Snowdonia Aerospace Airspace Change Proposal Design Principles (Stage 1B), ACP-2019-58 Llanbedr Danger Area (DA) – Version 3

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Document Details

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Second reviewer and release authorisation		Chief Executive

Issue	Amendment Details	Date
1.0	First formal release incorporating analysis of the stakeholder engagement	5th June 2020
2.0	Updated to incorporate comments received from Stage 1 Gateway Review	3rd August 2020
3.0	Updated to include Appendix C mapping the stakeholder feedback to revised Design Principles, decisions and conclusions	14th August 2020

Executive Summary

This report documents the "Stage 1B Design Principles" element of the Snowdonia Aerospace LLP submission for an Airspace Change Proposal, Reference: ACP-2019-58, Llanbedr Danger Area (DA), under the Civil Aviation Authority (CAA) CAP1616 Airspace Change Process.

Snowdonia Aerospace LLP is continuing to progress and further develop a number of complementary business opportunities at Llanbedr Aerodrome relating to aerospace Research, Development, Test and Evaluation (RDT&E) and military aircraft training. To support these operations (and others) action is required to upgrade and formalise the current airspace around the Aerodrome as the present provision is insufficient to meet the identified future need and risks restricting opportunities that are in the strategic economic interest of the UK and Welsh governments and required to sustain long term employment in the region. Snowdonia Aerospace LLP (hereafter also referred to as the Change Sponsor) is therefore developing two Airspace Change Proposals (ACPs) to underpin these activities:

- ACP-2019-58, Llanbedr Danger Area (DA), which can be accessed online via: https://airspacechange.caa.co.uk/PublicProposalArea?pID=193
- ACP-2020-02, Llanbedr Aerodrome Traffic Zone (ATZ), which can be accessed online via: https://airspacechange.caa.co.uk/PublicProposalArea?pID=211

This document relates to the former application, ACP-2019-58, with a view to creating a permanent Danger Area that will enable Llanbedr Aerodrome to increase support to the RDT&E for next-generation UK aerospace - *e.g.* drones (particularly non-military drones for good), electric aircraft, urban/regional air mobility vehicles, balloons, airships, near-space testing *etc*.

The CAA Civil Aviation Publication CAP1616 defines a six-stage process through to implementation of a permanent airspace change, some of which have more than one step. This document addresses the requirements for Stage 1B: Design Principles.

The design principles encompass the safety, environmental and operational criteria and strategic policy objectives that the Change Sponsor aims for in developing the airspace change proposal. Key to the process is a two-way conversation with relevant stakeholders and interested parties that provides an opportunity to combine local context with technical, operational and safety considerations. The desired outcome is a shortlist of principles to inform the development of airspace design options and against which they can be qualitatively evaluated.

Snowdonia Aerospace (SAC) has undertaken a number of stakeholder engagement activities to help shape the DA design principles. In addition to a number of targeted stakeholder meetings, a questionnaire was also sent out to over 200 stakeholders and interested parties.

The following primary conclusions have been drawn:

1. The responses were consolidated for analytical consistency so as to consider a single response from each separate organisation. This results in a total of 36 independent responses, of which 29 (81%) are positive, 7 (19%) are neutral, and 0 (0%) are negative;
2. The engagement process was a valuable activity as it allowed SAC to refresh and widen relationships with local stakeholders and highlighted the key issues that will help shape the remainder of the Airspace Change Proposal (ACP);
3. Positive responses were received both from the aerospace/aviation community who are seeking to make use of the permanent Danger Area to enhance their products and services and also from the local community who can see the benefit that this business would bring to the regional economy;

4. The neutral responses raised issues/questions relating to two principle factors, (i) the impact of segregation on the flexible use of airspace for other aviation operators, and (ii) the potential noise/general nuisance impact on non-aviation leisure activities in Snowdonia National Park;
5. The draft design principles have been reviewed and revised in light of (4) and the final statement is presented below in Table 1;
6. The Aerodrome Manual will need to be updated to reflect the change in airspace status and agreed operating procedures.

ID	Category	Design Principle
1	Technical / Safety	The airspace design will provide an area of segregated airspace (a Danger Area (DA)) local to Llanbedr Aerodrome for the safe research, development, test and evaluation (RDT&E) of novel aerospace systems
2	Technical	The DA design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201
3	Technical / Operational	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
4	Technical / Operational	The DA design will be consistent with the operation of the Aerodrome Traffic Zone (ATZ) (assuming successful conclusion of ACP-2020-02)
5	Safety	The design will not adversely affect the safety of operations at other nearby aerodromes
6	Safety / Operational	Operating hours of the Flight Information Service (FIS) and DA will be linked to ensure consistent traffic procedures and radio calls, and demand for changes in operating hours of the FIS will require a corresponding change in the operating hours of the DA and vice-versa
7	Environmental / Operational	Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement
8	Environmental	The design should, where possible, take account of local planning policy including that of the Snowdonia National Park Authority and the aerodrome registered Safeguarding Map
9	Operational	Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
10	Operational	Impact on General Aviation (GA), gliding, microlight flying, hang gliding, paragliding or model flying should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles

Table 1 *- Final technical, safety, environmental and operational design principles for ACP-2019-58, Llanbedr Danger Area (DA)*

There were also some general queries raised by the non-aviation community, which SAC has sought to address, namely:

1. The current two-way discussion is an initial "stakeholder engagement" intended to help shape the design principles and not a formal "public consultation" process[1]. There has been no intent on the part of SAC to limit discussion and a full and formal public consultation will be conducted later in the process (Stage 3C, scheduled for Autumn 2020) in line with the Gunning principles and standard Government guidance;
2. The overtly technical nature of the engagement to date is a necessary consequence of where we are in the ACP design process, but opportunities for further general engagement/consultation will be available as per (1).
3. A Danger Area is only one element of a multi-faceted Operating Safety Case (OSC) that will determine where, when and how a novel aerospace system can operate, and an overarching safety assessment will be presented as part of the Stage 2B analysis.

The following recommendations are also made for immediate follow-on activities:

1. SAC will write back to all respondents with a thank you letter and a further explanation of the process, a summary of Stage 1 and 2 findings, and highlighting opportunities for further engagement/consultation;
2. SAC will also consider how engagement/consultation materials are developed to suit a range of audiences, such as how technical information will be communicated in an accessible way to non-aviation stakeholders.
3. SAC will ensure that all future direct written communication is provided in both English and Welsh languages.

[1] CAP1616 defines "consultation" as a formal process seeking input into a decision, undertaken in line with the Gunning principles and Government guidance, and "engagement" as a catch-all term for developing relationships with stakeholders, covering a variety of activities including but not limited to consultation, information provision, regular and one-off meetings and forums, workshops and town hall discussions.

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1. Introduction

1.1. Background

Llanbedr Aerodrome (EGFD), Gwynedd (Figures 1a-1d), is sited on a coastal promontory at the northerly end of Cardigan Bay[2] with bi-directional over-water approaches to the 2000m+ main runway (17/35), which is at an elevation of 8m above mean sea level. There are two additional cross runways 05/23 and 15/33. Under upcoming aerodrome licensing proposals it is currently intended the runways will be 2,188m, 1,199 and 799m respectively. The local geography is predominantly coastal lowland and farmland within Snowdonia National Park that is bounded to the east by the Rhinog mountains, which rise to 756m at a distance of 9500m (approx.) from the main runway. The village of Llanbedr (population 645, 2011 census) is 2000m (approx.) to the north-east of the northern threshold and there's also a transitory population during summer months at the Shell Island campsite (approx. 1000m to the north-west of the main runway northern threshold) and the Dyffryn caravan park (approx. 500m to the south of the main runway southern threshold). The overall population density is consistent with that for Gwynedd as a whole - *i.e.* <50 people per square km[3,4].

Fig. 1a *- aerial view looking west*

Fig. 1b *- aerial view looking east*

Fig. 1c *- aerial view looking north*

Fig. 1d *- aerial view looking south*

Llanbedr Airfield has a long history and established use for the research, development, test and evaluation (RDT&E) flying activities, particularly associated with the use of target drones, and also as a secondary/tertiary operating site for RAF Valley (EGOV, approx. 58km north/north-west). An Aerodrome Traffic Zone (ATZ)[5] and the original Danger Area D202 supported these activities prior to QinetiQ/MOD vacating the site in 2004, along with extant Danger Area D201, the closest edge of which is 25km (approx.) south-west of Llanbedr[6].

[2] View on Google Maps
[3] Ref: National Statistics Wales, June 2018
[4] Ref: Annual Lower Super Output Area (LSOA) Population Estimates, 2018
[5] Aerodrome Traffic Zone (ATZ) as detailed in Article 5 of the Air Navigation Order, 2016, Ref: Air Navigation Order, 2016
[6] Ref: https://www.aurora.nats.co.uk/htmlAIP/Publications/2018-08-02/html/eAIC/EG-eAIC-2018-087-Y-en-GB.html

The airfield currently supports an increasing mix of small (<20kg) and light (<150kg) drone RDT&E and General Aviation (GA) operations together with visiting military aircraft (fixed wing and rotary) and others including the search and rescue (SAR) helicopter from Caernarfon (EGCK, approx. 35km north/north-west), Police helicopter and Air Ambulance. The airspace is currently Class G. A local Flight Information Service (FIS) has been provided to support day-to-day operations and a Temporary Danger Area (TDA)[7] has previously been consulted on and implemented as and when required, either as a whole or in part, to support RDT&E activities and provide a safe corridor to D201. There are GA aircraft operations most flyable days with an average of 100 to 200 movements per month. The airfield has also been designated as one of the candidate sites for a UK Spaceport by the Department for Transport (DFT) and Snowdonia Aerospace LLP has recently received a grant award from the UK Space Agency to generate a Horizontal Spaceport Development Plan.

1.2. Opportunity to be addressed and Statement of Need

Snowdonia Aerospace LLP is continuing to progress and further develop a number of complementary business opportunities at Llanbedr Aerodrome relating to aerospace RDT&E and military aircraft training. To support these operations (and others) action is required to upgrade and formalise the current airspace around the Aerodrome as the present provision is insufficient to meet the identified future need and risks restricting opportunities that are in the strategic economic interest of the UK and Welsh governments and required to sustain long term employment in the region. Snowdonia Aerospace LLP (hereafter also referred to as the Change Sponsor) is therefore developing two Airspace Change Proposals (ACPs) to underpin these activities:

- ACP-2019-58, Llanbedr Danger Area (DA), which can be accessed online via: https://airspacechange.caa.co.uk/PublicProposalArea?pID=193
- ACP-2020-02, Llanbedr Aerodrome Traffic Zone (ATZ), which can be accessed online via: https://airspacechange.caa.co.uk/PublicProposalArea?pID=211

This document relates to the former application, ACP-2019-58, with a view to creating a permanent Danger Area that will enable Llanbedr Aerodrome to increase support to the RDT&E for next-generation UK aerospace - *e.g.* drones (particularly non-military drones for good), electric aircraft, urban/regional air mobility vehicles, balloons, airships, near-space testing *etc*. The Statement of Need for the application is declared as follows:

- *To provide an environment for safe operation of all ongoing aerospace-related Research, Development, Test and Evaluation (RDT&E) activities in the vicinity of Llanbedr Airfield (EGFD) and the ability for associated aircraft to transit safely to/from Danger Area D201 to undertake extended range/endurance/altitude testing (in accordance with extant D201 procedures) without concern for other air traffic.*

The proposal explicitly supports the Airspace Modernisation Strategy (CAP1711) by creating a permanent test zone in which to explore the airspace integration issues associated with new airspace users such as drones that are currently identified as “unknowns” in Chapter 5 of CAP1711.

1.3. The cause of the opportunity and associated factors or requirements

The preface to the UK Government Aerospace Industrial Strategy, 2018, states that:

- *‘Environmentally-friendly aircraft will increasingly incorporate electric technologies, and we anticipate more aircraft operating autonomously in the future. New markets for drones and Urban Air Mobility vehicles will be developed. We want the UK to be at the cutting edge of these exciting developments much as we were when Sir Frank Whittle developed the world’s first jet engine’.*

Llanbedr has long been a UK national asset for aerospace RDT&E and there has been increased demand in recent years given its ideal location for Beyond Visual Line-of-Sight (BVLOS) drone testing.

[7] Ref: “Request for TDA “Approval in Principle” For UAS operations at Llanbedr Aerodrome”, QINETIQ/MS/AD/LET1404197, Sept 2014

These activities have been satisfied to date by use of a Temporary Danger Area, but both customer demand and the need for confidence and reliance are now such that an application for a Permanent Airspace Change is warranted. The combination of safety, operational, technical and environmental factors already pertaining to low volume RDT&E activities is not expected to change. Moving to a permanent Danger Area will allow an increase in throughput to satisfy the market need and provide UK businesses in these sectors with a surety of being able to operate in the UK on a reactive basis. Many UK businesses have chosen to undertake their testing abroad due to the uncertainties around availability of adequate and appropriate commercial trials environments. Figures 2a – 2f below gives an indication of some of the wide variety of novel aerospace systems and applications that have previously been tested at Llanbedr Aerodrome and which would benefit from a permanent Danger Area to help accelerate development and commercial exploitation.

***Fig. 2a** – Penguin B used to explore the potential for aeromedical delivery drones*

***Fig. 2b** – Vertical Aerospace electric Urban Air Mobility (UAM) vehicle*

***Fig. 2c** – Scheibel S100 Camcopter used to explore the potential for search/rescue drones*

***Fig. 2d** – Astigan solar-powered high altitude, long endurance (HALE) vehicle*

***Fig. 2e** – C-Astral Bramor used to explore the potential for mapping and surveying drones*

***Fig. 2f** – The view of Cardigan Bay from the B2Space near-space testing balloon*

2. Draft Design Principles

2.1. CAP1616 requirements and document scope

The CAA Civil Aviation Publication CAP1616[8] provides guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information.

CAP1616 defines a six-stage process through to implementation of a permanent airspace change, some of which have more than one step. However, it is recognised that requested airspace changes can vary hugely in size, scale and complexity and this variation has led the CAA to scale the process accordingly (CAP1616, Para. 50). Furthermore, the CAA will consider requests from the Change Sponsor for additional scaling of the process when there is a good reason and it is proportionate to do so.

On the 23rd January 2020 the CAA Airspace Regulation team met with Snowdonia Aerospace LLP to discuss an appropriately scaled submission for ACP-2019-58, Llanbedr Danger Area. Subsequent to this meeting, the CAA agreed to a scaled CAP1616 submission with a combined Define, Develop and Assess Gateway in July 2020. To meet this combined Gateway, Snowdonia Aerospace as the Change Sponsor is required to submit the following documents:

- Stage 1A: Assess Requirements - Statement of Need (previously submitted)
- Stage 1B: Design Principles;
- Stage 2A Options Development;
- Stage 2B Options Appraisal.

This document addresses the requirements for Stage 1B: Design Principles. The design principles encompass the safety, environmental and operational criteria and strategic policy objectives that the Change Sponsor aims for in developing the airspace change proposal. Key to the process is a two-way conversation with relevant stakeholders and interested parties that provides an opportunity to combine local context with technical, operational and safety considerations. The desired outcome is a shortlist of principles to inform the development of airspace design options and against which they can be qualitatively evaluated.

The remainder of this section describes the initial set of draft design principles for ACP-2019-58, Llanbedr Danger Area, as put forward by the Change Sponsor. Thereafter, Section 3 details the stakeholder engagement process, Section 4 summarises the stakeholder feedback and an analysis of the impact on the design principles, and Section 5 updates a definitive list of design principles and describes the next steps.

2.2. Initial statement of ACP-2019-58, Llanbedr Danger Area (DA) design principles

The purpose of CAP1616 is to avoid “solutionising” and to impose a structured process that delivers a considered and balanced airspace design and implementation. An important part of Step 1B is for the design principles to be drawn up through discussion between the Change Sponsor and affected stakeholders at this early stage in the process.

In this regard, an initial limited set of draft design principles was drawn up, as per Table 2 below, which sought to capture the basic technical requirements from the Statement of Need and set these within a fundamental operational context – *e.g.* flexible use of airspace (FUA) principles (see Section 2.3). These draft principles were then included within a questionnaire that was circulated to the stakeholder community along with supplementary questions relating to safety and environmental factors with a view to helping us develop definitive set of design principles.

[8] Ref: https://publicapps.caa.co.uk/docs/33/CAP1616_Airspace%20Change_Ed_3_Jan2020_interactive.pdf

ID	Category	Design Principle
1	Technical	The airspace design will be appropriate to the need described and provide a safe environment for airspace users.
2	Technical	The airspace design must incorporate a sufficient area to accommodate the wide range of anticipated different types of air vehicle requiring to use it for the range of RDT&E purposes.
3	Operational	The airspace design must minimize the impact to other airspace users by activation only when required based on need.
4	Technical / Operational	The airspace design should be as accessible as possible to other users and be managed in accordance with Flexible Use of Airspace (FUA) principles as far as is practicable (Efficiency and Airspace Sharing).
5	Technical / Operational	The airspace design should be in accordance with current airspace regulation and use a pre-existing designation of airspace with established parameters (Conformity, Simplicity and Safety).

***Table 2** - Draft design principles for ACP-2019-58, Llanbedr Danger Area*

2.3. Flexible Use of Airspace

European Commission Regulation (EC) No 2150/2005 of 23 December 2005[9] lays down common rules for the flexible use of airspace (FUA), defined as follows:

- *"Flexible use of airspace is an airspace management concept described by the International Civil Aviation Organisation (ICAO) and developed by the European Organisation for the Safety of Aviation (Eurocontrol), according to which airspace should not be designated as either purely civil or purely military airspace, but should rather be considered as one continuum in which all users' requirements have to be accommodated to the maximum extent possible".*

In the UK, CAP 740, UK Airspace Management Policy[10], serves as a means of compliance to the essential requirements of both Reg (EC) 2150/2005 (Flexible Use of Airspace Regulation) and Reg (EU) 373/2017 (Common requirements for providers of air traffic management/air navigation services). CAP 740 also ensures compliance with supporting Eurocontrol guidance.

With regard FUA and its application to the Llanbedr Danger Area, the key requirement is stated in CAP740, Appendix A (UK Flexible Use of Airspace Strategy), Paragraph 7b:

- *Minimise airspace segregation by activating airspace volumes based on need rather than routine activation through set times defined in the AIP11. Where possible the routine activation should be by Notice to Airmen (NOTAM) to facilitate Strategic Airspace Management.*

It is the Change Sponsors intention to fully follow these stated principles within the design and operation of the proposed ACP-2019-58 for the Llanbedr Danger Area. Section C10 of Appendix C (Military ASM Policy) shall also be considered, where possible, when it applies to a civil DA.

[9] Ref: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32005R2150&from=EN
[10] Ref: https://publicapps.caa.co.uk/docs/33/CAP740_Issue7_Am1_Nov_2019(cor).pdf

3. Engagement Process

3.1. Strategy

The engagement strategy has been dictated very strongly by the impact of the Covid-19 pandemic, the need to avoid face-to-face meetings and to move all communication to email and video/phone conferencing. This introduced a slight hiatus in the immediate aftermath of the UK-wide lockdown on 23rd March 2020, but the breadth and scope of the engagement has not been unduly affected.

We adopted a two-stage engagement process, initially seeking the opinion of the two communities that are most likely to be impacted by the proposed airspace change, namely the current airspace user community, principally associated with operations at RAF Valley, and the residential and land owner community local to Llanbedr via Gwynedd County Council and local community councillors. The initial airspace user community engagement proceeded as planned via teleconference on 26th March 2020. A local community engagement event had been scheduled for 15th April 2020 but had to be rearranged to 12th May via videoconference. This discussion was dominated by issues relating to ACP-2020-02, Llanbedr Aerodrome Traffic Zone (ATZ) and hence issues relating to ACP-2019-58, Llanbedr Danger Area (DA) have been followed up via email and SAC has produced and distributed an additional non-technical summary note in lieu of standalone meeting minutes.

Stage two of the engagement process was to send out a questionnaire document via email to as wide a network of potential stakeholders and interested parties as possible. We drew up a list of additional stakeholders and interested parties based on our existing network of contacts, but also taking into account suggestions made by the user and local communities' representatives. The questionnaire was based on the draft design principles outlined in Section 2.2 but re-cast as questions with additional detail on the associated business opportunity in order to be as open as possible with the stakeholder community and to better solicit opinion. The questionnaires were distributed on 13th May with a requested return date of 29th May, although responses received after this date have still been considered.

The stakeholder feedback and an analysis of the impact on the design principles is summarised in the next section, Section 4.

3.2. List of stakeholders

The questionnaire was distributed to over 200 stakeholders and interested parties. The full list of stakeholders that have been party to the CAP1616 ACP-2019-58, Llanbedr Danger Area (DA) Stage 1B engagement process is detailed at Appendix A.

3.3. Stakeholder engagement questionnaire

The engagement questionnaire that was distributed to the above list of stakeholders is detailed at Appendix B.

3.4. Engagement evidence

Minutes of all of the above meetings, additional notes and the completed questionnaires are provided separately as Annex 1.

3.5. Engagement versus Consultation

The current stakeholder engagement will be augmented by a full public consultation later in the ACP process (Stage 3C). CAP1616 defines "engagement" and "consultation" thus:

- Consultation is a formal process seeking input into a decision, undertaken in line with the Gunning principles and Government guidance;
- Engagement is a catch-all term for developing relationships with stakeholders, covering a variety of activities including but not limited to consultation, information provision, regular and one-off meetings and forums, workshops and town hall discussions.

4. Stakeholder Feedback and Analysis of Design Principles

4.1. General

We received 36 unique responses to the stakeholder questionnaire – *i.e.* a single response from each separate organisation. Of these 36 responses, 29 (81%) were deemed to be positive toward the airspace change proposal, 7 (19%) were deemed to be neutral, and 0 (0%) were deemed to be negative.

In general, we wish to keep separate the two airspace change proposals we are pursuing, namely ACP-2019-58, Llanbedr Danger Area (DA) and ACP-2020-02, Llanbedr Aerodrome Traffic Zone (ATZ), in order to avoid any confusion. However, it is worth noting that we received notably less responses to the DA engagement than for the earlier ATZ engagement having sent the questionnaire to broadly the same communities. The issues raised were also generally less emotive (there were no negative responses), but there were some comments from the non-aviation community that the engagement was overly technical. This is a necessary consequence of where we are in the ACP design process, but we will write back to all stakeholders and interested parties with a thank you letter and a further explanation of the process, a summary of Stage 1 and 2 findings, and highlighting opportunities for further engagement/consultation. SAC will also consider how future engagement/consultation materials can be developed to suit a range of audiences, including how technical information will be communicated in an accessible way to non-aviation stakeholders.

Positive responses were received both from the aerospace/aviation community who are seeking to make use of the permanent Danger Area to enhance their products and services and also from the local community who can see the benefit that this business would bring to the regional economy. Many of the positive responses provided a simple statement of support without commenting on specific design principles, but in the sections below we have taken the general comments together with the more detailed technical, safety, environmental and operational comments/questions highlighted in the neutral responses to revise and refine a definitive set of design principles for ACP-2019-58, Llanbedr Danger Area (DA).

A valuable by-product of the initial stakeholder engagement process is that is has allowed SAC to refresh and widen relationships with other nearby aviation operators, notably with the nearest airfield at Talybont/Peniarth, 11 nautical miles to the south of Llanbedr. Regardless of the Danger Area, the increased communication will contribute to a general enhancement of air safety.

Review of the original Design Principles in light of the engagement feedback highlighted the need for action/modification/revision. A full mapping of individual stakeholder feedback comments to the Design Option decisions and conclusions discussed above can be found in Appendix C to this report and the compendium of original stakeholder correspondence can be found in the standalone Annex 1.

The rationale for the changes and the evolution of the revised set of Design Principles is expanded further in Sections 4.2 to 4.5 below and summarised in Table 3.

ID	Category	Draft Design Principle	Action/modification required
1	Technical	The airspace design will be appropriate to the need described and provide a safe environment for airspace users.	The definition of the technical principles needs to be more explicit
2	Technical	The airspace design must incorporate a sufficient area to accommodate the wide range of anticipated different types of air vehicle requiring to use it for the range of RDT&E purposes.	The definition of the technical principles needs to be more explicit

3	Operational	The airspace design must minimise the impact to other airspace users by activation only when required based on need.	Additional design principles are required that also reflect the need to minimise the impact on the non-aviation community
4	Technical / Operational	The airspace design should be as accessible as possible to other users and be managed in accordance with Flexible Use of Airspace (FUA) principles as far as is practicable (Efficiency and Airspace Sharing).	The definition of the technical principles needs to be more explicit and additional operational principles are needed to reinforce the emphasis on FUA
5	Technical / Operational	The airspace design should be in accordance with current airspace regulation and use a pre-existing designation of airspace with established parameters (Conformity, Simplicity and Safety).	The definition of the technical principles needs to be more explicit and additional safety/ operational principles are needed to reinforce the emphasis on safe airspace management

***Table 3** – Indentification of action/modification required with regard to the draft design principles for ACP-2019-58, Llanbedr Danger Area in light of engagement feedback*

4.2. Technical

Many of comments and questions relating to the technical definition of the proposed airspace change were received from aviation stakeholders who already have a degree of familiarity with the Temporary Danger Area (TDA) and the second of our airspace change proposals that relates to provision of an Air Traffic Zone (ATZ). We have therefore refined the list of technical design principles to explicitly reflect (a) the need for specific segregated airspace features, (b) the intent to partition the airspace and only make active/segregate the minimum area required to support test activities at any given time, and (c) the need to be technically and operationally consistent with the ATZ.

Other comments and questions were received that are more appropriate to a discussion of specific design options and so will be addressed as part of the Stage 2A analysis.

The revised set of technical design principles is stated in Table 4.

ID	Category	Design Principle
1	Technical / Safety	The airspace design will provide an area of segregated airspace (a Danger Area (DA)) local to Llanbedr Aerodrome for the safe research, development, test and evaluation (RDT&E) of novel aerospace systems
2	Technical	The DA design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201
3	Technical / Operational	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
4	Technical / Operational	The DA design will be consistent with the operation of the Aerodrome Traffic Zone (ATZ) (assuming successful conclusion of ACP-2020-02)

***Table 4** - Revised technical design principles for ACP-2019-58, Llanbedr Danger Area (DA)*

4.3. Safety

A number of questions were received as to how we intend to ensure safe flying operations when the Danger Area is active. Again, some of the comments and questions are more appropriate in the context of specific design options and will be addressed as part of the Stage 2A analysis, but the fundamental principle that will apply is the provision of a Flight Information Service (FIS) during hours of operation of the Danger Area to ensure consistent traffic procedures and radio calls.

It should be noted that a Danger Area is only one element of a multi-faceted Operating Safety Case (OSC) that will determine where, when and how a novel aerospace system can operate. An overarching safety assessment is a necessary requirement at Stage 2B and hence broader issues relating to possible supporting technology and operating procedures will be addressed at this point.

The revised set of safety design principles is stated in Table 5.

ID	Category	Design Principle
5	Safety	The design will not adversely affect the safety of operations at other nearby aerodromes
6	Safety / Operational	Operating hours of the Flight Information Service (FIS) and DA will be linked to ensure consistent traffic procedures and radio calls, and demand for changes in operating hours of the FIS will require a corresponding change in the operating hours of the DA and vice-versa

***Table 5** - Revised safety design principles for ACP-2019-58, Llanbedr Danger Area (DA)*

4.4. Environmental

As noted previously, there were no outright negative responses and the issues raised were generally less emotive than with the previous ACP-2020-02 ATZ engagement, but a principle environmental factor raised by respondents was the potential noise/general nuisance impact on non-aviation leisure activities in Snowdonia National Park. These issues are explicitly acknowledged in two additional design principles.

The revised set of environmental design principles is stated in Table 6.

ID	Category	Design Principle
7	Environmental / Operational	Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement
8	Environmental	The design should, where possible, take account of local planning policy including that of the Snowdonia National Park Authority and the aerodrome registered Safeguarding Map

***Table 6** - Revised environmental design principles for ACP-2019-58, Llanbedr Danger Area (DA)*

4.5. Operational

Operational issues feature in many of the technical, safety and environmental design principles already highlighted above, but recognising the number of comments we received regarding the access to and flexible use of airspace, we have identified two further design principles that explicitly acknowledge the need for operating procedures to minimise the impact on other aviation users and that these may be different for the military and general aviation communities.

The revised set of operational design principles is stated in Table 7.

ID	Category	Design Principle
9	Operational	Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
10	Operational	Impact on General Aviation (GA), gliding, microlight flying, hang gliding, paragliding or model flying should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles

Table 7 *- Revised operational design principles for ACP-2019-58, Llanbedr Danger Area (DA)*.

There was also a more general question about operating hours and how this would impact on the above principles. The standard operating hours for Llanbedr Aerodrome are 0900 to 1700 on Monday to Friday and typically we would only expect the Danger Area to be activated during these periods and then only when required. However, there may be a requirement for some trials platforms (*e.g.* HALE platforms, an example of which is shown in Figure 2d) to take advantage of lighter wind conditions, typically early morning or late evening, and consequently the operating hours will be extended as required to accommodate this activity. In these circumstances the aim again would be to promulgate the activity Monday to Friday, but these operations are expected to have very little impact (if any) on other airspace users. Furthermore, there may also be situations - *e.g.* where a short duration trial has been delayed by weather - where a limited amount of weekend flying may be required. We anticipate that any operations outside of standard hours will only be in exceptional circumstances and very rare in occurrence. As much notice as possible will be given to other airspace users. This is consistent with the FUA principles outlined in Section 2.3 and captured in Design Principles #3, #9 and #10.

5. Conclusions

5.1. Conclusions and recommendations

Snowdonia Aerospace has undertaken a number of stakeholder engagement activities as part of the "Stage 1B Design Principles" element of the Airspace Change Proposal, Reference: ACP-2019-58, Llanbedr Danger Area (DA), under the Civil Aviation Authority (CAA) CAP1616 Airspace Change Process. In addition to targeted stakeholder meetings, a questionnaire was also sent out to over 200 stakeholders. The following primary conclusions have been drawn:

1. The responses were consolidated for analytical consistency so as to consider a single response from each separate organisation. This results in a total of 36 independent responses, of which 29 (81%) are positive, 7 (19%) are neutral, and 0 (0%) are negative;
2. The engagement process was a valuable activity as it allowed SAC to refresh and widen relationships with local stakeholders and highlighted the key issues that will help shape the remainder of the Airspace Change Proposal (ACP);
3. Positive responses were received both from the aerospace/aviation community who are seeking to make use of the permanent Danger Area to enhance their products and services and also from the local community who can see the benefit that this business would bring to the regional economy;
4. The neutral responses raised issues/questions relating to two principle factors, (*i*) the impact of segregation on the flexible use of airspace for other aviation operators, and (*ii*) the potential noise/general nuisance impact on non-aviation leisure activities in Snowdonia National Park;
5. The draft design principles have been reviewed and revised in light of (4) and the final statement is presented below in Section 5.2;
6. The Aerodrome Manual will need to be updated to reflect the change in airspace status and agreed operating procedures.

There were also some general queries raised by the non-aviation community, which SAC has sought to address, namely:

1. The current two-way discussion is an initial "stakeholder engagement" intended to help shape the design principles and not a formal "public consultation" process[11]. There has been no intent on the part of SAC to limit discussion and a full and formal public consultation will be conducted later in the process (Stage 3C, scheduled for Autumn 2020) in line with the Gunning principles and standard Government guidance;
2. The overtly technical nature of the engagement to date is a necessary consequence of where we are in the ACP design process, but opportunities for further general engagement/consultation will be available as per (1).
3. A Danger Area is only one element of a multi-faceted Operating Safety Case (OSC) that will determine where, when and how a novel aerospace system can operate, and an overarching safety assessment will be presented as part of the Stage 2B analysis.

The following recommendations are also made for immediate follow-on activities:

1. SAC will write back to all respondents with a thank you letter and a further explanation of the process, a summary of Stage 1 and 2 findings, and highlighting opportunities for further engagement/consultation;

[11] CAP1616 defines "consultation" as a formal process seeking input into a decision, undertaken in line with the Gunning principles and Government guidance, and "engagement" as a catch-all term for developing relationships with stakeholders, covering a variety of activities including but not limited to consultation, information provision, regular and one-off meetings and forums, workshops and town hall discussions.

2. SAC will also consider how engagement/consultation materials are developed to suit a range of audiences, such as how technical information will be communicated in an accessible way to non-aviation stakeholders.
3. SAC will ensure that all future direct written communication is provided in both English and Welsh languages.

5.2. Final statement of ACP-2019-58, Llanbedr Danger Area (DA) Design Principles

Based upon the responses to the stakeholder engagement questionnaire and associated discussions and analysis presented in Section 4, the final technical, safety, environmental and operational design principles for ACP-2019-58, Llanbedr Danger Area, have been defined as follows:

ID	Category	Design Principle
1	Technical / Safety	The airspace design will provide an area of segregated airspace (a Danger Area (DA)) local to Llanbedr Aerodrome for the safe research, development, test and evaluation (RDT&E) of novel aerospace systems
2	Technical	The DA design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201
3	Technical / Operational	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
4	Technical / Operational	The DA design will be consistent with the operation of the Aerodrome Traffic Zone (ATZ) (assuming successful conclusion of ACP-2020-02)
5	Safety	The design will not adversely affect the safety of operations at other nearby aerodromes
6	Safety / Operational	Operating hours of the Flight Information Service (FIS) and DA will be linked to ensure consistent traffic procedures and radio calls, and demand for changes in operating hours of the FIS will require a corresponding change in the operating hours of the DA and vice-versa
7	Environmental / Operational	Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement
8	Environmental	The design should, where possible, take account of local planning policy including that of the Snowdonia National Park Authority and the aerodrome registered Safeguarding Map
9	Operational	Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
10	Operational	Impact on General Aviation (GA), gliding, microlight flying, hang gliding, paragliding or model flying should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles

Table 8 *- Final technical, safety, environmental and operational design principles for ACP-2019-58, Llanbedr Danger Area (DA)*

5.3. Next steps

The design principles stated in Table 8 will be used to help generate the Design Options (Stage 2A) and inform the Design Options Appraisal (Stage 2B). More generally, the conclusions and recommendations will also be used to help inform the Consultation Preparation (Stage 3A).

Appendix A - List of stakeholders

The following list of stakeholders have been party to the CAP1616, ACP-2019-58, Llanbedr Danger Area (DA) Stage 1B engagement process, and have received the engagement questionnaire detailed in Appendix B.

Organisation / Party	Representative
Across UAVs	
ADS Group	
Aerospace Wales	
Airbourne Solutions Ltd.	
Airbus Operations Ltd	
Airbus / Serco	
Airlines UK	
Airspace4all	
Airport Operators Association (AOA)	
Airfield Operators Group (AOG)	
Aircraft Owners And Pilots Association (AOPA)	
Airspace Change Organising Group (ACOG)	
AIR-11GPBM-ATM Safeguarding SO3	
AIR-11GPBM-DAAM & Assurance SO1	
AIR-11GPBM-DAAM & Ranges SO3	
Argoed Farm	
Artemis Space Technologies	
Ascent	
Association of Remotely Piloted Aircraft Systems UK (ARPAS-UK)	
Astigan Ltd.	
ATS Aberporth	
Aviation Environment Federation (AEF)	
B2space Ltd	
British Airways (BA)	
Babcock MSC (Onshore)	
BAE Systems Warton	

[redacted]	
Barmouth Community Council	
[redacted]	
Bristow	
British Airline Pilots Association (BALPA)	
British Balloon and Airship Club	
British Business and General Aviation Association (BBGA)	
British Gliding Association (BGA)	
British Helicopter Association (BHA)	
British Hand Gliding and Paragliding Association (BHPA)	
British Microlight Aircraft Association (BMAA) / General Aviation Safety Council (GASCO)	
British Model Flying Association (BMFA)	
British Skydiving	
Drone Major	
Cadw	
Caernarfon Airport	
Callen-Lenz Associates Ltd	
Cameron Balloons Ltd	
Campaign for The Protection Of Rural Wales	
Castle Air	
Civil Aviation Authority Innovation Team (Regulatory Sandbox)	
Cloudbasepro	
Connected Places Catapult	
[redacted]	
[redacted]	
Coptrz	
Country Land & Business Association Wales	
[redacted]	

Cyclops Air Ltd	
DAATM-AIRSPACE OPS SO2	
Defence UAS Capability Development Centre	
Department of Transport	
Deimos Space UK Ltd	
Denbigh Gliding	
DES WPNS ENG-HD	
DES WPNS TEST-OMWPNS-Air Ranges	
Dronamics Global Ltd	
Dyffryn Ardudwy Community Council	
Eastern Airways	
Electroflight	
[redacted]	
Faelere Farm	
Farmers Union of Wales	
Frazer-Nash Consultancy Ltd	
General Aviation Alliance (GAA)	
Guild of Air Traffic Control Officers (GATCO)	
Gwynedd County Council	
Harlech Community Council	
Hawarden	
Hawksland Unmanned Aircraft Systems	
Heavy Airlines	
Helicopter Club of Great Britain (HCGB)	
Hen-Dy Farm	
Hereford Gliding	
Honourable Company of Air Pilots (HCAP)	
Iprosurv	
Isle of Man CAA	
[redacted]	
[redacted]	

Light Aircraft Association (LAA)	
Lindstrand Technologies Ltd	
Liverpool John Lennon Airport	
Llanbedr Community Council	
Llanfair Community Council	
London Sailplanes	
Low Fair Airlines	
[redacted]	
Maes Y Garnedd	
Manchester University	
Manna Aero	
Maritime Coastguard Agency	
Midlands Gliding Club	
Military Aviation Authority (MAA)	
Ministry of Defence - Defence Airspace and Air Traffic Management (MOD DAATM)	
National Farmers Union Cymru	
National Police Air Services	
National Trust	
NATS	
Natural Resources Wales	
Navy Command HQ	
NESTA	
Newton Launch Systems Ltd	
North Wales Air Ambulance	
North Wales Economic Ambition Board	
North Wales Fire & Rescue	
North Wales Police	

North Wales Resilience Forum	
North Wales Tourism Board	
Pembrey Airport	
PDG Helicopters	
PPL/LR (Europe)	
Prism Defence	
QinetiQ	
RMR Consultants	
Rolls Royce	
[redacted]	
Royal Aero Club	
Samad Aerospace	
Satellite Applications Catapult Ltd	
[redacted]	
Sent into Space	
[redacted]	
Shell Island	
SHY-ATC CTRL 06	
SHY-OPS SFSO	
SHY-SATCO	
Skyports Ltd	
[redacted]	
Snowdonia Enterprise Zone	
Snowdonia Flight School	
Snowdonia National Park Authority	
Southampton University	

Spaceflight Academy Ltd	
Space Forge	
[redacted]	
Swanwick	
SWK-OC 2 OPS	
Talsarnau Community Council	
Talybont Airfield	
Talybont Community Council	
Thales UK	
[redacted]	
The Drone Office	
Trent Valley Gliding Club	
UAVE Ltd	
UK Airprox Board (UKAB)	
UK Flight Safety Committee (UKFSC)	
UKLSL	
UK Research & Innovation (UKRI)	
UK Space Agency	
Ultra Intelligence and Communications	
United States Air Force Europe (3rd Air Force-Directorate of Flying (USAFE (3RD AF-DOF))	
VAL-OPS WG ATCO 4	
VAL-OPS WG ATCO 2	
VAL-OPS WG OC	
VAL-OPS WG STANAT OC	
VAL-OPS WG T2 STANAT	
VAL-OPS WG T6 STANAT	
VAL-OPS WG SFSO	
Vertical Aerospace Ltd	
Visit Wales	
[redacted]	
Welsh Government	

Welsh Office	
Welshpool Airport	
West Wales Airport	
Whizzard Helicopters	
[redacted]	
Windhorse Aerospace Ltd	
Ystimgwern Farm	
22 Group	
22TRG GP-FT SO2 AS	
22TRG GP-FT FJ SO2	
72 SQN-OC C FLT	

Appendix B - Stakeholder questionnaire

The following questionnaire relating to the CAP1616, ACP-2019-58, Llanbedr Danger Area (DA)Stage 1B engagement process, was based on the draft design principles outlined in Section 2.2 but re-cast as questions with additional detail in order to better solicit opinion. The questionnaires were distributed to the stakeholders listed in Appendix A.

Llanbedr Aerodrome Airspace Change Proposal

ACP-2019-58

12th May 2020

Initial Engagement Letter. Response deadline 29th May 2020

To: All stakeholders and interested parties.

Why are you being contacted?

This document refers to a proposed change of airspace use, surrounding Llanbedr Airfield, the principle purpose of which is to enable research, test, development and experimental (RTD&E) flight of a range of novel aircraft including unmanned air systems (drones), electric aircraft , urban air taxis and space and near space related operations. We are contacting you in order to seek your feedback so as to inform the future Airspace Change Proposal (ACP).

Does this concern me?

If you represent people who fly in North Wales, and, or, organisations that are concerned with North Wales, or you are an individual for whom this proposal may have implications, then you will want to understand this application. We appreciate time is short in order to gather a consensus so we would urge that this email communication is forwarded to anyone in your organisation that may be interested. They can respond through you or directly to us as an individual. Please note that this is an initial engagement to help shape the design and that further comment will be possible as part of a formal public consultation later in the year.

Introduction to this ACP.

All Airspace Change (ACP) proposals in the U.K. are now conducted under a process enshrined in a document called CAP1616 produced by the Civil Aviation Authority (CAA). The entire process is mapped on line and all airspace change proposals can be seen at https://airspacechange.caa.co.uk/ To see proposed changes in relation to Llanbedr Airfield simply go to this link and type in the postcode LL45 2PX. This letter refers to an airspace change proposal reference ACP-2019-58 for the establishment of a Danger Area and this is one of two proposals. An engagement letter reference ACP-2020-02 for an Air Traffic Zone was distributed to a range of stakeholders and interested parties last week. It is required that the two proposals are dealt with entirely separately.

This letter will:

a. Inform you of the scope of the proposed change ACP-2019-58, which is to introduce airspace to enable continued RDT&E in relation to drones, experimental aircraft and spaceflight at Llanbedr Airfield.
b. Inform you of the perceived requirement for change.
c. Seek your feedback especially in relation to the design principles for this proposal.

Where are we?

We, that is Snowdonia Aerospace LLP (SA) who are known as the Change Sponsor (CS), are at the start of a process that is scheduled to complete in August 2021. However, it is very important to

understand that this is your opportunity to make an early contribution which could influence the design principals and the outcome of the design options in relation to this proposal. To participate at this stage we must have feedback returned to us by the deadline highlighted above, May 29th 2020. Before that date we will respond to questions sent to the dedicated email address provided below. There will be a further opportunity to comment in the Consultation Stage which will start later this year.

We are currently at Stage 1B Design Principles. Stage 1A Assess Requirements (including a Statement of Need), has been completed and minutes of various meetings and records of documents submitted have been uploaded to the aforementioned https://airspacechange.caa.co.uk/ under the quoted reference.

Impact of Coronavirus.

SA determined, given the CAA capability to work from home and use telephone conferencing, that it was quite possible that the agreed timeline identified for this ACP to progress might not be affected from this perspective. SA are likewise unaffected in our ability to engage in internal meetings and progress matters.

Having lost the opportunity to engage with the community on 15th April 2020 and with a great deal of uncertainty at that point for all of us about health and welfare of family and friends, we determined that we would engage with stakeholders and interested parties at this stage by email, and seek email responses and exchanges via this method.

Design Principles. (DPs)

The Design Principles will influence the eventual outcome of the type of airspace, its shape, height, and area. With stakeholders and interested parties feedback we will develop the design principles as the criteria by which we can develop Design Options. On the original Statement of Need, and on the above referred to CAA link, the application is referred to as being for a 'Danger Area' (DA). Within this application we have also referenced and illustrated the existing Temporary Danger Area (TDA) as approved in 2014. This is merely for background and context. We must stress that this new application is to start with a blank piece of paper and not merely seek to apply for the current TDA to become a permanent DA. Given the current classifications of airspace in the UK we thought at the time of the application that a DA was appropriate however it may be that stakeholders and interested parties would like to see a different type of airspace or even a new classification of airspace.

We have to start at square one. So, it may be that an important DP is that any airspace should not prohibit the transit of other air traffic. Or, that the airspace should not unnecessarily be over populated areas.

Whatever airspace is designed it would be a DP that the airspace would only be activated for the time that it needs to be used.

Design Principles in relation to the introduction of airspace are also concerned with geography, population distribution, environmental considerations and economic considerations, consequently there is an opportunity to provide local context with technical considerations when considering the Design Principles.

Why we cannot keep using a Temporary Danger Area.

A Temporary Danger Area is something that can be applied for only on the basis that it is temporary. It is not something that CAA policy allows to be repeatedly promulgated for use on a long term basis. Additionally, a Temporary Danger Area application has to be submitted a minimum of 90 days in advance of any proposed activity. This is a barrier to opportunity in the UK because firstly there is no certainty for users that the airspace will be approved, or approved in time. And, secondly it delays innovation, by preventing more spontaneous access to airspace if appropriate, and risks on each application, that technical delay would see the TDA time approval pass and the trial fail.

The operational aim of the proposal.

The TDA described above is now, with increasing demand from the novel aerospace and space sectors for access to dedicated airspace, not able to satisfy that need nor is it acceptable to implement on a regular basis to the CAA. The principle aim of this ACP is to create airspace that will satisfy the growing need for RDT&E in the novel aerospace and space sectors and this is described further and fully in the Statement of Need which can be seen at https://airspacechange.caa.co.uk/ under the quoted reference.

Safety constraints or opportunities.

As a part of the journey of the re-development at Llanbedr Airfield as an aerospace centre we have already made considerable investment in infrastructure and just before lockdown at the end of March 2020 we secured CAA Approval in our own right as an Air Navigation Service Provider (ANSP). This means that we employ the Flight Information Service Officers (FISO) directly and manage all the Safety Management associated with the operation in accordance with Regulation. From a safety opportunity position it means that an Air Traffic service, called a Flight Information Service (FIS), is already approved to provide information to pilots within the existing Class G airspace and likewise to pilots within any different designation a portion of that airspace is given. The radio approval we hold allows the FISO to provide a FIS to a 14nm radius of the aerodrome and to an altitude of 6,000ft.

Operational constraints or opportunities.

The extent (563 acres) and remote coastal location of Llanbedr Airfield provides the principal operational opportunity for the novel aerospace and space sectors. The benefit of flying at Llanbedr Airfield has been illustrated in the application documentation on the aforementioned CAA link. Whilst this is a new airspace application the fact is that some of the first unmanned aircraft ever to fly in the UK were developed and tested at Llanbedr from the 1950's and flown in a large Danger Area that existed for 50 plus years until the Ministry of Defence sold the airfield in 2004. The loss of this DA airspace in 2004 is of course an operational constraint now.

The most recent example of using the Temporary Danger Area referred to was to enable a drone to fly Beyond Visual Line of Sight (BVLOS) to drop a defibrillator on a beach near Barmouth. This drone project was sponsored by the UK Space Agency and the Welsh Ambulance Service and was the initial proof of concept stage of a proposed plan to develop a service to illustrate the benefits of using drones in support of the NHS in rural Wales. The ongoing development of this project will require the need to operate in designated airspace. See photograph below.

Technical constraints or opportunities.

There are no known technical constraints to the introduction of the sort of new airspace envisaged. It is presently Class G airspace which is open to anyone. However, we do want to provide an access corridor to D201 14nm to the south west. Where proposed new airspace will abut the existing Danger Area 201 a buffer policy will be developed in discussion with MOD and in accordance with existing policy

The RAF presently use the airspace although their tactical training area commences at 6,000ft. This is still Class G Airspace but with the advice that it is used for this purpose. There is considerable technical opportunity associated with securing approval of this ACP, namely to research, test, develop and experiment with novel aircraft and subsequently innovate and develop new modern cost effective, safe and environmental friendly air systems including control systems and communications, of conspicuity devices and sensors. For our ANSP, in terms of technology and unmanned traffic management.

Economic constraints or opportunities.

The UK under its Industrial Aerospace Strategy Policy has a strong commitment to continue as one of the most attractive locations for the global aerospace and aviation industries. As part of this the UK is taking a lead in delivering cleaner, quieter and more innovative aircraft. They wish to "fast-track the electrification of flight, exploit the global potential of new urban mobility solutions and pioneer autonomous aviation."

Many of these initial experimental aircraft systems are unable to operate safely in traditional airspace and require extensive RDT&E within a dedicated controlled airspace environment. The lack of a suitable Danger Area for this innovation would be a substantial economic constraint to the UK aerospace sector and leave them behind Europe and the rest of the World. This sector is hugely important to the UK economy. It provides over 120,000 highly skilled jobs. The sector has an annual turnover of £35bn, the majority of which comes from exports to the rest of the world. This is a world-leading industry, driving growth and prosperity across the UK, supporting jobs that pay about 40 per cent above the national average.

Llanbedr with its investment to date, its ongoing investment presently planned, and its history and development of a Centre of Excellence to support this sector, can, with the establishment of a permanent DA, aid the UK in delivering these aspirations.

The policy regulatory framework with which the proposal must comply.

SA are following the process described in detail in CAP1616 as mentioned in the introduction. As part of this we are engaging with potential stakeholders and interested parties to seek their views and comments on the proposed Design Principles to be employed in the development of design options for airspace.

Stakeholders engaged include but are not limited to: the wider drone and space community, RAF Valley, DAATM, QinetiQ, local councils and communities, General Aviation including based GA aircraft owner/operators, regular or previous users, NATMAC and National Air Traffic Services (NATS), local landowners, statutory bodies and parties having an interest in the region.

Engagement.

Specific engagement meetings were set up with the local councils' liaison groups, which included local councils and community representatives, the Welsh Government, Snowdonia Enterprise Zone Board and other members of the Llanbedr Oversight Board, for the 15th April 2020. These meetings had to be cancelled due to Coronavirus. We are proceeding as described above under: 'Impact of Coronavirus'.

A list of all those sent this communication has been complied at Appendix A to this letter.

Presentations and displays used in the CAP1616 process to date are available to view at https://airspacechange.caa.co.uk/ under the quoted reference. These should assist all stakeholders

and interested parties in understanding more fully the context of this ACP and thereby contribute to the development of the proposed Design Principles now being considered.

To enable maximum engagement at this difficult time we have set up a dedicated email response address da.acp@snowdoniaaerospace.com which will be used throughout the CAP 1616 process.

Development of Design Principles (DPs).

CAP 1616 guidance explains that it is important for the DPs to be drawn up through engagement between the CS and affected stakeholders and interested parties at this early stage in the process, and that unanimous agreement on the principles may be unlikely.

SA have drawn up a list of ten proposed design principles for comment upon in the below Questionnaire. Feel free to make comment and also suggest any other principle you think should be incorporated as part of the design principles now being considered. According to your feedback the DPs will be prioritised as to which is felt to be most important and a final list of DPs will be utilized in examination of the Design Option.

Your Responses.

The questions / statements in the Questionnaire below are designed to help us understand any constraints that could be considered during the CAA CAP 1616 Design Principles step of the Define Stage, Design Principles (1B). Please insert your responses below to each of the following questions. Where additional sheets or documents are used please make it clear which specific questions the additional sheets are responding to. ALL documents are to be returned to: da.acp@snowdoniaaerospace.com as previously described. The first 5 questions give an option to agree or disagree. If you agree or disagree it would be helpful to have additional supporting comments to this. If any of the questions are not applicable or relevant, please say so against the appropriate question in the comment box. Please just copy the completed questionnaire pages to send, with any additional supplementary response.

SA, the CS, sees the first Design Principle as the most important as safety is paramount, and the first five as fundamental. But, please also advise if you think the CS should prioritise some DPs over others.

QUESTIONNAIRE IN RELATION TO:

Llanbedr Aerodrome (Danger Area) ACP-2019-58

Representative Organisation:

(Please insert details of the Organisation you are replying on behalf of)

1. The design of airspace is appropriate due to the need described and in order to provide a safe environment for airspace users. (See: Statement of Need.)		
Your response:	Agree	Disagree
Other comment:		
2. The design must allow access to sufficient area to accommodate the wide range of anticipated different types of air vehicle requiring to use it for the range of RDT&E purposes, but could be sub divided		
Your response:	Agree	Disagree

Other comment:		
3. The design must minimize the impact to other airspace users by activation only when required based on need.		
Your response:	Agree	Disagree
Other comment:		
4. The airspace should be as accessible as possible to other users and be managed in accordance with Flexible Use of Airspace (FUA) principles as far as is practicable (Efficiency and Airspace Sharing)		
Your response:	Agree	Disagree
Other comment:		
5 The design should be in accordance with current airspace regulation and use a pre existing designation of airspace with established parameters (Conformity, Simplicity and Safety)		
Your response	Agree	Disagree
Other comment:		
6. Please let us know if there are any day time or night time constraints that you consider the CS could take into account when making this application.		
Your response		
7. Please provide any details of any issues or constraints due to local General Aviation Operations that you believe may have an impact on the airspace design		

Your response
8. Please provide details of any constraints the introduction of this design may have on gliding, microlight flying, hang gliding, paragliding or model flying.
Your response
9. Are there any local development projects, or existing particularly noise sensitive areas, that the CS should be aware of?
Your response
10. Please advise us of any other issues or constraints you feel the CS could consider when designing its new airspace.
Your response please provide details.

Thank you for your cooperation in completing this questionnaire. Your comments will provide a valuable input to aid development of the Design Principles against which the options for the Danger Area airspace design can be developed.

All completed forms have to be kept to evidence the CS engagement with stakeholders and interested parties but this information remains confidential.

Snowdonia Aerospace LLP / Change Sponsor

Appendix C – Mapping of Stakeholder feedback to revised Design Principles, decisions and conclusions

No (a)	Stakeholder Responses (b)	Source (c)	Broad Design Principle Themes (d)	DP # (e)	Specific Shortlisted Design Principle / Comments (f)
1	GA must have a right of access	Questionnaire	Operational / flexible use of airspace	10	Impact on General Aviation (GA), gliding, microlight flying, hang gliding, paragliding or model flying should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
2	The DP must provide for flexible use of airspace		Operational / flexible use of airspace	10	As above
3	The DP must prepare for wider use of e-conspicuity		Technical / Safety	1	This is noted and is a part of the UTM development case and will be considered as a safety matter in the context of this DP. DP 1: The airspace design will provide an area of segregated airspace (a Danger Area (DA)) local to Llanbedr Aerodrome for the safe research, development, test and evaluation (RDT&E) of novel aerospace systems
4	In line with Airspace Modernisation minimum airspace volumes should be used to meet the need		Technical / Operational	3	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
5	There should be an analysis of overall airspace safety changes		Safety		This is a part of the CAP 1616 process
6	There should be a proper validation of forecast traffic levels		CAP 1616		This is a part of the CAP 1616 process
7	The DA would separate aircraft in an area where it is not generally possible to receive a radar service		Technical / Safety	1	The airspace is necessary especially due to the BVLOS activity. This is not a DP.

8	The ACP would be of significant benefit to the UK aerospace industry if it can be activated at short notice and is available at low cost		Technical / Safety	1 / 3	The design should assist meeting these operational requirements
9	Sub-division allows flexible use but would make assessment on flight planning software more difficult. A larger DA with a crossing service might be better		Technical / Operational	3	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
10	A new classification of airspace would not be well received.		Technical / Safety	1	Supports the DA principle
11	The farming community need to be able to use drones as this is of increasing importance for farm management		Technical / Operational / Flexible Use of Airspace	3	The operation of VLOS drones is governed by national regulation. Communication by farmers with the CS is to be encouraged.
12	There is a problem of light aircraft transiting to the west seldom transponder equipped and often only with handheld radio		Technical / Operational Airspace Management	3	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
13	The DA should enhance flight safety in the area		Technical / Safety & Safety operational	1 / 3 / 6	The implementation of airspace (1), the design (3), and provision of a FIS (6) will provide flight safety assurance.
14	As the ACP develops the design needs to seek to improve co-ordination and integration of traffic to make the overall use of the airspace as efficient and safe as practical		Technical / Operational / Safety	3 / 6	As above
15	There should be safe access to the airspace when the DA is not in use		Technical / Operational & Safety & Flexible Use of Airspace principles	3 / 6 / 10	See these DPs
16	The LJLA Stage 3 formal public consultation has been completed the CS should be cognitive of the proposed changes as the Llanbedr design is developed		Future Airspace Strategy	N/A	Noted.

17	Existing paragliding and hang-gliding actives need to be considered at the Harlech main take-off and the Harlech cliff take-off		Technical / Operational Other airspace users	3	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
18	As above at the Fairbourne take off		Other airspace users	3	As above
19	The paragliding & hang-gliding community offered an alternative design		Design Options	N/A	To be reviewed
20	Assurance is sought for access to other air traffic outside the times of DA activity		Flexible Use of Airspace		The airspace will be Class G outside times of notified activity
21	Promulgation of activity in the early hours or late in the evening must be possible for the launch of aerostats or balloons		Times of Operation		This is noted
22	Flexibility of timing is required also due to the need to take advantage of a weather window		Times of activation		This is noted
23	The volume of airspace of the TDA seems ideal for the nature of BVLOS flying for smaller commercial companies as access to MOD DA is either not possible due primacy of MOD or too expensive		Technical / Safety / Operational	1 & 3	The design should assist meeting these operational requirements
24	The ACP lacks volume for larger systems		Technical	2	The DA design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201
25	The DA should be available for booking at any time throughout the 24 hour period		Times of activation		This is noted
26	The consideration of noise sensitive areas at Stage 1b of the ACP process is welcomed but consideration should be given to the Snowdonia National Park and nominated quiet areas.	CAP 1616	Environmental	7	Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement
27	The National trusts expects that new noise modelling is to be introduced this	CAP 1616	Environmental	7	As above

	year and that this new policy should be followed				
28	Environmental impact including CO2 emissions and local air quality should be assessed in accordance with CAP1616	CAP 1616	Environment	7	As above
29	Would like to understand more detail of how the DA would be managed including the overlap of the ATZ and the DA		Technical / Operational / Safety	3 / 6	See DPs, Meets conformity simplicity / safety requirements
30	Weekends and evening flying are of particular interest to Mona GA aircraft		Operational / Other airspace users	10	Impact on General Aviation (GA), gliding, microlight flying, hang gliding, paragliding or model flying should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
31	NATS would like to understand the predicted usage in terms of height and duration of D201 when accessed from the proposed DA		D201		This is described in some detail in the stakeholder responses on the CAA portal.
32	Experience in UAS flight trials has proven that it is essential to have sufficient area across both land and sea to cater for a wide variety of system types and sensors. The trials area needs to be sufficiently large enough to cater for various airspeeds as well as providing large enough search and reconnaissance areas to test the system capability.		Technical / Operational Design Options	3	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
33	Sub division of the area is highly desirable permitting potential segregation of simultaneous trials activities, or increases flexibility to other airspace users by minimising the trials operational area only to that which is required		Technical / Operational	3 / 10	See these DPs
34	Activation should only be on an as required basis with FUA principles adopted as much as possible.		Operational / Flexible Use of Airspace	10	Impact on General Aviation (GA), gliding, microlight flying, hang gliding, paragliding or model flying should, where possible, be minimised via

					operating procedures in line with Flexible Use of Airspace principles
35	In order to provide clear unambiguous information across the general aviation community it is essential that existing designation notation is maintained.		Technical / Operational	3	Noted. See DP. This will be reviewed with Design Options
36	Use of the proposed airspace both day and night is essential to test the full capability of a UAS but should be constrained to only that required to minimise any impact on the local community.		1 / 7 Technical / Safety / Environmental	7	Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement
37	Methods to increase UAS conspicuity in consideration of existing light aviation should be explored.		Conspicuity		The CS is cognisant of a UTM benefit and that conspicuity will assist the DAAIS and potentially other airspace users.
38	It is essential that clear communication paths are assured to notify when the proposed airspace is active.		Safety / Operational	6	Operating hours of the Flight Information Service (FIS) and DA will be linked to ensure consistent traffic procedures and radio calls, and demand for changes in operating hours of the FIS will require a corresponding change in the operating hours of the DA and vice-versa
39	The development of this ACP should not lead to an exclusion of military traffic use of D201		D201	9	Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
40	The envisaged development of the Snowdonia Enterprise Zone includes the ability of aircraft under development and space related vehicles to access D201. The design of the new ACP must accommodate this connection for future users.		Technical	2	The DA design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201
41	The CS should take account of the need of local people and not cause unnecessary disturbance outside of normal business hours.		Environmental / Operational / Times of activity	7	Note the DP. As described fully elsewhere the standard objective will be to operate 9 – 5 weekdays. However, there is a fundamental requirement to use weather windows that may

					present early and, or late. In most circumstances the platforms seeking these opportunities will be lightweight, require less power than larger vehicles, and in consequence will produce less noise. The CS believes these issues will be adequately addressed as DP 7 is considered.
42	The ACP as in the TDA example, together with use of D201 will meet the needs of Newton Launch Systems but the flexibility of time of use is essential due to the nature of trials activity.		Technical / Operational Times of operation	3	As above though this response notes the nature of trials activity which additionally to the above means technical work, usually delay, meaning adjustments required to the flight departure time.
43	Use of the airspace at weekends and on evenings will extend opportunities for broader community involvement such as amateur groups, students and outreach activities.		Times of operation / community involvement		The CS had not conceived this would be a part of DPs but would encourage such involvement as we have done previously as in STEAM activity.
44	The eastern part of the Area A in the TDA example is unnecessary		Technical / Operational	3	This is not the case. A number of stakeholders have cited the need on occasion to trial over land as well as sea.
45	A DA crossing service or equivalent should be provided to assist with precautionary landings for gliders		Safety / Operational Airspace Management	6	See DP. A DAAIS will be provided
46	There is a risk to glides not being able to access a safe landing area when the DA is active		Safety / Operational	6	As above. The FIS will always give priority to an aircraft making an emergency landing
47	An assured access corridor to D201 is essential for satellite recovery		Technical / D201	2	The DA design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201
48	The safety of any airspace users contained within segregated airspace should not be to the detriment of other airspace users. With the volume of flying from RAF Valley set to increase the MOD would have to scrutinize any design options to fully understand the impact this will have		Safety / Flexible Use of Airspace	1 / 5 / 6 / 9 / 10	See relevant DPs.

	on MOD activity and whether there is any increased risk to life.				
49	The MOD would be expecting to see the DA as small as possible whilst ensuring maximum access to all airspace users.	Technical / Operational	Flexible Use of Airspace / Design Options	3	The DA design will consist of multiple segments that should, where possible, allow the area of segregated airspace to be kept to a minimum in line with Flexible Use of Airspace principles while still meeting operational requirements
50	Depending on design options, the medium level 4 FTS activity may be impeded. The area is used by Texan T1 with a base of 4000ft and Hawk T2 with a base of 5000ft. Furthermore, low level sorties are common.		Design Options	9	Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
51	The MOD understand that access to D201 is a key enabler, however, the MOD would require confirmation on how they would operate and, if intending to utilise the MOD airspace what facilities they would require If there is a requirement to operate in the 201 complex regularly we would expect agreement through an LOA, similar to WWA, or as contracted through QQ/DE&S NB: EG D201 – DE&S QQ use would have to be paid for any additional services – ATS/Equipment etc.		D201	9	This is understood although we understand from discussions with the DA manager that we could also use D201 by providing our own safety assurance (radar) or book through West Wales Airport rather than QinetiQ.
52	MOD would be keen to ensure appropriate LOAs were a condition of any approved DA.		Safety / Airspace Management	9	See DP 9. The CS would seek to be able to engage with RAF Valley directly at the earliest opportunity to develop a LOA or with MOD if that is appropriate.

53	There is a wide range of activity within D201 (as listed in the AIP). The MOD would be keen to ensure that proposed adjacent Das would not have any impact on the operations contained within D201.		Safety / design Options	2 / 3 / 6 / 10	See the DPs. The multiple segment approach to the design will ensure zero impact on D201 whenever the air corridor is not required. A DAAIS will provide flight information
54	MOD would be keen to understand how safe access to airspace would be achieved. RAF Valley do not have sufficient radar coverage, furthermore, the MOD would be interested to understand how the provision of ATS around/in the DA (as required) could be achieved. The MOD are keen to support FUA principles.		Airspace Management / Flexible Use of Airspace / conspicuity	3, 9	Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace principles
55	Evolving UAS policy should be considered as this ACP progresses.		CAA UAS Policy	N/A	Noted.
56	The MOD would be keen to understand how a DA (bridge) is sufficient from a safety case perspective for all different UASs.		Technical / Safety / Design Options	2	This will be further addressed at the Design Option stage
57	The MOD would be keen to understand how safe delivery of DACS could be provided. Would this be with a FISO? If there is an intention to ask QQ (providers of ATS at Aberporth), the MOD request early engagement.		Safety / Operational / Airspace management	6	A DAAIS is a CAA approved alternative to a DACS. This will be provided by a FISO. In the case of a transit to D201 airspace managed by QQ the UAS would contact Aberporth in advance of entry to D201 to request entry as would any other aircraft. In the case of a UAS this would normally be with a pre booked approved slot.
58	Weekend operations would have negligible impact on MOD operations.		Times of operation	9	Noted.
59	Does the DA need to be 5nm inland and potentially restrict the movement of other aircraft?		Technical / Operational / Design Options	3	It is envisaged the use over land will be minimal and restrictions on other airspace users will therefore be minimal being assisted by the

					segmented approach to design. It is essential to this UK civil trials airspace proposal that a varied test environment can be provided.
60	How is the airspace closed to other users just when the UAV is airborne?		Safety / Operational / Airspace management	6	There will always by a FISO on duty during the promulgated time of activity. Airspace users can use the airspace at any time but would be unwise to do so if the DAAIS advises the DA active.
61	Opportunities to allow GA traffic to depart and arrive into Llanbedr when the DA is active need to be explored so as not to inhibit base operators unnecessarily.		Safety / Operational / Airspace management	6	As above
62	If airborne trials will be extensive then there should be as much advance warning as possible.		Airspace management		This is noted.
63	Parachutists will always operate in Area A and never with UAVs airborne but we are concerned about tandem skydives which are often booked months in advance.		Airspace Management		This is noted.
64	Operations should be limited to weekdays 9 – 5 when there would be good availability of emergency services .		Environmental / Operational	7	As previously described. Note the DP. As described fully elsewhere the standard objective will be to operate 9 – 5 weekdays. However, there is a fundamental requirement to use weather windows that may present early and, or late. In most circumstances the platforms seeking these opportunities will be lightweight, require less power than larger vehicles, and in consequence will produce less noise. The CS believes these issues will be adequately addressed as DP 7 is considered.
65	Polices and procedures should be developed around separations by distance and time rather than airfield closure to GA.		Airspace Management		Noted

66	The opinion of local Community Councils is important but Public Protection requirements must be met (noise etc) and planning issues discussed with the SNPA		Environmental / Operational	7	Any impact on the environment and associated leisure activities should, where possible, be minimised via operating procedures and should, where possible, take account of any local development projects or noise sensitive areas that are highlighted as a result of stakeholder engagement
67	The principles of conformity, simplicity and safety should be applied.		Design Options		Noted
68	Conspicuity of other airspace users that might encroach on the active DA would be beneficial.		Conspicuity		Noted
69	We regard the previously consulted TDA as the minimum area / volume.		Design Options		Noted
70	The airspace must be permanent to allow testing at short notice.		Design Options	1	The airspace design will provide an area of segregated airspace (a Danger Area (DA)) local to Llanbedr Aerodrome for the safe research, development, test and evaluation (RDT&E) of novel aerospace systems
71	Adequate control of airspace must take account of the slow flying nature of some of the air vehicles to be tested as these cannot readily manoeuvre to avoid other air traffic.		Airspace Management		Noted
72	Long endurance vehicles may require airspace to fly and land at night.		Times of operation		Noted
73	A ceiling of a minimum of 6,000ft is essential for test of stall and spin characteristics		Design Options		Noted

Table C1 *- Mapping of the key points of stakeholder feedback on the draft Design Principles / Stakeholder Questionnaire (detailed in full in Annex 1) to the revised Design Principles, decisions and conclusions drawn in Section 4 of this report.*

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