LONDON AIRSPACE MANAGEMENT PROGRAMME (LAMP) PHASE 1A

CAA DECISION: PART APPLICABLE TO LAMP PHASE 1A MODULE D

CAP 1366/D

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AIRSPACE CHANGE PROPOSAL – MODULE D

LUTON AND NORTHOLT AIRPORTS STANDARD INSTRUMENT DEPARTURE (SID) SWITCH

PROPOSED BY NATIONAL AIR TRAFFIC SERVICES (NATS)

References:

A. Module D – Interface for Luton and Northolt Airports (SID Switch) ACP Issue 2.0 dated March 2015.

B. LAMP Phase 1a: ACP environmental benefits Report v 1.2 dated March 2015.

C. LAMP Phase 1A Bridging Module Issue 1 dated February 2015.

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

INTRODUCTION

1. 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 aerodromes. 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.

2. 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.

3. 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.

4. This decision document expressly incorporates the contents of the **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E**[1] which thereby forms part of the CAA's decision in respect of the airspace change proposal in this Module. This decision document contains the information and decisions specific to the proposal outlined in LAMP Phase 1A Module D (Reference A).

5. This decision relates to the proposal outlined in Reference A which is known as LAMP Phase 1A Module D - Interface for Luton and Northolt Airports (SID Switch) ACP; this Module proposes switching aircraft using the existing departure routing of the Luton and Northolt Standard Instrument Departure (SID) via Detling to Dover onto the routing of the existing MATCH SIDs (MATCH is a reporting point to the east of Harlow). This proposal was presented to the airline communities at LAMP stakeholder forums prior to being submitted to the CAA for approval.

6. The purpose of this document is to provide an overview of the proposal and the CAA's decision on it.

INFORMATION THAT HAS BEEN CONSIDERED

7. In making this decision, the CAA has considered the documents set out above and set out in the **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E** and we have recorded our analysis of that material in the CAA's Operational Assessment and Environmental Assessment.[2]

[1] http://www.caa.co.uk/CAP 1366.

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

PROPOSAL OVERVIEW

8. The proposal is to switch the aircraft currently departing Luton and Northolt on the Detling SID departures which route to Dover via Detling, over to the routing of the existing MATCH SIDs which follow a track towards the Clacton VOR.[3] At MATCH, the departures will then follow existing Air Traffic Services (ATS) route Q295 as far as DAGGA. At DAGGA, it is proposed a new ATS route M85 with a lower limit of FL85, will be established routing DAGGA – ITVIP. After ITVIP, the re-routed traffic will follow the existing ATS routes towards Belgian airspace. A diagram (extracted from the airspace change proposal submitted to the CAA) to show the re-routing and the new ATS route M85 (overlaid on existing airspace) is shown at Annex A.

9. The re-routing is designed to achieve an improved climb profile for Luton and Northolt departures. In addition, this re-routing is designed to enable the aims and objectives of the airspace change proposed in Module C of the LAMP Phase 1A. Cross reference to other Modules is highlighted in this Part of the decision where appropriate. This Module does not propose to change the shape or size of controlled airspace.

10. The proposed revised routing would be in operation for 24 hours of the day. However, the existing Detling SIDs will be retained for use for a small number of flights; these would be for infrequent positioning flights, or for a very small number of flights routing via Dover into French airspace via RINTI if they are unable to use the re-route via M85 due to high level Danger Area activity at Shoeburyness (D138). Whilst this is a possible scenario, the likelihood of high level Danger Area activity occurring at the same time as the flights routing into French airspace via RINTI is extremely small.[4]

CHRONOLOGY AND ENGAGEMENT

11. The CAA has accepted that consultation with environmental stakeholders (including those communities overflown by aircraft and therefore potentially affected by aircraft noise) was not required for this proposal because it is not anticipated that the proposed change (i.e. the re-distribution of departing traffic from the SIDs via Detling) will involve changes to the location or distribution of aircraft below 7000ft AMSL. This accords with the Secretary of State's guidance to the CAA (the 2014 Guidance)[5] which states that consultation is not required

[3] The VOR is the navigational aid located at Clacton.

[4] The total numbers on this route from September 2014 to August 2015 was 23 in total, i.e. an average of 2 per month. High level Danger Area activation for Shoeburyness (D138) is also a very infrequent occurrence.

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

for changes below 7000ft.[6] The Secretary of State's policy is that above 7000ft AMSL, the CAA's priority (as regards our consideration of the environmental impact of the proposed change) should be on minimising CO_2 omissions as opposed to noise emissions.

12. NATS, as the sponsor, presented the proposed route change that is the subject of this airspace change proposal at the LAMP stakeholders' forum on 4 March 2014.[7]

STATUTORY DUTIES

13. As set out in the **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E**, the CAA's statutory duties and functions are contained in section 70 of the Transport Act 2000 (the Transport Act), the CAA (Air Navigation) Directions 2001, as varied in 2004 (the 2001 Directions), and the 2014 Guidance to the CAA on Environmental Objectives relating to the exercise of its air navigation functions (the 2014 Guidance).[8]

14. In summary, the CAA's primary duty under section 70(1) of the Transport Act requires that the CAA exercises its air navigation functions so as to maintain a high standard of safety in the provision of air traffic services. This duty takes priority over the remaining material considerations set out in section 70(2). Where an airspace change proposal satisfies all of the material considerations identified in section 70(2) and where there is no conflict between those material considerations, the CAA will, subject to exceptional circumstances, approve the airspace change proposal. Where an airspace change proposal satisfies some of the material considerations in section 70(2) but not others, this is referred to as a conflict within the meaning of section 70(3). In the event of a conflict, the CAA will apply the material considerations in the manner it thinks is reasonable having regard to them as a whole. The CAA will give greater weight to material considerations that require it to "secure" something than to those that require it to "satisfy" or "facilitate". The CAA regards the term to "take account of" as meaning that the material considerations in question may or may not be applicable in a particular case and the weight the CAA will place on such

guidance.pdf.

6 CAA's own guidance on airspace change proposals set out in CAP 725 (https://www.caa.co.uk/CAP725) has not been updated to reflect the changes in the Secretary of State's Environmental Guidance and is still based on the now withdrawn 2002 Guidance from the Secretary of State.

7 LAMP stakeholders' forums are attended by aviation stakeholders e.g. airlines, airports and associated Air Traffic Services Providers, GA airspace user groups and the MOD.

8 Revised in 2014 by the Department for Transport https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf.

material considerations will depend heavily on the circumstances of the individual case. The analysis of the application of the CAA's statutory duties in this ACP is set out below.

Safety

15. 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 addition to the conclusions in respect of safety set out in the **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E** the CAA has made the following conclusions with respect to safety.

16. We are content that the revised routing of the Detling departures switched over to the routing of the MATCH SIDs can be managed safely by NATS. The integration of traffic switched onto the new routing will be managed and co-ordinated with other traffic using standard air traffic control techniques. We note that the alignment of the ATS route M85 is through the Shoeburyness Danger Area complex. However, we also note that arrangements for the Flexible Use of Airspace[10] with existing routes aligned through the Danger Areas will be the same for this ATS route M85 and are therefore provided for in the extant and in our view effective Memorandum of Understanding (MoU) with the Danger Area sponsor. If Danger Area activity precludes traffic using M85, a re-route via Clacton and the new (U)M84 proposed in Module A will become the flight planned route for the duration of Danger Area activity. As traffic will routinely reach FL150 before DAGGA before turning south, aircraft will routinely be above the normal upper limit of the Shoeburyness Danger Area D138 (13000ft AMSL) and therefore aircraft are only anticipated to be re-routed in this way a few times a year.

17. Nevertheless, in the interests of safety, NATS must comply with a regulatory requirement in that it is a condition of the CAA's approval of this proposal that if the re-route scenario does occur (and as (U)M84 is adjacent to D138A) if D138A is also activated by NOTAM above its normal upper limit of 6000ft AMSL (which happens a few times a year), NATS will ensure that aircraft on (U)M84 will be kept clear of the Danger Area, as the aircraft pass to the east of the Shoeburyness Danger Area complex.

18. LAMP Phase 1A addresses some of the current LTMA's tactical intervention and legacy design hotspots. In particular the proposal contributes to a significant reduction in complexity through the systemised de-confliction of routes.

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

[10] The Flexible Use of Airspace is an expression used to describe how restrictions on flying through an area are turned on and off and only in place when needed.

Consequently, safety in the region would be enhanced by the switching of the Luton and Northolt Detling SIDs as proposed in this Module.

19. Accordingly, the CAA is satisfied that a high standard of safety can be maintained as a result of this proposal.

The most efficient use of airspace

20. The CAA is required to secure the most efficient use of the airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.[11]

21. The CAA considers that the most efficient use of airspace means the 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.

22. 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.

23. In this respect, the CAA is content that the re-routing of Luton and Northolt SIDs via MATCH will enable an improvement in the efficiency of integrating traffic through the busy controlled airspace in the south-east of England, in particular, through the very busy and congested area in the vicinity of and above Detling. Currently the Luton departures are routinely held below arriving traffic inbound to Heathrow. (Other traffic departing from Stansted and London City also follow similar routings as the Luton and Northolt traffic towards Detling, and like the Luton and Northolt SIDs, are subject to similar restrictions in climb profiles.) This will no longer be necessary if the changes proposed in Module A, B and C are approved.

24. Moreover it is anticipated that by removing the Luton and Northolt departures from this busy flow, this will alleviate the traffic congestion and enable better departure profiles to be achieved by the London City departures to the south-east which is described in Module C. In turn, these changes to routings not only enable better climb profiles for Luton and Northolt departures, they also enable better climb profiles for London City departures. This is because the London City departures will now be able to climb earlier without having to be integrated with the Luton and Northolt departures; this also enables more efficient and semi-systemised arrival routes for London City. When Module D and the changes outlined in Module A for Stansted departures are combined with the proposals for London City network changes in Module C, the end result is anticipated to be that the whole LAMP Phase 1A design package produces an overall more

[11] Transport Act 2000, section 70(2)(a).

efficient route network: not just for traffic departing from Luton and Northolt (outlined in this Module), but also for Stansted departures (proposed in Module A), and the new network arrival system for London City as proposed in Module C.

Requirements of aircraft operators and owners

25. The CAA is required to satisfy the requirements of operators and owners of all classes of aircraft.[12]

26. In this respect, as there is no change to the size and shape of controlled airspace to support Module D as the re-routed traffic will follow the existing MATCH SIDs towards DAGGA, and that the new ATS route is contained within existing controlled airspace, the CAA is content there is no impact to Class G users.

27. The re-routed SIDs can be managed safely on the MATCH SID routing and integrated with all other routes in the south-east. Whilst this adds up to 8NM to the track mileage compared with the distance to Dover using the Detling SID, the extra track miles are offset by the benefits realised with the improved climb performance. The CAA Environmental Assessment concluded that despite the extra track miles there would be an overall reduction in CO_2 emissions resultant from a reduction in fuel burn. In particular, the CAA's Environmental Research and Consultancy Department (ERCD) Environmental Assessment report concluded that :

Based upon the assessment presented in the ACP (the overarching Environmental Benefits Section – see Reference B), and the subsequent adjustment by the CAA, the annual estimate for the CO_2 reduction as a result of this Module (once the enabled fuel figures have been adjusted to account for tactical vectoring, a reduction of 21%) is a range from 2,280 – 4,560 tonnes in 2016 (1,439 tonnes of fuel x 3.18) and a range from 2,726 – 5,451 tonnes in 2020 (1,714 tonnes of fuel x 3.18).

28. Full details are in the Environmental Assessment.[13] We therefore confirm that there is an anticipated CO_2 benefit for traffic departing via the re-routed standard instrument departure via MATCH.

29. The CAA has therefore concluded, and taken its decision in this Module on the basis that it is anticipated that there will be a CO_2 benefit for traffic departing via the re-routed SID via MATCH and Dagga, which is co-incident with anticipated lower fuel costs for operators and owners of aircraft.

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[12] Transport Act 2000, section 70(2)(b).

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

Interests of any other person

30. 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.

31. The CAA is required to take account of the interests of any person (other than an operator or owner of an aircraft) in relation to the use of any particular airspace or the use of airspace generally. The CAA examined a number of anticipated impacts.

32. This decision document deals with consideration of the anticipated environmental impact on the public on the ground in the paragraphs relating to the environmental impact of the proposed change below.

33. Because this proposal enables the changes proposed in the other Modules we have concluded that the changes proposed in this Module are likely to benefit air navigation service providers as it is anticipated that air traffic control workload will reduce.

Guidance on environmental objectives

34. In performing the CAA's statutory duties, we are obliged to take account of the 2014 Guidance provided by the Secretary of State to the CAA on Environmental Objectives.[14] In addition to the conclusions in respect of the environment set out in the **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E**, the CAA has made the following conclusions with respect to the anticipated environmental impact of the proposal.

35. The CAA's ERCD has undertaken an assessment of the environmental impact of this change.[15]

36. When reviewing the CAA's material consideration of the impact of the proposal on operators and owners of aircraft (see above) we set out our analysis of the anticipated reduction in CO_2 emissions resulting from this Module. Moreover, as discussed in Module C, overall, the LAMP Phase 1A package enabled by the Module D proposal, is anticipated by NATS to provide an estimated 34,900 tonnes of CO_2 savings in 2016. Fuel savings are predicated on a number of factors and have been calculated for a series of scenarios for 2016 and 2020 timelines. Taking a more conservative assessment, for the purpose of making this decision we have concluded that we anticipate that the LAMP Phase 1A

[14] Transport Act 2000, section 70(2)(d).

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

changes overall, (as enabled by Module D) would deliver a reduction of approximately 17,400 tonnes of CO_2 in 2016 and 20,800 tonnes in 2020.

37. Since this proposal and the other airspace changes within LAMP Phase 1A require no changes to ground infrastructure, we anticipate that there will be no effects on land-take and biodiversity.

38. Since the proposed change does not alter operations below 1000ft AMSL we anticipate there will be no effect on local air quality. We do not anticipate that there will be any effects on Areas of Outstanding Natural Beauty and National Parks.

39. There are unlikely to be any tranquillity or visual intrusion impacts as a direct result of these changes.

40. We have considered the anticipated impact on noise emissions of the proposed changes. When doing so we have had regard to the altitude-based priorities as given to the CAA by the Secretary of State in the 2014 Guidance to CAA on Environmental Objectives.

41. We have concluded that we do not anticipate there will be a significant impact on noise emissions (within the meaning of Paragraph 9 of the Secretary of State's 2001 Directions to the CAA). See the incorporated **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E**, Annex A for an explanation of the CAA's policy in this regard.

42. We have reached this conclusion because all affected aircraft (that is aircraft displaced or located differently as a consequence of the proposed change) will be above, and probably well above, 7000ft AMSL. Nevertheless we acknowledge that there will be a difference in traffic flows, and as a consequence, noise but because of the altitude of the flights any such noise impact will be minor even if the noise is perceptible by some.

43. Having carefully considered this information, we have concluded that the change proposed in this Module is likely to generate fuel and CO_2 savings whilst having no other (or negligible) environmental impacts. We have taken into account that the CO_2 savings are achieved by displacing flights from one SID to another SID above 7000ft AMSL, and that this displacement may result in an increase in noise impact that is perceptible by some people. We have taken into consideration the likely magnitude of any such noise impact, and the fact that the 2014 Guidance makes it clear that for any airspace changes above 7000ft AMSL the priority environmental consideration should be climate change and CO_2 emissions.

Integrated operation of ATS

44. We are required to facilitate the integrated operation of air traffic services provided by or on behalf of the armed forces of the Crown and other air traffic services.[16]

45. In this respect, there is no impact on other ATS providers.

Interests of national security

46. We are required to take into account the impact any airspace change may have upon matters of national security.[17] There are no impacts for national security.

International obligations

47. We are required to take into account any international obligations entered into by the UK and notified by the Secretary of State.[18] There are no international implications for this particular Module.

REGULATORY DECISION

48. The CAA has decided that the proposed airspace design is safe, which satisfies the CAA's primary statutory duty. It is also the CAA's duty to consider the anticipated impact on each of the other material considerations identified in section 70(2) of the Transport Act. In accordance with section 70(3) of the Transport Act, and the CAA published policy, the CAA is required to consider whether the airspace change proposal produces any conflicts between the material considerations identified in section 70(2). We have in particular noted that the significant benefit anticipated to the efficient use of airspace and in reduction of CO_2 emissions requires the redistribution of the noise impact of aircraft above 7000ft AMSL as described above.

49. We have decided that in order to achieve the anticipated benefits consequential on the airspace change proposed in this Module, the CAA will approve this change. A diagram from the ACP material to show the changes is shown at Annex A.

50. Module D as a stand-alone proposal is justified in its own right, notwithstanding the noise impacts described above, for the reason of the anticipated benefits also set out above. However, this SID switch proposal in the Module is also an enabler for the LAMP Phase 1A Module C proposal, the benefits of which are set out in a separate decision.

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[16] Transport Act 2000, section 70(2)(e).

[17] Transport Act 2000, section 70(2)(f).

[18] Transport Act 2000, section 70(2)(g).

51. The CAA has decided that the proposed change should also be approved to realise the wider benefits of LAMP Phase 1A. The LAMP Phase 1A package of proposals in Modules A to E is anticipated to deliver benefits in terms of safety and efficiency of airspace and in terms of CO_2 emissions. The overall LAMP Phase 1A package will deliver network-wide changes that have safety benefits through greater use of systemisation, removal of airspace hotspots and by ensuring that sequencing of London City arrivals occurs earlier in the arrival phase leaving less chance for Thames Radar controllers to become overloaded. Overall, a more efficient use of airspace will be achieved through the de-confliction of arrival and departure routes which will enable capacity benefits to be delivered in the future.

52. The revised airspace will become effective from 4 February 2016 (AIRAC 2/2016) and was promulgated via a double AIRAC cycle. The Part 1 of the AIRAC data for this and other LAMP Phase 1A Modules was distributed by AIS on 26 November 2015. In addition, an Aeronautical Information Circular (AIC) Y076/2015 was also distributed on 26 November 2015 to provide a full breakdown of the changes proposed in LAMP Phase 1A.

53. In line with our standard procedures the implications of the change will be reviewed after one full year of operation, at which point, the CAA will obtain feedback and data to contribute to the analysis.

Civil Aviation Authority

22 December 2015

ANNEX A

Luton and Northolt existing airspace and traffic routings

Luton and Northolt departures via DVR currently fly SIDs aligned through BPK (towards ROWAN in this diagram – see the first section of the highlighted route in red) after which they turn towards DET as shown in Figure 1. The SID climb is typically restricted to not above 7000ft below the arriving Heathrow traffic.

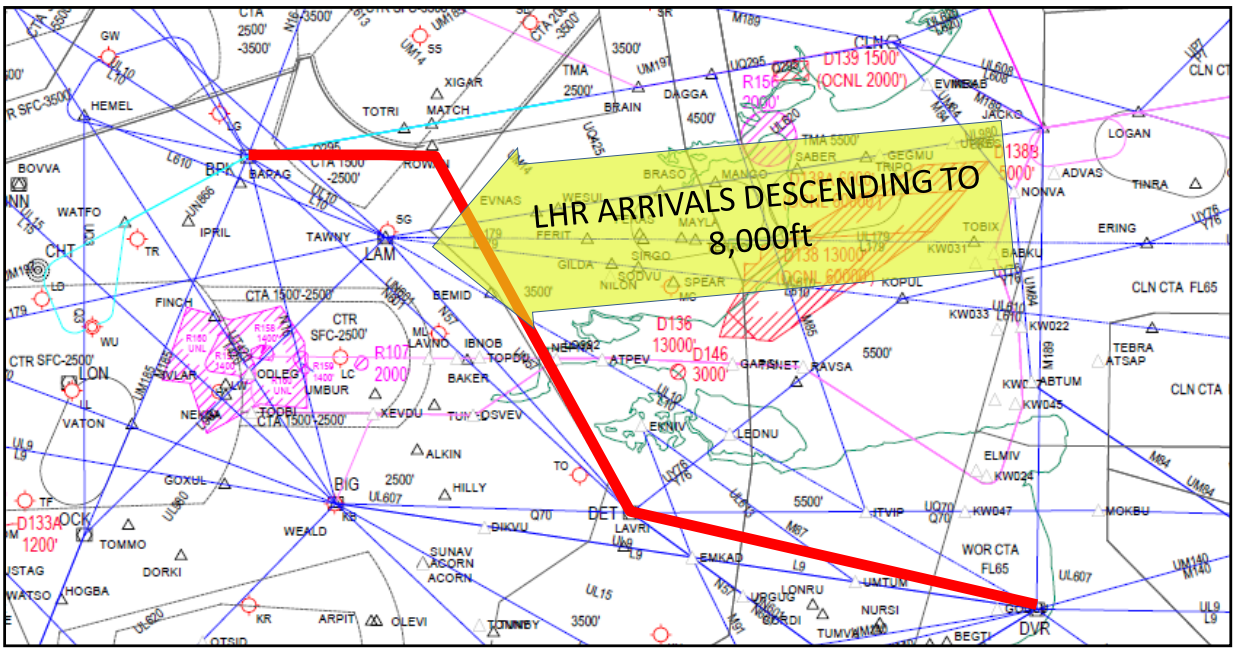

Figure 1: Current Luton and Northolt departure situation.

FOR ILLUSTRATIVE PURPOSES ONLY

Luton and Northolt proposed change and traffic routings

The re-routed SIDs will route towards DAGGA, then ITVIP achieving a better climb profile of approx 15-20,000ft before tactical vectoring towards ITVIP whilst being separated from Heathrow arrivals.

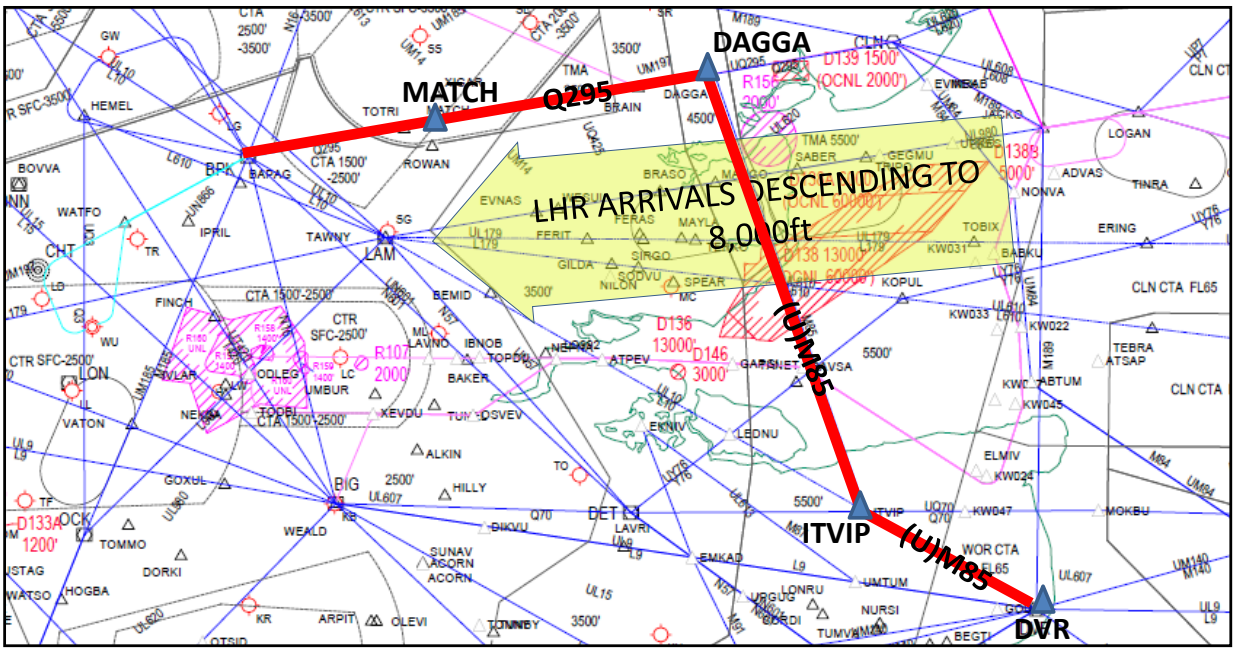

Figure 2: Proposed Luton and Northolt departure situation.

Note: Whilst the diagram indicates M85 shown as an upper route (UM85) the upper element of M85 above FL245 was subsequently not required.

FOR ILLUSTRATIVE PURPOSES ONLY

ANNEX B

Conditions of the CAA's decision to approve the Module D proposal

In addition to the Conditions that attach to the CAA's decision to approve the proposals in each of the Modules A-E in the LAMP Phase 1A ACPs, set out in **CAA Decision: Part applicable to each LAMP Phase 1A Modules A – E**, it is a condition of the CAA's approval of the proposal in Module D that

- 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.

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