

## CAA Operational Assessment

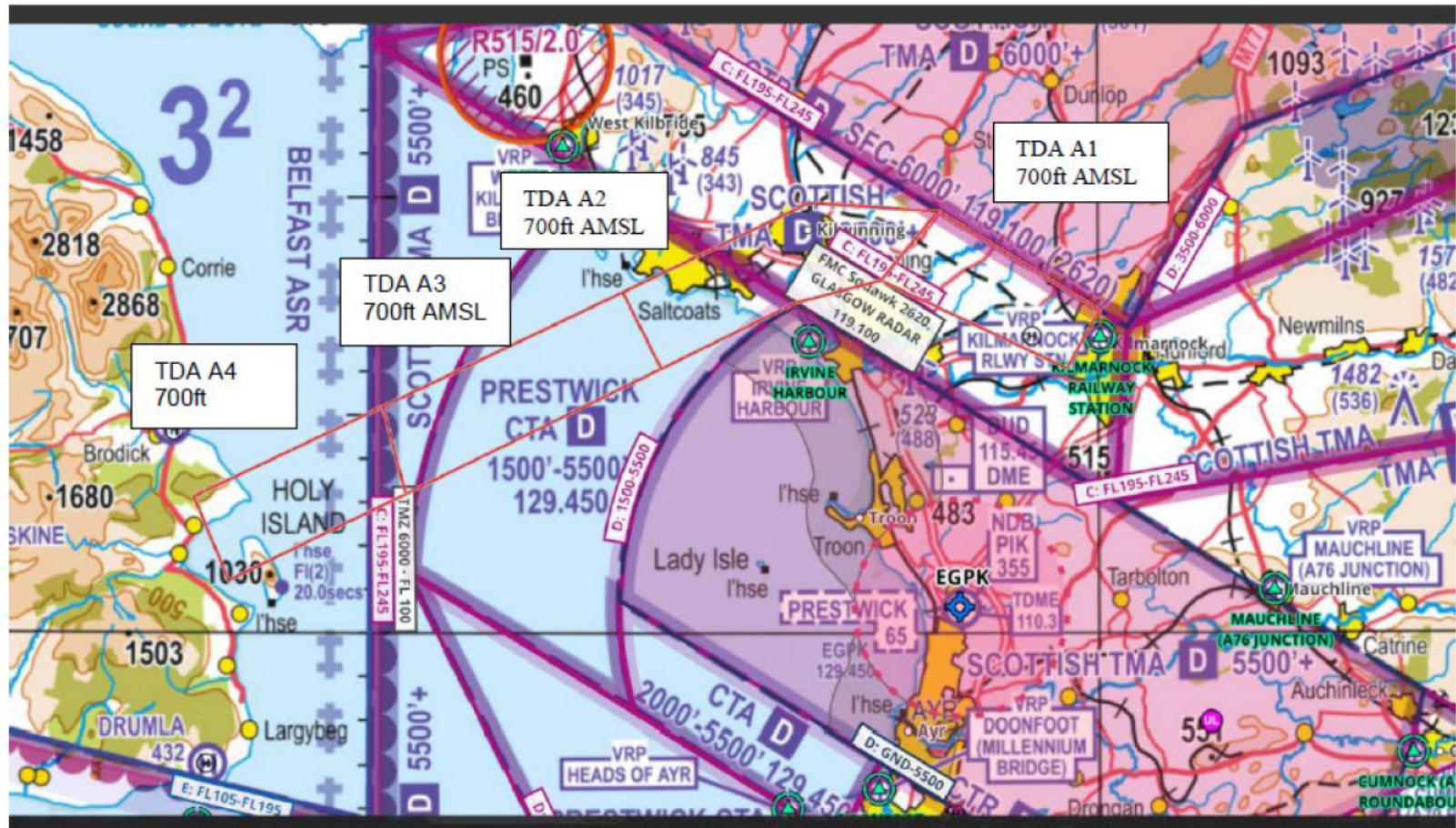
Title of airspace change proposal	CAELUS Trial C – Ayrshire and Arran
Change sponsor	AGS Airports Ltd
Project reference	ACP-2022-103
Account Manager	██████████
Case study commencement date	04/01/2024
Case study report as at	06/08/2024
<p><i>Instructions</i></p> <p>In providing a response for each question, please ensure that the ‘status’ column is completed using the following options:</p> <ul style="list-style-type: none"> <li>• YES</li> <li>• NO</li> <li>• PARTIALLY</li> <li>• N/A</li> </ul> <p>To aid the SARG Lead it may be useful that each question is also highlighted accordingly to illustrate what is:</p> <p>resolved <span style="background-color: #90EE90;">YES</span> not resolved <span style="background-color: #FFD700;">PARTIALLY</span> not compliant <span style="background-color: #FF6347;">NO</span></p>	

<p><b>Executive Summary</b></p> <p>This temporary change for an airspace trial is in support of the CAELUS ConOps which looks to trial various aspects of an ecosystem that could be required to facilitate a drone service for NHS, capable of being scaled to operate nationally. The trials will aim to further understanding of the safe operations of BVLOS and indeed all airspace operations in controlled airspace while validating the important potential improvements in NHS services.</p> <p>The flights for this temporary change will be within a TDA. UAS operations will need to scale to meet the demand of the populous associated with conurbations. This temporary change enables the project to evaluate and develop the supporting systems in the round across the whole ecosystem to ensure safe and equitable integration of crewed and uncrewed operations whilst providing NHS staff valuable opportunity to understand how a service might operate and to compare across diverse geographies by working within multiple health boards in Scotland. The TDA provides the safety of flight for all airspace users with the intention to reduce the segregation as these supporting systems are validated, developed and approved by the regulator.</p>
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1.	Justification for change and options analysis (operational/technical)	Status
1.1	Is the explanation of the proposed change clear and understood?	YES
	<p>TDA complex to allow BVLOS operations between hospitals.</p> <p>The proposed activity to be undertaken will consist of a series of live flights between University Hospital Crosshouse and Arran War Memorial Hospital. The flights will take place over the course of 4 weeks with a payload provided by the NHS. The live trial will see the Skyports UAV flying for 4 weeks during the validity of the AIC (target AIC publication date 22 Aug 24) starting from 27 Aug 24 to ensure aviation stakeholders have sight of the AIC and promulgate of the activation via NOTAM.</p>	
1.2	Are the reasons for the change stated and acceptable?	YES
	<p>The flights conducted during the activation of the TDA will be used to work towards the accommodation phase of BVLOS flights in unsegregated airspace and to meet the following objectives in a safe manner:</p> <ul style="list-style-type: none"> <li>a. Demonstrate safe integrated BVLOS operations in the vicinity of commercial airport operations inside Controlled Airspace</li> <li>b. Determine level of impact for crewed aviation</li> <li>c. Demonstrate UA Remote Pilot (RP) can communicate with ATC to ensure airspace is only segregated when absolutely necessary, minimising impact to other airspace users.</li> <li>d. Demonstrate the UTM capabilities that could enable upscaling and integration in the future through adoption of technology (such as sharing of flight intent data, mission requests, conformance monitoring)</li> <li>e. Produce final report which can be used by CAA to enable a pathway to regulation.</li> </ul> <p>The following data will be gathered in order to validate success of the defined objectives and to inform any advice and recommendations to the stakeholders/regulators involved in similar trials:</p> <ul style="list-style-type: none"> <li>a. Operations fully conducted as per identified procedures. Any deviations from ideal uninterrupted flights are in agreement with pre-defined contingency procedures (e.g., rally point landing) and pose no additional risk.</li> <li>b. Record any events that would not have occurred if the UAV trial did not take place. That includes aircraft delays, refused/delayed clearances, transits of airspace.</li> </ul>	

	<p>c. Collection of feedback via interview/questionnaire by ATC and RP.</p> <p>d. Supervision of the UTM system by non-operational ATC. Collection of feedback via interview/questionnaire by ATC and RP. Confirm reliability of the system as well as accuracy/delay of the streamed data.</p> <p>e. Gather CAA feedback on the received results. Agree on acceptable repetition required to confirm the concept; agree on any acceptable changes to the processes that would bring the trial a step closer to being considered "routine operations".</p> <p>f. Calculations and data recording to determine the surveillance (non-operational) and UTM partners (Plane Finder and ANRA) systems benchmarks.</p>	
1.3	Have all appropriate alternative options been considered, including the 'do nothing' option?	YES
	The design has evolved in accordance with stakeholder feedback.	
1.4	Is the justification for the selection of the proposed option sound and acceptable?	YES
	The proposed design meets current policy for segregation of BVLOS activity – TDA in Class G. The design has evolved in response to stakeholder feedback and enables the trial activity to take place while minimising impacts on other airspace users.	





The sponsor has removed the leg which crossed the CTR to the south of Prestwick airport and now is proposing flights wholly in Class G in a TDA. The design of the sector that abuts the CTR is the same as for the previous proposal so may contain an unnecessary part to the south of the RPAS flight path.

2.	Airspace description and operational arrangements	Status
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2.1	Is the type of proposed airspace design clearly stated and understood?	YES																				
<p>The proposal for operation in TDAs is well understood and the sponsor is proposing a SUACS provided by Prestwick ATC to allow some flexible use of the TDA sectors when the RPAS is not flying in a particular sector.</p>																						
2.2	Are the hours of operation of the airspace and any seasonal variations stated and acceptable?	YES																				
<p>The sponsor has indicated that the TDA will be activated for 4 weeks between 23 September 2024 and 15 November 2024. The timings for the flights are detailed in the table below.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 25%;">AM Activation</th> <th style="width: 10%;"></th> <th style="width: 40%;">PM Activation</th> </tr> </thead> <tbody> <tr> <td><b>WEEK 1</b></td> <td><b>07:00-10:00 L</b></td> <td>OR</td> <td><b>13:00-16:00 L</b></td> </tr> <tr> <td><b>WEEK 2</b></td> <td><b>07:00-10:00 L</b></td> <td>AND</td> <td><b>13:00-16:00 L</b></td> </tr> <tr> <td><b>WEEK 3</b></td> <td><b>07:00-11:00 L</b></td> <td>AND</td> <td><b>13:00-16:00 L</b></td> </tr> <tr> <td><b>WEEK 4</b></td> <td><b>07:00-11:00 L</b></td> <td>AND</td> <td><b>13:00-17:00 L</b></td> </tr> </tbody> </table>				AM Activation		PM Activation	<b>WEEK 1</b>	<b>07:00-10:00 L</b>	OR	<b>13:00-16:00 L</b>	<b>WEEK 2</b>	<b>07:00-10:00 L</b>	AND	<b>13:00-16:00 L</b>	<b>WEEK 3</b>	<b>07:00-11:00 L</b>	AND	<b>13:00-16:00 L</b>	<b>WEEK 4</b>	<b>07:00-11:00 L</b>	AND	<b>13:00-17:00 L</b>
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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 operation is contained with the TDAs adjacent to the Prestwick and Glasgow CTR. The airports are supportive of the proposals and the sponsor has indicated that Prestwick will provide a SUACS for the TDAs in accordance with the LoA with the operator. Information has been provided about temporary procedures at Glasgow and the LoA HazID and the TOI from Prestwick that has been provided have been accepted by the CAA as appropriate.	
2.4	Is the supporting statistical evidence relevant and acceptable?	N/A
2.5	Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?	YES
	The airspace within which the activity will take place is segregated while the RPAS is in that particular sector. Prestwick ATC will be able to provide a SUACS against the known location of the RPAS.  The documentation related to the provision of a SUACS based on the position report of the RP is accepted by the CAA.	
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
	The sponsor has drafted a LoA with Prestwick that sets out the airspace management procedures to enable flexible use of TDA sectors when this airspace is not being utilised by the RPAS.  The documentation related to the provision of a SUACS based on the position report of the RP is accepted by the CAA.	
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
	The sponsor has received feedback from a number of stakeholders who utilise the airspace. The operator of Mayfield Farm airstrip had concerns about the impact on their potential operations. The sponsor has agreed to arrange their activity to enable a time window for an arrival or departure movement from Mayfield Farm and this is captured in their LoA with Prestwick:  <i>Before commencing a flight, RP will telephone Prestwick ATC. If Skyports have co-ordinated a window for a movement at Mayfield Farm, they should confirm with Prestwick ATC that the movement has departed or arrived before requesting activation of the airspace...</i>	



	Several emergency services operators raised concerns about access for CAT A traffic. The sponsor has proposed that the SUACS and associated procedures that the operator will take will mitigate this for the TDA sectors.	
2.8	Is the evidence that the airspace design is compliant with ICAO SARPs, airspace design & FUA regulations, and Eurocontrol guidance satisfactory?	YES
	The inclusion of DAs in Class G airspace to segregate the BVLOS activity is in line with the CAA's SUA policy.	
2.9	Is the proposed airspace classification stated and justification for that classification acceptable?	N/A
	No change to airspace classification is proposed.	
2.10	Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?	N/A
	No change to airspace classification is proposed.	
2.11	Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation.)	YES
	TDA complex will be published as an AIC and activated via NOTAM.	
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 sponsor has proposed a SUACS to enable the maximum use of the DAs while NOTAMed as active.	
2.13	Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?	YES
	The airspace structures are only established to a maximum of 700 feet amsl and the anticipated requirement for airspace users to access the airspace is low. The sponsor will provide a SUACS and SAAIS.	
2.14	Are any airspace user group's requirements not met?	NO
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
	Subject to RPAS Team OA.	
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

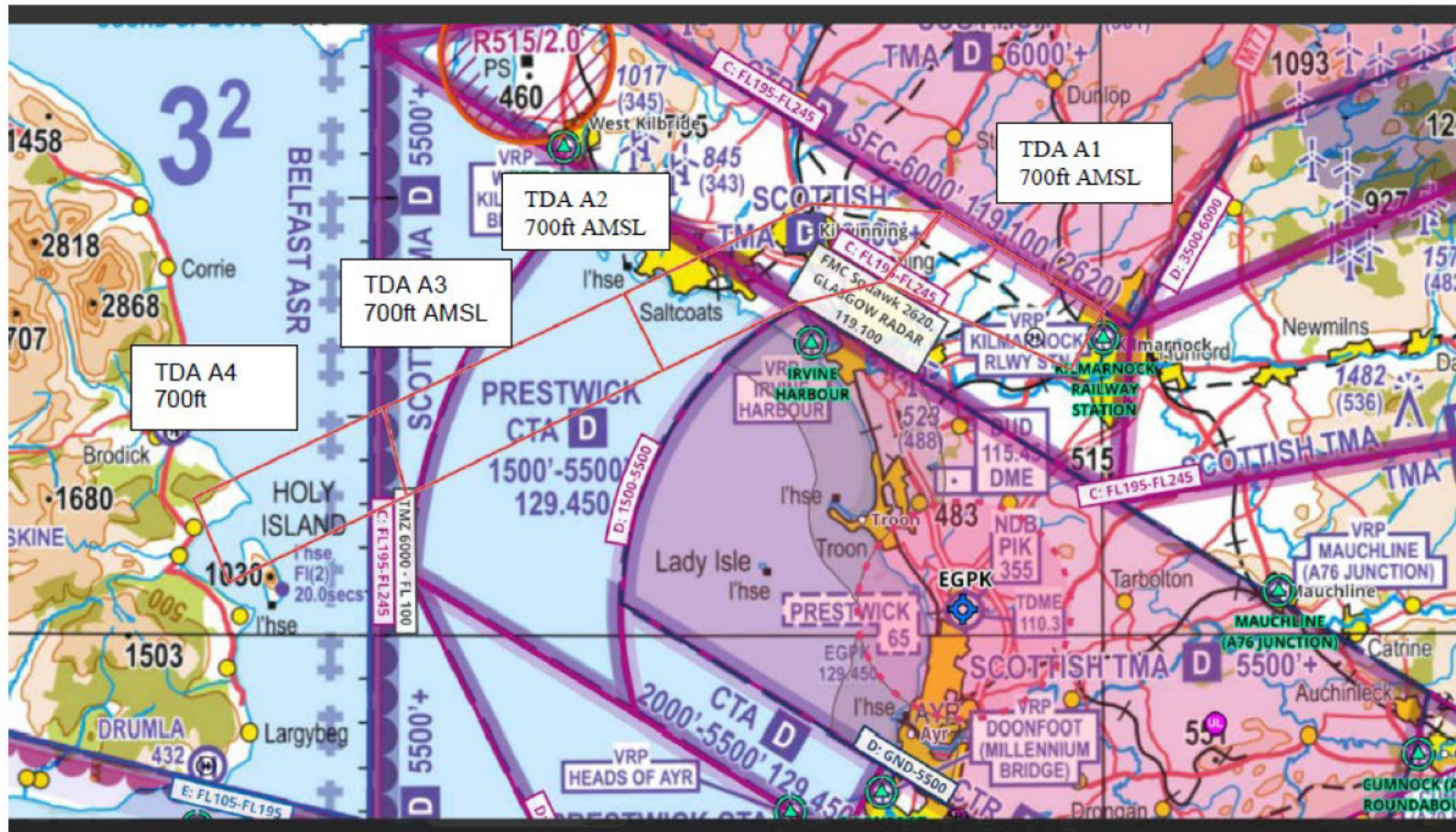


	<p>The CAA's Policy Statement <a href="#">SPECIAL USE AIRSPACE - SAFETY BUFFER POLICY FOR AIRSPACE DESIGN PURPOSES</a> requires that activity contained in a DA that includes Unmanned Aircraft System Beyond Visual Line of Sight (BVLOS) with an Indicated Airspeed (IAS) of 150 KTS or less, contain a buffer between the DA and TMA, CTR or CTA of 3nm and 2,000ft.</p> <p>A dispensation from the policy requirements has been requested by the sponsor. The mitigations provided by the sponsor are acceptable to ensure that the hazard is contained within the SUA and that there is positive ATC management of the potentially hazardous activity. The activity shall be contained with internal buffers in accordance with current policy applied by the RPAS Team and the airspace structures are adjacent to the Prestwick CTR with Prestwick ATC as the controlling authority for that airspace. The agreed procedures developed between the ANSP and the RPAS operator are accepted as suitable by the CAA, so the dispensation should be provided.</p>	
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?	N/A
	BVLOS activity within the proposed airspace structures will be segregated from other traffic and access only enabled when the RPAS is not in that sector of the proposed airspace.	
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
	Subject to RPAS Team OA.	
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
	<p>The LoA between Skyports and Prestwick ATC should detail the operating arrangements that will apply as well as the associated TOI for Prestwick (and Glasgow).</p> <p>The documentation related to the provision of a SUACS based on the position report of the RP is accepted by the CAA.</p>	
2.21	Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?	N/A

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3.	Supporting resources and communications, navigation and surveillance(CNS) infrastructure	Status
3.1	Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:	YES
	<ul style="list-style-type: none"> <li>• <b>Communication:</b> 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?</li> </ul> ATM and RPAS content.	YES
	<ul style="list-style-type: none"> <li>• <b>Navigation:</b> 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?</li> </ul> ATM and RPAS content.	YES
	<ul style="list-style-type: none"> <li>• <b>Surveillance:</b> Radar provision – have radar diagrams been provided, and do they show that the ATS route/airspace structure can be supported?</li> </ul> ATM and RPAS content.	YES
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?	

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



Airspace volumes are described in the documentation using WGS84 coordinates. These have been plotted and match the proposed airspace in the diagram provided now that one minor error has been amended by the sponsor.

4.2	Do the charts clearly indicate the proposed airspace change?	YES



4.3	Has the change sponsor identified AIP pages affected by the change proposal and provided a draft amendment?	YES
	Proposed change will be promulgated by AIC.	
4.4	Has the change sponsor completed the WGS84 spreadsheet and submitted to the CAA for approval?	N/A

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:	
	a) Impact on IFR General Aviation traffic, on Operational air traffic or on VFR General Aviation traffic flow in or through the area.	
	Given the limited period of time that the TDA will be active for and the vertical extent from surface to 700ft AMSL, as well as the provision of a SUACS, the impact on other traffic will be minimal.	
	b) Impact on VFR Routes.	N/A
	c) Consequential effects on procedures and capacity, i.e. on SIDs, STARs, holds. Details of existing or planned routes and holds.	

	The proposed airspace is not expected to impact Prestwick airport's operation as it is wholly outside of CAS.	
	d) Impact on airfields and other specific activities within or adjacent to the proposed airspace.	
	Airfields' feedback was considered and were content with the final proposal.	
	e) Any flight planning restrictions and/ or route requirements.	
	None	
5.2	Does the change sponsor consultation material reflect the likely operational impact of the change?	YES

Case study conclusions – to be completed by Airspace Regulator (Technical)	Yes/No
Has the change sponsor met the SARG airspace change proposal requirements and airspace regulatory requirements above?	YES
<p>The sponsor has developed an airspace design in accordance with current policy on segregation of BVLOS activity using TDA sectors in Class G. The design takes into consideration feedback from stakeholders engaged as part of the process. The airspace design contained a small area that was related to a previously included route that is no longer required. The sponsor has updated the design to remove unnecessary airspace in the proposal.</p> <p>The documentation related to the provision of a SUACS based on the position report of the RP is accepted by the CAA.</p>	

RECOMMENDATIONS/CONDITIONS/PIR DATA REQUIREMENTS	Yes/No
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<p>Are there any Recommendations which the change sponsor <b><u>should try</u></b> to address either before or after implementation (if approved)? If yes, please list them below.</p>	
<p>To reduce the impact on other airspace users and in accordance with FUA principles, the sponsor should deactivate the TDAs at the earliest opportunity should they no longer be required.</p>	
<p>Are there any Condition(s) which the change sponsor <b><u>must fulfil</u></b> either before or after implementation (if approved)? If yes, please list them below.</p>	
<p>The Operational Safety Case for this activity shall be accepted and an Operational Authorisation (OA) granted prior to any NOTAMs being promulgated to activate the TDAs.</p> <p>The LoA between Skyports and Prestwick and the Prestwick and Glasgow TOIs must be accepted by ATM.</p> <p>These conditions must be fulfilled before flying can commence.</p>	
<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.</p>	

**General summary**

The sponsor has developed a complex of airspace structures to contain BVLOS RPAS activity to demonstrate the feasibility of the transport of essential medicines, bloods and other medical supplies throughout Scotland. The objectives of the trial are to:

- a) Demonstrate safe integrated BVLOS operations in the vicinity of commercial airport operations
- b) Determine level of impact for crewed aviation
- c) Demonstrate UA Remote Pilot (RP) can communicate with ATC to ensure airspace is only segregated when absolutely necessary, minimising impact to other airspace users.
- d) Demonstrate the UTM capabilities that could enable upscaling and integration in the future through adoption of technology (such as sharing of flight intent data, mission requests, conformance monitoring)
- e) Produce final report which can be used by CAA to enable a pathway to regulation.

The sponsor has proposed an appropriate structure to segregate the BVLOS activity.

The proposed structure ensure that the BVLOS activity is segregated from other airspace users, allowing the sponsor and their partners to evaluate the operations in relation to their objectives.

The likely impact of the TDA to enable the activity is low due to the altitude of the structures and the short period of time that they are to be used for (4 weeks).

Operational assessment sign-off	Name	Signature	Date
Operational assessment completed by Airspace Regulator (Technical)	[REDACTED]	[REDACTED]	06/08/2024
Principal Airspace Regulator comment / Decision	Name	Signature	Date



Operational assessment conclusions approved by Principal Airspace Regulator	[REDACTED]	[REDACTED]	08/08/2024
Principal Airspace Regulator Comments and Decision:			