ability to convert Mode C responses to altitude. These issues would ultimately produce a mis-match in the display of aircraft level depictions between Air Defence and Air Traffic Organisations, as well as the pressure datum used when operating within the same Class G en-route environment. Consequently there is a greater risk of controller error caused by misinterpretation of aircraft level data as a result of this proposal.</p> <p>CAA conclusion</p> <p><i>The issue of ASACS operations and the use of ASR pressures, as well as their ability to convert Mode C responses to altitude will have to be addressed by the MOD before implementation of an 18,000ft TA.</i></p>
13	Loss of low level Class G airspace below CAS	Industry perception of issues brought about by the loss	The level of Flight Level based CAS rises with high pressure, and gives important and valuable Class G airspace in best flying conditions, without worthwhile compensation in times of low pressure, when conditions are often unsuitable for S&RA flight. (GAA & FASVIG response)

		of low level Class G airspace below CAS.	<p>CAA conclusion</p> <p><i>As part of the implementation of a raised TA, the CAA should review the bases of CAS at the same time to see whether or not any CAS can be reverted to Class G.</i></p>
14	Forecast and future benefits	Forecast benefits of any changes required as a consequence of a change in the TA. This includes future benefits realised through the redesign of airspace.	<p>Several GA pilots consider that a raised TA will simplify procedures and make it easier to avoid infringing CAS. From their perspective a raised TA also greatly reduces the risk associated with forgetting to set Standard Pressure Setting where this is required. Most GA pilots also appreciate the removal of Regional Pressure Settings based on a forecast QNH as this also provides them with greater awareness of terrain and CAS proximity. Commercial pilots believe that benefits will be realised if the TA change leads to more efficient arrival and departure routes. They also state that it could improve safety by reducing the number of level busts and reducing workload. IATA also anticipates a reduction in fuel burn during climb and approach procedures due to avoidance of level flight segments.</p> <p>The MOD response states that the introduction of a raised harmonised TA at 18,000ft produces both benefit and dis-benefit. The benefits however, are all associated with the lower airspace and airfield environment whilst the significant dis-benefits are associated with the en-route environment. Also, to mitigate the additional workload placed on MOD ATS stakeholders, prioritisation to ensure that core military tasks are achieved will reduce the ability of the MOD (inclusive of</p>

			<p>BAe Systems Warton) to provide existing levels of services to Commercial Aviation routing within Class G airspace. Ultimately this will result in refusals of service and requests for co-ordination may not be as readily accommodated.</p> <p>Generally speaking, ANSPs/airport operators do not believe there will be many benefits to their operations of a raised TA; conversely they expect implementation costs to be considerable whilst the benefits are felt by the aircraft operators. Humberside Airport believes that for their operation within Class G airspace, it will be less safe between 3,000ft to FL195 as currently everyone operating in that level band should be operating on the same pressure datum of 1013 hPa. In the future they fear that their controllers will not know which pressure aircraft not under their control are flying on.</p> <p>In the period following the TA change the NDDG members expect benefits to arise across the air transport network from enabling a redesign of the route structure in terminal airspace to performance based navigation (PBN) standards, delivering capacity, flight efficiency and environmental improvements; specifically:</p> <ul style="list-style-type: none">▪ Flight efficiency benefits generated by more Continuous Climb Operations enabled by additional level options, with related CO2 and noise benefits;▪ ATM delay reductions, enabled by additional airspace capacity;▪ Potential safety enhancements from a reduction in level busts.
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			<p>The NDDG points out the importance of recognising that these benefits are generated from the implementation of significant airspace changes that capitalise on the opportunities offered by a higher TA and not from the TA harmonisation itself. There are no direct benefits expected to the airport operators/ANSPs from TA harmonisation at 18,000ft without the implementation of subsequent airspace changes. NDDG members recognise the challenges associated with making airspace changes, especially at low altitudes in the busy terminal environment, linked to the introduction of PBN procedures and the management of noise impacts on the ground. Therefore it believes that the forecast enabled benefits of TA harmonisation should be treated with caution.</p> <p>BAe Systems Warton perceives no benefits to their operations from a revised TA. In fact they believe the change will result in unwelcome costs to the business and an increased workload to those controllers/pilots engaged in test flying.</p> <p>NATS states that LAMP Phase 2 is dependent upon the implementation of a raised TA. However, a number of external factors are impacting both the LAMP and TA projects. In particular, uncertainties around UK Aviation Policy, the outcome of the Airports Commission recommendations regarding new runway infrastructure in the south east and evolving requirements from NATS' airport stakeholders. NATS anticipated that benefits from future airspace developments such as LAMP Phase 2 would be greatly enabled by a raised TA, but it feels that</p>
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			<p>this airspace change is looking increasingly unlikely in the short term and raising the TA in isolation provides no benefits across business areas but does increase ATCO workload.</p> <p>Isle of Man ATC believes that if the opportunity is taken to redesign CAS and procedures affecting its airspace, this would lead to improved airspace utilisation and the introduction of CDAs.</p> <p><i>CAA comments</i></p> <p><i>Most GA pilots are in favour of a raised TA as it simplifies procedures and reduces risk for their operations. They also appreciate the move from Regional Pressure Settings based on a forecast QNH to actual settings, as this provides them with greater awareness of terrain and CAS proximity. For commercial pilots and aircraft operators, the benefits will mainly be realised if the TA change leads to more efficient arrival and departure routes being designed, although pilots also state that it could improve safety by reducing workload and the number of level busts.</i></p> <p><i>The MOD recognises the benefits of a raised TA within the lower airspace and airfield environment, but it feels that there are significant dis-benefits associated with the en-route environment. Prioritisation of core military tasks could also mean a reduction of services to Commercial Aviation routing within Class G airspace.</i></p> <p><i>As the LAMP Phase 2 project has a dependency upon the implementation of a raised TA, NATS is generally supportive of the project. However, the external</i></p>
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			<p><i>factors affecting NATS' operations mean that it is not inclined to support a raised TA prior to the implementation of a systemised airspace. This is particularly relevant in the context that raising the TA in isolation provides no benefits; it should therefore only be implemented when NATS is in a position to follow the raised TA with major airspace change in order to benefit from the substantial outlay that a raised TA will involve.</i></p> <p><i>As anticipated, the consultation has shown that there are no direct benefits of a raised TA for ANSPs, and the main burden of cost is likely to fall on them. Generally speaking therefore, with the exception of NATS, other ANSPs have not supported a raised TA, whatever the timescale.</i></p> <p><i>Whilst it is recognised that traffic operating between 3,000ft and 18,000ft will no longer be operating on the Standard Pressure Setting (SPS), this traffic will also never need to consider SPS setting issues. Additionally, the likelihood is that, despite being on potentially different QNHs, the difference between QNH settings will generally be relatively small compared to the potential differences involved between SPS and local QNH on a day when the pressure is particularly high or low.</i></p> <p>CAA conclusion</p> <p><i>The financial implications of a higher harmonised TA are significant for certain sectors of the industry, and the CAA would want to ensure that the</i></p>
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			<p><i>project delivers overall benefits to the customer, as determined at the State level, which would make the investment, particularly by ANSPs, worthwhile. A Business Engagement Assessment (BEA) document will be maintained and updated to ensure that it reflects the opinions of stakeholders in terms of the likely effects on their operations regarding costs and/or benefits. This document will be published in advance of implementation once the effects on the industry have been analysed and assessed.</i></p> <p><i>In view of the fact that NATS will not now deliver the systemised airspace structure which relies on an 18,000ft TA within the RP2 timescale, the CAA's conclusion is that implementation of an 18,000ft TA will need to be moved from RP2 to RP3; i.e. from 2020 onwards. As stated by NATS, it should also be implemented shortly before, and in conjunction with major systemised airspace change in order to benefit from the substantial outlay that a raised TA will involve.</i></p>
15	ASR boundary procedures	The proposed procedures associated with the expected magnitude and frequency of pressure	Whilst many comments have been accepting of the proposals for managing ASR boundaries, several responses, particularly from GA pilots, state that the ASR system is overly complex and they request that the number of ASRs is significantly reduced. The BGA on the other hand, believes that the ASRs are too large. One response states that the intention to have a single, high-level horizontal delineation, but with multiple vertical delineations not only hugely increases the areas where there is the opportunity for error to occur, but also provides for new

		<p>differentials at ASR boundaries within the UK and the methodology prescribed to manage such differences.</p>	<p>and different types of error to occur which either do not exist at present or are very unlikely to cause problems. One responder doubted that the frequency and magnitude of pressure differentials happens as rarely as is claimed by the met data stated, however it should be noted that the analyses used gridded data sets that enabled pressure frequency calculations over oceans and other data sparse areas. METAR data was not used for this element of the analysis.</p> <p>The GAA and FASVIG fully support the removal of the current forecast Regional Pressure Settings. However, they see the only reason for the proposed Altimeter Setting Regions (ASRs) using the actual QNH of selected airports, is for determining QNH settings for en-route CAS. Both GAA and FASVIG submit that they are irrelevant or not in general appropriate to flight in Class G, apart from the recognised risk of infringement of CAS from below when there is significant variation of the ASR setting from the local. In practice, both organisations feel that use of an ASR setting when flying in Class G will be rare and they believe that Pilot Operating Procedures should reflect this. They feel that there is a wide range of aircraft types, types of mission, and pilot experience and qualifications using class G, but the GAA believes virtually all combinations of these are best served by using a QNH from a station within 50NM.</p> <p>GATCO believes that the procedure for managing interactions crossing, and close to, ASR boundaries should be standardised nationally; i.e. it should be a MATS Part 1 level requirement, not a local unit instruction one. BALPA agrees with the</p>
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			<p>procedures but recognises that there is a potential hazard when crossing adjacent ASR boundaries if required to reset QNH during altitude capture.</p> <p>From an MOD perspective, the benefits associated with the proposal could be introduced without the requirement to raise the TA, whilst the dis-benefits are introduced as a result of the ASRs and resulting pressure differentials at boundaries. The MOD feels that the requirement to manage pressure differentials within the en-route environment introduces significant complexity and extra workload upon controllers to achieve the same levels of safety as are achieved today whilst using a single standard pressure datum.</p> <p>In their joint response, Birmingham, East Midlands and Leeds Airports comment that, whilst the proposed ASR boundary lines may be appropriate for the system as a whole, the responders believe that they have been set with the larger UK airports in mind to the detriment of the regional airports. The ANSPs concerned believe that they will be required to take into account four different QNH settings when designing revised procedures to accommodate the TA change.</p> <p>The NDDG members disagree with the proposed ASR positions. The proposal results in NDDG member airports having to account for multiple QNH values (3 and possibly 4) into account. The management of multiple values makes it challenging for NDDG airports to derive benefits from the TA change. The NDDG</p>
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			<p>believes that the proposed boundaries may fit well for the London airports and Manchester, but will create workload issues for many other airports.</p> <p>HIAL believes that the CONOPs is perhaps more suited to the ATS surveillance environment as monitoring of flights will be more difficult for non-surveillance ATSU's.</p> <p>BAe Systems Warton disagrees with one element of the proposed ASR boundaries. They would prefer that there was only one ASR region in their main operating area of the Irish Sea instead of having to operate on the Kelvin ASR in the Northern part of their main operating area and the Potter ASR to the South. It would also avoid crossing an ASR boundary when conducting air-to-air refuelling in Area 13 in the Irish Sea. It should be noted that allowances in the CONOPs could mitigate some of these issues.</p> <p>Eastern Airways agrees with the procedures devised, although they perceive them as introducing significant additional complexity for no benefit to their operations, especially in Class G airspace.</p> <p>The Prospect ATCOs' Branch agrees that a sufficient level of maturity exists with the ASR design and commends the work carried out in realigning the altimeter setting regions as set out in the proposals.</p>
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			<p><i>CAA comment</i></p> <p><i>Stakeholders should be aware that a significant element of work of the TA Project Team went into defining the ASRs and providing a safe rationale for their size, shape and relationship to CAS. Each ASR is based on a major airport at its centre which is capable of providing 24 hour met service. In this case, any difference between the major airport QNH and the ASR QNH is likely to be negligible, although the ASR QNH will change at regular half-hourly intervals whereas the airport QNH will not. Basing the ASR QNH on the major airport means that a significant amount of traffic in each ASR should not need to change between aerodrome QNH and ASR QNH or vice versa. The aim has been to create ASRs that are as large as possible to be operationally viable within CAS, yet sufficiently small to ensure that the pressure differences within and between ASRs are as low as practicable. As such, it is recognised that ASR lines cannot always be placed in the most advantageous position to suit all ANSPs. Therefore, the CONOPs allows a large degree of flexibility in terms of how individual ANSPs choose to operate, with airports being able to use their own QNH within their area of operations.</i></p> <p><i>Additionally, it should be noted that the TA CONOPs does not require pilots flying in Class G airspace to adopt the ASR QNH system if use of aerodrome QNHs would be more appropriate.</i></p>
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16	ASR names	The proposed names of the Altimeter Setting Regions (ASRs).	<p>Whilst 83% of the responders to whom this question applied agreed with the chosen ASR names, the other 17% disagreed, with some offering alternative suggestions.</p> <p><i>CAA comment</i></p> <p><i>Responders will not necessarily be aware of the limiting factors which apply to the selection of names; however, all suggested options have been forwarded to the TA Project Team for their consideration.</i></p>
17	Communicating ASR data	The method of communicating ASR data which	<p><i>In view of changes which are anticipated to the method of communicating ASR data, the TA Project Team was not in a position to offer clear options of what would be available to stakeholders following implementation. The uncertainty is</i></p>

		<p>best suits stakeholders' operations.</p>	<p><i>caused by the fact that RPS data provisioned by the FOUK70 Met Office bulletin via the AFTN will be discontinued at some point in the future. With that in mind, it was decided to ask this question of stakeholders in any case, with the understanding that there would inevitably be caveats to responses as stakeholders do not have the complete picture at this stage.</i></p> <p>In its response, the MOD states that throughout the CONOPs, mitigations for hazards are identified that require the timely and accurate dissemination of ASR pressures simultaneously to all ATS providers. Whilst the MOD accepts these theoretical mitigations, they are reliant on equipment, delivery and display methods that don't, as yet, exist.</p> <p>HIAL states that it is important to ensure that whatever system/format replaces FOUK70 is compatible with AFTN. If XML is the preferred format then it should be configured to be compatible with either AFTN or AMHS, thus alleviating the ANSP from considerable cost associated with the TA project. HIAL believes that whilst this agreement lies marginally outside the scope of the TA project, it is clearly associated and should form a greater part of future discussion and/or consultation.</p> <p>Of the responders to whom this question applied, 84% preferred for the ASR bulletin to be made available via a web based Extensible Markup Language (XML) service over the Internet. Although it would only be available for a short period post the ASR bulletin introduction, 8% opted for the FOUK70 to be revised or</p>
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			<p>modified to provision ASR data, with the remaining 8% opting for the ASR bulletin to be provisioned by an XML message over the Aeronautical Message Handling System (AMHS).</p> <p><i>CAA comments</i></p> <p><i>An important consideration for all ANSPs is that AFTN will not be supported by BT after 2018, so there is a driver to move away from this legacy protocol. This change is outside of any new procedures introduced as part of the TA project. Additionally there is a move to using technologies that will enable the aviation industry to make use of greater levels of data richness i.e. Data Exchange models.</i></p> <p><i>See ICAO Annex Update Annex 3 amendment 77 for digital data references & ICAO Doc 10003 for iWXXM.</i></p>
18	Cost of ASR bulletin format	The cost impact to stakeholder operations of implementing changes to the ASR bulletin format.	<p><i>In view of the uncertainty caused by the fact that RPS data provisioned by the FOUK70 Met Office bulletin via the AFTN will be discontinued at some point in the future, stakeholders have made it clear that it is very difficult and in some cases impossible to calculate costs at this stage.</i></p> <p>The MOD has stated that the lack of detail in the CONOPs in regard to the methodologies to be employed in the distribution of ASR information means that no assessment of costs for the upgrade of display equipment can be undertaken</p>

			<p>at this time. Therefore, before implementation, greater clarity and detail on the equipment requirements and method of ASR bulletin distribution need to be articulated, and sufficient time given for upgrades to be made to the systems required to display such information. The MOD considers this to be the single greatest technical risk to a successful and safe implementation of a raised TA.</p> <p>Muir Matheson who provides the METCOM system and display for Humberside Airport has advised that the cost to modify the existing METCOM to display four Regional Pressures is currently £2,000. However, the cost to change the whole system to extract information from the new ASR Bulletin is unknown until the format is publicised and a decision made between the successor to AFTN, as either AMHS or a web-based XML service. Subsequently, an investigation can be undertaken as to whether the METCOM can be adapted and at what cost.</p> <p>HIAL states that no budget has been either investigated or allocated to this project. Until now, before ASR provision format and AFTN continued support were questioned, costs were not deemed significant. Though it would not be their choice, if HIAL is required to install AMHS systems to integrate with met systems at ATSUs, then costs are unknown at this stage. HIAL believes that it is unacceptable to expect stakeholders to assess the impact of changing to a new system without clear articulation of options/proposals.</p> <p>Isle of Man ATC is equally unable to quantify costs at this stage.</p>
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			<p><i>CAA comments</i></p> <p><i>An important consideration for all ANSPs is that AFTN will not be supported by BT after 2018, so there is a driver to move away from this legacy protocol. This change is outside of any new procedures introduced as part of the TA project. Additionally there is a move to using technologies that will enable the aviation industry to make use of greater levels of data richness i.e. Data Exchange models.</i></p> <p><i>See ICAO Annex Update Annex 3 amendment 77 for digital data references & ICAO Doc 10003 for iWXXM.</i></p>
19	Time required to implement ASR bulletin format	The time anticipated for stakeholders to implement changes to the ASR bulletin format.	<p>The pilot of one commercial airline anticipates a very quick transition to a new operational procedure.</p> <p>Before implementation, the MOD requires greater clarity and detail on the equipment requirements and method of ASR bulletin distribution to be articulated, and sufficient time given for upgrades to be made to the systems required to display such information.</p> <p>Wholly owned by the Scottish Government, HIAL states that its normal lead in time for ATE replacement is circa five years and is reviewed annually. Any additional requirement for ATE, such as AMHS in this case, will affect all future ATE replacement plans, especially during this continuing economic downturn</p>

			<p>where capital and revenue costs are under intense scrutiny. HIAL would therefore consider five years to be the minimum time for implementation.</p> <p><i>CAA comment</i></p> <p><i>The CAA acknowledges the size of the task in terms of implementing an 18,000ft TA. The CAA would therefore propose a long enough implementation period, including allowing sufficient time to implement a revised ASR bulletin format.</i></p>
20	Management of interfaces between airfield QNH and ASR QNH or between airport and en-route airspace connectivity	Organisational agreement or disagreement with the proposed management of interfaces between airfield QNH and ASR QNH or between airport and en-route airspace connectivity.	<p>One smaller ANSP pointed out it would take time and practice until controllers are comfortable with the new procedures as, unlike large units, such a change cannot be simulated.</p> <p>In their joint response, Birmingham, East Midlands and Leeds Airports and also the NDDG disagreed with the proposal for management of interfaces between airfield QNH and ASR QNH or between airport and en-route airspace connectivity, although no further explanation is given for why.</p> <p>Eastern Airways agrees with the proposal but highlights that there is still a need to interface between QNH and 1013 as well as between airfield QNH and ASR QNH. They believe this adds complexity and risk for no benefit to their operations.</p> <p>One responder suggested that one of the original purposes of the TA project was to remove the loss of levels caused by pressure differences in the holding environment. The responder states that what is suggested seems the only safe</p>

			<p>way to manage the interfaces, but claims that the proposal fails to achieve the original aim, and thus its validity or necessity should be questioned; especially as the 'original' lost levels still occur, but at FL190 and above.</p> <p>Another responder suggested that airfield and regional QNHs should be combined, however, safety assessments conducted by the TA Project Team would not support this option.</p> <p><i>CAA comment</i></p> <p><i>Whilst responses reflect general agreement with the proposals for management of interfaces, there were some caveats. Whilst predictability of levels within the TMA environment was always considered advantageous, it has always been recognised that this could only be achieved at the cost of levels lost in the en route arena where it is believed it will have less overall impact.</i></p> <p>CAA conclusion</p> <p><i>The project should continue to work closely with the major ANSPs to see if the issues they perceive as being critical to their operations could not be managed by them utilising their airfield QNH throughout their area of operations. In most cases, this should mean that they only need to consider the ASR QNH when transferring traffic to adjacent ANSPs, albeit that there may be more than one frequency for each ANSP to consider.</i></p>
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21	Ensuring terrain and obstacle clearance	Individual or organisational agreement or disagreement with the proposed method of ensuring terrain and obstacle clearance whilst using either an ASR or airfield derived pressure datum.	<p>In one comment, the responder felt that the risk had been transferred from the Commercial Air Transport pilot to, potentially, an inexperienced GA pilot who now has to remember where he is and what he has to apply when and where. Whilst there may be some truth in this perception, the GA community as a whole has been broadly supportive of this proposal.</p> <p>The GAA notes that pressure altimetry is rapidly becoming irrelevant for terrain clearance. RNAV (GNSS) equipment is now very widespread in GA aircraft flown IFR, is approved for public transport, and gives height accurate for precision LPV approaches. Simpler equipment but of similar accuracy is commonly used in light aircraft, including microlights.</p> <p>Humberside Airport states that there is no guarantee of terrain clearance compared to the lowest Forecast QNH. The TA project accepts that this is the case and this is why suitable mitigation has been included in the CONOPs.</p> <p>Humberside believes that the Actual QNH requires a more complicated methodology to be applied by pilots with less knowledge and less experience by asking them to add additional feet (200ft or 500ft) onto their altitude based on the pressure. Again, whilst this may be true, it has the general support of the GA community who are most likely to be affected by this procedure.</p> <p>The GATCO response suggested that ATCO training should emphasise that the added 200/500 feet is a minimum not an absolute figure. GATCO also points out</p>
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			<p>that the CONOPs contains a proposed methodology for terrain/obstacle clearance whilst using ASR QNH, but there is no supporting documentation or evidence of where this is derived from, or any assessment to indicate the consequences/ benefits/risk mitigation anticipated as a result of this figure. Whilst this statement is true, evidence is available of the thinking behind this process, however, it was not considered essential for it to be included in the consultation.</p> <p>The MOD does not accept that the use of ASR pressures offers sufficient mitigation for the prevention of Controlled Flight into Terrain (CFIT) for aircrew engaged in autonomous low flying operations within Class G airspace, given the requirement for constant updates accompanied with associated warnings to ensure the validity of the ASR datum. As a result, the MOD, in conjunction with the MET Office, has had to take steps to introduce its own Low Flying pressure product to replace the current RPS values to ensure that appropriate mitigation for this risk is achieved.</p> <p>BAe Systems Warton acknowledges that the proposals in the UK State CONOPs to ensure terrain and obstacle clearance separation appear to be robust, however Warton notes that the addition of an extra 200ft or 300ft when using an ASR QNH may mean that military aircraft that would have previously achieved 'VMC below' on a 'cloud break', may now fail to do so when these proposed arrangements are introduced.</p>
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			<p><i>CAA comments</i></p> <p><i>Despite the high levels of support for this proposal, including the perception of increased situational awareness regarding high terrain in IMC; comments also reflect some stakeholders' concerns. Specifically, there were two references to the procedures being too complex. However, at a CAA Class G workshop, (referred to in paragraph 5.45 of the State Safety Assurance Report), these concerns were not echoed by workshop attendees. Of the responders to whom this question applied, 94% agreed with the proposed method of ensuring terrain and obstacle clearance, and 6% disagreed.</i></p> <p>CAA conclusion</p> <p><i>Notwithstanding the fact that the MOD has decided to pursue the introduction of a 'Low Flying Pressure' to mitigate the specific risks associated with their autonomous low flying operations, in view of the overall high levels of support for this proposal, it is concluded that the procedures in the CONOPs for ensuring terrain and obstacle clearance whilst using either an ASR or airfield derived pressure datum are acceptably safe.</i></p>
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22	Ensuring safe underflight or overflight of airspace reservations	Individual or organisational agreement or disagreement with the proposed method of ensuring safe underflight or overflight of airspace reservations (such as Danger Areas) in Class G airspace.	<p>One responder commented that some operators routinely operating up to the edge of reservations may not be able to get updated data in flight; it is hard to see how to solve this issue, particularly for non-radio aircraft.</p> <p>The MOD response states that risk is introduced in part by the removal of RPS values, but equally by the degrading validity of actual pressure datum over distance and time from the point of observation. This degrading validity produces a discrepancy between the observed and actual vertical distance above mean sea level as indicated on an aircraft's altimeter. The MOD accepts that the mitigations placed within the State CONOPs are sufficient to remove this risk when aircraft are in receipt of an ATS, given the provider has ready access to appropriate/accurate pressure datum. However, in relation to the safe over-flight of airspace reservations whilst using ASR pressures, the MOD has concerns that the processes advocated within the CONOPs are only achievable when aircrew are in receipt of an ATS. When such services are not provided within Class G airspace, the advocated process is considered overly complex when engaged in autonomous flight due to the requirement for constant ASR updates and the application of corrections dependent on the level of pressure variation. These requirements would increase aircrew workload by virtue of complexity, increasing the risk of inadvertently infringing such airspace features. The MOD therefore advocates that a more simplistic option be conceived by the CAA to counter this issue. Furthermore, whilst every effort has been made in the design of the MOD's</p>
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			<p>Low Flying pressure product to ensure that, as far as possible, it provides a more accurate datum than the current RPS value, it should be recognised that by virtue of the 'lowest forecast' nature of this product, a small but increased possibility exists of infringing CAS from below. This is due to the change in pressure datum defining base levels of CAS from a constant Flight Level to one based on ever changing ASR values.</p> <p><i>CAA comments</i></p> <p><i>Despite high levels of support for this proposal, comments also reflect some stakeholders' concerns. These were very similar in tone to the responses to the terrain clearance proposal, including two references to the procedures being too complex. Of the responders to whom this question applied, 88% agreed with the proposed method of ensuring safe underflight or overflight of airspace reservations, whilst the remaining 12% disagreed.</i></p> <p><i>The MOD has concerns for its aircraft conducting autonomous flights, particularly when operating in close proximity to terrain, however the nature of such operations is almost exclusive to the MOD, and as such the organisation is free to utilise a system of its choosing which does not rely on the ASR QNH to ensure safe underflight or overflight of airspace reservations.</i></p>
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			<p>CAA conclusion</p> <p><i>In view of the overall high levels of support for this proposal from most stakeholders, it is concluded that the procedures in the CONOPs relating to the proposed method of ensuring safe underflight or overflight of airspace reservations are acceptably safe.</i></p>
23	Improving RTF phraseology	Individual or organisational suggestions for improvement of RTF phraseology within the UK.	<p>Although the responses included several requests to keep RTF phraseology as it is, there were a number of suggestions for improving it, and the individual responses are listed below:</p> <ul style="list-style-type: none"> ▪ Remove the need to use the word 'hectopascal' especially in the busy TMA environment. (Seven responses suggested this, including those from British Airways and Virgin Atlantic). The joint response from Birmingham, East Midlands and Leeds Airports and the NDDG submission propose the removal of the requirement to use the word 'hectopascals' in RT transmissions when the QNH is less than 1000; they also suggest improvements to the numerical phraseology requirements or removing them altogether. ▪ Resolve the occasional confusion with the "Climb now" instruction to cancel SID climb restrictions; a second responder suggested removing it completely. ▪ Introduce "Descend Now" as an approved instruction.

			<ul style="list-style-type: none"> ▪ Remove the origin and destination of the flight on each initial call. ▪ Reduce the number of syllables required. ▪ Similar to operations in the USA and Canada, once an aircraft has been cleared below the TA, all subsequent transmissions could omit the words ‘feet’ and ‘QNH’. For example, an aircraft requests descent and is cleared below the TA: “Big Jet 123 descend to sixteen thousand feet on the London QNH 1005 hPa”. Subsequent clearances could continue: “Big Jet 123 descend to eleven thousand”, “Big Jet descend to eight thousand” and so on. Climbs below the TA could be operated in a similar way. (BALPA response) ▪ Improvements to the numerical phraseology requirements. ▪ Include the name of the ASR when reporting altimeter setting. Example: “XXX altimeter setting is...” ▪ During RTF conversations a clear statement of which QNH is in use. (BGA response) ▪ Reduce complexity and the need for increased VHF comms distracting both ATC and pilot from more critical safety related tasks. (Eastern Airways response)
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			<p><i>CAA comment</i></p> <p><i>These comments have been noted and whilst some of these suggestions are already being pursued by the TA Project Team, the complete list has been forwarded to the team for their consideration when producing the final CONOPs for implementation.</i></p>
24	Showing different QNH areas on charts	How the difference between areas based on airfield QNHs and ASR QNHs should be shown on charts.	<p>There were several suggestions for how to deal with this issue and the individual responses are listed below:</p> <ul style="list-style-type: none"> ▪ This will add clutter on charts that are already cluttered. A period of electronic training or dissemination of information prior to the changeover would be sufficient. ▪ The boundaries of the ASRs have no value outside the lateral limits of CAS, and should not be shown on charts. (GAA response) ▪ If ATC procedures are robust, it should be transparent to the pilots what the source of the pressure setting is. Information could be in chart briefing notes, as required/appropriate. (Virgin Atlantic response) ▪ If the ATC procedures are robust, it will be transparent to the pilots what the source of the pressure setting will be. Information should be in STAR briefing notes, readily available in flight and simple. The pilot does not care who provides altimeter setting; the pilot will use the altimeter setting provided by the controller. When the pilot changes radio frequency and a

			<p>new controller (or agency) provides a new altimeter setting – pilot will adjust: “Aerodrome QNH setting used for this procedure” or “XXX Altimeter Setting Region altimeter used for this procedure”. (IATA response)</p> <ul style="list-style-type: none"> ▪ Naming of airspace will suffice. ▪ Use the ICAO code for airfields (EGLL) and a 3 letter ASR abbreviation (Cotswold - CWD). ▪ HIAL ATC Units lie within Class G airspace and are protected solely by ATZ. Future ACP proposals should see Inverness CAS established in the form of CTR and CTA. Perhaps the last 2 letters of the ICAO identifier could indicate an Airfield QNH datum whereas an ASR datum could indicate those other, i.e. Edinburgh CTA 2500-6000 (PH) or Scottish TMA 5500 (Kelvin) - FL195. (HIAL response) ▪ It should be depicted as present for RPS. There should not be an issue, as controlled airspace clearances will include the appropriate QNH, and ASR QNHs will be passed much as RPS is passed at present. ▪ GATCO agrees that showing this differentiation on charts would be useful and helpful. ▪ Clearly and unambiguously. ▪ This is very unclear as airways charts currently show airways that transit CTAs with no indication of the CTA.
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			<ul style="list-style-type: none"> ▪ It is important to understand whether to utilise a published ASR or the airfield QNH. This should be colour coded with a different colour for ASR use and an airfield utilising QNH within its CAS; there would need to be a readily identifiable symbol. ▪ Simple coloured or broken lines should be sufficient. (Two responses) ▪ Use of different colours or symbols on the charts. ▪ Different colours for aerodrome and en-route QNHs. (BGA response) ▪ Bold outlines. ▪ Currently, blue, black, magenta, green and grey are used on charts, so a new chart colour would be needed – orange or purple maybe. ▪ CAS - e.g. SFC - 6500 (Airfield QNH); Airways - 7500 (Potter QNH) (Isle of Man ATC response) ▪ This is related to VFR charts and UK AIP pages, however, NATS has a vested interest in reducing level busts through clear unambiguous data on maps/charts thus would recommend the State convene an industry workshop post consultation to propose the best option(s) for State consideration through FASIIG. (NATS response) ▪ The NDDG members recognise the importance of clear, unambiguous data on maps and charts and recommend that the State convene an industry workshop through the FAS Industry Implementation Group (FASIIG) post the consultation to propose the best option(s) for consideration.
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			<ul style="list-style-type: none"> ▪ QNH-CTR/CTA; QNH-ASR <p><i>CAA comment</i></p> <p><i>These comments have been noted and the complete list has been forwarded to the TA Project Team for their consideration when producing the final CONOPs for implementation.</i></p>
25	The Nominal VSM concept	Individual or organisational agreement or disagreement with the proposed Nominal Vertical Separation Minima concept.	<p>Of the responders to whom this question applied, 84.5% agreed with the proposed Nominal VSM concept, whilst the remaining 15.5% disagreed. Individual responses to this proposal are listed below:</p> <ul style="list-style-type: none"> ▪ The consultation documentation states that it is not as safe. The problem is that different units control within the same volume of airspace. Everyone must adopt the same rule in a particular piece of airspace; there cannot be a choice. Whilst it is understood that this will mainly be applicable within CAS as a safety case will be required for Class G operations, an ANSP using Nominal VSM within CAS at the base of CAS against another ANSP that does not utilise Nominal VSM within Class G below CAS would make coordination difficult. ▪ Variation of QNH over the relatively short distances will be negligible. Altimeters are nowadays very accurate but ATC can use up to 200ft discrepancy which potentially reduces separation from 1,000ft to 600ft.

			<p>6hPa of difference is only 162ft. An extreme worst case scenario would still give a separation of 438ft which still gives a miss.</p> <ul style="list-style-type: none"> ▪ GATCO believes it is important that an assessment of the correct use of Nominal VSM, and its acceptability in practice, is an integral part of the Post Implementation Review. ▪ The MOD accepts the mitigations and safety arguments used by the State in its proposed use of Nominal VSM. ▪ It is clearly a requirement as the project would be unworkable without it. However, it is clearly going to result in aircraft closer together, and some erosion of margins. It's hard to see how the number of reportable incidents or occurrences could do anything but rise. <i>(See CAA Comments below)</i> ▪ Agree, but only if it is adopted to support an 18,000ft TA. NATS would not want nominal VSM in current operations ahead of the implementation of a higher harmonised TA. ▪ Only if related to an 18,000ft TA – HAL would not want nominal VSM in current operation ahead of the higher harmonised TA. (London Heathrow Airport response) ▪ Given the requirement for this process to achieve at least risk neutrality, the joint response from Birmingham, East Midlands and Leeds Airports strongly disagrees with the proposal. The responders feel they would be required to submit safety case work in support of procedures that would include
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			<p>nominal vertical separation minima, which they believe accepts significantly reduced absolute separation between aircraft and is therefore less safe than existing requirements. Otherwise operators at their respective airports would be significantly penalised with restrictions required to deliver absolute separation in multiple QNH environments. In their opinion, this presents a clear conflict which they believe is unacceptable. (See CAA <i>Comments below</i>)</p> <ul style="list-style-type: none"> ▪ Regarding Nominal Vertical Separation Minima, the NDDG members disagree with the proposed concept, especially if it were to be implemented in current operations ahead of the transition to a higher TA. The NDDG members believe that a raised TA would result in reduced airspace containment for Instrument Flight Procedures. Aerodrome SID procedures are predicated on the airfield QNH and not the ASR QNH. There is no PANS-OPS procedure for where the pilot on a SID should change from airfield QNH to ASR QNH, therefore the ANSP cannot guarantee that an aircraft will remain within nominal VSM parameters at all times. ▪ NVSM simplifies the transition between regions, although there is increased workload in confirming which QNH aircraft are flying on. (Isle of Man ATC response) ▪ Humberside Airport believes that if Nominal VSM is so good, it should be detailed in the State Safety Case and adopted by all using identical QNH
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			<p>tolerance methods, rather than every ANSP (or other control organisation) having to produce its own generic safety case. The airport feels that organisations controlling within the same airspace should not be adopting potentially different criteria; it feels that the criteria should appear in a CAA CAP (e.g. MATS Part 1) and all ANSPs should follow it where appropriate. Where it was not considered appropriate, any variance should be detailed in their MATS Part 2.</p> <ul style="list-style-type: none"> ▪ BAe Systems Warton recognises the significant benefits that a constrained application of Nominal VSM would bring to the objective of raising the UK TA to 18,000ft. They would ideally like to employ it outside of CAS between aircraft on the Warton Aerodrome QNH and those on either the Blackpool Airport QNH or the Potter ASR QNH. Warton also requests that the CAA ensures that any Safety Case to employ a Nominal VSM of up to 2hPa should be as straightforward as possible. ▪ Although the company agrees with the proposal, Eastern Airways believes that it introduces further complication which is likely to lead to increased errors by either ATC or aircrew. <p><i>CAA comments</i></p> <p><i>Despite the relatively high levels of support for this proposal, comments also reflect stakeholders' concerns, particularly regarding safety. On this subject, it is</i></p>
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			<p><i>important that stakeholders recognise that the CONOPs is not proposing a reduction of current separation standards, but rather it acknowledges and exploits the scope of known ‘allowances’ within the vertical separation minimum as defined by ICAO. These comments have been noted and the complete list has been forwarded to the TA Project Team for their consideration when producing the final CONOPs for implementation.</i></p> <p>CAA conclusion</p> <p><i>In view of the overall high levels of support for this proposal from most stakeholders, it is concluded that the procedures in the CONOPs relating to the proposed Nominal Vertical Separation Minima concept are acceptably safe.</i></p>
26	Additional feedback	Any additional feedback which individuals or organisations feel they wish to communicate.	<p>All general comments made on the website, as well as major points made via other means during the consultation, have been included here. Where the issue has not already been dealt with within this document, additional CAA comments have been added as appropriate:</p> <ul style="list-style-type: none"> ▪ We would prefer to see the ASRs introduced as soon as possible, not necessarily at the same time as the harmonised TA. (AOPA) <p><i>CAA comment</i></p> <p><i>Noted</i></p>

			<ul style="list-style-type: none">▪ PPL/IR members fly at relatively low level on Airways between the UK and near continent on a very regular basis. 95% of our FIR crossings are between the existing TAs of France and Belgium and the proposed new TA. That means that the current smooth transition at QNE disappears and there will be a discontinuity. In most of Europe, and most particularly France and Belgium, whose FIR boundaries we cross most, VFR flight is permitted on Airway routes at intermediate altitudes. Level changes of both IFR and VFR traffic might cross, increasing risks of close or actual collision and certainly TAS/TCAS alerts. Furthermore, our aircraft are comparatively sensitive to the requirements of level change. Many of our aircraft have up to eight levers that need to be adjusted twice for a level change (throttles, pitch, mixture, cowl flaps all x2) and also it can take several minutes to "tune" the engines for best performance at a level. For these reasons we would like to see level changes across the FIR boundaries minimised. But on days of very (but not exceptional) high or low pressure, where the QNH might differ from 1013 by anything up to 750ft, the "obvious" change in altitude may not be available because it breaches semicircular requirements. Thus we could see a 1750ft climb or descent, which would be additional workload, engine wear and fuel burn. Furthermore, we see similar issues for VFR flights across the boundary. These are our biggest concerns and, as far as we can see, they have not been mentioned. We
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			<p>cannot comment on our support or opposition to the overall package until these issues are bottomed out. (PPL/IR Europe)</p> <p>CAA conclusion</p> <p><i>Before implementation, the UK TA project will need to engage further with neighbouring ANSPs to ensure that all boundary procedures are fully agreed and workable.</i></p> <ul style="list-style-type: none"> ▪ The BGA are concerned at an effective loss of airspace where a base will change from a flight level to an altitude. On a high pressure day when conditions are good for cross country flying with a pressure of for example 1030hp there is a loss of 500ft of "usable" height to pilots. The management of being on the right QNH will be a challenge for pilots. Glider pilots by the very nature of the sport will fly as close to the vertical limits of airspace as possible using modern moving map displays and flight loggers to record their flight. The gliding movement will need to ensure that their flight navigation systems will be compatible with the methodology of the ASR measurements. The CAA have repeatedly suggested that in line with the TA consultation a review of airspace especially at lower levels (altitudes) could take place. Will this happen? (BGA response) <p>CAA comment</p> <p><i>It is still the CAA's intention to review bases of CAS at lower levels and this was confirmed with the implementation of LAMP Phase 1A on 4th February</i></p>
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			<p><i>2016. As part of the decision letter approving that project, the CAA committed to reviewing the bases of CAS within the London TMA, specifically along the south coast. This review is currently underway with the aim of implementing any changes resulting from it in early 2017.</i></p> <ul style="list-style-type: none"> ▪ HAL views the benefits of the TA to 18,000ft as enabling: <ol style="list-style-type: none"> 1. Resiliency through additional headroom 2. Improved departure performance/flow with a reduction in MDIs and STAMs due currently to capacity issues enroute 3. Implementation of FAS through PBN 4. Noise reduction through airspace design using appropriate respite options, CCOs and CDAs and optimal climb gradients, and steeper, 2 segmented and curved approaches 5. Improved fuel efficiency for our airlines and emissions reduction (CO2) as aircraft routings are more predictable and efficient. <p>(London Heathrow Airport response)</p> <p><i>CAA comment</i></p> <p><i>Noted</i></p> ▪ It is inappropriate to impose an onerous and costly change, particularly on smaller units, solely for the benefit of airports in the South East of England. The TA should be lowered as much as practicable and the option of SIDs to a flight level explored further. (Exeter response)
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			<p><i>CAA comment</i></p> <p><i>On the subject of SIDs to a Flight Level; the CAA has conducted several workshops over the years to study the issue, and has concluded that, whilst SIDs to a Flight Level are indeed feasible and permissible where they are designed away from the effects of adjacent procedures, they are very difficult to accommodate in busy TMA airspace where procedures from different airports interact with and affect each other. In view of these findings, the CAA does not intend to conduct any further studies on this issue.</i></p> <ul style="list-style-type: none">▪ It would have been useful to have been able to provide comments against every question. I had to select different timescales/costs in order to be able to type comments for some questions. Also it would have been more efficient to have the survey in the same order as the Questions for Industry was laid out; I had to keep checking that all of the questions had been asked. I will also email comments not covered by the survey and of a more individual nature to taconsultation@caa.co.uk. (Humberside Airport) <p><i>CAA comment</i></p> <p><i>Noted; unfortunately, the questions on the website were revised at a late stage in order to make them more user friendly; this was not co-ordinated with the main documentation.</i></p>
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			<ul style="list-style-type: none"> ▪ If the 18,000ft TA change were to be deferred for circa five years, the NDDG members propose that a detailed Feasibility and Options study is undertaken on the alternative options. The study should be a cross industry project, including the industry, CAA, NATS and MoD. It may include concepts like, SIDs to a Flight Level, GNSS height accuracy and radar derived height using new surveillance solutions such as multi-static passive radar and holographic radar. <i>CAA Comment</i> <i>Noted; see previous CAA Comments regarding SIDs to a Flight Level.</i> ▪ IATA is strongly in favour of a harmonized transition altitude at 18,000 ft. This will improve safety by harmonising and standardising of operating procedures (SOPs) across different regions of the world. For environmental and economic reasons it is providing for benefits through improvements to the vertical profiles of aircraft arrivals and departures in the TMAs. The elimination of step climb/ descent procedures will reduce the exposure to pilot errors. (IATA response) <i>CAA Comment</i> <i>Noted</i> ▪ I think this would be a good thing if it were to improve efficiency (and therefore save money), however if it couldn't be shown to do that then more investigation is needed. There is also the problem that the rest of Europe
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			<p>needs to come on board all at the same time to standardise procedures. (Commercial pilot)</p> <p><i>CAA comment</i></p> <p><i>Noted; however, a Europe-wide solution to standardise TAs across the continent is not being pursued by EASA at this stage.</i></p> <ul style="list-style-type: none"> ▪ I wholeheartedly support the idea of a change to a single, harmonised transition altitude of 18,000 ft within the UK and also within Europe. I am a current heavy-jet captain with an international airline, operating throughout the world, but I have also considerable experience of light and general aviation in the UK and overseas, including as an instructor. I have some 20,000 hours and over forty years' experience. In my rime, I have operated using QFE for local airfield operations, and also using QNH and, in the UK, Regional Pressure Setting. Without a doubt, the simplest system I have encountered is using QNH for all "low-level" ops, in co-ordination with a relatively high, uniform transition altitude. That system works extremely well for high-level jet and turbo-prop operations but equally well for light (unpressurised) aircraft ops. In my view, a sea-level pressure setting used at any level where terrain might be encountered, greatly increases terrain awareness and reduces the likelihood of CFIT. Furthermore, a high TA and associated high TL afford pilots of high-performance aircraft much more chance to avoid altitude busts in departures with level-offs in the first few
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			<p>thousand feet and equally in arrivals with level-offs in the last few. The proposed change is a good one and I very much hope we will enhance flight safety by adopting it forthwith. (Commercial/GA pilot)</p> <p><i>CAA comment</i></p> <p><i>Noted</i></p> <ul style="list-style-type: none"> ▪ A minor point. Students training for a career in commercial aviation would not experience flight at FL until post IR with a raised TA. There may be a safety impact when carrying out initial Type training where FL will be first encountered for real. (Pilot) <p><i>CAA comment</i></p> <p><i>Noted; however, for many GA pilots, use of FL will no longer be an issue.</i></p> <ul style="list-style-type: none"> ▪ While the CONOPs has clearly been formed from a lot of hard work and careful assessment, and with safety in mind, it is clear that the TA project will increase workload of both pilots and controllers, reduce the quantity of airspace available through necessary buffers at interfaces and increase the opportunity for errors, all while reducing (nominally!) the distance between aircraft. Nor is it clear what efficiency gains can be produced. It is therefore very difficult to see the justification for such a project, when all it actually delivers is supposedly a framework for future airspace and procedure design, and not one that will necessarily be useable, or replicated throughout Europe as proven by the HETA findings. Harmonisation sounds
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			<p>like a good idea, but 'one size covers all' is not the same as 'one size fits all', and this does not fit with the original intention. (ATCO and pilot)</p> <p><i>CAA comment</i></p> <p><i>Noted</i></p> <ul style="list-style-type: none">▪ The Met Office highlighted the need to ensure that suitable altimetry corrections to an aircraft's altitudes are applied during cold temperatures. It noted that on some occasions during rapid moving low pressure depressions there could be a combination of extreme pressure across the ASR, forecast inaccuracy, and the effect of cold weather on altimetry could lead to an error of 500ft. However it noted that these are rare events, but requested assurance that cold weather corrections to altimetry had been considered during this work. <p><i>CAA comment</i></p> <p><i>Cold temperature corrections remain the responsibility of the pilot, and any requirements to make such adjustments are in addition to any which may be required by adopting procedures from the TA CONOPs.</i></p> <ul style="list-style-type: none">▪ NATS has highlighted that workshop outputs have indicated some potentially high risk classes and points to key areas of focus for the project. The high indicative outcomes result from:<ul style="list-style-type: none">a) Management of voice communications and phraseologyb) Tactical pressure management
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			<p>c) Misjudging vertical profiles within, across or in the vicinity of Altimeter Setting Region boundaries</p> <p>d) Vertical infringements and pressure management related level busts</p> <p>There is anticipated to be some time to allow further development of necessary mitigations over the coming years in conjunction with the capabilities provided by a new operating environment. The effectiveness of the mitigations on the indicative outcomes and the impact of the mitigations in terms of cost and schedule will become more mature within this timeframe.</p> <p>NATS notes that through the project lifecycle of TA it has become clear that external factors are challenging plans to deliver major airspace changes, notably:</p> <p>a) Public reaction to a change in noise patterns</p> <p>b) Planned consultation on the Airspace Change process and treatment of noise</p> <p>c) Impending Government decision on runways in the South East</p> <p>d) Reduced willingness of airports to support LAMP developments.</p> <p>For these reasons, NATS has completed a consultation, in accordance with its license obligations with our airline customers on the conclusion that delivery of the LAMP Phase 2 as originally envisaged is no longer possible in the original timescales because of these changes in the wider industry</p>
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			<p>environment. If NATS continued with the previous plan it would be unsuccessful and would not deliver the envisaged benefits. NATS has therefore delayed LAMP delivery until RP3 as it is important that LAMP is delivered at a time when the full benefits for our customers can be realised. This means that raising the Transition Altitude needs to be ahead of and closely aligned to LAMP implementation and so a synchronised introduction date of 2023/2024 respectively for both projects is optimal. (NATS response)</p> <p><i>CAA comment</i></p> <p><i>Noted and mostly commented on previously</i></p> <ul style="list-style-type: none"> ▪ In view of changing circumstances regarding the LAMP project and government decisions on airport expansion, the MOD offers the following recommendations: <ul style="list-style-type: none"> a) The decision to implement a raised/harmonised TA of 18,000ft should be deferred, until the decision on airport expansion in the London Area has been resolved and its implications on LAMP Ph2 are clearly understood. In the interim: b) Consideration should be given to a revised proposal, introducing a harmonised TA at or below 10,000ft to remove the dis-benefits associated to the en-route environment whilst retaining the
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			<p>demonstrated benefits associated within the lower airspace and airfield environments.</p> <p>c) Alternative methods of achieving a systemised approach and departure concept within the LAMP area should be investigated, taking into consideration advances in technology, projected forward into the next decade, rather than reliance on barometric altimeter settings to achieve the desired outcome.</p> <p>d) Lessons should be drawn from the development and implementation of the NTCA project prior to affirming that 18,000ft is absolutely required. (MOD response)</p> <p>Quoting from the CAA's State Safety Report, the MOD highlights a number of areas within which safety issues are either neutral or still need to be addressed. In June 2015 the MOD proposed a number of concepts which were designed to alleviate these safety concerns to the State TA project. Primary of these was the lowering of the proposed harmonised TA to 10,000ft. This level was chosen to remove the known issues within the en-route environment whilst retaining the demonstrated benefits within the lower airspace and airfield environment. The MOD regrets that these proposals were not taken forward.</p> <p><i>CAA comment</i></p> <p><i>Noted</i></p>
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			<ul style="list-style-type: none">Prospect ATCOs' Branch supports in principle the introduction of a harmonised TA to improve safety. However the Branch rejects the implementation of the TA of 18,000ft in its current form without a revalidation of the project, aligned with the revised London Airspace Management Project (LAMP) timescales and the Pilot Common Project requirements around Performance Based Navigation (PBN) in high density TMAs. The Branch would also urge that timescales for implementation are aligned with a revised Future Airspace Strategy, and the delivery of the Pilot Common Project. The Branch understands that the proposed change is principally an 'enabler' for the wider LAMP, in allowing Standard Instrument Departures (SIDs) to have higher levels above the current TA of 6,000ft. Given the significant difficulties that have been experienced in the proposed implementation of LAMP and the halt in further development at this time, we would also question the need for continuing any work on the TA project. It has been noted that two-thirds of responses to the first consultation indicated a preference for change but it is not clear that this indicated a change to 18,000ft itself. Therefore if it is deemed necessary from a safety point of view to harmonise a UK-wide TA then the chosen altitude of 18,000ft should be revisited. <p><i>CAA comment</i></p> <p><i>Noted</i></p>
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			<ul style="list-style-type: none"> ▪ Whilst this plan may possibly bring improvements to the South of England airspace capacity, (which I understand is runway capacity limited anyway), it will have a negative financial and operational impact on the Eastern Airways scheduled domestic operation for no benefit to us. Given the MOD's comments about Class G airspace controller availability to supply deconfliction services, it is also likely to drive our aircraft into the airways system on trunk English-Scottish routes at peak times. There will be an increased risk of level busts as a result of the increase in altitude changes required per flight. This is in addition to the other issues which an increase in VHF RT will cause, as required to support aircraft frequently adjusting altitude due to QNH changes, either by region or as a result of an actual change. <p>CAA conclusion</p> <p><i>As part of the requirement to introduce a more systemised airspace structure, the CAA should engage with commercial operators before an 18,000ft TA is implemented so that any issues can be better understood and managed. Additionally, the TA project will need to undertake further work to address the issues of high RTF loading and the management of ASR boundary crossings outside CAS before implementation of an 18,000ft TA.</i></p>
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Appendix B

Consultees

NATMAC

- AOA (Airport Operators Association)
- AOPA (Aircraft Owners & Pilots Association)
- British Airways
- BALPA (British Airline Pilots Association)
- BATA (British Air Transport Association)
- BBAC (British Balloon & Airship Club)
- BGA (British Gliding Association)
- BHA (British Helicopter Advisory Association)
- BHPA (British Hang Gliding & Paragliding Association)
- BMAA (British Microlight Aircraft Association)
- BPA (British Parachute Association)
- GASCo (General Aviation Safety Council)
- GATCO (Guild of Air Traffic Control Officers)
- HAL (Heathrow Airport Limited)
- Heavy Airlines
- HCGB (Helicopter Club of Great Britain)
- The Honourable Company of Air Pilots
- Light Airlines
- Low-cost Airlines
- MOD including MOD Safety
- NATS (En Route) Plc
- NATS (Services) Ltd
- LAA (Light Aircraft Association)
- UAVS (Unmanned Aerial Vehicle Systems Association)
- UKAB (United Kingdom Airprox Board)
- UKFSC (United Kingdom Flight Safety Committee)

Non-NATMAC

- DfT
- IAA (Irish Regulator)
- IAA (Irish ANSP)
- Irish Air Corps
- Norwegian CAA
- Avinor (Norwegian ANSP)
- Royal Norwegian Air Force
- States of Jersey
- Director Civil Aviation, Guernsey
- Director Civil Aviation, Isle of Man
- CAA, Belgium
- Trafikstyrelsen, Denmark
- CAA, Finland
- DGAC, France
- CAA, Iceland
- Ministry of Transport, Netherlands
- Transportstyrelsen, Sweden
- Jersey ATC
- Isle of Man ATC
- Belgocontrol, Belgium
- Naviair, Denmark
- Finavia, Finland
- DSNA, France
- Isavia, Iceland
- LVNL, Netherlands
- LfV, Sweden
- Eurocontrol
- EASA
- ICAO
- IATA
- UK Met Office
- BAe Warton
- HIAL
- Serco
- Aberdeen Airport
- Barrow/Walney Island Airport
- Belfast Aldergrove Airport
- Belfast City Airport
- Biggin Hill Airport
- Birmingham Airport
- Blackpool Airport
- Bournemouth Airport
- Bristol Airport
- Cambridge Airport
- Cardiff Airport
- Carlisle Airport
- Coventry Airport
- Cranfield Airport
- Doncaster Sheffield Airport
- Dundee Airport
- Durham Tees Valley Airport
- East Midlands Airport
- Edinburgh Airport
- Exeter Airport
- Farnborough Airport
- Glasgow Airport
- Gloucestershire Airport
- Hawarden Airport
- Humberside Airport
- Isle of Man Airport
- Leeds Bradford Airport
- Liverpool Airport
- London City Airport
- London Gatwick Airport

- London Heathrow Airport
- London Luton Airport
- London Stansted Airport
- Londonderry/Eglinton Airport
- Lydd Airport
- Manchester Airport
- Newcastle Airport
- Newquay Airport
- Northolt Airport
- Norwich Airport
- Oxford Airport
- Prestwick Airport
- Scilly Isles/St Mary Airport
- Shoreham Airport
- Southampton Airport
- Southend Airport
- Yeovil Airport
- All UK aerodromes without UK AIP entries
- ASAP S.R.O.
- Davidson Ltd
- gCAP Ltd
- Jeppesen Airspace and Airport Services