

CAA Environmental Assessment

Airspace Trial

Title of airspace change proposal	Enabling T&E activity of Protector in UK airspace Spring/Summer 2024
Change sponsor	Ministry of Defence
Project reference	ACP-2023-047
Account Manager	██████████

Instructions

In providing a response for each question, please ensure that the 'status' column is completed using the following options:

- YES
- NO
- PARTIALLY
- N/A

To aid the decision maker, highlight each question accordingly to illustrate what is:

resolved YES not resolved PARTIALLY not compliant NO

1. Introduction

This ACP is for an airspace trial to establish and trial a Temporary Danger Area (TDA) centred on RAF Marham. The trial seeks to confirm whether RAF Marham is a suitable diversion airfield for the large Remotely Piloted Air System (RPAS), Protector RG Mk1. Protector will be operated out of RAF Waddington where permanent segregated airspace has been established to enable access through Class G airspace to its UK operating and training areas. Protector operations at Waddington are scheduled to start in late Spring 2024 for test and evaluation activities prior to the platform entering formal service.

The overarching objective of the trial is to establish whether RAF Marham is a suitable diversion airfield for Protector and to inform the development of ACP-2023-022 (currently at Stage 1 of the CAP1616 process) which seeks to establish permanent segregated airspace in the vicinity of RAF Marham to ensure suitable and enduring access to a diversion airfield for Protector. The Change Sponsor has defined four 'sub-objectives' and metrics to evaluate

the operational suitability of the dimensions of the TDA, the impact on other airspace users and associated operational procedures.

The proposed TDA comprises a 5 NM cylinder centred on RAF Marham. The airspace is divided into two vertical segments, the lower volume extending from SFC to FL105 and the upper volume from FL105 to FL195. The inclusion of vertical segments to the TDA was introduced in response to feedback from aviation stakeholders to reduce impacts on other airspace users when Protector was operating within the airspace, see figures 1 and 2 below:



Figure 1 - RAF Marham TDA Design

The airspace trial is scheduled to commence in June 2024 for a duration of 6 months. Two planned diversions to RAF Marham will be conducted in the period 1 June – 30 November 2024 with each diversion to include an arrival and departure. The TDA at RAF Marham will be activated for all Protector sorties from RAF Waddington including when there are no planned diversions (i.e. TDA will be active but not necessarily utilised). This is to enable Protector to access RAF Marham as a diversion airfield should RAF Waddington becomes unavailable due to unforeseen circumstances. The TDA will be

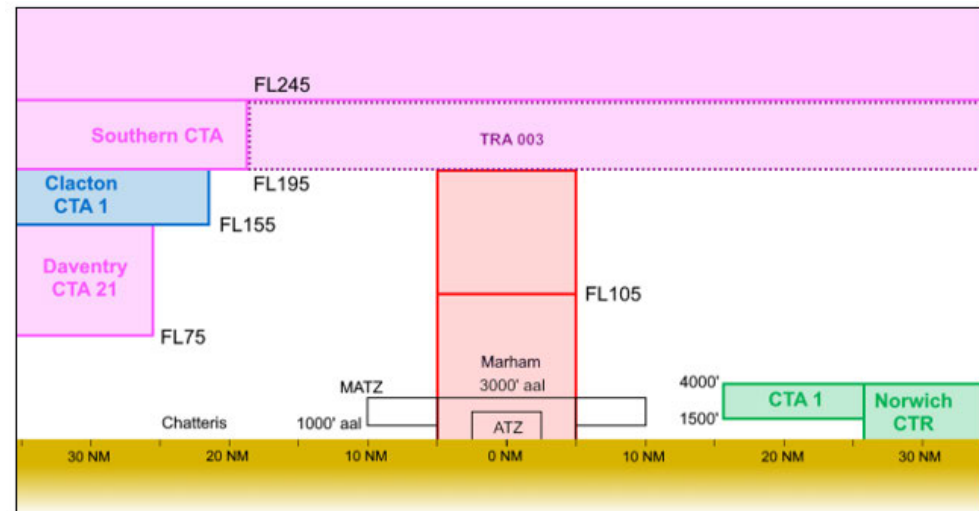


Figure 2 - RAF Marham SWN/E² TDA Cross-section

activated by NOTAM whenever Protector is flying.

The change sponsor anticipates that during the first 6 months, Protector will be flown during core flying hours Monday to Friday up to 3 times per week. Within the first 24 months of service, it is anticipated that up to 2 air vehicles may be flown simultaneously, including some night flying. A DACS will be available during TDA hours of activation from Marham ATC.

2. Statement of Need		Yes/No
2.1	Does the Statement of Need include any environmental factors?	No
	The statement of need does not include any environmental factors.	

3. Information to be conveyed to those affected		Status
3.1	Has the change sponsor adequately provided a justification for the change?	Yes
	The change sponsor has justified the need for the trial on the basis that operation of the RAF's new RPAS Protector from RAF Waddington (ACP-2019-18 approved 31 August 2023), requires nomination of a suitable diversion airfield. The trial is to inform the development of ACP-2023-022 (currently at Stage 1 of the CAP1616 process) which seeks to establish permanent segregated airspace in the vicinity of RAF Marham to ensure suitable and enduring access to a diversion airfield for Protector.	
3.2	Has the change sponsor adequately confirmed the effective period of the change?	Yes
	The change sponsor has confirmed that the effective period of change for the proposed trial ACP is for a period of 6 months from 1 June to 30 November 2024.	
3.3	Has the change sponsor provided sufficient details on the expected frequency of flights participating in the trial?	Yes
	<i>For trials longer than 90 days yet shorter than 12 months, sufficient details on the expected frequency (both absolute and as a</i>	

	<i>percentage of total traffic during the trial period) of flights participating in the trial must be provided.</i>	
	<p>The Change Sponsor has stated that there will be two planned diversions to RAF Marham during the trial period 1 June – 30 November 2024, with each diversion to include an arrival and departure. The TDA at RAF Marham will be activated for all Protector sorties from RAF Waddington, which will be during core flying hours, Monday to Friday, up to 3 times per week during the period of the trial. The use of RAF Marham for other routine training of aircrew during the trial period is not required. The only other occasion(s) when Protector would require access to RAF Marham during the trial will be in the event of an actual diversion as a result of the main runway at RAF Waddington being declared BLACK (runway unusable for a reason other than cloud base or visibility).</p> <p>The Change Sponsor has provided data from Waddington ATC for the number of occasions when the runway at RAF Waddington has previously been unavailable to aircraft operations due to the runway status being declared BLACK. Over the 5-year period (2018 – 2023) the runway at Waddington was unavailable on 22 occasions, an average of 4.4 occasions per year. The sponsor indicated that a proportion of these occurrences would be due to snow/snow clearing operations, conditions in which Protector would be unlikely to fly. Consequently, based on past records and the fact that the activation period for the trial is during the summer, the sponsor has estimated that the runway at Waddington might be unavailable on an average of two occasions during the trial period which would necessitate Protector diverting to RAF Marham.</p>	
3.4	Has the change sponsor provided sufficient details on the timing of flights participating in the trial?	No
	The sponsor has indicated that Protector flights will take place during 'core hours', but these have not been specified in the submission. No precise flight times have been provided.	
3.5	Has the change sponsor provided sufficient details on the typical altitudes of flights?	Yes
	The Change Sponsor has stated that the TDA structure will allow for Protector to traverse through Class G airspace to its UK operating and training areas in Class C airspace above FL195. The proposed TDA comprises a 5 NM cylinder centred on RAF Marham. The airspace is divided into two vertical segments, the lower volume extending from SFC to FL105 and the upper volume from FL105 to FL195. The Change Sponsor has estimated that the time taken for the RPAS to transit the two segments will be no more than 10 – 15 minutes per event.	
3.6	Has the change sponsor adequately provided a qualitative description of changes to traffic patterns, illustrated using operational diagrams overlaid on Ordnance Survey maps or similar?	Partial
	<i>For trials longer than 90 days yet shorter than 12 months, operational diagrams that illustrate the estimated overflight swathe of trial</i>	

	<p><i>traffic, up to 7,000 feet must be provided.</i></p> <p><i>The diagrams should be of sufficient detail for those affected to identify where they live in relation of the changes in traffic pattern.</i></p>	
	<p>For ACPs sponsored by the MoD, environmental impacts that are a direct result of military aircraft or military operations (including civil aircraft carrying out military function under contract) are not required to be considered or assessed. However, consequential environmental impacts from other airspace users (i.e. civil aviation) that are a result of the proposed change must be assessed in accordance with Level 1 or Level 2. (CAP1616 v4 paragraph B42).</p> <p>The change sponsor has provided a qualitative description of changes to traffic patterns but has identified that the surrounding airspace is Class G, uncontrolled airspace, which means that the activity of other airspace users is difficult to predict with any certainty.</p> <p>The change sponsor has described other military activity in the vicinity of RAF Marham associated with RAF Coningsby, RAF Lakenheath and RAF Mildenhall and identified Norwich Airport (NAL) approximately 20NM east of RAF Marham, which is served by a Control Zone (CTR) and Control Area (CTA) both up to 4,000 ft. An LOA is in place to facilitate safe ATC service to traffic to and from NAL and aircraft operating under the control of RAF Marham. The area is also populated by numerous civil airfields and airstrips supporting leisure flying (general aviation, gliding, paragliding and parachute activity). The change sponsor has identified East Winch and Broughton (North and South) private landing strips, which are within the RAF Marham Military Aerodrome Traffic Zone (MATZ). LOAs have been implemented between these airfields, in addition to agreements with Rookery Farm, Great Massingham and Southery Airfields which are also situated in the local vicinity.</p> <p>The change sponsor has indicated that whilst the MATZ is not a mandatory avoid for civil pilots, most call RAF Marham ATC when flying in proximity to the aerodrome and when requiring to transit within 5 nm of RAF Marham. A qualitative assessment was obtained from Marham ATC regarding the number of requests from civil airspace users to cross overhead RAF Marham (both inside and outside the MATZ). On an average day, Marham ATC estimated that they receive approximately 20 requests for MATZ and overhead crossings from general aviation (GA) passing within 5 nm overhead and operating below 7000 ft above aerodrome level (AAL). Of that total, up to 10 are estimated to cross above the MATZ. The total number of overhead crossings (inside and outside the MATZ) may peak to the high 20s on the busiest flying days but is estimated to be less than 30 on any given day.</p> <p>The change sponsor has also submitted a quantified monthly breakdown of MATZ crossing requests for the 12-month period October 2022 to September 2023 inclusive. The figures apply to requests for Monday to Friday only as Marham ATC does not routinely operate at the weekends. The highest number was recorded in June 2023 with 83 crossing requests. The change sponsor has calculated that this equates to a weekly total of just over 19 requests. Based on an assumption of 2 or 3 busy flying days in any given week, the data suggests an average of 6 – 10 MATZ crossing requests per day. These can be added to the estimate of up to 10 crossing requests above the MATZ which supports the qualitative estimate of 20 crossings per day of the Marham MATZ and overhead.</p> <p>It is noted that whilst the TDA may be activated, it will only be accessed by Protector on two occasions during the trial period for planned</p>	

	<p>diversion purposes, which equates to 4 events (2 x inbound and 2 x outbound). The use of RAF Marham will not be required for other routine training for Protector. Additional access to RAF Marham for actual diversions can only be estimated using past records for the frequency with which the runway at RAF Waddington has been unavailable. As detailed in Q3.3 above, this would equate to two possible occasions during the 6-month trial period.</p> <p>The change sponsor has stated that DACS requests will be denied whilst Protector is operating within the TDA, the impact of which is estimated to be a worst-case delay of 10 - 15 minutes per event. Using the estimate of no more than 2 unplanned diversions, the potential worst-case delays of 15 minutes may occur on up to 4 occasions (2 x inbound and 2 x outbound), the change sponsor has calculated that 15 minutes represents 2.5% of a 10-hour flying window. Therefore, based on up to 20 civil airspace users requesting crossings within 5 nm of RAF Marham spread throughout that window, a live diversion inbound or outbound is calculated to result in an average of less than 1 aircraft being impacted ($20 \times 2.5\% = 0.5$ aircraft). It is assumed that the same calculation would apply to the two planned diversions although the impact will be mitigated as the TDA will be activated via NOTAM at D-1 on those occasions.</p> <p>Based on this evidence, the change sponsor rationalises that the majority of civil aircraft will continue to request and obtain a DACS to cross the TDA when it is activated but Protector is not operating within it. Other mitigation measures such as Letters of Agreement (LoA) established with potentially impacted stakeholders (both military and civil) are also estimated to minimise impacts. The impact is further mitigated by the vertical separation of the TDA into two segments, allowing traffic access through the TDA once Protector has cleared each segment.</p> <p>The change sponsor has not provided any operational diagrams to estimate the overflight swathe of trial traffic as this would be difficult to predict in Class G airspace and, in any case, would only relate to a minimal number of civil aircraft movements impacted as a consequence of the proposed ACP.</p> <p>The CAA agrees that the consequential impact of the proposed Trial ACP on other airspace users would be minimal overall.</p>
3.7	<p>Has the change sponsor adequately provided an assessment of noise impacts?</p> <p><i>For trials of 90 days or less, typical noise levels at key locations must be provided.</i></p> <p><i>For trials longer than 90 days yet shorter than 12 months, L_{Amax} footprints illustrating the loudest and most frequent types of aircraft that will be participating in the trial must be provided:</i></p> <ul style="list-style-type: none"> • 65 dBA L_{max} footprints for noise from day flights (0700 to 2300) • 60 dBA L_{max} footprints for noise from night flights (2300 to 0700). <p><i>For trials longer than 90 days yet shorter than 12 months, equivalent footprints that illustrate where the trial traffic would otherwise have flown (this assumes that any aircraft that partakes in the trial would have flown on an alternate route that reflects current operations).</i></p>

	<i>For trials extending beyond 12 months, noise assessments using annualised noise metrics must be provided.</i>	
	<p>The change sponsor has presented a rationale and supporting evidence to show that there will be a minimal impact on civil aircraft. This is estimated to be an average of less than 1 aircraft during a 10-hour flying window (based on peak traffic days) as a result of two planned diversion events and an estimate of two possible unplanned diversion events during the trial period. The Class G nature of surrounding local airspace also makes it difficult to predict how aircraft will operate, and it would therefore be disproportionate to require submission of LMax footprints.</p> <p>The low volume of in-scope aircraft and the minimal operational use of the trial TDA at RAF Marham by Protector means that noise levels in excess of the 51 dB LAeq,16hr daytime Lowest Observed Adverse Effect Level (LOAEL) are unlikely to occur and therefore the change is unlikely to lead to an adverse impact on health and quality of life.</p> <p>The CAA accepts the sponsor's rationale and supporting evidence and concludes that there will be no material change in noise impacts as a result of this trial ACP.</p>	

4. Assessment of noise impacts		Status
4.1	Has the assessment of noise impacts identified in Question 3.7 been adequately assessed and presented in the final submission to the CAA?	Yes
	Yes, the sponsor has provided a qualitative assessment of noise impacts based on a quantitative analysis of the consequential impacts of the ACP on civil aircraft. The assessment has been presented within the final submission document, 'Trial Plan for Airspace Trial to support Protector T&E Flying in the vicinity of RAF Marham Submission – Version 1.1'.	
4.2	Summary of anticipated noise impacts from the final proposed airspace trial.	
	The sponsor has provided a high-level qualitative assessment of the noise impacts associated with the proposed TDA trial. Traffic analysis using quantitative data from RAF Marham ATC indicates that the activation of the TDA will have a minimal impact on civil aircraft with an average of less than 1 aircraft potentially re-routed when Protector is diverted to RAF Marham. This would be limited to two planned	

	<p>diversions and two possible additional diversions, should the runway at RAF Waddington become unavailable. The sponsor reasons that once the ACP is implemented, civil aircraft will request and obtain a DACS when the TDA is activated but not occupied by Protector. Requests for DACS will only be denied for a very limited time period (maximum 15 minutes) when Protector is actually operating within the TDA.</p> <p>Any increase in noise impacts from civil aircraft rerouted as a consequence of the ACP is therefore estimated to be 'negligible'. The change sponsor has scoped out any further quantitative assessment of noise impacts.</p> <p>In summary, the CAA concludes that:</p> <ul style="list-style-type: none"> Noise impacts will be negligible due to the number in-scope traffic that is likely to be consequentially impacted by the change, and that any impacts have potential to be further mitigated through the introduction of a DACS. The low volume of in-scope aircraft impacted as a consequence of the ACP means that noise levels in excess of the 51 dB LAeq,16hr daytime Lowest Observed Adverse Effect Level (LOAEL) are unlikely to occur and therefore the change is unlikely to lead to an adverse impact on health and quality of life. There will be a change in overflight for any aircraft required to re-route around the Danger Area, however due to the low number of affected in-scope aircraft, changes in overflight will be negligible.
--	--

5. Compliance with relevant policy and guidance from Government or the CAA		Status
5.1	<p>Has the change sponsor satisfied all relevant policy and/or guidance, with regards to environmental impacts of the proposed airspace change?</p> <p><i>Notably, has the change sponsor complied with the environmental requirements in:</i></p> <ul style="list-style-type: none"> <i>CAP1616: Airspace change: Guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information;</i> <i>CAP1616a: Airspace Change: Environmental requirements technical annex;</i> <i>DfT Air Navigation Guidance 2017: Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management.</i> <p>If a change sponsor has not complied with any aspect of those documents, have they provided a rationale and is it reasonable?</p>	Yes

	The sponsor has satisfied all relevant policy and/or guidance with regards to environmental impacts of the proposed airspace change.
--	--

6. Recommendations/Conditions		Status
6.1	<p>Are there any Recommendations which the change sponsor <u>should try</u> to address either before or after implementation (if approved)? If yes, please list them below.</p> <p><u>GUIDANCE NOTE:</u> Recommendations are something that the change sponsor <u>should try</u> to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.</p>	No
	There are no recommendations for the sponsor to address.	
6.2	<p>Are there any Condition(s) which the change sponsor <u>must fulfil</u> either before or after implementation (if approved)? If yes, please list them below.</p> <p><u>GUIDANCE NOTE:</u> Conditions are something that the change sponsor <u>must fulfil</u> either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors <u>must</u> observe any condition(s) contained within the regulatory decision; failure to do so <u>will usually</u> result in the approval being revoked.</p>	Yes
	<p>Yes, the sponsor must fulfil the following Conditions before the implementation of the trial (if approved).</p> <ul style="list-style-type: none"> The sponsor should collate, monitor and report to the CAA on the level and contents of any complaints associated with the trial throughout its period of operation (if approved). 	

Environmental assessment sign-off	Name	Signature	Date
Environmental assessment completed by Airspace Regulator (Environment)			05/02/2024

Environmental assessment approved by Manager Airspace Regulation (or alternative delegation of authority)			16/02/2024
---	---	---	------------