LONDON AIRSPACE MANAGEMENT PROGRAMME (LAMP) PHASE 1A

CAA DECISION: PART APPLICABLE TO EACH LAMP PHASE 1A MODULES A – E

(see also separate decision documents applicable only to each of Modules A – E)

CAP 1366

Published by the Civil Aviation Authority, 2015

Version 1	First published 22 December 2015
Version 1.1	Published 3 February 2016 Correction to the phrasing of the regulatory requirements for NATS to keep aircraft clear of D138A.
Version 1.2	Published 4 March 2016 Added version history
Version 1.3	Published 9 May 2016 31 August is now the revised date for the controlled airspace limits review, Portsmouth CTA re-classification review and introduction of segregated VFR operations; as specified in Module C No. 7 and 8, and Module E No. 2, 3, 4 and 5.

Amendments marked as underlined text.

The latest version of this document is available in electronic format at www.caa.co.uk

Contents

LONDON AIRSPACE MANAGEMENT PROGRAMME (LAMP) PHASE 1A

CAA DECISION: PART APPLICABLE TO EACH LAMP PHASE 1A MODULES A – E

(see also separate decision documents applicable only to each of Modules A – E)

Purpose of this part of the CAA Decision

1. LAMP Phase 1A is a collection of Airspace Change Proposals (ACP) comprising a collection of five proposals concerning the structure of airspace over the south-east of the UK. Each proposal has come to be known as a Module, Module A – E.

2. Each proposal has been considered separately and our decision in respect of each of them is set out in this document (and in an individual decision document (Parts applicable to Modules A – E respectively only)).

3. The contents of this Part of the CAA's decision are expressly incorporated by reference into each of the Modules' decisions.

Summary of the decisions made

4. For the reasons set out in each Module's decision document the CAA has decided as follows:

Module A – [Stansted SID Switch ACP Issue 2.1 dated April 2015]: this proposal switches traffic from the existing SID routing via Detling towards the south onto the route of another existing SID towards Clacton in the east. We have determined that the proposed design is safe and that, notwithstanding the re-distribution of some noise below 4000ft AMSL, there are significant benefits to be gained in the overall efficient use of airspace and a net reduction in CO_2. The proposal has been approved.

Module B – [London City Replications ACP Issue 1 dated February 2015]: this proposal replicates the existing conventional SIDs with RNAV-1 replications, and proposals to replicate the existing radar vectored arrival flight paths with RNAV-1 arrival procedures. We have determined that the proposed design will deliver significant flight safety benefits and result in improved airspace efficiency that will contribute to a net overall reduction in CO_2. The proposal has been approved.

Module C – [London City Network ACP Issue 2 dated March 2015]: this proposal comprises a number of changes mainly affecting the re-positioning of London City arrival procedures and two departure procedures to the south, changes to Southend arrival procedures, changes to Gatwick TIMBA arrival routes from the north-east and east, and lowering of controlled airspace in the Thames Estuary and a small portion of airspace over the eastern part of Kent. We have determined that the proposed design has significant flight safety and efficiency benefits that remove current hotspots and reduce the requirement for vectoring at low altitudes overland with the current risk of overload to the Thames Sector controllers. The environmental impacts have been identified and on balance the net benefits in terms of CO_2 outweigh the potential effects of concentration. The proposal submitted on 17 February 2015 has been approved. In addition, the further modification for additional controlled airspace over the sea subjected to consultation with aviation stakeholders on 2 April 2015 (Area F) has been approved.

Module D – [Luton/Northolt SID Switch ACP Issue 2.0 dated March 2015]: this proposal switches traffic from the existing SID routing via Detling towards the south onto the route of another existing SID (the MATCH SID) towards Clacton in the east. We have determined that the proposed design is safe and, having regard to the altitude-based priorities set out by the Secretary of State in regard to environmental issues, we are satisfied that the change will generate fuel and CO_2 savings while having minimal environmental impacts. The proposal has been approved.

Module E – [South Coast ACP Issue 2 dated March 2015]: this proposal changes the arrival route for Southampton and Bournemouth from the south-east, introduces changes to flight plannable routes for traffic arriving into Farnborough from the west, south-west and south-east, changes the flight plannable departure route for Bournemouth, Southampton and Farnborough departures to Europe via Dover above FL165, introduces 2 new air traffic services routes and lowering of controlled airspace over the Isle of Wight. We have determined that, notwithstanding some increases in controlled airspace and some re-routing of traffic that results in longer miles flown for a very small number of aircraft, the proposed design will deliver significant flight safety benefits and result in improved airspace efficiency that will contribute to a net overall reduction in CO_2. The proposal has been approved with one modification to the lower limits of controlled airspace over the Isle of Wight.

Conditions attached to CAA's approvals in respect of each of the Modules

5. A number of conditions attach to the CAA's approval of each of the proposals in LAMP Phase 1A Modules A – E. These are set out in the relevant Module's decisions and collectively at Annex B.

6. A Post Implementation Review (PIR) will commence one year after implementation of the changes approved in these Modules. It is a condition of the CAA's approval of each of these proposals that the sponsor(s) of each Module provide data required by the CAA throughout the year following implementation to carry out that PIR. The sponsor(s) will be advised of the specific data sets and analysis required, and the dates by when this information must be provided, in due course. The PIR is the seventh stage of the CAA's airspace change proposal process (set out in CAP 725, the Guidance on the Application of the Airspace Change Process[1]) and will consider whether *"the anticipated impacts and benefits, set out in the Airspace Change Proposal, have actually been delivered"*. The policy states that if those impacts and benefits have not been delivered then the review should *"ascertain why and … determine the most appropriate course of action"*.[2] (See Annex A for more detail.)

Next steps

7. The revised airspace will become effective from 4 February 2016 (AIRAC 2/2016) which was promulgated in the UK AIP via a double AIRAC cycle. AIC Y076/2015 was also distributed on 26 November 2015 which promulgated details of the changes.

The CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations

8. It is necessary to understand the CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations in order to understand the decisions the CAA has taken.

9. This information is set out in Annex A.

---

1 http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=395.

2 There are therefore a wide range of possibilities for the conclusions of a PIR; they include a rejection of the proposal, the imposition of further requirements on the proposal, and the making of wider recommendations, albeit that the success of the proposal is not dependent upon them.

The overriding aims and objectives of the LAMP Phase 1A Modules' airspace changes proposed and our decision with regard to those aims and objectives

10. In February 2015, National Air Traffic Services (NATS) submitted an Airspace Change Proposal (ACP) titled the London Airspace Management Programme (LAMP) Phase 1A proposal to the Civil Aviation Authority (CAA), to propose changes to airspace in the south-east of England including proposals to change a number of arrival and departure procedures at a number of airports. LAMP Phase 1A is a major airspace change designed to deliver modifications to airspace arrangements affecting a broad swathe of south-east England from Stansted to the Isle of Wight in order to provide, primarily, capacity and efficiency benefits. There are five individual elements (referred to as Modules) of the LAMP Phase 1A proposal.

11. The justifications presented by NATS for the LAMP Phase 1A proposals are that it will modernise airspace structure, improve the operational efficiency of the airspace providing capacity for the future, minimise future delay, improve the environmental performance of the airspace, reduce average CO_2 per flight and reduce the incidence of low level overflight of populated areas. It is acknowledged that of themselves, none of the Modules will increase the capacity of the airspace at this time but each of the Modules collectively contribute to a modernisation of the airspace that enables further systemisation, as and when further phases of airspace change are developed for the south-east of England and are put forward for consideration by the CAA.

12. NATS' stated aim for LAMP as a whole is to redesign the airspace network over the whole of London and the south-east. Initial plans were to consult on a complete package of network changes and 'swathes' and then follow this up with airport specific consultations prior to a phased implementation at single or groups of airports. However initial design work and programming issues meant that this plan was revised so that LAMP design and consultation was to be addressed in two main phases. The first centred around London City and Gatwick (referred to as LAMP Phase 1A) and the second around Luton, Stansted and Heathrow (referred to as Phase 2).

13. LAMP Phase 1A (the subject of these airspace change proposals) was progressed on this revised basis but almost all of changes (apart from one, high level arrival route to the TIMBA Hold) for Gatwick were subsequently removed from scope. It should be noted that it is still NATS' and the airports' intention to progress subsequent phases of LAMP to realise greater improvement in the future and meet European requirements to modernise the airspace system. However, as of the date of this decision, future plans have been suspended by NATS pending the outcome of a decision on a future runway at either Heathrow

or Gatwick, and Department for Transport plans to revise the Air Navigation Guidance[3] to the CAA.

14. In recognition that progress towards a successful implementation of LAMP Phase 1A, taking into account the legal and policy context, would constitute progress towards the CAA's overall Future Airspace Strategy (FAS) policy objective it is a condition of NERL's Licence (Condition 10a) that "*the Licensee shall use reasonable endeavours to further implement the major air traffic management ("ATM") modernisation programmes set out in the UK FAS Deployment Plan of December 2012. These programmes are: the raising of the United Kingdom Transition Altitude ("TA"); the terminal airspace redesign under the London Airspace Modernisation Programme ("LAMP"); and the implementation of the* [Single European Sky Air Traffic Management Research (SESAR)*] Pilot Common Project.*"

15. In this part of the record of the CAA's decisions on Modules A – E of LAMP Phase 1A the CAA formally records that the aims and objectives of LAMP Phase 1A are objectives which it endorses and, subject to the terms of the regulatory and policy framework set out in Annexe A, the CAA will seek to approve changes to the UK airspace structure that meet the aims and objectives of LAMP.

Chronology and documents considered by the CAA in making its decision

16. The CAA held its Framework Briefing regarding LAMP Phase 1A with NATS on 12 February 2013.

17. In preparation for that meeting, during that meeting and in the communications that followed, NATS and the respective airports developed and refined their proposals to meet the overall aims and objectives of LAMP Phase 1A. As set out above, NATS and the respective airports decided during this time to break LAMP down into Phases – this being Phase 1A. However, for the reasons set out below, although the changes proposed relate to procedures at individual airports, an individual route or an individual block of controlled airspace, it was identified that each of the five changes should be considered together due to their interconnectivity and interdependence, whilst acknowledging the fact that CAA has five individual decisions to make.

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf.

18. Following a number of separate consultations by various sponsors in support of the LAMP Phase 1A proposals, the relevant elements have been submitted to the CAA in separate Modules. While some of these changes stand alone, some are interrelated and cannot occur unless other Modules of the airspace changes also take place. The overall fuel and CO_2 savings, which are an important factor when considering these airspace change proposals, are only delivered if all the Modules are implemented. The Module C proposal depends entirely on all other Modules. Modules A, D and E are stand-alone proposals and could be implemented without Module C.

19. It should be noted that whilst the LAMP Phase 1A package included proposals to change arrival and departure routes at Gatwick, these plans have been suspended and have not been progressed within LAMP Phase 1A. Albeit, as set out in Module C, to enable the LAMP Phase 1A London City network changes, it is proposed to realign Standard Arrival Routes (STARs) inbound to the Gatwick TIMBA Hold from the north-east and east where aircraft are in the descent to 7000ft AMSL (routinely FL80 depending on pressure settings). In addition the proposals in Module E for changes along the South Coast were not originally part of the LAMP Phase 1A set of proposals; these proposals have been extracted from an airspace change proposal development referred to as the Farnborough ACP and proposed by NATS to the CAA at the same time as the LAMP Phase 1A Modules A – D.

20. In one proposal (Module E – the South Coast change) the airspace change proposal has been modified after it was submitted to the CAA for consideration. That is, in response to feedback provided by the CAA in respect of the airspace change requested, the sponsor has modified their proposal to address that feedback. The CAA has taken its decision based on the terms of the latest iteration of the airspace change proposal (which will be published on the CAA's website[4]).

21. The final version of the Airspace Change Proposals (each of which is supported as appropriate with copies of the consultation material, the consultation feedback, and the consultation feedback report) is as follows:

    A. Module A - Stansted SID Switch ACP Issue 2.1 dated April 2015.

    B. Module B - London City Replications ACP Issue 1 dated February 2015.

    C. Module C - London City Network ACP Issue 2 dated March 2015.

    D. Module D - Luton/Northolt SID Switch ACP Issue 2.0 dated March 2015.

    E. Module E - South Coast ACP Issue 2 dated March 2015.

[4] http://www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Decisions/London-Airspace-Management-Programme-Phase-1A.

The CAA has also been provided with, and taken into account,

F. Bridging Module Issue 1 dated February 2015.

G. LAMP Phase 1a: ACP Environmental Benefits Report v 1.2 dated March 2015.

H. Route Design Assurance Report Issue 2 dated March 2015 (as amended).

I. Project Safety Assurance Report Issue 1 dated February 2015 (as amended).

J. Instrument Flight Procedure designs.[5]

CAA analysis of the material provided in support of the Airspace Change Proposals

22. As a record of our analysis of this material, for each Module, the CAA has produced:

- An **Operational Assessment** which is designed to brief the decision maker whether the proposal is fit for purpose. This assessment contains:

  Section 1. This includes the CAA's assessment of the airspace change proposal justification and options considered.

  Section 2. This includes the CAA's assessment of the proposed airspace design and operational arrangements. An assessment of the design proposal is produced to illustrate whether it meets CAA regulatory requirements regarding international and national airspace and procedure design requirements and whether any mitigations were required to overcome design issues.

  Section 3. This includes the CAA's assessment of whether adequate resource exists to deliver the change and whether adequate communications, navigation and surveillance infrastructure exists to enable the change to take place.

  Section 4. This includes the CAA's assessment of whether maps and diagrams explain clearly the nature of the proposal.

[5] For final versions of designs submitted, see published designs in the UK AIP (AIS website at: http://www.nats-uk.ead-it.com/public/index.php.html.

Section 5. This includes the CAA's assessment of the operational impacts to all airspace users, airfields and on traffic levels and whether potentially impacts have been mitigated appropriately.

The CAA's conclusions are arrived at after a CAA Case Study. An Operational Assessment is only completed if CAA airspace regulators recommend that the CAA approve the proposal. In that case the Operational Assessment will also include any recommendations for implementation such as conditions that should attach to approval if given.

- An **Environmental Assessment** which reviews the Environmental Assessment provided by the sponsor(s) requesting the change (which is one of the documents provided to the CAA along with the airspace change proposal). Our review will assess whether the sponsor has provided the data and information that had been agreed, at the Framework Briefing or in subsequent correspondence, must be provided as part of the request for the change proposed. These requirements are based on the provisions and policy in CAP 725 (see Annex A). These requirements have been designed to facilitate the assessments that the CAA must make when considering the environmental impact of the change (see above and in Annex A). We review the assessments made by the sponsor in the material provided to determine if they have been undertaken properly and the conclusions are reasonable. We will check a sample of their results and we may in some cases undertake our own analysis. We then prepare a report that summarises the environmental impacts and outlines what the anticipated impacts would be if the airspace change proposal was to be implemented, for consideration along with all the other material by the CAA decision maker.
- A **Consultation Assessment** which is designed to brief the CAA decision maker whether the proposal has been adequately consulted upon in accordance with the CAA's regulatory requirements, the Government's guidance principles for consultation and the Secretary of State for Transport's Air Navigation Guidance. The assessment will confirm whether the change sponsor has correctly identified the issues arising from the consultation and has responded to those issues appropriately. The assessment will rely, in part, on a comparison of the sponsor's consultation feedback report against the actual responses provided by consultees.

Overview of LAMP Phase 1A Proposals

23. Across all five Modules, we have considered the following proposals for changes to controlled airspace, SIDs, STARs and holding patterns.

- Five new Gatwick RNAV-5 STARs including small alignment changes into the existing TIMBA hold from the north-east and east.
- For London City (LCY):
  - New RNAV-5 STARs which route to new contingency holding stacks at JACKO (to the east of Shoeburyness) and GODLU (adjacent to Dover); a new Point Merge arrival structure for Thames Radar for both Rwy 09 and Rwy 27 where NATS will use linear holding techniques which form part of an RNAV-1 arrival transition route for each runway.
  - New RNAV-1 SID replications for all LCY departures, with the latter part of the LCY Detling SIDs to the south being slightly realigned to route via new point 'EKNIV'.
  - Lowering of some controlled airspace (CAS) in the Thames Estuary and in the north-east of Kent to support the new procedures.
- Biggin Hill RNAV-1 arrival transition.
- Re-sectorisation of NATS control sectors in the south and south-east.
- Re-routing of Stansted, Cambridge, Luton and Northolt 'Detling' (a navigational aid in the vicinity of Rochester) departures towards Clacton before turning to the south-east.
- Re-routing of the existing Southampton/Bournemouth STAR towards Southampton via the Solent, with some minor changes thereafter to arrival vectoring below 7000ft AMSL.
- Lowering of controlled airspace in the region over the Isle of Wight region from FL105 to FL65/75.
- New Air Traffic Services (ATS) link routes to provide connectivity for the re-routed Stansted, Cambridge, Luton and Northolt SIDs to re-join the previous routing to Continental Europe after Dover.
- New ATS link routes for the new LCY RNAV-1 SIDs via EKNIV to join the en-route structures at Dover and Lydd.
- New ATS route for Farnborough, Southampton and Bournemouth departures routing via Biggin Hill VOR to Dover VOR for entry to Continental Europe at FL165 and above.

- Raising of a small portion of controlled airspace off the south-east Kent coast from FL65 to FL75.

24. In summary, the purpose behind this set of proposals is to redesign the airspace so that routes arriving and departing the airports in the south-east are configured so that they avoid (or do not conflict with) each other to a greater extent than is presently the case. The main thrust of the LAMP Phase 1A proposal is to re-route Stansted, Luton and Northolt departures via Dover away from the existing departure routes via Detling as this route is currently also a flight path for the London City departures to the south.

25. This means that the existing flows for Stansted, Luton and Northolt are re-routed towards Clacton in the east. Because this departure flow has been re-positioned towards the east, it means that the London City departures will have less conflicting traffic, which currently restricts London City departures to climb as quickly as they otherwise could, and hence the London City departures will have an improved climb profile which means they can get higher earlier in departure, and as a consequence, it means that the arrival flows for London City can be re-positioned via the Thames estuary.

26. In the individual decision documents (Parts applicable to Modules A – E respectively only) there are attachments annexed showing the following:

Module A: Existing and proposed changes, with new route shown.
Module B: Diagrams to show new alignment of southerly (EKNIV) SIDs, existing arrival flight paths below 4000ft AMSL, and expected arrival flight paths of the new RNAV-1 arrival procedures below 4000ft AMSL.
Module C: The proposed network route system for London City from the JACKO and GODLU holds; the proposed changes to the London City southerly departures; new controlled airspace in the Thames Estuary.
Module D: Existing and proposed changes, with new route shown.
Module E: Diagrams to show the existing controlled airspace (CAS) the proposed CAS, the Option 8 refined proposal, and then the final approved CAS.

27. As set out above, each of the Modules is a separate airspace change proposal and the CAA has made five decisions. Nonetheless, in order for the relevant airspace change sponsors to articulate the aims and objectives of each airspace change, for the CAA to consider whether the changes proposed as a means of meeting those aims and objectives (within the relevant regulatory and policy context) should be approved, and for stakeholders to understand the rationale for the CAA's decisions, it is necessary to understand each change as part of the overall objective of LAMP Phase 1A.

28. In particular it is necessary to understand the overall structure in order to understand the adverse impacts the current[6] complex airspace design has on factors such as:

- the length of the routes flown by aircraft (due to delays on the ground and in airborne delay in holding patterns);
- the effect this has on the environment via increased fuel burn, emissions, or the need to keep aircraft lower over areas of population than could be achieved were the surrounding airspace redesigned;
- the effect on the number of aircraft that can safely be handled within a given volume of airspace (i.e. adverse impact on the efficient use of airspace);
- the impact on air traffic controller work load controlling aircraft through complex airspace structures.

29. It is also important to understand that due to the interactions between the many different complex structures in the area of the south-east of the UK covered by the LAMP Phase 1A proposals, some of the changes proposed are enablers that are necessary to permit or facilitate changes elsewhere in the overall airspace structure of that area.

30. As a result, when making its decision in respect of some of the Modules, and the CAA's assessment of the relevant statutory material considerations referred to above (and in more detail in Annex A), the CAA took into account anticipated benefits and impacts facilitated by one Module in respect of other Modules. This is explained in more detail in the individual Module decisions.

CAA conclusions on sponsors' consultations

31. In summary the CAA has decided that each of the Modules' consultations was adequate. Specific factors relevant to the assessment of the consultation in each Module are set out in the individual Module decisions.

32. The CAA sets out its requirements in respect of a consultation carried out prior to the submission of an airspace change proposal in CAPs 724 and 725[7]. The CAA takes into account the Cabinet Office Consultation Principles (2013 update) when assessing the adequacy of an airspace change proposal consultation.[8]

[6] Airspace design and change evolves over many years. Airspace designed for the types of aircraft flying 20-30 years ago still exists, however traffic density has changed enormously, and some aircraft performance has changed dramatically.

[7] CAP 724 https://www.caa.co.uk/CAP724 and CAP 725 https://www.caa.co.uk/CAP725.

[8] https://www.gov.uk/government/publications/consultation-principles-guidance.

The CAA provides information on the specific necessary characteristics of the consultation at the Framework Briefing carried out at Stage 1 of the airspace change proposal process as set out in CAP 725.

33. Once the CAA has received the airspace change proposal, and in addition to the guidance and requirements the CAA has communicated to the airspace sponsor(s) earlier in the airspace change proposal process, when assessing the adequacy of the consultation as part of the decision making process, the CAA takes into account a number of factors.

- We note that the airspace change process in CAPs 724 and 725 ensures that consultation takes place at a formative stage, before the airspace change has been put forward to the CAA as decision maker. It is our decision that the consultation takes place at a stage that is early enough to ensure that any feedback received can genuinely be taken into account by the airspace change sponsor and help to form the ultimate proposal put forward (if the sponsor decides after consultation to continue with the proposal) to the CAA.
- We recognise that the sponsor will have considered many different technical possibilities to achieve the outcome aimed for, taking into account the technical constraints of the airspace the airspace designer is working within. Nonetheless the CAA will assess whether the consultation adequately explained the options open to the sponsor (including the 'do nothing' option) and why the airspace change sponsor is minded at that stage to pursue the option which it has.
- We will assess whether in our view the consultation adequately explained the anticipated impact of the change proposed in order that anyone participating in the consultation could properly be expected to understand the anticipated impact of the proposed change on them.
- Finally we will assess whether the airspace change sponsor has demonstrated that it has taken into account the feedback it received during the consultation.

34. The CAA's assessment of each Module's consultation is contained in the CAA's Consultation Assessment for each Module, referred to above.

CAA assessment of material considerations under section 70 of the Transport Act 2000 common to each of the Modules

Conclusions in respect of Safety

35. The CAA's primary duty is to maintain a high standard of safety in the provision of air traffic services and this takes priority over all other duties.[9] In this respect, with due regard to safety in the provision of air traffic services, the CAA is satisfied that the proposals maintain a high standard of safety.

36. The CAA has made this assessment with regard to the Route Design Assurance Report and the Project Safety Assurance Report documents provided by NATS (References H and I referred to above). In summary the CAA has considered whether, in our view, the designs are safe, have been designed in accordance with ICAO criteria and have been properly subjected to flight validation requirements in accordance with published CAA policy in that regard.

37. The CAA has concluded that the Route Design Assurance Report (RDAR) and Project Safety Assurance Report documents were comprehensive in detail and provided the CAA with a high degree of confidence that NATS' safety by design principles were evident in the final airspace design.

38. CAA colleagues from both SARG Air Traffic Management and Airspace Regulation departments jointly reviewed the RDAR submission. It was evident that the methodology employed by NATS to demonstrate that the route spacing assurance for the new procedures has been appropriate and successful. As became evident during the analysis phase, whilst there have not been many pure RNAV v RNAV route spacing scenarios, the CAA's safety regulation oversight of the proposed design has been straightforward, and with the ongoing development of the RDAR and continued oversight, we are satisfied that the process followed for this part of the proposal has been robust. One outcome of the RDAR evaluation is a list of regulatory requirements which are conditions of the CAA's approval of the changes proposed. These are set out in the individual Module's decisions and included in the list of regulatory requirements and conditions attached at Annex B.

Conclusions in respect of securing the most efficient use of airspace

39. The CAA acknowledges that the overriding objective behind LAMP Phase 1A is to make more efficient use of UK airspace in the south-east of England and the CAA has decided that the changes proposed, if implemented will, collectively,

[9] Transport Act 2000, section 70(1).

significantly improve the efficiency of the use of airspace in the UK. The individual Modules' decision document sets out the CAA's conclusions on the impact each change proposed in each Module will have on the efficient use of airspace.

Conclusions in respect of the Environmental Impact of the changes proposed

40. We advised the Secretary of State in September 2015 that in our opinion none of the changes proposed in any of the Modules were anticipated to have the significant environmental impacts identified in paragraph 9 of the 2001 Directions.[10]

41. As set out above, the CAA has a duty to consider a number of material considerations including the anticipated impact of the change proposed on the environment. We do so for two reasons.

42. Firstly, we needed to form an opinion on whether the change will have the significant environmental impacts identified in paragraph 9 of the 2001 Directions from the Secretary of State to the CAA in order to decide whether the Secretary of State's consent would be needed to promulgate the change should the CAA agree to the airspace change proposal, or whether the decision was solely a matter for the CAA.

43. In September 2015 we wrote to the Secretary of State stating that in our opinion none of the changes proposed in any of the Modules were anticipated to have the significant environmental impacts identified in paragraph 9 of the 2001 Directions. This is because in none of the Modules was the overall exposure of any individual or community to noise on the ground anticipated to increase to a level that exceeds 57dB LA_{eq} 16 hour, where the increase in the level of exposure to noise in itself exceeds 3dB as a result of the changes proposed (the relevant CAA policy on this test is set out in Annex).

44. Secondly, we need to assess the anticipated environmental impact of each of the changes we have been asked to decide on, in order to take it into account together with the other material considerations, such as making the most efficient use of airspace, the requirements of operators and owners or the interests of others in relation to the use of airspace and so on.

45. With regard to this second reason for an environmental assessment, the CAA sets out its analysis of the environmental impact of the proposed change in each Module's decision and Environmental Assessment Report.

[10] Civil Aviation Authority (Air Navigation) Directions 2001 (as amended in 2004).

46. For the reasons set out in the individual Modules' decisions, the CAA acknowledges the anticipated environmental impact of the changes proposed and has decided to agree to the change requested. We have discussed above the need for five individual decisions whilst acknowledging the interconnectivity of all the Modules of LAMP Phase 1A. We have also concluded that looked at as a whole, the overall anticipated environmental impact does not cause us to reconsider our conclusions in respect of the individual Modules.

Other material considerations

47. The individual Modules' decisions set out the CAA's conclusions in respect of the anticipated impact of the proposed changes on the other material considerations the CAA must apply when making a decision whether to approve a change to the structure of airspace.

Conclusions

48. The CAA's summary of the information considered in respect of each Module, our assessment of the material considerations applied before reaching our decision, and the decision and reasons for it in respect of the proposal in each Module is set out in the five Module-specific decisions. The contents of this part of the decision are expressly incorporated within and form part of the five Module-specific decisions.

Civil Aviation Authority

22 December 2015

Annex A

The CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations

A1. The Secretary of State has given the CAA functions that relate to the structure and design of airspace in the Air Navigation Directions dated 2001 (amended in 2004).[11] In particular these Directions require the CAA to develop and enforce a policy for the sustainable use of UK airspace. By virtue of this function the CAA has developed its Future Airspace Strategy (known as FAS)[12] which is an initiative started by the CAA to create a joined-up UK airspace and air traffic management (ATM) modernisation programme across the many different stakeholder groups involved. The goal of FAS is to modernise the UK airspace and ATM infrastructure through significant technological improvements by 2030, to make a more efficient use of airspace (thereby providing airspace capacity benefits), as well as secure environmental (noise and emissions) and safety benefits.

A2. One means by which the CAA delivers the aims of FAS is via its statutory air navigation function to consider proposals from air navigation service providers and/or airports to change the structure of UK airspace (including the published instrument flight procedures) published in the UK's Aeronautical Information Publication (AIP).

A3. By section 70 of the Transport Act 2000 (the Transport Act), the CAA is under a general duty in relation to air navigation to exercise its functions so as to maintain a high standard of safety in the provision of air traffic services. That duty is to have priority over the CAA's other duties in this area of work.

A4. Noting that priority, the CAA's duties in relation to air navigation is to exercise its functions in the manner it thinks best so that:

- It secures the most efficient use of airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.
- It satisfies the requirements of operators and owners of all classes of aircraft.
- It takes account of the interests of any person (other than an operator or owner) in relation to the use of any particular airspace or airspace generally.
- It takes account of any guidance on environmental objectives given to the CAA by the Secretary of State.

---

11 The Civil Aviation Authority (Air Navigation) Directions 2001 (incorporating Variation Direction 2004).

12 http://www.caa.co.uk/Commercial-Industry/Airspace/Future-airspace-strategy/Future-airspace-strategy.

- It facilitates the integrated operation of air traffic services provided by or on behalf of the armed forces and other air traffic services.
- It takes account of the interests of national security.
- It takes account of any international obligations of the UK notified to the CAA by the Secretary of State.

A5. Where there is a conflict of these material considerations (other than safety, which must always take priority), the CAA must apply them as it thinks reasonable having regard to them as a whole.

A6. The CAA must exercise its functions in this area so as to impose on providers of air traffic services the minimum restrictions consistent with the exercise of those functions.

A7. The CAA will approve an airspace change proposal that best satisfies all of the material considerations (where safety is not in issue), or all the material considerations that are engaged. Where a change would satisfy some of the material considerations, but would be contrary to the fulfilment of others, then there is a conflict within the meaning of section 70 of the Transport Act. In reaching a decision in such circumstances, the CAA will apply its expertise to all the relevant information before it and use its judgement to strike a fair balance between the material considerations.

A8. In striking that balance the CAA relies on the wording of section 70 which indicates the relative importance of any given factor.

A9. In the instance of conflict, the CAA will usually offer suggestions to the sponsor of a proposal as to how the conflict might be mitigated or resolved, including encouraging the sponsor to engage with affected stakeholders in determining how the desired outcome might be achieved.

A10. The CAA considers the most efficient use of airspace to be that use of airspace that secures the greatest number of movements of aircraft through a specific volume of airspace over a period of time so that the best use is made of the limited resource of UK airspace. It is therefore concerned with the operation of the airspace system as a whole.

A11. The CAA considers the expeditious flow of air traffic to involve each aircraft taking the shortest amount of time for its flight. It is concerned with individual flights.

A12. The CAA considers the words “any person (other than an operator or owner of an aircraft)” to include airport operators, air navigation service providers, members of the public on the ground, owners of cargo being transported by air, and anyone else potentially affected by an airspace proposal.

A13. The Secretary of State has given the CAA specific guidance on environmental objectives within the meaning of section 70 of the Transport Act.[13]

A14. The 2014 Guidance includes the following:

The CAA's primary objective is to develop a "safe, efficient airspace that has the capacity to meet reasonable demand, balances the needs of all users and mitigates the impact of aviation on the environment".

…

In December 2012, the industry-led FAS Industry Implementation Group launched its plan for delivering Phase 1 of the FAS up to c2025. A considerable component of the plan is the need to redesign UK's terminal airspace to make it more efficient by using new procedures such as Performance-Based Navigation (PBN)[14] and better queue management techniques.

A15. The 2014 Guidance states the need to balance environmental factors against other factors:

The purpose of the Guidance is to provide the CAA and the aviation community with additional clarity on the Government's environmental objectives relating to air navigation in the UK. However, when considering airspace changes, there may be other legitimate operational objectives, such as the overriding need to maintain an acceptable level of air safety, the desire for sustainable development, or to enhance the overall efficiency of the UK airspace network, which need to be considered alongside these environmental objectives. We look to the CAA to determine the most appropriate balance between these competing characteristics.

A16. The need to strike a balance specifically in relation to noise is stated as follows:

The Government has made it clear therefore that it wants to strike a fair balance between the negative impacts of noise and the economic benefits derived from the aviation industry.

A17. The 2014 Guidance also states the Government's overall policy to limit the number of people significantly affected by aircraft noise.

A18. The 2014 Guidance states that the CAA should keep in mind the following altitude-based priorities.

[13] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf.

[14] Of which RNAV-1 is a type.

- In the airspace from the ground to 4000ft AMSL the Government's environmental priority is to minimise the noise impact of aircraft and the number of people on the ground significantly affected by it;
- where options for route design below 4000ft AMSL are similar in terms of impact on densely populated areas the value of maintaining legacy arrangements should be taken into consideration;
- in the airspace from 4000ft AMSL to 7000ft AMSL, the focus should continue to be minimising the impact of aviation noise on densely populated areas, but the CAA may also balance this requirement by taking into account the need for an efficient and expeditious flow of traffic that minimises emissions;
- in the airspace above 7000ft AMSL, the CAA should promote the most efficient use of airspace with a view to minimising aircraft emissions and mitigating the impact of noise is no longer a priority;
- where practicable, and without a significant detrimental impact on efficient aircraft operations or noise impact on populated areas, airspace routes below 7000ft AMSL should, where possible, be avoided over Areas of Outstanding Natural Beauty and National Parks as per Chapter 8.1 of the 2014 Guidance; and
- all changes below 7000ft AMSL should take into account local circumstances in the development of airspace structures.

The concept of altitude-based priorities reflects the Government's desire that only significant environmental impacts should be taken into account when considering the overall environmental impact of airspace changes. Any environmental impacts that are not priorities based on the above altitude-based criteria do not need to be assessed since the assumption is that they would not be significant.

A19. Subject to section 70 of the Transport Act, the CAA is directed by the Secretary of State to perform its air navigation functions in the manner that it thinks best calculated to take into account the following:

- The Secretary of State's guidance on the Government's policies on sustainable development and on reducing, controlling and mitigating the impacts of civil aviation on the environment and the planning policy guidance it has given to local planning authorities.
- The need to reduce, control and mitigate as far as possible the environmental impacts of civil aircraft operations, and in particular the annoyance and disturbance caused to the general public arising from aircraft noise and vibration, and emissions from aircraft engines.

- At the local, national and international levels, the need for environmental impacts to be considered from the earliest possible stages of planning and designing, and revising, airspace procedures and arrangements.

A20. The CAA is also specifically directed, where changes are proposed to the design or the provision of airspace arrangements, or to the use made of them, to:

- Where the changes might have a significantly detrimental effect on the environment, advise the Secretary of State of the likely impact and of plans to keep it to a minimum.
- Where such changes might have a significant effect on the level or distribution of noise and emissions in the vicinity of an airport, ensure that the manager of the airport, users of it, any local authority and any organisation representing the interests of person in the locality have been consulted.
- Where such changes might have a significant effect on the level or distribution of noise and emissions under the arrival tracks and departure routes followed by aircraft using an airport but not in its immediate vicinity, or under a holding area set aside for aircraft waiting to land at an airport, ensure the manager of the airport and each local authority in the areas likely to be significantly affected by the changes have been consulted.

A21. Further, the CAA is specifically directed where such changes might have one or more of these effects the CAA shall refrain from promulgating a change without first securing the approval of the Secretary of State. The Secretary of State has given no further direction nor guidance on the interpretation of these directions. Therefore the CAA proceeds on the basis that (a) the overall exposure to noise must increase to a level that exceeds 57dB LA_{eq} 16 hour as a result of the changes proposed; and (b) the increase in the level of exposure to noise must in itself exceed 3dB. The 57dB figure is drawn from the Government's own Aviation Policy Framework[15] (paragraphs 3.12 to 3.19 of the APF), in which it is stated that the Secretary of State would continue to treat the 57dB LAeq 16 hour contour as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance. The 3dB figure is one that has been used in the Government's APF in relation noise policy (i.e. as a trigger for acoustic insulation).

[15] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/153776/aviation-policy-framework.pdf.

A22. Any airspace change that a sponsor asks the CAA to approve follows a seven stage process known as the CAA's airspace change process.[16] A summary of that process is available on the CAA's website[17] and is also shown here.

The seven-stage process of an airspace change

Stage 1 – framework briefing

We meet with the organisation that is considering proposing an airspace change to discuss their plans, the operational, environmental and consultation requirements for proposing a change and set out the how the CAA process will run.

Stage 2 – proposal development

The organisation that is considering proposing the airspace change begins to develop design options and researches who needs to be consulted. They will also conduct an initial environmental assessment of the proposals which will need to be more detailed if, and by the time, the organisation proceeds with its proposal and prepares for consultation. It is recommended that the organisation invites a cross-section of parties who may be affected by the change to form a Focus Group to help with the development of the design options.

Stage 3 – preparing for consultation

The organisation that is considering proposing the airspace change decides on the most appropriate consultation method needed to reach all consultees. This could include a written consultation, questionnaires or surveys, using representative groups and open/public meetings. We will provide advice to the organisation on the scope and conduct of the consultation but it remains their responsibility to ensure that the appropriate level of consultation is undertaken. Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible. Consultation documents should be clear about the objectives of the proposal, what is being proposed, how the change would affect various stakeholders, the expected advantages and disadvantages of the proposals to all stakeholders, the consultation process and the scope to influence. If a single design option is being consulted upon, the document should state what other options were considered and why these were discarded.

[16] Published in CAP 724 https://www.caa.co.uk/CAP724 and CAP 725 https://www.caa.co.uk/CAP725

[17] http://www.caa.co.uk/default.aspx?catid=2111&pageid=12069.

Stage 4 – consultation and formal proposal submission

When the consultation is launched the organisation that is considering proposing the airspace change should make every effort to bring it to the attention of all interested parties. The organisation must ensure that accurate and complete records of all responses are kept. Following the consultation, the organisation collates and analyses all responses to identify the key issues and themes. There may be airspace design modifications in light of the consultation responses which results in the need for further consultation. The organisation is required to publish feedback to consultees. If the organisation decides it will submit a formal airspace change proposal to us to then its feedback document must include information on how the final decision on the option selected was reached. In addition to publishing the feedback report the organisation sends all the consultation responses to the CAA within its formal proposal submission.

Stage 5 – our decision

We undertake a detailed assessment of the proposal and may ask for clarification or supplementary information from the organisation requesting the change. Our assessment covers:

1. the operational need for, objectives and feasibility of the changes proposed
2. our analysis of the anticipated environmental benefits and impacts if the change were made; and
3. an assessment of the consultation carried out by the organisation proposing the change and of the responses received to that consultation.

Our conclusions in these three areas inform our decision whether to approve or reject the proposal. When making our decision the law requires us to give priority to safety but then to balance the need for the most efficient use of airspace with the needs of operators of aircraft and the environmental effect of aviation (including noise and CO_2 emissions). The means by which we assess and balance the environmental impact within our decision making process is set out in government policy which we implement. We normally aim to make our decision within 16 weeks of having all the information we need.

Stage 6 – implementation

If a change is approved then changes to airspace procedures and structures are timed to start on internationally specified dates which occur every 28 days on so called AIRAC-dates[18]. This ensures that the aviation community, as a whole, is aware of the changes and can prepare. In addition, the organisation that proposed the change should publicise the airspace change to members of the local community and other stakeholder groups who were consulted earlier in the process.

Stage 7 – operational review

Around 12 months after a change is implemented we will start a review of the change to assess whether the anticipated impacts and benefits, set out in the original airspace change proposal and decision, have been delivered and if not to ascertain why and to determine the most appropriate course of action. Once complete we will publish the review on our website.

[18] An internationally agreed system for the regulated co-ordination of aeronautical information updates and publication that occurs every 28-days on specified dates which apply globally.

Annex B

Conditions attaching only to the CAA's decision in respect of one of the five Modules A – E

LAMP PHASE 1A – CONSOLIDATED REGULATORY REQUIREMENTS MODULES A TO E	
Serial	**REQUIREMENT**
	MODULE A
1	When D138A is activated by NOTAM above the normal upper limit of 6000 ft, NATS is to radar monitor all aircraft using (U)M84 to ensure that aircraft are kept clear of D138A.
	MODULE B
1	Thames Radar controller to ensure that traffic entering the ATPEV Hold does not enter the Shoeburyness Danger Areas to the north-east.
2	The TC South Radar controller will monitor the vertical profile of the Heathrow Rwy 09 DET SIDs and take appropriate action to achieve separation between the Heathrow DET SID and the London City Rwy 09 arrivals if the controller considers separation could be eroded.
3	The TC North Radar controller will monitor the vertical profile of the Heathrow Rwy 09 BPK SIDs and take appropriate action to achieve separation between the London City Rwy 27 SIDs if the controller considers separation could be eroded.
4	The TC North Radar controller will monitor the vertical profile of the Heathrow Rwy 09 BUZAD SIDs and take appropriate action to achieve separation between the London City Rwy 27 SIDs if the controller considers separation could be eroded.

	MODULE C
1	The GEGMU and GODLU RNAV-5 STARs do not have the required protection in accordance with the SARG AR Airspace Containment Policy (i.e. 5NM either side of the nominal track) as they pass close to the north-west and north-east corners of Danger Area D037. NATS are to ensure controllers monitor traffic to ensure aircraft do not enter D037.
2	NATS to ensure traffic entering the GODLU Hold does not cross into the Paris FIR (this is a technical issue and in reality is not expected to occur).
3	NATS to ensure traffic entering the ROPMU Hold does not leave CAS to the north (this is a technical issue and in reality is not expected to occur).
4	NATS to ensure traffic entering the ATPEV Hold does not enter the Danger Areas to the north-east.
5	NATS to ensure traffic entering the OKVAP Hold does not cross into the Paris FIR (this is a technical issue and in reality is not expected to occur).
6	NATS is to monitor the performance of arrivals between: JACKO-NONVA and NONVA-BABKU, ERKEX-OKVAP, NEVIL-OSPOL and provide feedback to SARG IFP if there is evidence of any operational issues.
7	The utilisation of controlled airspace regarding climb and descent profiles following LAMP Phase 1A implementation is to be reviewed by NATS by 31 August 2016 in order to address the CAA's list of possible options for raising the lower limits of controlled airspace following implementation of LAMP Phase 1A which were discussed with NATS on 21 May 2015. NATS is to advise the CAA by 31 August 2016 regarding what revisions to the lower limits of controlled airspace are feasible and, if appropriate, advise the CAA which options are not feasible. Note: This is in conjunction with Module E. If changes are possible, these will be co-ordinated by the CAA for implementation at the next available ICAO Southern England and Wales 1:500,000 chart update.

8	By 31 August 2016, in conjunction with the above, determine whether the lower limits of the LTMA may be raised in LTMA Sectors 3 and 8 as follows: -- LTMA Sector 3 (3500-FL195) situated south of the Southend CTA 7 and, -- the revised LTMA Sector 8 from the north coast of Kent to the boundary of the LTMA Sector 21/N859 eastern extremity taking due consideration of the new southern arrival segment of the London City arrival transition procedure. NATS is to advise the CAA by 31 August 2016 regarding what revisions to the lower limits of controlled airspace are feasible and if appropriate, advise the CAA which options are not feasible. If changes are possible, these will be co-ordinated by the CAA for implementation at the next available ICAO Southern England and Wales 1:500,000 chart update. Note: This is in conjunction with Module E.
	MODULE D
1	When D138A is activated by NOTAM above the normal upper limit of 6000 ft, NATS is to radar monitor all aircraft using (U)M84 to ensure that aircraft are kept clear of D138A.
	MODULE E
1	NATS to monitor the track of a number of traffic entering the RUDMO Hold and ensure aircraft do not enter Danger Area D037.
2	The utilisation of controlled airspace regarding climb and descent profiles following LAMP Phase 1A implementation is to be reviewed by NATS by 31 August 2016 in order to address the CAA's list of possible options for raising the lower limits of controlled airspace following implementation of LAMP Phase 1A which were discussed with NATS on 21 May 2015. NATS is to advise the CAA by 31 August 2016 regarding what revisions to the lower limits of controlled airspace are feasible and, if appropriate, advise the CAA which options are not feasible. Note: This is in conjunction with Module C. If changes are possible, these will be co-ordinated by the CAA for implementation at the next available ICAO Southern England and Wales 1:500,000 chart update.

3	By 31 August 2016, in conjunction with the above, determine whether the lower limits of the LTMA may be raised in LTMA Sectors 3 and 8 as follows: -- LTMA Sector 3 (3500-FL195) situated south of the Southend CTA 7 and, -- the revised LTMA Sector 8 from the north coast of Kent to the boundary of the LTMA Sector 21/N859 eastern extremity taking due consideration of the new southern arrival segment of the London City arrival transition procedure. NATS is to advise the CAA by 31 August 2016 regarding what revisions to the lower limits of controlled airspace are feasible and if appropriate, advise the CAA which options are not feasible. If changes are possible, these will be co-ordinated by the CAA for implementation at the next available ICAO Southern England and Wales 1:500,000 chart update. Note: This is in conjunction with Module C.
4	By 31 August 2016, investigate re-classification of the new Portsmouth CTAs 1 and 2 from Class A to Class C. Notwithstanding details provided to the CAA during the Case Study concerning reasons why NATS could not manage Class C operations immediately on implementation, NATS is to determine if these areas could be Class C rather than Class A as proposed. If a reversion to Class C is possible, NATS is to provide the CAA with a proposal to revert the Portsmouth CTAs to Class C airspace for implementation in March 2017 meeting the appropriate AIRAC deadline and allowing for a CAA regulatory assessment of the proposal. The arrangements for this will be confirmed by the SARG Case Officer and handled through the Stage 7 PIR process.

5	By 1 May 2016, NATS is to engage with all General Aviation stakeholders who provided feedback to the consultation in respect of the airspace now approved as the Portsmouth CTA 1 and CTA 2. NATS is to determine which operations could be accommodated as segregated VFR activity in Class A airspace. For those activities requiring to use the airspace above FL65/75 as appropriate, such as specialist activities for example, high altitude spinning and stalling, which can be accommodated, NATS is to establish appropriate Letters of Agreements with the specific airspace users to cater for segregated VFR activity in Class A airspace. The LoA(s) is/are to contain specific notification and access arrangements, detailing the procedures to be followed. A draft LoA and exemption request is to be submitted to the CAA Case Officer for approval, prior to the agreements becoming effective. Any agreements established are to be ready for operational use by 31 August 2016.

Glossary

	2001 Directions	Civil Aviation Authority (Air Navigation) Directions 2001
	2002 Guidance	The Secretary of State's Guidance to the CAA on Environmental Objectives Relating to the Exercise of its Air Navigation Functions published in 2002
	2014 Guidance	The Secretary of State's Guidance to the CAA on Environmental Objectives Relating to the Exercise of its Air Navigation Functions published in 2014
A	A330	Airbus 330 Aircraft
	A380	Airbus 380 Aircraft
	a/c	Aircraft
	AAL	Above Aerodrome Level
	ACP	Airspace Change Process
	AIC	Aeronautical Information Circular
	AIP	Aeronautical Information Publication
	Alt	Altitude Above Mean Sea Level
	AMSL	Above Mean Sea Level
	ANO	Air Navigation Order
	ANSP	Air Navigation Service Provider
	AONB	Area of Outstanding Beauty
	APD	Approved Procedure Designer
	APF	Aviation Policy Framework
	ARINC 424	Airlines Electronic Engineering Committee - Navigation System Data Base
	ATC	Air Traffic Control
	ATM	Air Traffic Management
	ATS	Air Traffic Service
B	B747-400	Boeing 747-400 Aircraft
	B777	Boeing 777 Aircraft

C	CAA	Civil Aviation Authority
	CF leg	Course To Fix leg
D	dB	Decibel units
	dBA	Decibel units measured on an A-weighted scale
	DfT	Department for Transport
	DEM	Digital Elevation Model
	DER	Departure End of Runway
	DET	Detling D/VOR
	DME	Distance Measuring Equipment
	DVOF	Digital Vertical Obstruction File
	DVOR	DME/VOR Navigational Aid D DVR – Dover D/VOR (plus a number D21) = 21 nautical miles from the VOR
	DVR	Dover D/VOR
	D (plus 2 or 3 digit no.)	DME range from a navigational aid (eg DVR D21 = 21 nms from the specified beacon, in this case the Dover D/VOR)
E	EGGW	ICAO Location Indicator for London Luton Airport
	EGHH	ICAO Location Indicator for Bournemouth Airport
	EGHI	ICAO Location Indicator for Southampton Airport
	EGKK	ICAO Location Indicator for London Gatwick Airport
	EGLC	ICAO Location Indicator for London City Airport
	EGLF	ICAO Location Indicator for Farnborough Airport
	EGLL	ICAO Location Indicator for London Heathrow Airport
	EGMC	ICAO Location Indicator for Southend Airport
	EGSS	ICAO Location Indicator for London Stansted Airport
	EGWU	ICAO Location Indicator for Northolt Airport
F	FAS	Future Airspace Strategy
	FB WP	Fly-by waypoint
	FDR	Flight Data Recorder
	FIR	Flight Information Regions

	FL	Flight Level
	FMC	Flight Management Computer
	FMGC	Flight Management Guidance Computer
	FMS	Flight Management System
	FO WP	Fly-over waypoint
	FTE	Flight Technical Error
G	GNSS	Global Navigation Satellite System
	GPS	US DoD Global Positioning System
H	HDGs	Headings
	hPa	Hectopascal – 1 hectopascal is equivalent to 1 millibar
I	ICAO	International Civil Aviation Organisation
	IFP	Instrument Flight Procedure
	ILS	Instrument Landing System
	IRS	Inertial Reference System
J	JAA	Joint Aviation Authorities
K	KIAS	Indicated Air-speed in Knots
	Kts	Knots
L	Leq	Equivalent continuous sound level
	LAMP	London Airspace Management Programme
	LHR	London Heathrow
M	M	Magnetic
	Mag Var	Magnetic Variation
	MID	Midhurst D/VOR
	MSD	Minimum Stabilisation Distance
	MSL	Minimum Segment Length
N	NADP	Noise Abatement Departure Procedures
	NATS	The group of companies that includes NERL and NATS Services Limited
	NERL	NATS (En Route) plc

	ND	Navigation Display
	NOTAM	Notice to Airmen
	NPR	Noise Preferential Route
	NMS or nms	Nautical Miles
	NSE	Navigation System Error
P	PANS OPS	Procedures for Air Navigation Services Operations
	PBN	Performance-based Navigation
	PDE	Path Definition Error
	PF	Pilot Flying
	PIR	Post Implementation Review
	PIRG	PIR Group
	PM	Pilot Monitoring
	PNF	Pilot Not Flying
	PRNAV	Precision Area Navigation
	PT	Path Terminator
R	R plus 3 digit number	Radial (No:) from a VOR (eg. R260 = 260 degree radial from a specified point)
	RF Turns	Radius to Fix Turns
	RNAV-1	Area Navigation
	RNP	Required Navigation Performance
	RNP APCH	PBN approach procedure
S	SAM	Southampton D/VOR
	SEL	Sound Exposure Level
	SFD	Seaford D/VOR
	SID	Standard Instrument Departure
	STAR	Standard Terminal Arrival Route
	SW	South West
T	TF leg	Track to Fix leg
	TSE	Total System Error

V	VI leg	Vector to Intercept leg
	VOR	Very High Frequency Omnidirectional Radio Range
W	WP	Waypoint