

CAA Decision Log – Temporary Space Launch ACP

Airspace Change Proposal Title	Virgin Orbit Flight from Spaceport Cornwall (Southern TDA)
Airspace Change Proposal Reference	ACP-2021-031
Change Sponsor	Virgin Orbit UK Ltd
AIS Submission Target Date	N/A – AIC was published 22 Sep 2022, activation NOTAMs needed following decision.
CAA Decision Target Date	14 Nov 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"> • COMPLIANT • NOT COMPLIANT/ACTION REQUIRED • ISSUE/CONCERN TO HIGHLIGHT • NOT APPLICABLE 	
Executive Summary	
<p>Background</p> <p>Virgin Orbit (VO) 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 of a carrier aircraft (a modified B747 known as Cosmic Girl) and a rocket (known as Launcher 1 (L1)) carried on the fifth pylon of Cosmic Girl.</p> <p>This temporary airspace change proposal (ACP) is the associated airspace arrangements referred to in the various space licences required to be approved before the launch can take place. The proposal seeks to establish and/or ensure are in place five Temporary Danger Areas (TDAs) around the launch site (off the southern coast of Ireland) and the recovery site (off the west coast of Portugal), to enable L1 to</p>	

deliver satellites into orbit. Establishment of the five TDAs would allow L1 to be launched from Cosmic Girl from a known safe environment of pre-defined dimensions with airspace management procedures in place.

The TDAs have been designed to meet the specific requirements of the different phases of the launch activity. TDAs 1, 2 and 4 were originally proposed by the sponsor and TDAs 3 and 5 were further proposed by the sponsor after receiving the UK CAA's initial safety analysis.

1. **TDA 1** – The Race-Track DA (Surface (**SFC**) to Flight Level (**FL**) 400): This TDA would be established to provide protection for Cosmic Girl (with L1 attached) to fly a race-track profile with the launch being conducted on the second pass. The structure is big enough to contain the race-track manoeuvre and has an 11 nautical mile (**nm**) buffer added.
2. **TDA 2** – Rocket Ignition (SFC to Unlimited): This TDA is established to provide protection from the launch and is aimed at containing both nominal and non-nominal events. The dimensions of this TDA have been assessed by the CAA Commercial Space Team and been deemed appropriate to contain the hazard.
3. **TDA 3** – Transit TDA (SFC to Unlimited): This TDA would be established to join TDAs 2 and 4 to provide additional protection from the launch and aimed at containing debris in the event of a non-nominal event. The dimensions of this TDA have been assessed by the CAA Commercial Space Team. In the absence of being able to implement alternative air traffic risk mitigation procedures within this area, this TDA has been deemed necessary by the CAA Airspace Regulation Team and its dimensions have been deemed appropriate to contain the hazard by the CAA Commercial Space Team.
4. **TDA 4** – Stage 1 and Fairing Splashdown (SFC to Unlimited): This TDA would be established to provide protection from the debris fall from the Stage 1 and Fairing Splashdown. Its purpose is to contain the debris fall (to encompass a 6 σ statistical analysis for debris fall) with an additional 10 nm buffer applied. The dimensions of this TDA have been assessed by the CAA Commercial Space Team and been deemed appropriate to contain the hazard.
5. **TDA 5** – Stage 1 and Fairing Splashdown Continuation (SFC to Unlimited): This TDA would be established to provide additional protection from the launch and its purpose is to contain debris in the event of a non-nominal event. In the absence of being able to implement alternative air traffic risk mitigation procedures within this area, this TDA has been deemed necessary by the CAA Airspace Regulation Team and its dimensions have been deemed appropriate to contain the hazard by the CAA Commercial Space Team.

It is proposed that the five TDAs would be notified through Aeronautical Information Circulars (AICs) for a period of 90-days. **This temporary ACP is for a maximum of two take-offs of Cosmic Girl (with L1 attached) for the purpose of a single release of L1.** The sponsor will be required to identify a three-day launch window, which will consist of the planned launch date with the subsequent two days available as back updates should the launch be 'scrubbed' due to weather or technical issue.

The launch window will be notified for activation by NOTAM issued 15 days in advance. Should the launch window be missed entirely, a renewed NOTAM will be required, with a minimum of 15 days' notice. The sponsor's proposal includes an undertaking to activate the TDAs for the shortest possible time (approximately one to two hours) and to minimise the impact on other airspace users by conducting the launch late at night.

The target launch date is not before 11 November 2022 with backup dates of 12 and 13 November 2022 (these dates have been updated after the submission was received). However, VO acknowledge that these dates have operational risks so are looking for three-day launch window between the date of this decision (and/or the space licences, whichever is the later) and 6 January 2023.

Scope of the CAA's Decision

The proposed operation requires decisions on temporary changes to the notified airspace structure to be made by the UK CAA, as well as the Irish, Portuguese and Spanish National Aviation Authorities (NAAs) within their respective jurisdictions. 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.

- For the portion of TDA 3 that is situated within airspace managed by the UK, the UK CAA has the function of deciding whether to approve the proposed airspace design in accordance with its published strategy, procedures and policy.
- For the remaining portion of TDA 3, as well as TDAs 1,2 and 4, the UK CAA's assessment includes a recommendation to the Irish, Portuguese and Spanish NAAs that they will need to consider in deciding whether to approve the airspace structure proposed by the sponsor within their managed areas. The UK CAA's assessment has been able to consider the impacts in these areas given that the proposed airspace structures are situated over the Atlantic Ocean and entirely outside in any inhabited areas.
- For TDA 5, the UK CAA has provided information as part of this assessment to enable the Portuguese and Spanish NAAs to consider the impacts of the proposed structure and decide whether TDA 5 is required (because of the absence of alternative air traffic risk mitigation procedures) and should be approved, or to enable the Portuguese and Spanish NAAs to conclude that TDA 5 is not needed (due to the availability of alternative air traffic risk mitigation procedures). We also note that unlike TDAs 1 to 4 we are unable to consider the impact of the proposed TDA 5 airspace structure on other airspace users and on communities in the area of TDA 5: although some of the potential local impacts have been highlighted in the UK CAA's assessment, most are not fully known to or understood by the UK CAA and therefore not capable of assessment by the UK CAA. Such impacts will need to be considered by the Portuguese and Spanish NAAs together with our recommendation as part of their decision on whether to approve TDA 5.

Operational Assessment

Subject to the conditions to this decision, on the basis of the material reviewed by the UK CAA and the operation as understood by the UK CAA, the UK CAA is satisfied that the structure and dimensions of the proposed TDAs are sufficient to contain any hazards in the absence of alternative air traffic risk mitigation procedures, for both nominal and non-nominal events, and therefore that the proposed TDAs maintain a high standard of safety. However, to be able to implement, manage and notify the TDAs, there are several conditions precedent that need to be placed upon any decision to approve the activation. These conditions are set out in Section C.2 of this Decision Log.

Environmental Assessment

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 launch activity taking place largely over the High Seas and the altitudes at which new overflight is likely to occur over the Madeira Archipelago and the Canary Islands. With regard to the carrier aircraft, Cosmic Girl will fly as a typical 747 aircraft following a pre-determined flight path from the launch site to TDA 1, within the parameters of current airport operations. There will be no impact to other flights below 7,000 ft. Consequential noise impacts from aircraft rerouting are therefore not anticipated. For these reasons, no noise

assessment has been required for the temporary ACP. Other environmental impacts of the launch (i.e. CO2, local air quality, tranquillity) are deemed to be low / negligible for this short-term change.

Targeted Engagement Assessment

The sponsor has conducted thorough engagement with a number of stakeholders during the development of this temporary ACP. The sponsor has selected stakeholders appropriately and clearly communicated the design and impact of the airspace constructs to them. It is clear that significant collaboration, co-ordination and engagement has been required between national and international agencies to ensure the proposal is developed in an operational and safe manner. The sponsor has responded meaningfully to stakeholders and provided mitigations where possible (such as offering to accommodate the MoD's requirements on communications planning). The UK CAA is satisfied that the proposal has met the engagement requirements of the temporary airspace change process.

The sponsor should inform the stakeholders of the decision (when published), likely impacts and changes to the initial design (included the decision to not use the northern trajectory) and what will happen next. The sponsor is required to collate, monitor and report to the UK CAA on stakeholder feedback received during the period of the TDAs. The CAA would welcome confirmation on the level and contents of any stakeholder feedback received on a two-weekly basis throughout the duration of the TDAs.

Conclusion

Subject to the conditions as set out in Section C.2, the UK CAA's decision is to approve the associated airspace arrangements (as referenced in the space licence applications) proposed by the sponsor:

That is to:

- Reconfirm the decision made in August 2022 regarding the dimensions of UK airspace required to maintain a high standard of safety (part of TDA 3).
- Save for TDA 5, reconfirm the recommendation to Irish, Portuguese Spanish NAAs made in August 2022 regarding the dimensions of airspace managed by those NAAs that is required to maintain a high standard of safety (TDA 1, 2 and 4, part of TDA 3).
- Reconfirm the recommendation to the Portuguese and Spanish NAAs made in August 2022 that TDA 5 is required to maintain a high standard of safety unless the Portuguese and Spanish NAAs decide they can mitigate the need for TDA 5 by means of alternative air traffic risk management procedures.

And:

- Decide to implement a TDA above the Safety Control Zone (SCZ) at Spaceport Cornwall and above Boscombe Down at a time and with the dimensions to be determined by the CAA.
- Decide to approve the sponsors proposal for TDA 3 to the extent it sits in UK managed airspace.
- Decide to recommend the sponsor's proposal for the remainder of TDA 3, as well as TDAs 1, 2 and 4, for approval by the Irish, Portuguese and Spanish NAAs.

- Decide to recommend TDA 5 for approval by the Portuguese and Spanish NAAs unless they decide they can mitigate the need for TDA 5 by means of alternative air traffic risk management procedures.

PART A – Airspace Change Process

A.1 [Virgin Orbit Airspace Change Portal Site](#)

A.2 Virgin Orbit CAA SharePoint site

A.3 *Insert a summary of the change sponsors' progress through the regulatory process.*

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.

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, Ministry of Defence (MoD), Eurocontrol (ECTL), the Irish Aviation Authority (IAA), the Portuguese Space Agency, Airlines UK, the Maritime and Coastguard Agency and the Irish Coastguard.

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 TDAs, addition of new TDAs, notification processes and management of the airspace have all been impacted.

The sponsor has engaged with key stakeholders (NATS, MoD, ECTL and the Irish, Spanish, French and Portuguese NAAs) in weekly planning meetings since 14 Jun 2022 that will be continued until the launch.

In order to meet the internationally recognised timeframes for a previous target launch date in October 2022, the CAA conducted a Limited Operational Assessment of the temporary ACP (August 2022). The CAA's airspace regulation assessment at that stage was 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 that stage and for the purpose of that limited assessment, the CAA did not consider 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). Approval for the publication of the airspace coordinates was granted by the UK CAA and the Irish, Portuguese and Spanish NAAs but only on the basis that the activation

	<p>of the airspace would not be approved by the relevant NAAs (and launch would not occur) until all aspects of the proposal including its impacts had been satisfactorily assessed and were the subject of a separate, further and full decision.</p> <p>Since publication of the airspace structures on 22 September 2022, weekly coordination between all key stakeholders (NATS, Ministry of Defence (MoD), ECTL and the Irish, Portuguese and Spanish NAAs) has been ongoing and has resulted in an updated ACP submission dated 28 September being assessed containing updated airspace dimensions, notification and management procedures. Further engagement has resulted in a finalised Letter of Agreement (LoA) from all key stakeholders being signed and included alongside the ACP documentation.</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>Approval Status for SME Regulatory Assessments</p> <p>NOTE: this captures RAG status only – full details contained within each of assessment (hyperlinks inserted below)</p>			
	Space Safety Analysis	APPROVED	Operational	APPROVED
	Engagement	APPROVED	Environmental	APPROVED
	Aerodrome	<p><i>ADDRESSED IN SPACE LICENCE APPLICATIONS</i></p> <p><i>This has been subject to a separate review by the UK CAA Airspace, Aerodromes and ATM (AAA) Team and assurance provided to GD SARG already.</i></p>	ATM Safety	<p><i>ADDRESSED IN SPACE LICENCE APPLICATIONS</i></p> <p><i>This has been subject to a separate review by the UK CAA AAA Team and assurance provided to GD SARG already. The ATM Team have had sight of the draft LoA.</i></p>
	Economic Assessment & Statement	<i>NOT APPLICABLE</i>	IFP	<i>NOT APPLICABLE</i>
B.1.1	<p><i>Is there any other information outside of the regulatory assessments above which should be brought to the attention of the decision maker?</i></p>			

	No.		
B.2	Relevant Documents (title and hyperlinks to be inserted)		
	Operational Assessment	Engagement Assessment	Environmental Assessment
	Virgin Orbit ACP Submission	Virgin Orbit Multi-Party LoA (Latest Version)	CAA Space Team Safety Analysis Summary Report (see Space Licensing Decision Documents)
	Virgin Orbit Traffic Analysis Report	CAA Traffic Analysis Presentation	Published AIC EG Circ 2022 Y095
	Limited Decision Log – TDA Dimensions	Limited Operational Assessment – TDA Dimensions	Assurance of VO Launch – SARG 12 Oct 22
	Letter to Portugal – Activation Review (7 Oct) (see Space Licensing Decision Documents)	Letter to Spain – Activation Review (7 Oct) (see Space Licensing Decision Documents)	AIC Extension Supplementary ACP Decision
B.3	<p>Has the relevant legal and policy framework to the airspace change process been taken into account, including:</p> <ul style="list-style-type: none"> • the Air Navigation Directions; • the Airspace Modernisation Strategy; • section 70 of the Transport Act 2000; • the Air Navigation Guidance 2017 and any additional guidance on carrying out air navigation functions for the purpose of spaceflight activities (“2021 Additional Air Navigation Guidance”); and • CAP 1616 and associated publications. 		Yes
B.3.1	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		

	<p>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 TDAs.</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.</p>
B.4	CAA consideration of factors material to our decision whether to approve the change (Section 70 factors).
<p>Maintain a high standard of safety in the provision of air traffic services</p> <p>s.70(1)(i)</p>	<p>The UK 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>The UK CAA's August 2022 decision assessed whether the proposed airspace structures will maintain a high standard of safety. The CAA's assessment has not changed since August 2022.</p> <p>Based on the Flight Safety Analysis (FSA) methodology applied by the sponsor, subject to the assessment and condition referred to below, the CAA is satisfied that the proposal maintains a high standard of safety.</p> <p>TDA 1 was proposed by the sponsor to provide protection for Cosmic Girl (with L1 attached) to fly a race-track profile, based on the proposed flight path and race-track manoeuvre with an 11 nm buffer added. The dimensions of TDA 1 are deemed suitable from a safety perspective for this purpose.</p> <p>The sponsor has shown that the dimensions of TDAs for the rocket ignition and fairing splashdown (TDAs 2 and 4) are sufficient to contain any risk presented by a launch, for both nominal and non-nominal events, to 1×10^{-6} or greater. This is in accordance with FAA licensing requirements, and is a risk assessment methodology which the CAA considers appropriate to assess whether the proposal</p>

	<p>maintains a high standard of safety.</p> <p>The TDAs between TDAs 2 and 4 and beyond TDA 4 (i.e. TDAs 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 TDAs 3 and 5 have been assessed by the CAA Commercial Space Team and been deemed appropriate to contain the 1×10^{-7} risk contours. The UK CAA's view is that these additional TDAs are necessary to maintain a high standard of safety in the absence of being able to implement alternative air traffic risk mitigation procedures within this area.</p> <p>In the context of the proposed operation and the information available, the CAA is satisfied that mitigation to these levels provided for by the TDAs maintains a high standard of safety in the provision of air traffic services.</p> <p>The UK CAA also considers that the Portuguese and Spanish NAAs may decide they can mitigate the need for TDA 5 by means of alternative air traffic risk management procedures. If they are so satisfied then the UK CAA's recommendation is that TDA 5 is not required to maintain a high standard of safety.</p> <p>The UK CAA Airspace Regulation Team's assessment of whether the proposal maintains a high standard of safety is based on the sponsor's safety case report submitted as part of the commercial space licensing process under the Space Industry Act 2018 (SIA 2018) and associated regulations. The required expertise to evaluate that evidence is held by the UK CAA's Commercial Space Team.</p> <p>The safety case assessment is currently being finalised. While this is not expected to alter the UK CAA's assessment of safety as part of this application, confirmation from the UK CAA's Commercial Space Team that the proposed dimensions of the TDAs are sufficient to contain any hazards, following completion of the full safety case, will be needed before any activation of the temporary ACP in UK airspace can occur (see conditions below).</p> <p>The assurances provided by the UK CAA's AAA Team (Aerodromes and ATM Safety) have been taken into account in making this decision.</p> <p>In order to maintain a high standard of safety, the UK CAA will implement a TDA over the Spaceport Cornwall SCZ area and over Boscombe Down. This is discussed in more detail in section C.4 of this Decision Log.</p>
<p>Efficient use of airspace and expeditious flow of air traffic s.70(2)(a)</p>	<p>The UK 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 UK 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 UK CAA considers the expeditious flow of air traffic to involve each aircraft taking the</p>

	<p>shortest amount of time for its flight. It is concerned with individual flights.</p> <p>This temporary ACP seeks to establish five TDAs 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 TDAs 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 TDAs 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 CANARIAS FIRs and the SOTA. Segregating this volume of airspace for the duration of the launch (and the establishment of suitable buffers) has potentially complex impacts on other airspace users transiting the North Atlantic (NAT) and may require the re-routing or re-programming of flights.</p> <p>The sponsor has used analysis provided by ECTL to inform the decision not to launch until post-2200 UTC in order to minimise the impact of the launch activity on the NAT. Following this initial traffic analysis, the sponsor worked with the key stakeholders (NATS, ECTL, Ireland, Portugal and Spain) to further refine the traffic analysis.</p> <p>The resulting traffic analysis shows that the impact is relatively low for the bulk of the structure. The launch activity would be conducted at a time when general aviation activity in the departure area is low and also because it would be conducted over the High Seas and deconflicted from aircraft in the NAT by the establishment of the TDAs.</p> <p>However, the analysis does not provide any detail on the second and third order impacts to traffic flows in the vicinity of the Madeira Archipelago and the Canary Islands. Such impacts will need to be considered by the Portuguese and Spanish NAAs as part of their decision on whether to approve TDA 5.</p>
<p>Requirements of operators and owners of all classes of aircraft s.70(2)(b)</p>	<p>The UK CAA has a duty to satisfy the requirements of operators and owners of all classes of aircraft. Refer to row above (efficient use of airspace) regarding the impacts and mitigations on airspace users. These considerations have been taken into account by the UK CAA October 2022 Decision.</p>
<p>Interests of any other person in relation to the use of airspace s.70(2)(c)</p>	<p>The UK 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, ECTL, FAA, the Irish, Portuguese and Spanish Authorities, the Maritime and Coastguard Agency, the Marine Management</p>

	<p>Organisation, the Irish Coastguard and the North Atlantic Stakeholder Community.</p> <p>Planning and coordination meetings have been taking place between the sponsor and key stakeholders (NATS, MoD, ECTL and the Irish, Spanish, French and Portuguese NAAs) since 14 June 2022 and will be continued until the launch. These meetings have been used to ensure that each stakeholder understands their role and the mechanics of the launch activity and the associated activation/coordination of the airspace and to discuss a draft LoA setting out the parties' understanding of the requirements placed on them before any activation of the temporary ACP, or before launch, can occur (see conditions below).</p> <p>A final draft of the Multi-Party LoA is being circulated for approval and signature from VO, CAA, 78 Squadron, Area Control Centre Shannon, NERL, ENAIRE, NAV Portugal, Spaceport Cornwall, ECTL, Irish Aviation Authority and Autoridade Nacional da Aviação Civil (ANAC). The LoA defines the coordination procedures to be applied between the parties to permit VO utilise the airspace in the proposed TDAs. It is a condition precedent of this Decision that the sponsor and key stakeholders (identified in condition 2) have agreed terms of the draft LoA. The LoA will need to be signed before any activation NOTAMs are issued (15 days in advance of any launch as agreed in the LoA) (see conditions below).</p> <p>In terms of third-party safety risks to persons other than the owners and operators of aircraft (e.g. populations on the ground, marine users), these risks are assessed by the UK CAA as part of the commercial space licensing process under the SIA 2018 and associated regulations. A licence cannot be granted under the SIA 2018 unless the UK CAA is satisfied that no further reasonable steps can be taken to reduce the risks to the health, safety and property of persons to as low as reasonably practicable (ALARP) for the operations the applicant is proposing to undertake, and the remaining level of risk is acceptable. To make this determination, the applicant is required to submit a safety case report. The UK CAA's Airspace Regulation Team has reviewed the safety case report in its assessment of the temporary ACP and will not issue the space licences unless they conclude the risk is ALARP and acceptable (and it is a condition precedent to the implementation of this Decision that the space licences have been issued).</p>
<p>Secretary of State guidance on environmental objectives and spaceflight activities ss.70(2)(ca) and (d)</p>	<p>The UK CAA is required to take into account the Air Navigation Guidance 2017.</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"> • limit and, where possible, reduce the number of people in the UK significantly affected by adverse impacts from aircraft noise;

	<ul style="list-style-type: none"> • ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions; and • minimise local air quality emissions and in particular ensure that the UK complies with its international obligations on air quality. <p>The airspace design will result in air traffic movements of the modified Boeing 747 (Cosmic Girl) associated with the take-off from Spaceport Cornwall prior to launch and any test take-off manoeuvres.</p> <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 launch activity taking place largely over the High Seas and the altitudes at which new overflight is likely to occur over the Madeira Archipelago and the Canary Islands. With regard to the carrier aircraft, Cosmic Girl will fly as a typical 747 aircraft following a pre-determined flight path from the launch site to the TDA 1, within the parameters of current airport operations. There will be no impact to other flights below 7,000 ft. Consequential noise impacts from aircraft rerouting are therefore not anticipated. For these reasons, no noise assessment has been required for the temporary ACP.</p> <p>Other environmental impacts of the launch (i.e. CO₂, local air quality, tranquillity) are deemed to be low / negligible for this temporary ACP.</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 UK 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>A final draft of the Multi-Party LoA is being circulated for approval and signature from VO, CAA, 78 Squadron, Area Control Centre Shannon, NERL, ENAIRE, NAV Portugal, Spaceport Cornwall, ECTL, Irish Aviation Authority and Autoridade Nacional da Aviação Civil (ANAC). It is a condition precedent of this Decision that the sponsor and key stakeholders (identified in condition 2) have agreed terms of the draft LoA. The LoA will need to be signed before any activation NOTAMs are issued (15 days in advance of any launch as agreed in the LoA) (see conditions below).</p>
<p>Interests of national security s.70(2)(f)</p>	<p>The UK CAA's duty is to take account of the impact any airspace change may have upon matters of national security. The UK CAA is satisfied that the proposal has no impact on national security.</p>
<p>International obligations s.70(2)(g)</p>	<p>The UK 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 UK</p>

PART C – Stage 5 Recommendation

C.1	Taking the above information into account, what is your recommendation to the decision-maker for this proposal?
C.1.1	<p>Subject to the conditions as set out in Section C.2 of this Decision Log, the UK CAA Technical Regulator recommends that the UK CAA's decision is to approve the associated airspace arrangements (as referenced in the space licence applications) proposed by the sponsor:</p> <p>That is to:</p> <ul style="list-style-type: none"> • Reconfirm the decision made in August 2022 regarding the dimensions of UK airspace required to maintain a high standard of safety (part of TDA 3). • Save for TDA 5, reconfirm the recommendation to Irish, Portuguese Spanish NAAs made in August 2022 regarding the dimensions of airspace managed by those NAAs that is required to maintain a high standard of safety (TDA 1, 2 and 4, part of TDA 3). • Reconfirm the recommendation to the Portuguese and Spanish NAAs made in August 2022 that TDA 5 is required to maintain a high standard of safety unless the Portuguese and Spanish NAAs decide they can mitigate the need for TDA 5 by means of alternative air traffic risk management procedures. <p>And:</p> <ul style="list-style-type: none"> • Decide to implement a TDA above the Safety Control Zone (SCZ) at Spaceport Cornwall and above Boscombe Down at a time and with the dimensions to be determined by the CAA. • Decide to approve the sponsors proposal for TDA 3 to the extent it sits in UK managed airspace. • Decide to recommend the sponsor's proposal for the remainder of TDA 3, as well as TDAs 1, 2 and 4, for approval by the Irish, Portuguese and Spanish NAAs. • Decide to recommend TDA 5 for approval by the Portuguese and Spanish NAAs unless they decide they can mitigate the need for TDA 5 by means of alternative air traffic risk management procedures. <p>The UK CAA Technical Regulator has made this recommendation for the following reasons:</p> <ul style="list-style-type: none"> • The temporary ACP is considered to be in accordance with strategic objectives of the AMS and the draft AMS refresh. It is for a maximum of two take-offs of Cosmic Girl for the purposes of a single release of L1, the first rocket launch to space from the UK this year. • The UK CAA has concluded that the proposed airspace design (structure and dimensions) will maintain a high standard of

	<p>safety for the reasons set out above.</p> <ul style="list-style-type: none"> • The UK 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 spaceflight activity. • While the proposal would segregate large blocks of airspace for a short period of time (a launch window of 1-2 hours), the TDAs 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 sponsor's traffic analysis shows that the impact on airspace users is relatively low for the bulk of the structure. • The UK CAA has taken into account the interests of other persons in relation to the use of the airspace. The notification, activation and management procedures have been coordinated with key stakeholders such as NATS, MoD, ECTL and the Irish, Spanish, French and Portuguese NAAs. Those arrangements are detailed in a Multi-Party LoA which will need to be signed before any activation NOTAMs are issued (15 days in advance of any launch as agreed in the LoA). • The UK CAA has taken into account the Air Navigation Guidance 2017, the Additional Air Navigation Guidance 2021 and the Government's environmental objectives with respect to air navigation. The impact on noise has been taken into account when making this decision and we have noted that the launch activity (as opposed to the take-off of and landing of Cosmic Girl) is taking place largely over the High Seas. We have also noted the altitudes at which overflight is likely to occur over the Madeira Archipelago and the Canary Islands. We have concluded that this change limits the number of people in the UK significantly affected by adverse impacts from aircraft noise. Other environmental impacts of the launch (i.e. CO₂, local air quality, tranquillity) are deemed to be low / negligible for this short-term change. <p>In reaching this decision and recommendation, the UK CAA has also considered and taken our assessment of all our statutory duties as set out above into account.</p> <p>With regard to TDA 5, the UK CAA's decision to recommend is subject to the Portuguese and Spanish NAAs advising the UK CAA TDA 5 need not be recommended because alternative air traffic risk management procedures can be put in place. Additionally, the UK CAA's recommendation that TDA 5 should be implemented does not take into account some of the potential local impacts (such as second and third order impacts to traffic flows in the vicinity of the Madeira Archipelago and the Canary Islands) because these are not fully known to or understood by the UK CAA and therefore not capable of assessment by the UK CAA. Such impacts will need to be considered by the Portuguese and Spanish NAAs as part of their decision on whether TDA 5 is necessary and if so approved. However, it is recommended that if alternative air traffic risk management procedures cannot be put in place, the UK CAA's recommendation is that TDA 5 be approved and activated.</p>	
C.2	Are there any Recommendations and/or Conditions for the change sponsor to address prior to implementation (if approved)?	Yes
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"> 1. Recommended draft Condition 1: It is a condition precedent to the implementation of the UK CAA October 2022 ACP decision (including recommendation to other NAAs) that all necessary licences under the Space Industry Act 2018 to enable the first performance of a licensed activity to take place have been granted by the UK CAA and all conditions precedent to those licences have been met. 2. Recommended draft Condition 2: It is a condition precedent to the implementation of the UK CAA October 2022 ACP decision (including recommendation to other NAAs) that NATS (in its role as Airspace Management Cell (AMC)) confirms in writing to the UK CAA that the necessary desktop exercises have been successfully completed by NATS, MoD, Eurocontrol and the Irish, Portuguese and Spanish NAAs. 3. Recommended draft Condition 3: It is a condition precedent to the implementation of the UK CAA October 2022 ACP decision (including recommendation to other NAAs) that the sponsor has obtained the appropriate approvals from the Irish, Portuguese and Spanish NAAs to accept and implement the UK CAA’s recommendation regarding TDAs 1,2,3 and 4 and regarding TDA 5 (unless the Portuguese and Spanish NAAs advise the UK CAA that TDA 5 need not be recommended by the UK CAA because alternative air traffic risk management procedures can be put in place) before any activation of the temporary ACP within UK airspace can occur. 4. Recommended draft Condition 4: It is a condition precedent to the implementation of the UK CAA October 2022 ACP decision (including recommendation to other NAAs) that the CAA’s Commercial Space Team has decided the proposed dimensions of the TDAs are sufficient to contain any hazards, following completion of the CAA’s Commercial Space Team’s assessment and agreement to the sponsor’s full safety case. 5. Recommended draft Condition 5: It is a condition precedent to the implementation of the UK CAA October 2022 ACP decision (including recommendation to other NAAs) that the UK CAA has taken the necessary steps to implement a TDA over the SCZ of Spaceport Cornwall (to a height to be determined by the UK CAA) and over MoD Boscombe down (to dimensions to be determined by the UK CAA), both for a period to be determined by the UK CAA. 6. Recommended draft Condition 6: It is a condition precedent to the implementation of the UK CAA October 2022 ACP decision (including recommendation to other NAAs) that all required LoAs have been completed and signed copies have been provided to the UK CAA Airspace Regulation Team. 	
C.4	Are any other consents and approvals needed in order to permit the intended operation?	Yes
	Other NAAs	

	<p>As set out above, the proposed operation requires decisions on temporary changes to the notified airspace structure to be made by the UK CAA, as well as the Irish, Portuguese and Spanish NAAs within their respective jurisdictions. The structures described within this temporary ACP which are outside of UK responsibility will need to be approved by Ireland, Portugal and Spain within their managed airspace. It is important to note each State retains responsibility for approving any subsequent activation of a structure within their managed airspace. As such, a condition will be placed on the UK CAA's approval of this temporary ACP which requires the appropriate approval from the Irish, Portuguese and Spanish NAAs for the proposed airspace structures within the areas managed by them (see conditions above).</p> <p>Space Licensing Approvals</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. As such, a condition will be placed on the UK CAA's approval of this temporary ACP which requires the granting of all necessary licences under the Space Industry Act 2019 to enable launch activity to take place (see conditions above).</p> <p>Safety Clear Zone (SCZ)</p> <p>It is proposed as part of the commercial space licensing application that an SCZ area will be introduced for approximately four to six hours before departure. The SCZ is for the horizontal profile of the spaceport only.</p> <p>No assessment has been carried out by the sponsor in relation to the airspace vertically above the SCZ at Spaceport Cornwall.</p> <p>The launch mission is likely to attract a significant level of interest including potentially other aircraft wishing to see what is happening on the ground at Spaceport Cornwall. There are likely to be several media outlets in the area and GA aircraft operating in the local area.</p> <p>Therefore, in the interests of public safety, the UK CAA has considered the implementation of protection and segregation above the SCZ for other airspace users while the launch mission takes place. On this occasion, if the airspace is activated, the UK CAA has decided that a TDA above Spaceport Cornwall's SCZ is needed to maintain a high level of safety. In addition, a TDA is needed at Boscombe Down to maintain a high standard of safety in the event of a diversion without launch. The UK CAA will implement these TDAs.</p> <p>Noting this is the first UK-based space launch, we acknowledge that the sponsor was not asked to assess this risk which is why a TDA above Spaceport Cornwall and Boscombe Down was not part of the associated airspace arrangements proposed by the Sponsor along with its space licences applications. We also note that future proposals for TDAs in similar circumstances will require this risk to be assessed and an appropriate airspace structure to mitigate that risk be proposed by the sponsor as part of the associated airspace arrangements for the requisite space licence applications.</p>	
C.5	Are there any other comments/observations for the decision maker?	No
C.5.1	<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</i>	

	<i>(Correspondence).</i> N/A
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PART D – Final Regulatory Decision – Comment/Approval


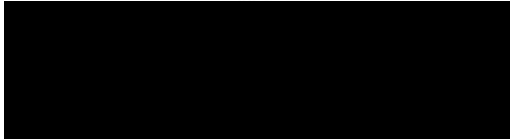
Technical Regulator / Account Manager			20 Oct 2022
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Manager Airspace Regulation comments:

This ACP reflects a complex proposition which has required significant coordination and support across NAAs to both understand the effects of the proposal and work to agreeing procedures and processes to mitigate impacts. Some of this work is still in progress and is thus reflected in the conditions proposed above.

This ACP is fundamentally based upon the establishment of a series of TDAs, to create a ‘segregated corridor’ to provide a safe airspace environment and enable a horizontal space launch. The proposed dimensions of this corridor have been informed by calculations submitted by the Sponsor and corroborated by the CAA Commercial Space Team. These calculations have described a bounded area which contain various levels of risk to other airspace users. Through the ACP process, it has been determined these areas require some form of mitigation to account for other airspace users in the event of an ‘off nominal event’. The size of this structure combined with the cross-border nature of this activity has necessarily driven a degree of complexity into this ACP and thus informed the proposed design. An understandable fact given this would be the first space launch of its type in European airspace. The proposed ACP is therefore reflective of a safe and logical approach to the introduction of a ‘new airspace user’.

It is important to note however that each State retains responsibility for approving any subsequent activation of a structure within their managed airspace. It is understood that Portugal or Spain may wish to adopt Air Traffic Management (ATM) procedures to address residual risk areas bound within the proposed TDA 5 dimensions; this may therefore not require the activation of TDA 5. These proposed ATM processes potentially mirror those used by the United States Federal Aviation Authority and likely reflect the ATM availability in that area. Cognisant of this ongoing work and subject to the imposition and acceptance of the conditions outlined above, which includes addressing for resolution the TDA 5 activation requirement prior to launch, I would recommend approving this ACP.

Manager Airspace Regulation			21 Oct 2022
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Head AAA comments:

This Temporary ACP represents the culmination of an enormous effort in collaboration across the UK aviation Industry and across Western European Authorities. Subject to imposing the conditions laid out in this document, I recommend GDSAR approves the recommended decisions in respect of this airspace change.

Head AAA	[REDACTED]	[REDACTED]	12 Nov 2022
<p>GD SAR comments and regulatory decision:</p> <p>GD SAR endorses the recommendations set out in this document and adopts the recommended decision and recommended reasons set out in Section C.1 as the CAA's decision in respect of this airspace change and the reasons for it. GD SAR endorses and imposes the conditions as set out in Section C.2.</p>			
GD SAR	[REDACTED]	[REDACTED]	14 Nov 2022