ACP-2020-024

E-7 WEDGETAIL OPERATING AREAS

STEP 3A

OPTIONS APPRAISAL (PHASE II – FULL)

V1.0

Ministry of Defence

Responsible Authors of this Document

The Change Sponsor for this Airspace Change Proposal is the Ministry of Defence (MoD). The project team is drawn from the ISTAR Force HQ.

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Only responsible authors may implement amendments via the Project lead. All revisions will be listed and detailed in the table below.

Revision Number	Affected part	Revised By	Notes
Initial Issue V1.0		Project Lead	

Contents

Glossary of terms

AARA	Air-to-Air Refuelling Area
ACP	Airspace Control Proposal
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
Airprox	Air Proximity
ALARP	As Low As Reasonably Practicable
ASACS	Air Surveillance And Control System
ASIMS	Air Safety Information System
ATC	Air Traffic Control
ATS	Air Traffic Service
CAA	Civilian Aviation Authority
CAP	Civilian Aviation Publication
DAATM	Defence Airspace and Air Traffic Management
DASOR	Defence Air Safety Occurrence Report
FGEN	Force Generation
FHQ	Force Head Quarters
FIR	Flight Information Region
FL	Flight Level
FRA	Free Route Airspace
FUA	Flexible Use of Airspace
GAT	General Air Traffic
ISD	In Service Date
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
MESA	Multi-role Electronically Scanned Array
NATO	North Atlantic Treaty Organisation
NATS	National Air Traffic Services
NM	Nautical Mile
NOTAM	Notice To Airmen
MAA	Military Aviation Authority
MDA	Managed Danger Area
MoD	Ministry of Defence
RA	Resolution Advisory
RAF	Royal Air Force
SoN	Statement of Need
TCAS	Traffic Collision Avoidance System
UIR	Upper Information Region
USAFE	United States Air Force Europe
UTC	Universal Time Coordinated

Introduction

Scope

0.1 This document forms part of Stage 3 of the Airspace Change Proposal, ACP-2020-024, new Operating Areas for the E-7 Wedgetail. The MoD identified a requirement to establish new Operating Areas for the E-7 Wedgetail as the extant areas used by the RAF E-3D Sentry until Jul 2022 and which will continue to be used by the NATO E-3A until 2035 are not suitable for E-7 operations. Whilst the E-3 flies in circular orbits (normally 15nm radius) or racetracks between 2 circular orbits the E-7 requires a 100nm x 20nm area to operate its advanced Multi-role Electronically Scanned Array (MESA) radar. This ACP aims to introduce new E-7 Operating Areas throughout the UK that are, wherever possible, co-located with extant E-3 areas so that the E-7 can achieve its mandated Defence Tasking.

0.2 The aim of this document is to provide evidence to the CAA that the Change Sponsor has adhered to the process laid out in CAP1616 for Stage 3 prior to the Consult Gateway. It aims to build upon the work undertaken during the Initial Options Appraisal in Stage 2 and develop the remaining airspace option in greater detail.

0.3 The deadline for the project is to establish new E-7 Operating Areas prior to the In-Service Date (ISD) of the aircraft. This was originally Q4 2023 but has now slipped to Q3/4 2024. The sponsor aims to complete the ACP and have the new areas included in AIRAC 04/2024 in order to allow the areas to be utilised for E-7 trials flying prior to E-7 ISD.

Summary of Stage 2 Initial Options Appraisal

0.4 The Initial Options Appraisal appraised (against the ‘do nothing’ baseline) two options, modified E-3 areas, and dedicated E-7 areas. As a result of stage 2A and the Design Principle Evaluation, only one option alongside the ‘do nothing’ baseline was carried forward – create dedicated E-7 operating areas.

Section 1 – Context

Engagement

1.1 Since stage 2, there has been no further information requested from the Stakeholders, and none required from the Change Sponsor.

Environmental Assessment

1.2 The Air Navigation Directions 2017 enable the CAA to disregard the environmental impacts of military aircraft when the proposal has been submitted by, or on behalf of, the MoD. However, the CO2 emissions of civil aircraft re-routing because of the proposed change must be assessed. A qualitative assessment has already been conducted. The Sponsor will evaluate whether quantitative analysis, via WEbtag or other means, is needed at Stage 3, however, it is not envisaged that this will be required - see page 13, NATS Assessment on Quantitative Modelling.

1.3 The acceptance and introduction of dedicated E-7 operating areas should negate the requirement for civilian airline traffic being re-routed. The areas are non-segregated so airliners can be routed through them. Without these dedicated areas re-routing, additional track miles and increased CO2 emissions are more likely to occur. Moreover, the E-7 can climb or descend within its dedicated area to avoid civilian traffic, negating additional fuel burn by airliners. As a result, there should be no net increase in CO2 emissions as a result of this airspace change proposal. **The Change Sponsor suggests that in line with the NATS Assessment on Quantitative Modelling (see page 13) any further effort to calculate any economic impact / impact on fuel burn and CO_2 emissions is unlikely to provide any valuable or meaningful measurements and would be disproportionate to the impact itself. The MOD proposes it is scoped out of this ACP.**

1.4 For context, baseline E-3 operations over the past 10 years have seen a single sortie per day varying in duration from 3-10 hours with an average of 8 hours. E-7 operations are anticipated to equate to this with one sortie per day of circa 8 hours duration. Introduced in the 1990s, the E-3 design is based on a 1970s airliner. The RAF E-3D variant entered service in 1991 with later generation engines which emitted less CO2 than the NATO variant. The E-7 is based on the Boeing 737-800 with modification. This aircraft has only 2 engines which are significantly more efficient and will generate less CO2 than the older E-3 engines. As a result there will be a net reduction in CO2 emissions with the introduction of the E-7 Wedgetail. Whilst the CAA does not require the MOD to qualify the impacts of CO2 emissions on their aircraft the sponsor feels this point is worthy of note.

Noise Assessment

1.5 The Department for Transport Air Navigation Guidance 2017 details the Government's altitude-based guidance.

- It clearly states that for all changes to airspace with no impact below 7000 feet the CAA should prioritise the reduction of aircraft CO2 emissions and the minimising of noise is no longer the priority; **The sponsor invites CAA to agree that this proposal constitutes a Level M2 in line with this guidance.**

Safety Assessment

1.6 A safety assessment was presented with the Stage 2 Options Appraisal. It is repeated here with specific data added from a Defence Air Safety Occurrence Report (DASOR)/Airprox search on the Air Safety Information System (ASIMS) since 2010.

1.7 *The evidence feeding into this safety assessment is based upon MOD and NATS incident reporting (DASORs/Airprox's) and engagement with E-3 crews who have successfully operated safely in the current structure in the UK. This assessment covers operating in the current E-3 orbits and the proposed E-7 tracks but does not include the transit to/from the orbit which would be undertaken using MOD/Civ ATC services. The proposed sortie rate and duration of the E-7 is similar to the E-3 so no additional workload should be placed on crews or controllers.*

1.8 The E-3 has operated safely in the current UK orbit structure for over 30 years. Notification of the required orbit is passed to Swanwick Mil (Military ATC) by a Military Pre-note/F2919 (Flight Plans) approx 2 hours prior to departure by the operating crew. This data is therefore available to both Mil and Civ ATC in a timely manner allowing sufficient time for safe planning and co-ordination against other traffic. One established in the operating area (orbit/track) the crew will maintain their allocated Flight Level (FL) allowing any conflicting traffic to be routed safely around the area laterally or vertically (airspace is non-segregated and not restricted). Separation once established in the operating areas is provided by Swanwick Mil in liaison with the Civilian sector; additionally, the E-7 is equipped with Traffic Collision Avoidance System (TCAS) to further enhance safety and avoid conflict. The aircraft also generates its own air picture with any conflicting air tracks (10nm or 2000ft) being called to the pilots to enhance their SA and overall safety awareness.

1.9 The proposed E-7 track structure has, wherever possible, being absorbed within the current E-3 orbit structure to maintain Situational Awareness (SA) for Air Traffic Units and limit the change to known safe operating areas/procedures. On some occasions the new E-7 tracks extend slightly outside the current operating areas, but orientation has been taken into account to limit the effect on ATS whilst maintaining the operational requirement for the E-7 radar. Where new tracks have been created their locations have been designed to have minimal impact on the civ sector, thus reducing potential conflict and enhancing air safety. It has not been

possible to totally isolate the proposed E-7 tracks from other Mil traffic requirements, however, when this conflict occurs, operating within an MDA or in close proximity to an Air-to-Air Refuelling Area (AARA) for example both the E-7 and conflicting Mil traffic will be coordinated to ensure safe separation by the same ATS.

1.10 In summary, safe operation within the new E-7 areas will be achieved by Swanwick Mil but enhanced by TCAS and the E-7's own sensor. The new areas have been overlayed where possible with E-3 orbits and consideration given to positioning new areas away from civ traffic routes to reduce potential conflict and enhance air safety.

1.11 The Change Sponsor has conducted a DASOR search through ASIMS, as well as a UK Airprox Board search for any safety incidents involving the E-3 in its orbit areas or in transit to/from its orbit areas since 2010. The search includes TCAS Resolution Advisory's (RAs). Of the 18 incidents found,14 were filed as a TCAS (RA). One of the incidents was assessed as a high severity incident, two as medium and the remaining 15 as low or negligible severity. The most notable high and medium severity reports were:

- 3 Dec 13 – E-3D airprox with F16. TCAS RA at 31000ft. Occurred on Exercise overseas, E-3D was being controlled by mil agency and the F16 aircraft by Al Dhafra Radar. Resolved by ATC and TCAS. High Severity.

- 14 Sep 10 – E-3D airprox with a Tutor aircraft. Recovery to RAF Waddington at FL85. Resolved by ATC and TCAS. Medium Severity.

- 1 Apr 16 – TCAS RA with KC135 aircraft. Occurred whilst conducting Air-to-Air Refuelling (AAR), pilots were visual with KC135, 1000ft separation was eroded during Rendezvous (RV) procedure. Resolved by TCAS and pilot intervention. Medium Severity.

1.12 None of the incidents included in this search involved separation minima being eroded between the E-3D Sentry and civilian airline traffic within the extant E3 operating areas. This validates the robust procedures already in place and the importance of known operating areas for E-7 in the future.

Report ID	Event Type	Date of Occurrence	Aircraft	Brief Title	Assessed Severity
asor\Waddington - RAF\8 Sqn\Sentry\10\133979	Incident	14/09/2010	Sentry	UKAB2010133 - Risk:C - AIRPROX - Sentry v Tutor	Medium
asor\Waddington - RAF\8 Sqn\Sentry\13\11604	Incident	03/12/2013	Sentry	E3D Airprox with F16 (DAAT:- MAC-CPMIL)	High
asor\Waddington - RAF\8 Sqn\Sentry\10\130206	Incident	29/04/2010	Sentry	UKAB 2010036 - Risk:C - AIRPROX - E3D v Harrier	Low

asor\Waddington - RAF\8 Sqn\Sentry\21\324	Hazard Observation	15/12/2021	Sentry	AIRPROX Report 245-21 Filed Relating to Sentry Sortie	Low
asor\Waddington - RAF\8 Sqn\Sentry\14\3992	Hazard Observation	17/04/2014	Sentry	TCAS RA (DAAT:- MAC-NCPMIL)	Low
asor\OOA Akrotiri\SentryDet\Sentry\16\3610	Incident	01/04/2016	Sentry	TCAS RA during AAR Rendezvous	Medium
asor\Waddington - RAF\8 Sqn\Sentry\13\7614	Incident	19/08/2013	Sentry	TCAS RA in visual circuit (DAAT;- MAC-CPMIL)	Negligible
asor\Waddington - RAF\8 Sqn\Sentry\21\1281	Hazard Observation	10/02/2021	Sentry	TCAS RA	Low
asor\Waddington - RAF\8 Sqn\Sentry\16\9345	Incident	30/08/2016	Sentry	TCAS RA.	Low
asor\Waddington - RAF\8 Sqn\Sentry\12\13827	Incident	02/05/2012	Sentry	Sentry TCAS RA in Lincs AIAA	Low
asor\Waddington - RAF\54 Sqn\Sentry\19\10869	Incident	23/10/2019	Sentry	TCAS RA	Negligible
asor\Waddington - RAF\8 Sqn\Sentry\16\1032	Hazard Observation	28/01/2016	Sentry	TCAS RA in VMC	Low
asor\Waddington - RAF\8 Sqn\Sentry\18\12194	Incident	13/11/2018	Sentry	Multiple TCAS RAs Against F-15 Pair	Low
asor\Waddington - RAF\8 Sqn\Sentry\12\12363	Incident	15/03/2012	Sentry	TCAS RA	Low
asor\Waddington - RAF\8 Sqn\Sentry\18\11815	Incident	05/11/2018	Sentry	TCAS RA	Low
asor\Waddington - RAF\8 Sqn\Sentry\19\9342	Hazard Observation	12/09/2019	Sentry	TCAS RA - monitor vertical speed	Negligible
asor\Waddington - RAF\8 Sqn\Sentry\20\12407	Hazard Observation	22/12/2020	Sentry	TCAS RA	Low
asor\Waddington - RAF\8 Sqn\Sentry\13\5481	Incident	20/06/2013	Sentry	TCAS RA whilst holding for recovery	Low

Table 1 – ASIMS search results

1.13 The proposed E-7 operating areas in this ACP have been deliberately chosen to be co-located with the extant E3 operating areas (a small number of new areas have also needed to be created). This will create a familiarity of the airspace for both the E-7 crews, Airspace Battle Managers, Air Traffic Controllers, NATS and the airline operators. Because of this familiarity, and the fact the airspace is non-segregated, controllers will be able to co-ordinate traffic in an expeditious manner providing safe and timely coordination and deconfliction in a predictable traffic environment. Whilst there is always the possibility of an airprox in the future involving an E-7 and a civilian airliner, the known operating areas along with TCAS and the ability of the E-7 to generate its own air picture all go to assure that the risk of collision is As Low as Reasonably Practicable (ALARP) and tolerable. The TCAS and MESA radar picture are already in situ to enable this to occur, the implementation of the dedicated operating areas is what the ACP strives to implement to complete the safe air picture.

1.14 Finally, the E-7 operating areas were deliberately constructed to be uncomplex, of the same lateral and vertical dimensions (100nm x 20 nm and FL270 to FL350) and non-segregated. This reduced complexity increases the capacity of the pilots operating in the airspace and the ATC agency providing a service. The uncomplexity of the new operating areas should ensure smooth, safe and harmonious operations with both the E-7 and civilian airliners operating safely in the same predictable environment.

Section 2 – Full Option Appraisal

2.1 Step 3A requires the Options Appraisal (Phase I) Initial that was carried out in Stage 2 to be developed further by providing quantitative details where required for each shortlisted option, including the 'do nothing'. The option to create dedicated E-7 Operating Areas was assessed against the 'do nothing' option based on the SoN:

Statement of Need

2.2 Currently the E-3D Sentry AEW Mk 1 utilises the UK AEW areas for UK training and operations. In 2023[1] the E-7 Airborne Early Warning Wedgetail Mk 1 will enter RAF service. Though fulfilling the same role as the Sentry, advances in technology mean that the Wedgetail will not be able to utilise exactly the same orbit areas. The Wedgetail will be required to fly approximately 100 nm by 20 nm racetracks. Best use can be made of some of the existing orbit areas (e.g. UK 1, 7 and 9) as they are both large enough to accommodate the Wedgetail flight profile and are appropriately located to enable Wedgetail to provide a service to its forecast traffic and trade. The existing orbit areas may still be utilised by NATO/visiting forces partners as the UK will retain its NATO commitment in this respect. Therefore, whist the extant orbit areas must remain in place for the time-being, there is a requirement for new orbit areas to be created where the current areas are not sufficient.

Design Principles

2.3 At Stage 1 the Change Sponsor, with feedback from Stakeholders, established a set of Design Principles in which to guide the airspace design options. The design principles agreed at the Stage 1 and 2B Gateway are as follows:

DP ID	Agreed Design Principle
a	Must be safe. The defined airspace must provide ATS providers a known traffic environment to ensure safe separation against GAT.
b	Defined areas must be sufficient in location to achieve training and operational objectives.
c	Defined areas must be the minimum dimension to achieve task.
d	Minimise the impact to Commercial Air Traffic flow, sector complexity and sector capacity.
e	Airspace management and FUA principles will be applied to ensure collaborative decision-making protocols and management processes are established.
f	Defined areas shall not be segregated airspace but will align to current or revised procedures detailed within current NATS/MOD interface documents.

[1] E-7 In Service Date (ISD) has moved to Q3/4 2024.

g	The defined areas will detail the separation standard required between GAT and the OAT using the designated area.
h	The design shall seek to rationalise existing areas where appropriate.
i	The design shall minimise the impact on all ATM stakeholders. This will include NATS and other Air Navigation Service Providers (ANSPs) (including foreign ANSPs) so as not to over complicate airspace, sector design and service provision.

Options Appraisal "Do nothing" v Create Dedicated E-7 Operating Areas

2.4 Figure 1 (below) shows the extant E3 orbit areas (highlighted in blue) Option 0. Figure 2 shows the proposed E-7 Operating Areas (highlighted in red) Option 1. The existing areas will remain to support NATO E-3A operations until the planned withdrawal from service of the NATO E-3 fleet in 2035. The "Do nothing" option is assessed against the proposed generation of "Dedicated E-7 areas".

Extant E-3 Operating Areas (Option 0)

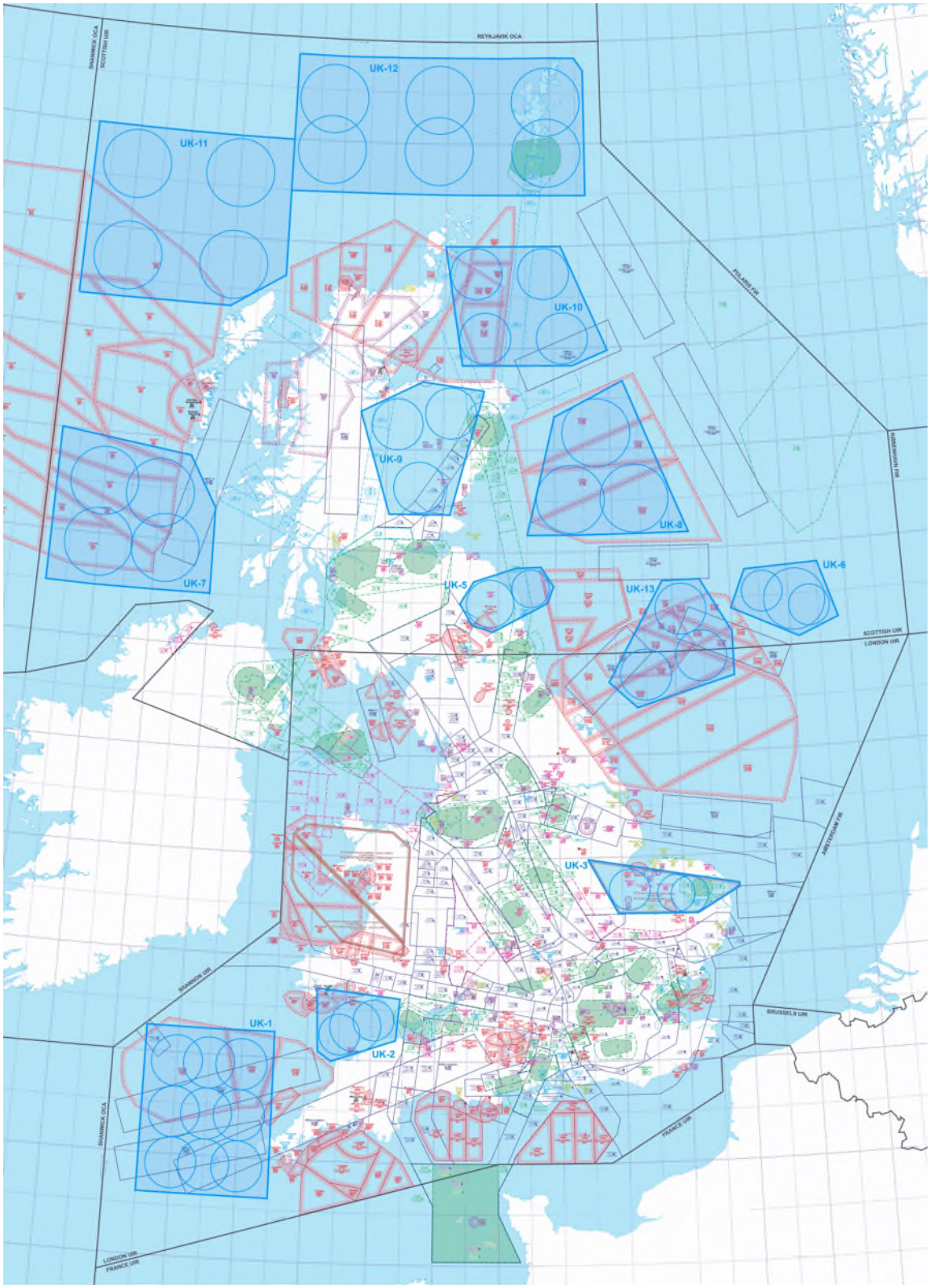

Figure 1 – Extant E-3 Operating Areas (highlighted in blue)

Create Dedicated E-7 Operating Areas (Option 1)

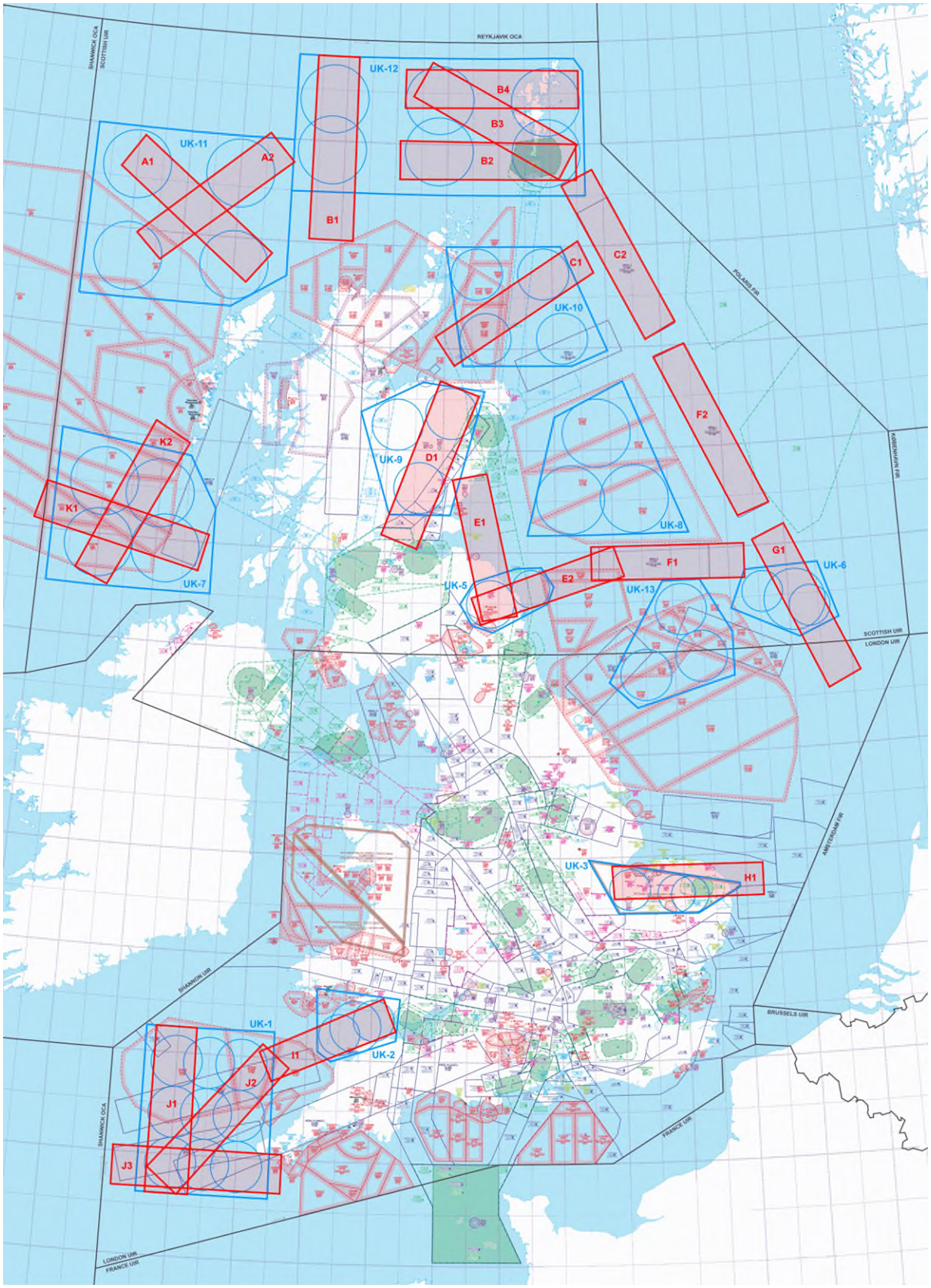

Figure 2 – Dedicated E-7 Operating Areas (highlighted in red)

Option 0 – Do Nothing

2.5 This option is included for comparison purposes only. The extant E-3 operating areas will continue to be used by the NATO E-3 force until 2035. E-7 operations could be conducted within these areas but would significantly affect the operation/capability of the E-7 MESA radar and restrict the ability of the MOD to conduct it's training and operational defence tasks.

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life	N/A
Evidence / Analysis		
The operating heights of the extant E-3 areas are FL270-FL350. It is therefore assessed that there would be no noise impact on health and quality of life to communities. Moreover, the vast majority of the areas are located over the sea and therefore communities are not affected - this metric is outside the scope of this ACP.		

Group	Impact	Level of Analysis
Communities	Air quality	N/A
Evidence / Analysis		
The operating heights of the extant E-3 areas are FL270-FL350. It is therefore assessed that there would be no detrimental impact on air quality to communities in any of the geographical areas. Moreover, the vast majority of the areas are located over the sea and are therefore not affected - this metric is outside the scope of this ACP.		

Group	Impact	Level of Analysis
Wider society	Greenhouse gas impact	Qualitative
Evidence / Analysis		
With continued use of the E-3 operating areas airliners could be routed in advance to avoid them or be allocated a transit Flight Level that negates a climb or descent to transit through them (non-segregated airspace). This would result in negligible additional fuel burn and have a negligible increase in greenhouse gas impact. Moreover, there are 13 E-3 operating areas. On the vast majority of occasions only one operating area will be active so impact to airlines across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to airline routings over this 48-hour period and therefore no change to CO2 emissions.		

Group	Impact	Level of Analysis
General Aviation	Access	Qualitative
Evidence / Analysis		
The operating heights within the extant E-3 operating areas are in the band FL270-FL350. It is therefore assessed that there would be minimal impact on General		

Aviation. The only identified exceptions are a small number of gliding sites that have published operating heights of SFC to Unlimited. On the rare occasion that one of these sites conflicts with an E-3 orbit ATC co-ordination or a change of E-3 orbit is instigated.

Group	Impact	Level of Analysis
General Aviation / Commercial Airlines	Economic impact from increased effective capacity	N/A
Evidence / Analysis		
Outside the scope of this ACP.		

Group	Impact	Level of Analysis
General Aviation / Commercial Airlines	Fuel Burn	Qualitative
Evidence / Analysis		
With continued use of the E-3 operating areas airliners could be routed in advance to avoid them or be allocated a transit Flight Level that negates a climb or descent to transit through them (non-segregated airspace). This would result in negligible additional fuel burn. Also, the E-3 can climb or descend to ensure airliners can maintain their allocated Flight Level trough the operating area – this presents minimal degradation to the radar picture for a short duration climb/descent. Moreover, there are 13 E-3 operating areas. On the vast majority of occasions only one operating area will be active so impact to airlines across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to airline routings over this 48-hour period and therefore no change to fuel burn.		

Group	Impact	Level of Analysis
Commercial Airlines	Training Costs	N/A
Evidence / Analysis		
No additional training costs to commercial airlines as a result of using the extant E-3 operating areas.		

Group	Impact	Level of Analysis
Commercial Airlines	Other Costs	N/A
Evidence / Analysis		
No additional costs to commercial airlines as a result of using the extant E-3 operating areas.		

Group	Impact	Level of Analysis
Airport / Air Navigation Service Provider	Infrastructure Costs	N/A
Evidence / Analysis		
No additional infrastructure costs to airports or air navigation service providers as a result of using the extant E-3 operating areas.		

Group	Impact	Level of Analysis
Airport / Air Navigation Service Provider	Operational Costs	N/A
Evidence / Analysis		
No additional operational costs to airports or air navigation providers as a result of using the extant E-3 operating areas.		

Group	Impact	Level of Analysis
Airport / Air Navigation Service Provider	Deployment Costs	N/A
Evidence / Analysis		
No additional deployment costs to airports or air navigation service providers as a result of using the extant E-3 operating areas.		

Summary of Option 0 Full Appraisal

2.6 Option 0, the do-nothing option, aimed to examine whether alternatives existed which would still allow the RAF Air Surveillance and Control System (ASACS) force to conduct their training and operational tasks in accordance with the SoN. The ability to continue to operate in the extant E-3 areas would place limitations on the new surveillance radar and ultimately affect the radar picture and level of safe control that the aircraft could provide to other air systems. This would result in an inability to meet specific Defence Tasks mandated to the ASACS force. Finally, evaluating this option against the 9 Design Principles it can be seen that it met 7 of the principles but not 2 important ones as follows:

- (b) Defined areas must be sufficient in location to achieve training and operational objectives.

- (c) Defined areas must be the minimum dimension to achieve task.

As a result, ongoing Defence Tasks could not be achieved to the same level of intricacy as they are currently, safe and secure radar coverage of UK airspace could not be guaranteed, and safe control of other air systems would be put at risk. This clearly articulates the requirement for new dedicated E-7 airspace.

Option 1 – Create Dedicated E-7 Operating Areas

Operating Principles

2.7 Option 1 is to create dedicated E-7 Operating Areas.

Frequency of Activation

2.8 As detailed in Stage 2A, it is expected that E-7 area activation will be in support of one sortie per day for a period of approximately 8 hours. During a sortie, an E-7 may use more than one area. It is assessed that UK East Coast areas will be used more than those elsewhere in the UK due to training requirements and support provided to RAF and USAFE fast jet training.

Weekend activation is only likely to be for major exercise activity or for national security requirements.

10 Year Forecast

2.9 It is anticipated that sortie rates for the E-7 fleet will not increase at all in the 10 years post in service date. This is predicated on annual flying rates mandated by the RAF. Whilst there is some ongoing discourse about an increase in the fleet size from 3 aircraft to 5 (should this ever be achieved) it is assessed that this would not result in increased E-7 flying within the London and Scottish UIRs as the additional flying hours would predominantly come with deployment of the capability to overseas locations.

2.10 Whilst civilian air traffic is likely to increase over the next 10 years, E-7 operations are likely to remain constant at one sortie per day. As a result, whilst CO2 emissions from civilian air traffic will likely increase over this period, it will not be as a result of this proposed ACP.

NATS Assessment on Quantitative Modelling

2.11 NATS were consulted over the value of investing in Quantitative Modelling, their Analytics team came up with the following conclusion:

The view is that it is not possible to accurately assess the environmental impact of E7 airspace and therefore it is an ineffective use of time and effort to perform any such task. The main constraining factors being:

- *The proposed airspace is not segregated from the network (and so does not affect the pre-tactical or flight planning aspects which would normally be assessed to measure any change to the current baseline)*
- *As it is only the aircraft that needs to be deconflicted from GAT, the airspace and aircraft are coordinated on a tactical basis between Mil and Civil ATC as and when required, at a mutually convenient level in the confines of the lateral airspace.*

- *The tactical nature and multiple variables at play here including multiple locations, time of day, required/requested levels, GAT / Network demand and frequency for example, adds significant complexity.*

It is our view that at best, and if even possible, any analytics would be excessively complex and unreliable to the point that the effort required would be prohibitive and any output would come with a number of CAVEATS that would make it open to challenge.

In summary the time, cost and complexity required to produce any data would not be proportionate to the change. Clearly there will be some Operational impact and we look forward to continuing our discussions on this and will, of course, provide formal feedback into the ACP process.

2.12 **The Change Sponsor suggests that in line with the NATS Assessment on Quantitative Modelling any further effort to calculate any economic impact / impact on fuel burn and CO_2 emissions is unlikely to provide any valuable or meaningful measurements and would be disproportionate to the impact itself. The MOD proposes it is scoped out of this ACP.**

Economic Assessment

2.13 This ACP proposes the establishment of E-7 airspace alongside existing E-3 operating areas. Given that the operation of this airspace will not be significantly different from that of the existing E-3 areas it is assessed that there will be no economic costs incurred beyond those already budgeted for on an annual basis, in summary no financial change to the extant baseline option. Furthermore, as the airspace vertical limits are FL270 - FL350 no economic costs should be incurred by airports, Air Navigation Service Providers, or airlines (training and logistical costs). Should it become apparent during the Stage 3 Consult phase that additional stakeholders have an input that may incur financial costs as a result of the implementation of this ACP then the sponsor will conduct a qualitative assessment on the proposed change.

Airspace Change Proposal Classification

2.14 The changes proposed in this ACP affect civil aviation traffic patterns at 7000’ or above and is therefore expected to be classified as **M2**. For the environmental assessment of a level M proposal, the Ministry of Defence need only ever assess the anticipated environmental impacts of the consequential changes on civil aviation patterns.

Option 1 - Options Appraisal

Group	Impact	Level of Analysis
Communities	Noise impact on health and quality of life	N/A
Evidence / Analysis		
As a Level M2, CAP1616 states that for aircraft about 7,000 feet, the prioritised environmental impact is CO2 emissions, and an assessment of noise impacts is not normally required. This proposal has the base of the E-7 operating areas at FL270, which will significantly reduce/mitigate all noise effects on the ground. Noise impacts were not a concern in any of the stakeholder engagement that was carried out prior to Stage 3A. Moreover, the majority of the proposed areas are over the sea and would therefore not affect communities.		

Group	Impact	Level of Analysis
Communities	Air quality	N/A
Evidence / Analysis		
The operating heights of the proposed E-7 operating areas are FL270-FL350. It is therefore assessed that there would be no detrimental impact on air quality to communities in any of the geographical areas. Moreover, the vast majority of the areas are located over the sea and are therefore not affected - this metric is outside the scope of this ACP. Finally, in accordance with CAP 1616 para B72 this assessment is not required as the proposal will not affect emissions below 1,000 feet.		

Group	Impact	Level of Analysis
Wider society	Greenhouse gas impact	Qualitative
Evidence / Analysis		
With dedicated E-7 operating areas airliners could be routed in advance to avoid them or be allocated a transit Flight Level that negates a climb or descent to transit through them (non-segregated airspace). This would result in negligible additional fuel burn and have a negligible increase in greenhouse gas impact. Moreover, there are 21 proposed E-7 operating areas. On the vast majority of occasions only one operating area will be active so impact to airlines across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to airline routings over this 48-hour period and therefore no change to CO2 emissions.		

Group	Impact	Level of Analysis
General Aviation	Access	Qualitative
Evidence / Analysis		
The operating heights of the proposed E-7 operating areas are in the band FL270-FL350. It is therefore assessed that there would be minimal impact on General Aviation. The only identified exceptions are a small number of gliding sites that have published operating heights of SFC to Unlimited. On the rare occasion that		

one of these sites conflicts with an E-7 area ATC co-ordination or a change of E-7 area can be instigated – this issue was raised by the British Gliding Association during Stage 2.

Group	Impact	Level of Analysis
General Aviation / Commercial Airlines	Economic impact from increased effective capacity	N/A
Evidence / Analysis		
Outside the scope of this ACP		

Group	Impact	Level of Analysis
General Aviation / Commercial Airlines	Fuel Burn	Qualitative
Evidence / Analysis		
With dedicated E-7 operating areas airliners could be routed in advance to avoid them or be allocated a transit Flight Level that negates a climb or descent to transit through them (non-segregated airspace). This would result in negligible additional fuel burn. Also, the E-7 can climb or descend to ensure airliners can maintain their allocated Flight Level trough the operating area – this presents minimal degradation to the radar picture for a short duration climb/descent. Moreover, there are 21 proposed E-7 operating areas. On the vast majority of occasions only one operating area will be active so impact to airlines across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to airline routings over this 48-hour period and therefore no change to fuel burn.		

Group	Impact	Level of Analysis
Commercial Airlines	Training Costs	N/A
Evidence / Analysis		
No additional training costs to commercial airlines as a result of using this airspace option as they will be operationally similar to E-3 orbit areas.		

Group	Impact	Level of Analysis
Commercial Airlines	Other Costs	N/A
Evidence / Analysis		
No additional costs to commercial airlines as a result of using this airspace option.		

Group	Impact	Level of Analysis
Airport / Air Navigation Service Provider	Infrastructure Costs	N/A
Evidence / Analysis		
No additional infrastructure costs to airports or air navigation service providers as a result of using this airspace option. Radar maps and charts will be updated in line with the AIRAC cycle. Therefore no additional costs (routine update process).		

Group	Impact	Level of Analysis
Airport / Air Navigation Service Provider	Operational Costs	N/A
Evidence / Analysis		
No additional operational costs to airports or air navigation providers as a result of using this airspace option.		

Group	Impact	Level of Analysis
Airport / Air Navigation Service Provider	Deployment Costs	Quantitative and monetise
Evidence / Analysis		
No additional deployment costs to airports or air navigation service providers as a result of using this airspace option.		

Summary of Option 1 Full Appraisal

2.15 Option 1, create dedicated E-7 Operating Areas aimed to produce the best solution with respect to airspace in which the E-7 Wedgetail could operate in order to allow the RAF ASACS force to conduct their training and operational tasks in accordance with the SoN. **This Option meets all 9 of the Design Principles.** Moreover, this option should have minimal impact on other airspace users and communities with respect to environmental and economic issues. There are minimal financial and other costs involved in the introduction of dedicated E-7 areas. There are also several advantages; these include safety, operational effectiveness, flexible use of airspace and environmental savings. Finally, the creation of dedicated E-7 operating areas allows the MOD to position this air system in the optimum geographical location to maximise the effectiveness of its advanced MESA radar ensuring all training, operational and defence tasks are met. **As such, Option 1 is the preferred option of the Sponsor.**

Section 3 – Conclusion

Summary

3.1 Option 0 ‘Do nothing’ is presented only as a comparison against Option 1 as it does not satisfy the Design Principles agreed in Stage 1. **Therefore Option 1 remains the preferred option of the Sponsor.**

3.2 It is assessed that the introduction of dedicated E-7 operating areas will have no environmental impact on communities and little or no environmental or economic impact on commercial airliners and other aviation Stakeholders. It is assessed that that this ACP will only have a limited impact on a small number of key stakeholders.

3.3 The Change Sponsor proposes that since the impact on other airspace users and the environment is considered to be low, further attempts to provide quantified or monetised analysis would be disproportionate and provide little if any additional clarity for stakeholders.

ACP Timeline

3.4 In order to meet the CONSULT Gateway on 26 May 2023, the Change Sponsor will submit all Step 3A documentation to the CAA by Friday 12 May 2023. Any redacted versions will then be uploaded to the Portal.

3.5 Provided a successful pass through the CONSULT Gateway, the Change Sponsor will then commence formal consultation Option 1 from Monday 5 June 2023.

3.6 The following CAP1616 timeline is anticipated:

Stage/Step	Description	Gateway Date
3B	CONSULT Gateway	26 May 2023
3C	Consultation Launch	5 June 2023
	Reminder to Stakeholders	11 August 2023
3D	Collate and review responses from consultation.	28 August 2023
4A	Update design	11 September 2023
4B	Submit Airspace Proposal to the CAA	27 October 2023
5	DECIDE Gateway	12 January 2024
6	IMPLEMENT into AIRAC 04/2024	April 2024

3.7 The Change Sponsor will continue the ACP process in accordance with the timeline agreed, submitting all required documentation in Stage 4A and 4B in order to allow the CAA to conduct the DECIDE gateway on 12 January 2024.