

# CAA Decision Log – Temporary Spaceport ACP

Airspace Change Proposal Title	Virgin Orbit Flight from Spaceport Cornwall (Southern TDA) Limited CAA Decision.
Airspace Change Proposal Reference	ACP-2021-031
Change Sponsor	Virgin Orbit UK Ltd
AIS Submission Target Date	12 Aug 2022
CAA Decision Target Date	12 Aug 2022
<p><i>Instructions</i></p> <p>In providing a response to each question and/or status, the following colour coding should be used:</p> <ul style="list-style-type: none"> <li>• <b>COMPLIANT</b></li> <li>• <b>NOT COMPLIANT/ACTION REQUIRED</b></li> <li>• <b>ISSUE/CONCERN TO HIGHLIGHT</b></li> <li>• <b>NOT APPLICABLE</b></li> </ul>	
Executive Summary	
<p><b>Background</b></p> <p>Virgin Orbit (<b>VO</b>) is a launch operator, which is seeking to achieve the first rocket launch to space from the UK this year, departing from Spaceport Cornwall. The system comprises a carrier aircraft (a modified B747 known as Cosmic Girl) and a rocket (known as Launcher 1 (<b>L1</b>)) carried on the fifth pylon of Cosmic Girl. The launch of L1 is proposed to be conducted within five temporary DAs in the SHANNON, SHANWICK, MADRID, LISBOA, and SANTA MARIA and CANARIAS Flight Information Regions (<b>FIRs</b>) / Upper Information Regions (<b>UIRs</b>) and the Shannon Oceanic Transition Area (<b>SOTA</b>). The temporary DAs are needed to provide a suitable airspace construct that covers the site of the VO launch and recovery. The temporary DAs are planned to be activated on one occasion, for a duration of approximately 1-2 hours. The launch will occur post 2200 UTC to minimise its impact on other airspace users within the region. The target launch date is not before 6 October 2022 with backup dates of 7 and 8 October 2022.</p>	

## Scope of the CAA's Decision

The Aeronautical Information Regulation and Control (**AIRAC**) is a 28-day cycle that manages the updating of aeronautical information globally. The days that information changes become operational (known as effective days) are internationally pre-determined.

The proposed operation requires aeronautical information to be published by Irish, Spanish and Portuguese National Aviation Authorities (**NAA**s) in their respective Aeronautical Information Publications (**AIP**s). The UK CAA has assessed the proposed airspace design in accordance with its functions, duties and published process for considering a temporary airspace change of this nature in airspace managed by the UK. The other NAAs will consider the CAA's assessment before deciding to promulgate the airspace design proposed by the sponsor and considered in this assessment.

In accordance with the AIRAC publication cycle, a launch date in October would require an application for the coordinates associated with the airspace change to be submitted by 12 August 2022. This would result in the publication of the coordinates in the relevant AIPs on 22 September 2022, enabling activation by Notice to Aviators (**NOTAM**) for a launch in October 2022.

In order to meet these internationally recognised timeframes for a target launch date in October 2022, the CAA has conducted a Limited Operational Assessment of the temporary Airspace Change Proposal (**ACP**). ***The CAA's airspace regulation assessment at this stage is confined to the safety of the structure and dimensions of the proposed temporary ACP (i.e. whether the proposed airspace construct is sufficient from a safety perspective to contain any hazards, for both nominal and non-nominal events, and thereby maintains a high standard of safety).*** At this stage and for the purpose of this limited assessment, the CAA has not considered any other aspects it would normally consider before agreeing or not to a proposed temporary ACP such as the operational procedures of the launch (notification, activation and management).

Further analysis and engagement activity is being carried out by the sponsor in relation to those elements. This assessment only relates to the dimensions of the temporary DAs. At a later date, when that further work has been provided to the CAA, the CAA will assess whether the dimensions of the temporary DAs remain fit-for-purpose and whether activation of the temporary DAs can be approved/recommended. Before making any decision to activate/recommend activation, the CAA will consider all the aspects of the proposal including its impacts.

Where material provided to the CAA after this assessment results in any changes needed to the structure and dimensions of the temporary ACP, the CAA will withdraw any decision made as a result of this assessment and will consider the proposed structure and dimensions afresh in a new decision.

## Safety Assessment

On the basis of the material reviewed by the CAA and the operation as understood by the CAA, the CAA is satisfied that the structure and dimensions are sufficient to contain any hazards, for both nominal and non-nominal events, and therefore that the temporary DAs are suitable from a safety perspective.

## Conclusion

It is recommended that the structure and dimensions of the temporary DAs be approved by the CAA/recommended to the relevant NAAs for notification noting the conditions as set out in Section C.2. A further decision is required before any activation of the temporary DAs can take place.

PART A – Airspace Change Process	
A.1	<a href="#">Virgin Orbit Airspace Change Portal Site</a>
A.2	Virgin Orbit CAA SharePoint site
A.3	<p><i>Insert a summary of the change sponsors’ progress through the regulatory process.</i></p> <p>The sponsor initially submitted a Statement of Need (SoN) in June 2021 and subsequently updated the SoN in October 2021 following the assessment meeting held in July 2021. The change to the SoN was as a result of discussions about progressing two separate airspace designs (one for a northern trajectory and the other for a southern trajectory) and the associated risks with the original approach. Therefore, the southern trajectory was progressed independently in this ACP. The northern trajectory ACP was formally withdrawn in May 2022.</p> <p>Following the assessment meeting, the sponsor commenced a period of preliminary engagement to gauge the impact on airspace users and airspace managers between 30 August and November 2021. A period of formal engagement was undertaken between 10 September and 15 November 2021 with key stakeholders such as NATS, MoD, Eurocontrol, the Irish Aviation Authority, the Portuguese Space Agency, Airlines UK, the Maritime and Coastguard Agency and the Irish Coastguard.</p> <p>Further engagement has taken place since 10 February 2022 due to a number of changes to elements of the proposal which have been the result of ongoing stakeholder feedback, CAA assessment and international engagement activity by the UK Government. Changes to the dimensions of the original temporary DAs, addition of new temporary DAs, notification processes and management of the airspace have all been impacted.</p> <p>The sponsor has engaged with key stakeholders (NATS, Ministry of Defence (<b>MoD</b>), Eurocontrol and the Irish, Spanish, France and Portuguese NAAs) in weekly planning meetings since 14 Jun 2022 that will be continued until the launch.</p>
A.4	<p><i>Are there any additional process requirements of the Civil Aviation Authority (Air Navigation) Directions 2017 (as amended) (the “Air Navigation Directions”) and/or the Air Navigation Guidance which apply to this airspace change, and have they been complied with?</i></p> <p>Not applicable.</p>
PART B – Airspace Change Process – STAGE 5	
B.1	<p><b>Approval Status for SME Regulatory Assessments</b></p> <p><b>NOTE: this captures RAG status only – full details contained within each of assessment (hyperlinks inserted below)</b></p>

<b>Space Safety Analysis</b>	<i>APPROVED</i>	<b>Operational</b>	<i>APPROVED</i>
<b>Engagement</b>	<i>NOT APPLICABLE</i>	<b>Environmental</b>	<i>NOT APPLICABLE</i>
<b>Aerodrome</b>	<i>NOT APPLICABLE</i>	<b>ATM Safety</b>	<i>NOT APPLICABLE</i> <i>ATM aspects are addressed in launch licence application and Airspace Regulation will review that assessment before making any secondary decision to approve/recommend the temporary DA to be activated</i>
<b>Economic Assessment &amp; Statement</b>	<i>NOT APPLICABLE</i>	<b>IFP</b>	<i>NOT APPLICABLE</i>
B.1.1	<i>Is there any other information outside of the regulatory assessments above which should be brought to the attention of the decision maker?</i> No.		
<b>B.2</b>	<b>Relevant Documents (title and hyperlinks to be inserted)</b>		
<a href="#"><u>Limited Operational Assessment</u></a>	--	--	--
<b>B.3</b>	<b>Has the relevant legal and policy framework to the airspace change process been taken into account, including:</b> <ul style="list-style-type: none"> <li>• the Air Navigation Directions;</li> <li>• the Airspace Modernisation Strategy;</li> <li>• section 70 of the Transport Act 2000;</li> <li>• the Air Navigation Guidance 2017 and any additional guidance on carrying out air navigation functions for the purpose of spaceflight activities; and</li> <li>• CAP 1616 and associated publications.</li> </ul>		<b>Yes</b>

<p>B.3.1</p>	<p>This proposal is for a temporary change to the notified airspace design. Where such changes are proposed to airspace managed by the UK a specific airspace change process in CAP 1616 applies. For the purpose of making this decision/its recommendation to the relevant NAAs, the CAA has applied this process. Formal appraisal of different options is not required but the sponsor must undertake targeted engagement with aviation stakeholders. The detailed process requirements are published in Part 1a of CAP 1616. Further, the CAA’s Policy for Permanently Established Danger Areas and Temporary Danger Areas applies to the establishment of temporary DAs.</p> <p>As per direction 7(1) of the Air Navigation Directions 2017, the CAA must consider and determine any temporary ACP in accordance with its Airspace Modernisation Strategy (CAP 1711) (AMS). In making that decision, the CAA has a duty to apply the material factors in section 70 of the Transport Act 2000.</p> <p>The AMS sets out the ends, ways and means of modernising airspace, focusing on the period until the end of 2024. The ends are derived from UK Government and relevant international policy and the ways of achieving them include new airspace design, new operational concepts and new technologies. To establish the means of delivering modernised airspace, such as the resources needed, the AMS requires industry-led working groups to draw up delivery plans, with delivery overseen by the CAA. The AMS recognises the need for UK airspace to accommodate commercial spaceflight and other new technologies that are constantly being developed.</p> <p>The AMS is currently undergoing a refresh to, among other things, place integration of all airspace users at the core of the strategy, including accommodating new types of aerial craft like drones, advanced air mobility (aerial taxis) and spacecraft. The draft AMS refresh (CAP 2298a) identifies that airspace requirements for spacecraft and launch activities will be large in order to provide suitable protection for the operation. This is likely to place restrictions on other airspace users, albeit infrequently and for relatively short periods of time.</p> <p>The Air Navigation Guidance 2017 sets out the Government’s key environmental objectives with respect to air navigation. As the temporary ACP has been submitted to facilitate a spaceflight activity, the Additional Air Navigation Guidance 2021 also applies. That guidance excludes use of the DfT’s TAG analysis tool as regards the monetisation of noise impacts, but continues to require sponsors to monetise other direct and indirect (as a result of the consequential changes on civil aviation patterns) environmental impacts (e.g. CO<sub>2</sub>). Sponsors are also not required to undertake a Cost Benefit Analysis of their options (because the potential noise impact will not be monetised using TAG).</p>
<p><b>B.4</b></p>	<p><b>CAA consideration of factors material to our decision whether to approve the change (Section 70 factors).</b></p>
<p>Maintain a high standard of safety in the provision of air traffic services</p> <p>s.70(2)(a)</p>	<p>The CAA’s primary duty is to maintain a high standard of safety in the provision of air traffic services and this takes priority over all other duties.</p> <p>Based on the Flight Safety Analysis (<b>FSA</b>) methodology applied by the sponsor, the CAA is satisfied that the proposal maintains a high standard of safety.</p> <p>The sponsor has shown that the dimensions of temporary DAs for the rocket ignition and fairing splashdown (temporary DAs 2 and 4) are sufficient to contain any risk presented by a launch, for both</p>

	<p>nominal and non-nominal events, to <math>1 \times 10^{-6}</math> or greater, which is in accordance with FAA licensing requirements, and is a risk assessment methodology which the CAA considers appropriate to assess whether the proposal maintains a high standard of safety.</p> <p>The temporary DAs between temporary DAs 2 and 4 and beyond temporary DA 4 (temporary DAs 3 and 5) provide additional protection from the launch. Their purpose is to contain debris in the event of a non-nominal event. The dimensions of temporary DAs 3 and 5 have been assessed by the CAA Commercial Space Team and been deemed appropriate to contain the <math>1 \times 10^{-7}</math> risk contours. The CAA decided that these additional temporary DAs were necessary to maintain a high standard of safety in the absence of being able to implement air traffic procedures and other mitigations within this area.</p> <p>In the context of the proposed operation and the information available at this time (and, in particular, the proposed time of day of the launch), the CAA is satisfied that mitigation to these levels provided for by the temporary DAs maintains a high standard of safety in the provision of air traffic services. These conclusions will be kept under review as more information becomes available and if the CAA's assessment of safety changes it will not approve/recommend activation of the temporary DAs.</p> <p>In terms of third-party safety risks to persons other than the owners and operators of aircraft, further consideration of those risks will be taken into account when the CAA considers whether to approve/recommend activation of these temporary DAs (once the specific launch time and dates are known).</p>
<p>Efficient use of airspace and expeditious flow of air traffic s.70(2)(a)</p>	<p>The CAA has a duty to secure the most efficient use of the airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic. The CAA considers the most efficient use of airspace to mean securing the greatest number of movements of aircraft through a specific volume of airspace over a period of time so that the best use is made of the limited resource of UK airspace. The CAA considers the expeditious flow of air traffic to involve each aircraft taking the shortest amount of time for its flight. It is concerned with individual flights.</p> <p>This temporary ACP seeks to establish five temporary DAs around the launch site (off the southern coast of Ireland) and the recovery site (off the West coast of Portugal), to enable L1 to deliver satellites into orbit. Establishment of the temporary DAs would allow L1 to be launched from Cosmic Girl from a known safe environment of pre-defined dimensions with airspace management procedures in place.</p> <p>While the temporary DAs have been designed to meet the specific requirements of the different phases of the launch activity, they will extend across large areas of the Atlantic spanning the SHANNON, SHANWICK, MADRID, LISBOA, SANTA MARIA and CANARIAS FIRs / UIRs and the SOTA. Segregating this volume of airspace for the duration of the launch (and the establishment of suitable buffers) will have impacts on other airspace users transiting the Atlantic and may require the</p>

	<p>re-routing or re-programming of flights.</p> <p>To minimise these impacts, this particular launch and flight path will be a one-time event occurring post 2200 UTC. The sponsor has utilised analysis provided by Eurocontrol to limit the launch time to coincide with the lowest amount of traffic in the NAT and committed to only activating the temporary DAs for one hour.</p> <p>Further analysis is being carried out to define the launch window. The timing of the launch will be crucial to the CAA's decision on whether to approve/recommend activation of the temporary DAs.</p> <p>Impacts on the efficient use of airspace and the expeditious flow of traffic will be taken into account when the CAA considers whether to approve/recommend activation of these temporary DAs (once the specific launch time, date and management procedures are known).</p>
<p>Requirements of aircraft operators / owners s.70(2)(b)</p>	<p>The CAA has a duty to satisfy the requirements of operators and owners of all classes of aircraft.</p> <p>Refer to row above (efficient use of airspace) regarding the impacts and mitigations on airspace users. These considerations will be taken into account when the CAA considers whether to approve/recommend activation of these temporary DAs (once the specific launch time, date and management procedures are known).</p>
<p>Interests of any other person in relation to the use of airspace s.70(2)(c)</p>	<p>The CAA has a duty to take account of the interests of any person (other than an owner or operator of an aircraft) in relation to the use of any particular airspace or the use of airspace generally.</p> <p>The sponsor has identified a number of key stakeholders for this temporary ACP and has engaged with them throughout the development of the proposal. They include: NATS, Eurocontrol, FAA, the Irish, Spanish and Portuguese Authorities, the Maritime and Coastguard Agency, Marine Management Organisation, Irish Coastguard and the North Atlantic Stakeholder Community.</p> <p>The full impacts of the proposed structures and new procedures associated with this temporary ACP on the requirements of these stakeholders is not currently known. Letters of Agreement (<b>LoAs</b>) are yet to be developed, pending additional details to be agreed by relevant stakeholders as to the notification, activation and management details of the launch.</p> <p>Impacts on the interests of these persons will be taken into account when the CAA considers whether to approve/recommend activation of these temporary DAs (once the specific launch time, date and management procedures are known). The CAA will need to be satisfied as to these matters before it can approve/recommend activation of the temporary DAs (which includes providing signed copies of any LoAs to the CAA).</p>
<p>Secretary of State guidance on environmental objectives</p>	<p>The CAA is required to take into account the Air Navigation Guidance 2017 in making its decision on</p>



<p>and spaceflight activities ss.70(2)(ca) and (d)</p>	<p>whether to approve this temporary ACP.</p> <p>In the Air Navigation Guidance 2017, the Government has set environmental objectives with respect to air navigation. These environmental objectives are 'designed to minimise the environmental impact of aviation within the context of supporting a strong and sustainable aviation sector. The objectives are, to:</p> <ul style="list-style-type: none"> <li>• limit and, where possible, reduce the number of people in the UK significantly affected by adverse impacts from aircraft noise;</li> <li>• ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions; and</li> <li>• minimise local air quality emissions and in particular ensure that the UK complies with its international obligations on air quality.'</li> </ul> <p>The proposed airspace design is not anticipated to have an adverse noise impact on the health and quality of life of the general public due to the location over sea and altitudes at which overflight is likely to occur. Other environmental impacts of the launch (i.e. CO<sub>2</sub>, local air quality, tranquillity) are deemed to be low / negligible. The environmental impacts of the launch will be taken into account when the CAA considers whether to approve/recommend activation of the temporary DAs.</p> <p>The CAA is also required to take into account the Additional Air Navigation Guidance 2017 given that the purpose of the temporary ACP is to facilitate spaceflight activity. That guidance modifies procedures as to the monetisation of noise and cost benefit analysis and noise levels. As the CAA has concluded that a noise impact assessment is not necessary and there is no requirement for a cost benefit analysis of this temporary ACP, the Additional Air Navigation Guidance 2017 is not relevant.</p>
<p>Integrated operation of air traffic services provided by or on behalf of the armed services of the Crown s.70(2)(e)</p>	<p>The CAA's duty is to facilitate the integrated operation of air traffic services provided by or on behalf of the armed forces of the Crown and other air traffic services.</p> <p>The sponsor has identified the MoD as a key stakeholder for this temporary ACP and has engaged with the MoD throughout the development of the proposal.</p> <p>The full impacts of the proposed structures and new procedures associated with this temporary ACP on the operational requirements of the MoD is not currently known. An LoA with the MoD is yet to be developed, pending additional details to be agreed by relevant stakeholders as to the notification, activation and management details of the launch.</p> <p>Impacts on the MoD will be taken into account when the CAA considers whether to approve/recommend activation of the temporary DAs (once the specific launch time, date and management procedures are known). The CAA will need to be satisfied as to these matters before it</p>



	can approve/recommend activation of the temporary DAs (which includes providing signed copies of any LoAs with the MoD to the CAA).	
Interests of national security s.70(2)(f)	The CAA's duty is to take account of the impact any airspace change may have upon matters of national security. The CAA is satisfied that the proposal has no impact on national security.	
International obligations s.70(2)(g)	The CAA's duty is to take account of any international obligations entered into by the UK and notified by the Secretary of State. No such international obligations have been notified to the CAA.	
<b>PART C – Stage 5 Recommendation</b>		
<b>C.1</b>	<b>Taking the above information into account, what is your recommendation to the decision-maker for this proposal?</b>	
C.1.1	<p><i>Insert narrative which clearly sets out the decision which is collectively recommended by the team of regulatory SMEs.</i></p> <p>The CAA has decided to approve/recommend the structure and dimension of the airspace design proposed by the sponsor. The CAA has not decided to approve/recommend activation of the airspace design which will be the subject of a further assessment and decision at a later date. The CAA has made this decision for the following reasons:</p> <p>The temporary ACP is considered to be in accordance with strategic objectives of the AMS and the draft AMS refresh. It is for a one-off launch, the first rocket launch to space from the UK this year. The CAA has concluded that the proposed airspace design (structure and dimensions) will maintain a high standard of safety for the reasons set out above. The CAA notes that the implementation of this design will have an impact on the efficient use of airspace and has noted its strategic objective in the AMS to accommodate space flight activity. While the proposal would segregate large blocks of airspace for a short period of time (a launch window of 1-2 hours), the temporary DAs represent the minimum airspace deemed necessary to contain the hazard and the launch will occur post 2200 UTC to minimise its impact on other airspace users within the region. The CAA has taken the impact on the efficient use of airspace into account when making this limited decision on the structure and dimension of the proposed airspace design. In reaching this decision, the CAA has also considered and taken our assessment of all our statutory duties as set out above into account.</p> <p>Further consideration of the CAA's statutory duties will be necessary when the CAA considers any request by the sponsor to approve/recommend activation of the temporary DAs which are the subject of this decision.</p>	
<b>C.2</b>	<b>Are there any Recommendations and/or Conditions for the change sponsor to address prior to implementation (if approved)?</b>	<b>Yes</b>
C.2.1	<i>This section will initially be populated with those recommended by the SMEs but will be updated to reflect only those which have been deemed necessary by the decision makers.</i>	

	<p><i>Recommendations are not mandatory, whereas conditions are requirements that must be met before the airspace change is activated. Conditions may include, for example, the need for all other necessary consents and approvals to be in place (such as a spaceport licence), notification and management processes, the need for inter-governmental agreements to be in place.</i></p> <ol style="list-style-type: none"> <li>1. This decision is limited to the safety of the structure and dimensions of the temporary DAs.</li> <li>2. This decision has been made on the basis of the information provided to date. If material outstanding at the time of this assessment results in any changes to the structure and dimensions of the temporary ACP or if subsequent information changes the nature of the operation such that the dimensions of the temporary DAs considered in this assessment are no longer suitable: <ol style="list-style-type: none"> <li>a. the CAA will not approve/recommend activation of the temporary DAs;</li> <li>b. a decision will be made to withdraw this decision; and</li> <li>c. a new or amended ACP proposal on the acceptable dimensions of any temporary DA will be considered.</li> </ol> </li> <li>3. In any event, a separate CAA decision is needed before activation of the temporary DAs can be approved/recommended.</li> </ol>	
<b>C.4</b>	<p><b>Are any other consents and approvals needed in order to permit the intended operation?</b></p> <p>This approval is required to enable the structures to be submitted with sufficient time for notification. Resultant activation and use of these structures will be subject to a separate CAA regulatory decision. Noting the structures described within this temporary ACP are outside of UK responsibility, these structures have been separately approval by Ireland, Portugal and Spain as required. It is important to note each State retains responsibility for approving any subsequent activation of a structure within their delegated airspace.</p> <p>In order to conduct commercial space launch activity, the sponsor (and/or its spaceport and launch operator partners) must apply for and obtain the appropriate Spaceport, Range and Launch Operator Licences from the CAA's Commercial Space Team.</p>	<b>Yes</b>
<b>C.5</b>	<p><b>Are there any other comments/observations for the decision maker?</b></p>	<b>No</b>
C.5.1	<p><i>Use this section to provide a short summary (by numbers and themes) of any correspondence that we have received directly in relation to the airspace change proposal. Relevant data can be obtained from the Airspace Specialist (Correspondence).</i></p> <p>n/a</p>	

PART D – Final Regulatory Decision – Comment/Approval			
Technical Regulator / Account Manager	[REDACTED]	[REDACTED]	12 Aug 2022
<p>Manager Airspace Regulation comments:</p> <p>Cognisant this approval is only considering the dimensions of the proposed structures and rationale for their use, I am content to recommend their submission into the Aeronautical Information Management System is approved. This approval is required to enable the structures to be submitted with sufficient time for notification. Resultant activation and use of these structures will be subject to a separate CAA regulatory decision. Noting that some of the structures described within this temporary ACP are outside of UK responsibility, these structures have been separately approved for notification by Ireland, Portugal and Spain as required. It is important to note each State retains responsibility for approving any subsequent activation of a structure within their delegated airspace.</p> <p>The dimensions of the proposed structures within this ACP bound the areas with the calculated risk contours of <math>1 \times 10^{-6}</math> and <math>1 \times 10^{-7}</math>. It is noted that the FAA routinely utilise different assured processes to mitigate risks within the <math>1 \times 10^{-7}</math> risk areas. However, at the current time, those assured processes are not developed within the UK and may be impractical to implement within the timeframe for this launch when considering the complexity of cross-border operations. This proposal therefore represents a safe alternative and is reflective of a necessary and logical approach to the introduction of a 'new type of airspace user' within UK airspace. Extraordinary collaboration with neighbouring States has been at the heart of this ACP, where further development of this ACP will be dependent upon this collaborative approach.</p>			
Manager Airspace Regulation	[REDACTED]	[REDACTED]	12 Aug 2022