CAA Environmental Assessment

Airspace Trial

Title of airspace change proposal	CAELUS Trial C – Ayrshire and Arran
Change sponsor	AGS Airports Ltd
Project reference	ACP-2022-103
Account Manager	[redacted]

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

AGS Airports Ltd (sponsor) submitted an Airspace Change Proposal (ACP) for a temporary change to airspace design to allow the delivery of a Concept of Operations (ConOps) for the transition to fully integrated Unmanned Aircraft (UA) at a national level. The sponsor intends to utilise volumes of segregated airspace in the vicinity of Prestwick Airport in the Ayrshire and Arran region to prove elements of their proposed future concept of integrated airspace allowing Remotely Piloted Aircraft Systems (RPAS) Beyond Visual Line of Sight (BVLOS) operations to transport essential medicines, bloods, and other medical supplies, as part of the CAELUS2 Future Flight Challenge project.

The proposed operations will consist of a series of flights between University Hospital Crosshouse and Arran War Memorial Hospital over the course of 4 weeks with periods of activation up to twice a day. The change sponsor states that Skyports will publish their planned flying programme 48 hours in advance showing the planned start and finish times for flying activity and the sequence of routes to be flown.

To accommodate the BVLOS flights in unsegregated airspace the change sponsor requests the activation of a complex of Temporary Danger Area (TDA) segments in

class G airspace. The TDA segments are in the form of a corridor with have vertical dimensions of surface level to a maximum of 700ft above mean sea level (AMSL) and lateral dimensions of 2-4 km. The drone will operate not above 400ft above surface level at all times.

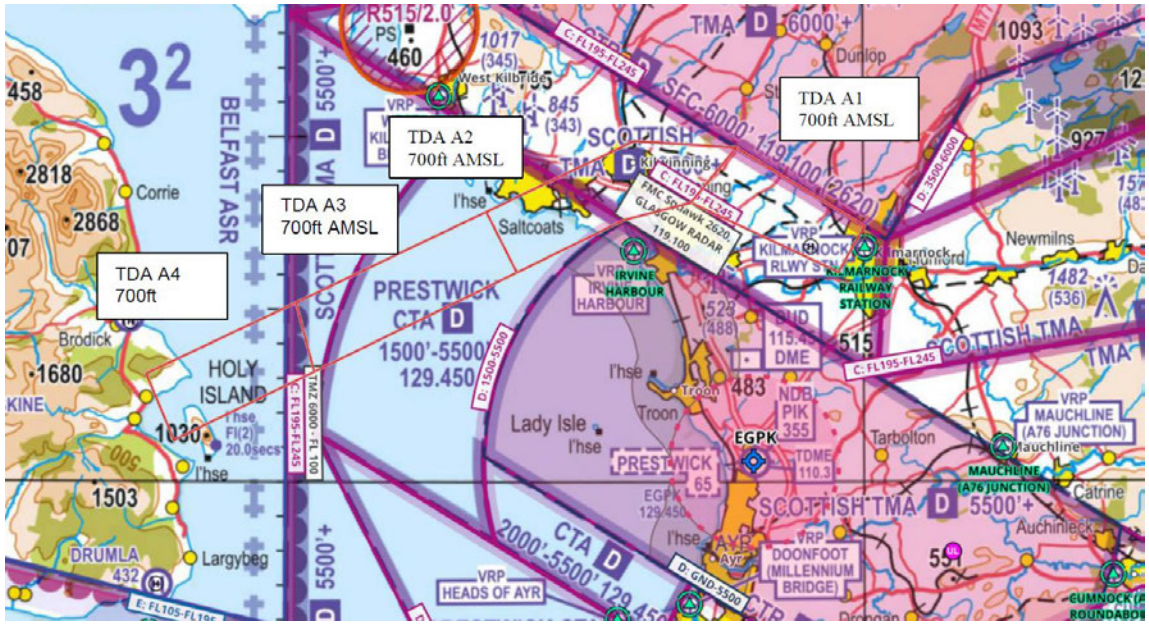

Figure 1: Proposed route with TDA segments

The RPAS will be a Swoop Kite, supplied by unmanned aircraft system (UAS) manufacturer, Swoop Aero and will be operated by Skyports DS. The UAS will be equipped with ADS-B 1090 IN and OUT, and Mode S capability.

Section 70 (2) of the Transport Act 2000 requires the CAA to take account of any guidance on environmental objectives given to it by the Secretary of State (SofS) when carrying out its air navigation functions, namely the Air Navigation Guidance 2017 (ANG 2017). For temporary changes to airspace design, ANG 2017 paragraph 2.13 requires that the CAA consider the sponsor's assessment of the noise impact before a decision on the proposal is made, unless the CAA is satisfied that the specific details of the proposal mean that this is not needed. In addition, ANG 2017 paragraph 2.3 states that in circumstances where a temporary airspace arrangement would affect the distribution of air traffic below 7,000 ft., where practicable, the communities that may be affected should be informed prior to the change being implemented. The sponsor is therefore also expected to consider the anticipated noise impacts as a result of any consequential changes on other airspace users (i.e., impacts below 7,000 ft.). CAP1616 (v4) paragraphs B81-B85 outline the environmental assessment requirements that sponsors of temporary ACPs are required to follow. Due to the short-term nature of temporary changes, there is no requirement for the sponsor to assess longer-term environmental impacts (i.e., CO2, local air quality, tranquillity, biodiversity).

2. Statement of Need		Yes/No
2.1	Does the Statement of Need include any environmental factors?	YES
	The statement of need does not include any specific environmental factors, but it identifies the adoption of UAS as an opportunity to reduce the impact of traffic congestion and CO2 emissions while transporting medical supplies.	

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 that, as per CAP 722, BVLOS RPAS operations require a certified Detect and Avoid (DAA) system. In its absence, current regulations require RPAS BVLOS flights to be contained within segregated airspace to separate them from other airspace users. The change sponsor has proposed a TDA structure to be established to provide this segregation and enable them to conduct their operations.	
3.2	Has the change sponsor adequately confirmed the effective period of the change?	YES
	Yes, the change sponsor has stated that the proposed change in the airspace structure will be required for 8 weeks, out of which 4 weeks will be used to conduct the operations with periods of activation up to twice a day. The trial's target start date is 27 August 24.	
3.3	Has the change sponsor provided sufficient details on the expected frequency of flights participating in the trial? *For trials longer than 90 days yet shorter than 12 months, sufficient details on the expected frequency (both absolute and as a percentage of total traffic during the trial period) of flights participating in the trial must be provided.*	YES
	The change sponsor plans to conduct operations over a 4-week period with periods of activation up to twice a day.	
3.4	Has the change sponsor provided sufficient details on the timing of flights participating in the trial?	YES
	The change sponsor states that Skyports will publish their planned flying programme 48 hours in advance showing the planned start and finish times for flying activity and the sequence of routes to be flown. They also mention that they will promulgate the TDA activation times by NOTAM at least 24	

<table>
<tr><td></td><td colspan="2">hours before the planned use. In the latest submission the change sponsor does not include specific information on the timing of flights.

<u>29/07/2024</u>
In the submission Doc V5 the outstanding issue was addressed.
Operations will take place over a 4-week period with periods of activation up to twice a day.
<table>
<tr><td></td><td>AM activation</td><td></td><td>PM activation</td></tr>
<tr><td>Week 1</td><td>07:00-10:00 L</td><td>or</td><td>13:00-16:00 L</td></tr>
<tr><td>Week 2</td><td>07:00-10:00 L</td><td>and</td><td>13:00-16:00 L</td></tr>
<tr><td>Week 3</td><td>07:00-11:00 L</td><td>and</td><td>13:00-16:00 L</td></tr>
<tr><td>Week 4</td><td>07:00-11:00 L</td><td>and</td><td>13:00-17:00 L</td></tr>
</table></td></tr>
<tr><td>3.5</td><td>Has the change sponsor provided sufficient details on the typical altitudes of flights?</td><td>YES</td></tr>
<tr><td></td><td colspan="2">The change sponsor has stated that the RPAS flights will be operated at a cruising altitude not above 400ft above surface level. The TDA segments have vertical dimensions of surface level to a maximum of 700ft above mean sea level (AMSL).</td></tr>
<tr><td>3.6</td><td>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?
For trials longer than 90 days yet shorter than 12 months, operational diagrams that illustrate the estimated overflight swathe of trial traffic, up to 7,000 feet must be provided.
The diagrams should be of sufficient detail for those affected to identify where they live in relation of the changes in traffic pattern.</td><td>YES</td></tr>
<tr><td></td><td colspan="2">Considering the latest submitted documentation (Final Submission, Doc V4 – July 24) the change sponsor describes that there will be no change to established aircraft routes below 7000ft and no change to existing promulgated airspace holds or VFR reporting points.
A Temporary Operating Instruction (TOI) will be in place for Prestwick ATC and Letters of Agreement will be held between Prestwick ATC and the UAV operator (Skyports). Prestwick ATC will provide a Special Use Area Crossing Service (SUACS); Prestick ATC may permit other aircraft to access the TDA segments subject to known status of the activity within it and the relevant TOI and LOAs.
In the event of an aircraft in emergency/priority flights or infringement of CAS by unknown aircraft, the ATCO will follow the procedures as set out in the TOI which will be approved by the CAA Aerodrome Inspector. It is acknowledged that the approval of this ACP will be conditional upon the approval of the of the TOI.
The time of activation of the TDA will be notified by NOTAM at least 24 hours in advance of the RPAS operations.
The change sponsor has provided high level operational diagrams of the proposed route overlaid on maps allowing very high-level identification of likely</td></tr>
</table>

	exposed noise receptors, along with population density charts to demonstrate the level of impact.	
3.7	Has the change sponsor adequately provided an assessment of noise impacts? *For trials of 90 days or less, typical noise levels at key locations must be provided.* *For trials longer than 90 days yet shorter than 12 months, LAmax footprints illustrating the loudest and most frequent types of aircraft that will be participating in the trial must be provided:* • *65 dBA Lmax footprints for noise from day flights (0700 to 2300)* • *60 dBA Lmax footprints for noise from night flights (2300 to 0700).* *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).* *For trials extending beyond 12 months, noise assessments using annualised noise metrics must be provided.*	YES
	The change sponsor has provided typical noise data for the Swoop Kookaburra Mk III RPAS. The UAS to be used in respect of this ACP is the next generation Swoop aircraft, the Kite which the sponsor has indicated is designed very similarly to the Kookaburra (fixed-wing, Vertical Take-off and Landing (VTOL) and noise impacts are considered to be similar. On this basis, the sponsor indicates that the noise levels (maximum spot point noise levels, L_{ASmax}) from the RPAS are expected to be: • 76dB L_{ASmax} during take-offs and landing (86dB L_{ASmax} considering a noise penalty of 10 dB) • 49dB L_{ASmax} during cruising at a height of 200ft above ground level (59dB L_{ASmax} considering a noise penalty of 10 dB) The noise penalty has been added to take account of tonal frequencies associated with multi-rotor UAS in line with CAA guidance. The sponsor states that the UA is a hybrid-powered lift transitional platform which takes off and lands vertically and under normal circumstances will cruise at a height of 400ft above ground level. Typical L_{ASmax} at this altitude have not been provided, however, taking into account the reduction of sound intensity over distance, the predicted noise level on the ground is likely to be less than 59dB L_{ASmax}, considering the noise penalty. The sponsor mentions that take-off and landing, which constitutes the most impactful part of the operation in terms of noise, typically takes 17.57 seconds at standard climb/descend rate, and 8.98 seconds at maximum climb/descend rate. In the final submission, the change sponsor has provided maps with the proposed RPAS route plotted on population density charts to illustrate the take-off, landing and routing of the RPAS (Figure 2) and maps showing the identified noise sensitive receptors near the TOLPs (Figures 3 to 5). However, there are inconsistencies in the document the sponsor needs to address, such as alignment between text and numbering of figures, pointing out the correct position of the TOLPs and referring to information only relevant to this final version of the ACP.	

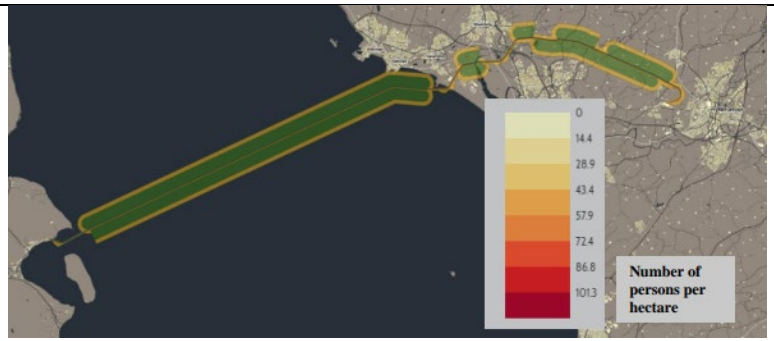

Figure 3: Population density map with flight routes overlaid

- The Arran TOLP is shown to be located in a field next to the Arran Outdoor Centre (Figure 3). The nearest noise receptors are identified as residential buildings approximately 65 m to the west and 75-80 m north of the TOLP.

Figure 3: Arran TOLP (Field Near Arran Outdoor Centre) and distance from nearest sensitive noise receptors (left) and arrival/departure route to/from Arran TOLP (right) Note that the red dot on the right figure does not point out the position of the TOLP indicated on the left figure.

- The Crosshouse Hospital TOLP is located on NHS hospital grounds (Figures 4 and 5), which implies it is close to sensitive noise receptors. The sponsor states that there is a need for the UA to take-off and land as close to the hospital as possible to facilitate medical delivery for the NHS. To reduce the noise impact on patients and members of the public, the sponsor has indicated two options for the TOLP. One location (Figure 4) is within a field at the back of the hospital (Option 1) and the other (Figure 5) is on a private land approximately 200m NW of option 1 (Option 2). For option 1, while the change sponsor has identified in previous submissions noise sensitive receptors, providing information on the distance, in the latest submission no such information is included. Based on the proposed location and information from previous submissions, the closest

noise receptors are residential buildings in a distance approximately 135-275 m away from the TOLP. For option 2, the change sponsor has identified as closest noise receptors farm buildings in a distance approximately 60m (although the approximate distance is not indicated in the submitted document). Although close to the TOLP the change sponsor indicates that the farm buildings are owned by the landowner of the field, who is therefore aware of the operations and has provided permission. Other buildings close to the TOLP include farm, residential and hospital buildings, approximately 155-180m from the TOLP.

Figure 4: Crosshouse hospital - arrival and departure route to/from Crosshouse hospital TOLP (left), Option 1 TOLP (red circle) (middle), sensitive noise receptors and distance from TOLP (right) (image was submitted in previous version-used here for distance reference purposes – it is not included in the latest submission)

Figure 5: Crosshouse hospital TOLP, Option 2 TOLP and identified noise receptors and distance from TOLP (no information on how they will approach the TOLP is provided)

The sponsor does not provide information to support whether they have informed the noise receptors mentioned above about the expected noise levels. For Crosshouse hospital option 2 the change sponsor mentions that they have permission from the landowner but does not provide information to indicate that they have informed them on the anticipated noise levels.

Consequential impact from other airspace users has not been assessed by the change sponsor but is likely to be minimal (see Question 3.6).

29/07/2024

In the submission Doc V5 the outstanding issues were addressed.

Chapter 5 (Environmental and Noise Impacts) was amended to provide clarity on the below points:

- Inconsistencies in the document, such as alignment between text and numbering of figures, pointing out the correct position of the TOLPs and referring to information only relevant to this final version of the ACP (par. 33, fig.4, fig.5, par.35)

Figure 6: Arran TOLP (Field Near Arran Outdoor Centre) and distance from nearest sensitive noise receptors (right) and arrival/departure route to/from Arran TOLP (left)

- Information on the distance of noise receptors from TOLPs is included in the documentation.
- Arrival and departure route to/from Crosshouse TOLP is provided for both options.

Figure 7: Crosshouse hospital - arrival and departure route to/from Crosshouse hospital TOLP Option 2 (right), Option 1 TOLP (red circle) (left) and Option 2 TOLP (red circle) (middle) with identified sensitive noise receptors and distance from TOLP

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
	The change sponsor presented their rationale on noise impacts in the document '*Final Submission, Doc V4 – July 24*' – Chapter 5. Environmental and Noise Impacts. The sponsor indicates the typical noise levels from the RPAS and qualitatively describes the changes in traffic patterns, providing details of the frequency of flights and typical altitudes. Also, the change sponsor provides operational diagrams showing the proposed flight routes and states that the flights were designed in a way that minimised noise in the area of operations. The sponsor concludes that they do not envisage any adverse impact due to small noise footprint and short span of time of operations. Affected communities in close proximity to the RPAS TOLPs areas can identify their location in the provided images. The sponsor has also identified sensitive noise receptors in close proximity to the RPAS TOLPs that are likely to be exposed to noise levels; however, the sponsor hasn't provided information to suggest that they have all been informed about the potential noise disturbance (see Question 3.7). However, there are inconsistencies in the way the information is included in the document and the sponsor must amend it for clarity (see Question	

	3.7). **29/07/2024** In the submission Doc V5 the outstanding issues were addressed (see Question 3.7).	
4.2	Summary of anticipated noise impacts from the final proposed airspace trial.	
	The change sponsor has indicated the following typical noise levels from the proposed UAS operations (based on proxy UAS Swoop Kookaburra Mk III UA (fixed-wing VTOL): • 76dB L_{ASmax} during take-offs and landing (86dB L_{ASmax} considering a noise penalty of 10 dB) • 49dB L_{ASmax} during cruising at a height of 200ft above ground level (59dB L_{ASmax} considering a noise penalty of 10 dB) The change sponsor mentions that take-off and landing, which constitutes the most impactful part of the operation in terms of noise, typically takes 17.57 seconds at standard climb/descend rate, and 8.98 seconds at maximum climb/descend rate. The sponsor states that under normal circumstances the RPAS will cruise at an altitude of 400ft above ground level. Typical LAS_{max} at this altitude have not been provided, however, considering the reduction of sound intensity over distance, the predicted noise level on the ground is likely to be less than 59dB LAS_{max}, (including addition of a 10dB noise penalty to adjust for tonal characteristics associated with multi-rotor UAS). The change sponsor has overlaid the operational diagrams of the proposed RPAS routings on population density charts to demonstrate the RPAS take-offs, landings and tracks have been designed to minimise overflight of populated areas. Also, the sponsor has identified most noise receptors in close proximity to the RPAS TOLPs (as described in 3.6) that are likely to be exposed to noise levels but has not provided evidence to support that they have been informed about the likely noise impacts. The change sponsor must amend the latest submission to ensure clarity and amend inconsistencies in the way the information is included in the document and include information only relevant to this version of the ACP. Considering the provided information, the noise levels, the duration of the change, the low volume of flights and the distance of the TOLPs from the nearest noise receptors it is unlikely that noise receptors will be subject to noise levels in excess of 65 dB LAS_{max}. Consequential noise impact from other airspace users has not been assessed by the sponsor but this is likely to be minimal given the duration of the trial and the proposed mitigation measures. **29/07/2024** In the submission Doc V5 the outstanding issues were addressed (see Questions 3.4 and 3.7).	

5. Compliance with relevant policy and guidance from Government or the CAA		Status
5.1	**Has the change sponsor satisfied all relevant policy and/or guidance, with regards to environmental impacts of the proposed airspace change?** *Notably, has the change sponsor complied with the environmental requirements in:* • *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;* • *CAP1616a: Airspace Change: Environmental requirements technical annex;* • *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.* **If a change sponsor has not complied with any aspect of those documents, have they provided a rationale and is it reasonable?**	PARTIALLY
	There are two conditions the sponsor must fulfil either before or after the implementation of the ACP (if approved) – see Question 6.2. Once the conditions are fulfilled, the sponsor will have satisfied all relevant policy and/or guidance regarding the environmental impacts of the proposed airspace change	

6. Recommendations/Conditions		Status
6.1	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. ***GUIDANCE NOTE:*** *Recommendations are something that the change sponsor **should try** 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.*	No

6.2	Are there any Condition(s) which the change sponsor **must fulfil** either before or after implementation (if approved)? If yes, please list them below. ***GUIDANCE NOTE:*** *Conditions are something that the change sponsor must fulfil either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors must observe any condition(s) contained within the regulatory decision; failure to do so will usually result in the approval being revoked.*	Yes
	Yes, the sponsor must fulfil the following conditions either before the implementation of the ACP (if approved): • The sponsor is required to convey the environmental impacts of the proposed change to any communities that may be affected by the ACP, especially the ones close to the take-off and landing points, where the noise impacts are expected to be more significant, prior to the change being implemented (if approved). • The sponsor should monitor and report to the CAA on complaints associated with the ACP once it has been implemented (if approved).	

Environmental assessment sign-off	Name	Signature	Date
Environmental assessment completed by Airspace Regulator (Environment)	[redacted]	[redacted]	08/07/2024
Environmental assessment approved by Principal Airspace Regulator	[redacted]	[redacted]	08/07/2024