

CAA Operational Assessment

Title of airspace change proposal	Caernarfon Complex Trial
Change sponsor	Bristow Helicopters Ltd
Project no.	ACP-2020-050
Account Manager	
<i>Case study commencement date</i>	07 Oct 2020
<i>Case study report as at</i>	22 Feb 2021

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 SARG project leader's efficient project management it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved Green not resolved Amber not compliant Red

Executive Summary

The Caernarfon Complex Trial seeks to Trial and evaluate novel and innovative technologies to allow a UAS to see, sense or detect conflicting traffic or other hazards and take the appropriate action. The specific technologies are focused on the detection and avoidance of other air users and support the underlying principles of:

- a) Ensuring the platform is safe to operate (principally prevention of loss of safe separation)
- b) Non-restrictive to other air users
- c) Regulatory compliance

The project aims to evaluate beyond visual line of sight (BVLOS) operation of the Schiebel S-100 Camcopter and sensors/payloads as a potential UK SAR asset. Bristow Helicopters aim to contribute to a body of evidence to support UAS safety case development and the transition to more inclusive and flexible airspace.

Bristow established the UAS Prototype Service in 2017 to explore the utilisation of UAS for UK SAR. They have been undertaking UAS flights in the North

West Wales since 2018 and in 2019 the company embarked on a 2-year trial to develop a UAS capability for UK SAR. The project comprises several phases, the first three incorporating a concept demonstration and platform evaluation, complete over the last 2 years. This Phase 3 seeks to undertake simulated scenario-based SAR sorties, the first stage being incorporated into this ACP which will evaluate and assess novel electronic conspicuity technologies to support UAS integration into UK airspace.

1.	Justification for change and options analysis (operational/technical)	Status
1.1	Is the explanation of the proposed change clear and understood?	Yes
	The intent of Bristow is to provide a safe Airspace Trials area within which technologies are trialled to support underlying principles of ensuring the platform is safe to operate non-restrictive to other air users whilst ensuring regulatory compliance.	
1.2	Are the reasons for the change stated and acceptable?	Yes
	This ACP is proposing a Trial to trial innovative technologies to allow a UAS to see, sense or detect conflicting traffic or other hazards and take the appropriate action and falls under the umbrella of innovation. The purpose of this ACP is to provide an area where technology systems and procedures can be developed, especially in support of SAR operations.	
1.3	Have all appropriate alternative options been considered, including the 'do nothing' option?	Yes
	A do-nothing option is not appropriate in this instance as it would not deliver any capability. Use of alternate location/airspace (established Danger Area) would not meet the business objectives. Therefore, a single option has been considered as per the proposal.	
1.4	Is the justification for the selection of the proposed option sound and acceptable?	Yes
	The sponsor is proposing a Temporary Danger Area for the duration of the trial.	
2.	Airspace design changes description and operational arrangements	Status
2.1	Is the type of proposed airspace design clearly stated and understood?	Yes
	The airspace design submitted is in support of the evaluation of the UAS Programme objectives and comprise of a Maritime TDA Complex and a Land TDA complex.	
	The maritime complex consists of transit corridor from Caernarfon Aerodrome over the sea divided into three sections (Transit 1 SFC –	

	<p>2000ft AMSL, Transit 2 SFC- 3000ft AMSL, Transit 3 SFC – 3000ft AMSL and Transit 4 SFC to 4000ft AMSL) These lead to two Operating Areas (OA1 SFC - 5500ft AMSL and OA2 SFC-8000ft AMSL).</p> <p>The land complex consists of a transit corridor from Caernarfon Aerodrome over land divided into two sections (Transit 5 SFC – 3000ft AMSL and Transit 6 SFC to 5500 AMSL) leading to an Operating Area (OA 3 5000ft-7000ft AMSL)</p>	
2.2	Are the hours of operation of the airspace and any seasonal variations stated and acceptable?	Yes
	The sponsor estimating usage of the maritime complex 2 to 3 times a week, with a weekend usage generally 1 weekend per month. The land complex has an estimated average usage of 1 day per week, with a weekend usage likely to be 1 weekend per month.	
2.3	Is any interaction with adjacent domestic and international airspace structures stated and acceptable including an explanation of how connectivity is to be achieved? Has the agreement of adjacent States been secured in respect of High Seas airspace changes?	Yes
	The sponsor has provided LOAs with RAF Valley, Caernarfon Airport and Bristow Helicopters Ltd and between Bristow Helicopters Ltd, The British Gliding Association, The British Hang Gliding and Paragliding Association and The General Aviation Alliance.	
2.4	Is the supporting statistical evidence relevant and acceptable?	Yes
	Following discussions between the BGA, BHPA and GAA a concession was made to reduce the radius of OA3 from 4nm to 3nm to reduce the impact to the GA activities in the immediate vicinity.	
2.5	Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?	Yes
	Bristow Helicopter Limited not be providing any ATS. Discussions with RAF Valley and Caernarfon Airport has resulted in the associated LOA with regards to a DACS/DAAIS provision.	
2.6	Are any draft Letters of Agreement and/or Memoranda of Understanding included and, if so, do they contain the commitments to resolve ATS procedures (ATSD) and airspace management requirements?	Yes
	Discussions with RAF Valley and Caernarfon Airport has resulted in the associated LOA with regards to a DACS/DAAIS provision.	

2.7	Should there be any other aviation activity (low flying, gliding, parachuting, microlight site etc) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, what action has the change sponsor carried out to resolve any conflicting interests?	Yes
	LOAs have been established with the adjacent airspace operators to achieve procedures, operating hours and an airspace design agreeable to those conducting aviation activity.	
2.8	Is the evidence that the airspace design is compliant with ICAO SARPs, airspace design & FUA regulations, and Eurocontrol guidance satisfactory?	Yes
	The TDA will be notified through an approved AIC. The co-ordinates for the structure do not need to be CAP1054 compliant.	
2.9	Is the proposed airspace classification stated and justification for that classification acceptable?	Yes
	It is proposed that all BVLOS drone operations are contained within segregated airspace using a Temporary Danger Area.	
2.10	Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?	Yes
	<p>During periods of TDA activation GA traffic will be able to access the airspace with a DACS provision when Valley are open and a DAAIS is provided by Caernarfon when Valley are closed.</p> <p>LOAs are to be developed to facilitate entry to the TDA for aircraft under the control of RAF Valley.</p>	
2.11	Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation.)	Yes
	<p>Promulgation of the TDA through NOTAM in addition to direct coordination with adjacent aerodromes and airspace users. The TDA will be promulgated through an AIC with specific TDA activations by NOTAM no later than H-24.</p> <p>Activity times will be negotiated as per the LOAs to enable maximum deconfliction of sorties.</p>	
2.12	Is there a commitment to allow access to all airspace users seeking a transit through controlled airspace as per the classification, or in the event of such a request being denied, a service around the affected area?	Yes

	The airspace proposal is for a TDA. Although Bristow Helicopter Ltd are not providing an air traffic service there is an LOA in place with RAF Valley and Caernarfon for the provision of a DACS and DAAIS.	
2.13	Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?	Yes
	When activated transit of the maritime complex TDA will be restricted to aircraft under the control of RAF Valley and a DAAIS is available from Caernarfon Airfield. Specific protocols through an LOA has been arranged for OA3.	
2.14	Are any airspace user group's requirements not met?	Yes
	In general, most objections were logged regarding to the proposed UAS operations in the vicinity of OA3. In addition to their objection to OA3, DAATM also logged an objection to the proposed maritime complex however agreement was again proposed by an LoA between RAF Valley and BHL. The remainder of the objections have been met through the redesign of the final airspace design and the LOAs.	
2.15	Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).	N/A
2.16	Is the airspace design of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to contain horizontal and vertical flight activity (including holding patterns) and associated protected areas in both radar and non-radar environments?	Yes
	The OSC has been approved by the UAS Sector team for operations within the TDA environment.	
2.17	Have all safety buffer requirements (or mitigation of these) been identified and described satisfactorily (to be in accordance with the agreed parameters or show acceptable mitigation)? (Refer to buffer policy letter.)	Yes
	The airspace design does not impact adjacent airspace iaw the buffer policy.	
2.18	Do ATC procedures ensure the maintenance of prescribed separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures?	Partly
	The two LOAs detail procedures to ensure separation standards from the UAS system and other airspace users with provision of DACS and DAAIS from RAF Valley and Caernarfon.	
	The LOA detail procedures at para 22 to enable information regarding the status of the TDA to be passed by Bristow to non-participating	

	<p>aircraft in the event the UAS is airborne and the DAAIS provision is in the process of being transferred to Caernarfon should RAF Valley require to close unexpectedly. The UAS operators are not trained FISOs and therefore under the current provision of a DAAIS are not able to offer this service. The ACP Sponsor is keen to develop this capability as part of their trial but are do not currently have any robust evidence to show that they can meet an acceptable alternative.</p> <p>It is therefore a condition of this approval that the LOA be revisited and para 22 be removed.</p>	
2.19	Is the airspace structure designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace?	Yes
	Yes	
2.20	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?	Yes
	The TDA complex lies close to RAF Valley ATZ and Caernarfon ATZ and an LOA is in place to detail the operating arrangements.	
2.21	Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?	N/A
3.	Supporting resources and communications, navigation and surveillance	Status (CNS) infrastructure
3.1	Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:	
	<ul style="list-style-type: none"> Communication: Is the evidence of communications infrastructure including RT coverage together with availability and contingency procedures complete and acceptable? Has this frequency been agreed with AAA Infrastructure? 	Yes
	<p>Communication is detailed in the LOA and the operating safety case.</p> <p>Caernarfon have a VHF operating licence which extends to 10nm for transmission. However Caernarfon have also confirmed they routinely <i>receive</i> calls at ranges in excess of 30nm from EGCK. Caernarfon currently have sufficient <i>technical</i> capability to cover the entire complex however require an expansion of their Ofcom licence to <i>respond</i> to contacts beyond 10nm. Caernarfon are currently in the process of applying for an update to their current Ofcom permission to <i>respond</i> to contacts beyond this 10nm range. Caernarfon do however currently have sufficient radio coverage and licencing to support UAS operations in OA3.</p>	

It is therefore a condition of this ACP approval that if Caernarfon do not receive an expansion of their licence to sufficiently cover the OA1 and 2 in time for the activation of the TDA from 08 Apr then in the event that RAF Valley are not able to offer a DACS provision, the DAAIS will be provided by London Information. An amendment to the LOA will be required in this instance.		
	<ul style="list-style-type: none"> Navigation: Is there sufficient accurate navigational guidance based on in-line VOR or NDB or by approved RNAV-derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrol standards? For example, for nav aids, has coverage assessment been made, such as a DEMETER report, and if so, is it satisfactory? 	N/A
	<ul style="list-style-type: none"> Surveillance: Radar provision – have radar diagrams been provided, and do they show that the ATS route/airspace structure can be supported? 	N/A
3.2	Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growth acceptable?	N/A
4.	Maps/charts/diagrams	Status
4.1	<p>Is a diagram of the proposed airspace included in the proposal, clearly showing the dimensions and WGS84 co-ordinates?</p> <p>(We would expect sponsors to include clear maps and diagrams of the proposed airspace structure(s) – they do not have to accord with aeronautical cartographical standards (see airspace change guidance), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals.)</p>	Yes
	Yes - although minor errors are contained within the proposal detailed.	
4.2	Do the charts clearly indicate the proposed airspace change?	Yes
	Yes	
4.3	Has the change sponsor identified AIP pages affected by the change proposal and provided a draft amendment?	N/A

	Yes	
4.4	Has the change sponsor completed the WGS84 spreadsheet and submitted to the CAA for approval?	N/A
	Work in progress	
5.	Operational impact	Status
5.1	Is the change sponsor's analysis of the impact of the change on all airspace users, airfields and traffic levels, and evidence of mitigation of the effects of the change on any of these, complete and satisfactory? Consideration should be given to:	Yes
	a) Impact on IFR General Aviation traffic, on Operational air traffic or on VFR General Aviation traffic flow in or through the area.	Yes
	LOAs are being developed with neighbouring ANSPs, including the MoD	
	b) Impact on VFR Routes.	Yes
	The sponsor has addressed the objections from the GA community and MoD through airspace redesign and LOAs.	
	c) Consequential effects on procedures and capacity, i.e. on SIDs, STARs, holds. Details of existing or planned routes and holds.	N/A
	d) Impact on airfields and other specific activities within or adjacent to the proposed airspace.	Yes
	The sponsor has addressed the objections from the GA community and MoD through airspace redesign and LOAs.	
	e) Any flight planning restrictions and/ or route requirements.	N/A
5.2	Does the change sponsor consultation material reflect the likely operational impact of the change?	Yes

Case study conclusions – to be completed by SARG project leader		No
Has the change sponsor met the SARG airspace change proposal requirements and airspace regulatory requirements above?		Yes
<ul style="list-style-type: none"> The Sponsor has demonstrated an understanding of the operations of a TDA complex and has established strong relationships with adjacent airspace users to mitigate impact. The OSC has been approved for the operations proposed. The discussions that have taken place between the Sponsor and the MoD and GA community has shown the Sponsor is keen to consider the impact on others and have presented a coherent and well thought out argument with a clear operational purpose. 		
RECOMMENDATIONS/CONDITIONS/PIR DATA REQUIREMENTS		
<p>Are there any Recommendations which the change sponsor should try to address either before or after implementation (if approved)? If yes, please list them below.</p> <ul style="list-style-type: none"> The LOA detail procedures at para 22 to enable information regarding the status of the TDA to be passed by Bristow to non-participating aircraft in the event the UAS is airborne and the DAAIS provision is in the process of being transferred to Caernarfon should RAF Valley require to close unexpectedly. The UAS operators are not trained FISOs and therefore under the current provision of a DAAIS are not able to offer this service. The ACP Sponsor is keen to develop this capability as part of their trial but are do not currently have any robust evidence to show that they can meet an acceptable alternative. It is therefore a condition of this approval that the LOA be revisited and para 22 be removed. It is a condition of this ACP approval that if Caernarfon do not receive an expansion of their licence to sufficiently cover the OA1 and 2 in time for the activation of the TDA from 08 Apr then in the event that RAF Valley are not able to offer a DACS provision, the DAAIS will be provided by London Information. An amendment to the LOA will be required in this instance. A condition is being placed that the use of OA1 and OA2 is predicated on the ability for RAF Valley, Caernarfon or London Information providing a DAAIS. For the periods that these entities cannot provide a DAAIS then the OA1 or OA2 areas shall not be used. During the engagement with the GA community with respect to OA3 a LOA was reached in order to mitigate the impact of the TDA design between the Sponsor and BGA BHGA and the GAA. This was in lieu of the OSC being approved for operations to be conduction within a TDA that was of a design not contiguous with the ground. The OSC has been approved to allow such an airspace design in this instance and therefore negates the requirement for such an LOA to be considered. The removal of this LOA does not change the intention behind the LOA. It is a condition of this approval that the Sponsor communicates the nullity of the LOA to the 		Yes

signatories.	
<p><i><u>GUIDANCE NOTE:</u></i> 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>	
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><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 observe</u> any condition(s) contained within the regulatory decision; failure to do so <u>will usually</u> result in the approval being revoked. Conditions should specify the consequence of failing to meet that condition, whether that be revoking the ACP or some alternative.</p>	
Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below.	Yes
<p><u>GUIDANCE NOTE:</u> PIR data requirements concerns any specific data which the change sponsor <u>must</u> collate post-implementation, if indeed the airspace change proposal is approved. Please use this section to list any such requirements so that they can be captured in the regulatory decision accordingly.</p> <p>Safety Data – incidents related to the airspace design</p> <p>Service provision/resource issues</p> <p>Infringement Statistics</p> <p>Traffic figures – usage</p> <p>LOA – confirmation of level of use</p> <p>Impact on MoD</p> <p>Stakeholder feedback</p>	
General summary	

The sponsor is proposing to establish a TDA to facilitate trials for innovative technologies in order to support the next stage BVLOS operations and support SAR operations.

Comments and observations

The TDA forms one part of a phased approach to developing BVLOS operations outside segregated airspace. The Sponsor has a history of operating BVLOS within TDAs in a similar environment and has operated in support of SAR operations. The Sponsor intends to develop a robust safety case and documentary to move forward in their stages and develop the argument for incorporating a TMZ. BHL are keen to engage with the Innovations Team to understand the requirements and way forward to support unsegregated operations.

Operational assessment sign-off	Name	Signature	Date
Operational assessment completed by Technical Regulator			25 Feb 21
Manager Airspace Regulation Comment/Decision	Name	Signature	Date
			25/02/2020

Manager Airspace Regulation Comments: I accept the rationale for a TDA in support of this trial. Currently TDA is the means by which the CAA segregates BVLOS UAS operations from other Class G users. TDA cannot however be the medium to long-term way of facilitating BVLOS UAS operations in Class G because of the constraints (albeit temporary) they place on other Class G users, they are unlikely to facilitate all the types of BVLOS operation the operators would like to undertake in Class G and, ultimately, the number of BVLOS TDA that can be approved or active at any one time will be self-limiting. I am supportive of this trial because it is ultimately about BVLOS getting out of TDAs in Class G. It was also good to see the sponsors of a trial TDA for BVLOS UAS demonstrate an openness to been influenced and amend their proposal to help mitigate some of the impact.

