CAA Operational Assessment

Title of airspace change proposal	Llanbedr Danger Area
Change sponsor	Snowdonia Aerospace LLP
Project no.	ACP-2019-58
Account Manager	[redacted]
Case study commencement date	15/02/21
Case study report as at	17/05/21

Instructions

In providing a response for each question, please ensure that the 'status' column is completed using the following options:

- yes
- no
- partially
- n/a

To aid the SARG project leader's efficient project management it may be useful that each question is also highlighted accordingly to illustrate what is:

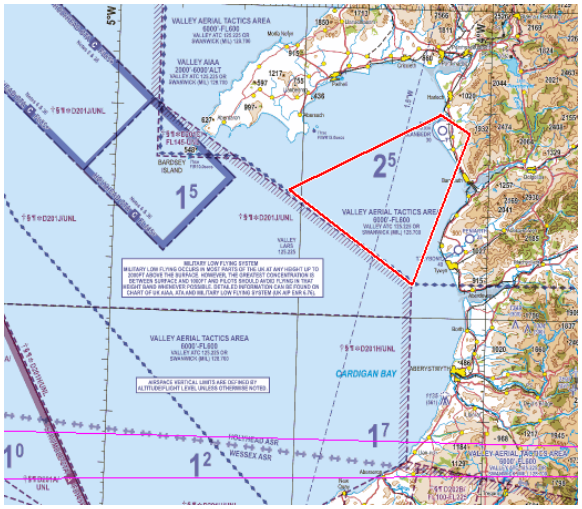
resolved Green not resolved Amber not compliant ....Red....

Executive Summary

The sponsor has proposed a complex of 11 individual Danger Areas that can be activated separately or in combination. Each has been designed to enable a specific environment/activity whilst attempting to minimise the impact to other airspace user. The sponsor has attempted to embrace Flexible Use of Airspace (FUA) to minimise impact within an area where there are multiple stakeholders. However, this approach is dependent upon the production of 2 Letters of Agreement that directly relate to Airspace Management , where 1 is fundamental to enabling access to D201, a Design principle of the ACP, and the second is required to minimise potential impact to the MoD. Both LOAs yet have not progressed beyond early draft stage, however the MoD has confirmed that they are progressing this work with the Sponsor. A third LOA has also been provided in a draft format where this LOA details notification arrangements with the local Paragliding and Hang-gliding users Fundamentally the lack of capability to provide a Danger Area Crossing Service (DACS) has required the sponsor to attempt to build in flexibility through pre-tactical activation, resulting in a very complex design. The resultant impact of this design is directly proportional to the amount of time the various Danger Areas will be activated and the combination in which they can be activated. This therefore adds a further degree of complexity to both the management of the structure and the resultant airspace picture.

Unlike through the AMC process there is not a body that will review and monitor daily the application of FUA and the resultant impact. Therefore, these considerations would need to be incorporated within any approval document and thus conditions have been proposed below.

1.	Justification for change and options analysis (operational/technical)	Status
1.1	Is the explanation of the proposed change clear and understood?	Yes
	Yes. There is a consistent text throughout all documentation that clearly express the drivers for the change and the intent of the proposal. This is corroborated by the engagement feedback where responses indicate a good understanding. All documentation uses the same or similar introduction which clearly outlines the current site and the intent to increase Research and Development Test Flying. Particularly regarding Unmanned Aircraft Systems which in accordance with Policy will require Danger Areas to achieve. Furthermore, it is also made clear that the sponsor intends to create a link to D201 to the South West to enable access to the larger Danger Area (DA), this will both inform the design and require the Sponsor to develop access procedures.	
1.2	Are the reasons for the change stated and acceptable?	Yes
	Yes. The ACP outlines the intent of this change is to establish permanent Danger Areas to support the trialling of novel technologies within the UK. A business case has not been provided to demonstrate the demand requirement; however, this requirement is corroborated by both the feedback received during the consultation and the historic use of Llanbedr for trial work including the regular application of a Temporary Danger Area (TDA). The ACP itself was born from an understanding of the CAA Air Navigation Directions 2017 (As amended) and the requirement to not seek to continually establish a temporary structure in place of a permanent change.	
1.3	Have all appropriate alternative options been considered, including the 'do nothing' option?	Yes
	Due to the nature of the requirement to create segregated airspace a Danger Area is required, therefore the options are limited to the design of the Danger Area and informed by the design options. In particular Design Option 2 which states: *'The design will also provide an air corridor that will link Llanbedr Aerodrome with the existing Danger Area D201'* This option itself limits the design to a corridor to the West of the airfield.	



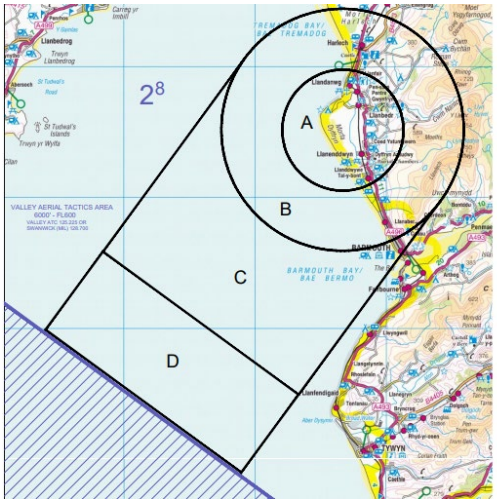
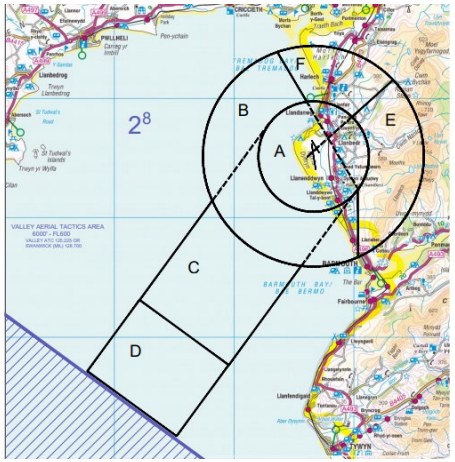
Any designs are again significantly informed by the lack of radar provision, where to limit impact to other airspace users the sponsor has increased the modularisation of the design. This is also informed by the Radio coverage and ability to provide a Danger Area Activity Information Service. The modularised design has also been selected to support the range of operation types they may conduct, this itself has been informed by previous TDA and analysis of industry requirements. Fundamentally they plan to activate the minimum number of areas required to achieve the task.

Within these constraints the sponsor put forward two similar 'modularised' proposals. Given the constraints above the two proposals are logical.

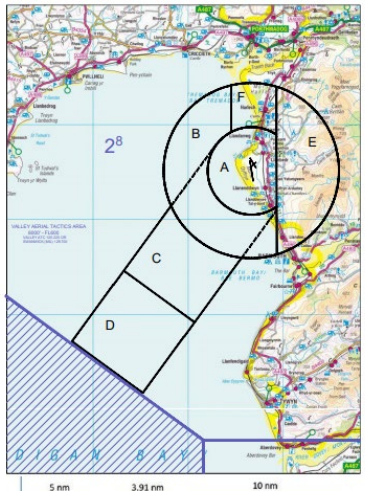
Within their design options document for CAP1616 step 2a, the Sponsor did not specifically consider a do-nothing option, this was however considered within their initial options appraisal 2b document. The 'do-nothing' option was presented as a continual application and use of Temporary Danger Areas. The document itself however makes clear that TDAs are subject to approval but it would be the intent for the Sponsor to continually apply for TDAs.

Noting:

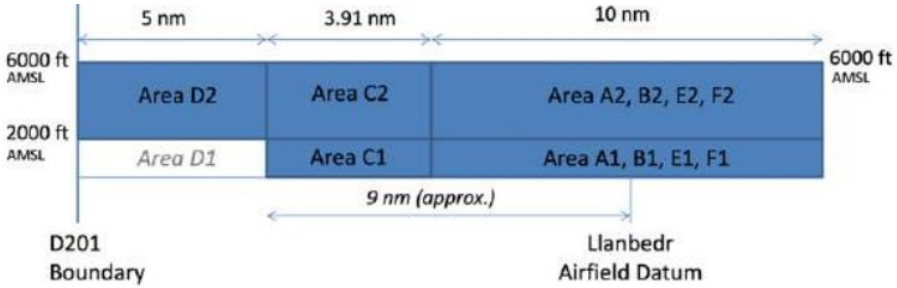
- The CAA Air Navigation Directions 2017 (As amended) limit the use of temporary structures in place of undertaking a permanent change.

	• Policy requires that UAS BVLOS is conducted in segregated airspace, therefore, to conduct BVLOS trials this will demand a Danger Area or equivalent. • The Sponsor states it is an assumption for the continual approval of TDA to enable BVLOS operations at the site. • The Sponsor acknowledges there would be a significantly reduced capacity of BVLOS operations if a TDA approach was required compared to permanent availability and therefore applies this capacity reduction to the comparison of options. • The historic routine use of TDA within that area for this purpose. This do-nothing comparison is therefore logical as it reflects the current and historic use of that airspace aligned with the effect if this ACP was not approved.	
1.4	Is the justification for the selection of the proposed option sound and acceptable?	Yes
	Llanbedr has a recent history of establishing TDA to enable trial UAS flights demonstrating a requirement. This history is also used to corroborate the design as both proposals broadly align with previous TDA. Prior to submission, the Sponsor did not have a preferred option, instead developing two options which satisfied their technical Design requirements.  Option 1  Option 2	

Post consultation, it was determined that Option 1 was the clearer to understand, whereas Option 2 provided more flexibility for activation and limiting impact to other users.



Option 2B



Options 2B side on view, identifying 11 independent structures

Post engagement Option 2B has been proposed. This proposal made two adjustments from the Option 2 design:

- An adjustment of the internal divide of sectors E&F in response to the high ground to the east of the airfield and enabling a route for GA to transit.

- An extension of area D from 4nm to 5nm in length. Area D is not contiguous with the sea but instead starts at 2,000ft AMSL, Area D1 above is not a DA but has been named by the sponsor within the diagram to support identification and discussion within the document to identify the gap under D2, whereas area C starts from sea level. This effectively forms a tunnel for aircraft to transit between Area C and D201. The extension of the area from 4 to 5nm was to increase this separation and reduce the funnelling effect.

The amendments reflect changes to option 2 which are logical and follow from the consultation. The design is however complex where this complexity is driven by the location of the surrounding high ground, surrounding traffic considerations and the limited capabilities of Llanbedr in not being able to provide a DACS due to the type of ATS provide from the aerodrome.

2.	Airspace description and operational arrangements	Status
2.1	Is the type of proposed airspace design clearly stated and understood?	Yes
	Yes, the design is clearly articulated within the documents, both described in text and through pictures. The Sponsor understands the structure and how activation and de-activation will be managed. Regarding the role of a Danger Area Authority (DAA), the sponsor is aware that they are responsible for ensuring activity is contained within the area. Noting this is one of few non-military managed permanent Danger Area specifically for enabling UAS operations, this brings wider consideration. Within a Military context this safety consideration is managed through the Military Aviation Authority and air system Release to Services. From a Llanbedr perspective, the DA is to support innovative activity as discussed and analysed within the associated documentation including the Environmental and Consultation document sets. Therefore, the only hazardous activity that can occur within the DA should be UAS BVLOS flight, Balloon activity and flights which require a degree of segregation to enable, this will require the creation of a new Danger Area Descriptor or Trials and Evaluation for single or multiple aircraft conducting manoeuvres that may not be able to comply with the Rules of the Air; this is differentiated from High Energy manoeuvres which are not required. With regard to BVLOS UAS flight this will require the operators to have an approved Operational Safety Case (OSC) from the CAA RPAS team. The OSC considers the proposed airspace structure to ensure it satisfies the requirements to contain the hazard. Llanbedr as part of their proposal expect all operators to have an OSC therefore satisfying this element of their role as a DAA for UAS operations. For other activity they will have a responsibility to put in place process which ensure the activity will be contained. Furthermore, the Sponsor is aware that the DA is being used to establish a segregated environment and this will require coordination with other Llanbedr based operations. The airspace design itself relies upon applying the concept of Flexible Use of Airspace (FUA), leading a proposed DA complex of 11 independent structures. The sponsor understands this is not only about activating 'only when required' but also applying a degree of Collaborative Decision Making (CDM) when determining potential activation levels in the first instance; this has formed a key part of their design. In determining their requirement, the Sponsor has assessed the predicted activation requirements for each element of the overall structure in line with their business plan, with the intent to manage these activations in line with the CDM process. The sponsor provides a predicted number of activations but does not impose any substantive restrictions upon themselves. This CDM consideration is particularly important within their proposal when considering access to the D201 complex and for how local traffic associated with RAF Valley is being considered. Both LOAs are still being reviewed and are at an early draft stage with evidence that discussions are ongoing.	

2.2	Are the hours of operation of the airspace and any seasonal variations stated and acceptable?	Not Resolved

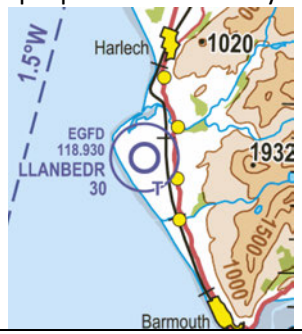
It is proposed that each segment of the DA will be activated by NOTAM a minimum of 24 hours prior to activation and only for the minimum amount of time. It is expected that normal activations would occur between the hours of:

0900-1700 Monday to Friday with the possibility of activations on the weekend and/or out of hours. There is an expectation that the level of activation will be greatest during Summer months where there is likely to be an increase in GA and Military activity. Noting this the sponsor has proposed the following expected days of activation for each area:
Area A – 107 days
Area B – 35 days
Area C – 12 days
Area D – 12 days
Area E – 6 days
Area F – 6 days

Max altitude 2000ft 71
Max altitude 6000ft 36

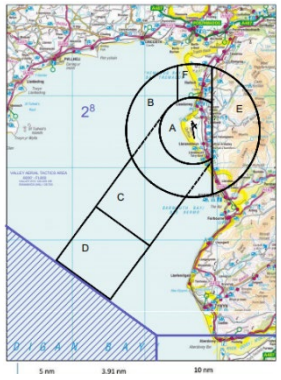
When considering the altitude split calculation noted above, in the case of Area A (which will be required to be activated for all BVLOS operations), this is constituted of structures A1 and A2. A1 only would be activated of up to 71 days (providing sfc -2,000ft) and A1 and A2 for up to36 days (providing sfc to 6,000ft). Areas B-F activations would be reduced in line with the figures noted above.

Structure:
To take into account transiting GA traffic that follow the coastline against the issue of the high ground to the East, see chart extract below, Llanbedr propose not routinely operating elements of Areas B or F (structures B1,B2, F1 and F2) when area E (structure E1 or E1 and E2) is active.



	Area B is not expected to be notified active when Area C is active and vice versa, this accounts for the apparent overlap in structure per diagram in section 1.4. Area C would enable transit to Area D and to facilitate long range testing, where Area C could be operated independently of Area D. Area D is not contiguous with the sea, Area C however is contiguous. This variation is due to the sponsor considering potential glide characteristics of some of the air systems they are looking to accommodate. Effectively the UAS could operate in Area D and in the event of an engine failure the glide characteristics would enable the UAS to glide into Area C as a minimum. Approval to operate in Area D under these conditions would require consideration within the Operational Safety Case which would consider the ground risk. This accounts for the variation in Area C and Area D design. Area D will only be activated when UAS are transiting to D201 or as an extended straight-line testing corridor. It is anticipated this will be active for not more than 12 times per year. The design of all elements of the structures and the fact they are activated by NOTAM ensures that they should only be activated for the minimum amount of time, limiting the impact and ensuring the activation time is the minimum amount required.	
2.3	Is any interaction with adjacent domestic and international airspace structures stated and acceptable including an explanation of how connectivity is to be achieved? Has the agreement of adjacent States been secured in respect of High Seas airspace changes?	Not resolved
	The proposed structure sits below the Valley AIAA which is between 6,000ft AMSL – FL660. RAF Valley during consultation identified that the aircraft operating in that notified space will routinely drop down below 6,000ft AMSL. To address this point, the Sponsor has vertically divided the structure to account for this and is supported by a proposed LOA with a strict notification protocol. The structure is designed to enable access into D201, which accounts for the South West Corridor design. The sponsor is currently in talks with the MoD to enable access to D201. The MoD have indicated that they are content to facilitate access using a similar arrangement that has been established with West Wales Airport. This will require both LOAs to be finalised to satisfy this requirement.	

2.4	Is the supporting statistical evidence relevant and acceptable?	Yes
	No statistical analysis has been provided of other airspace users. The Sponsor has provided the number of movements at Llanbedr but does not quantify the volume of other regional airspace users who do not originate at Llanbedr through statistical analysis. General descriptions have been provided of the airspace as well as significant engagement with known airspace users including the GA, local gliding clubs and the MoD, qualifying the qualitative approach. Owing to the nature of the change and the airspace within which it sits this is deemed proportionate for this ACP.	
2.5	Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?	Not resolved
	This ACP is creating 'segregated airspace' which reduces the mixing of traffic at Llanbedr but will have external associated impact as well as potentially increasing overall workload. A safety assessment has been conducted on how the change would affect Llanbedr operations and an ATM assessment which includes the incorporation of the mitigations outlined within the Safety Assessment. Within the risk assessment 'Funnelling of GA traffic in conflict with military traffic' remains Amber post mitigations. The specific mitigations to address this point was increasing the length of Area D and redesigning Area E and minimising its activation. **Recommended Condition** A suggested limitation on E activation was allied in the proposal to not activating B and F. No limitation was proposed linking Area E and Area C activations. Considering the diagram below it can be seen if Area C was activated when Area E was activated concurrently, this would be more significant than if area B and/or F were activated concurrently with Area E. Noting the lack of DACS this could potentially result in a significant re-route and funnelling of traffic underneath Area D (element D1 in diagram in section 1.4 above). A proposal to satisfy this section should be to apply the same pre-condition that Area C could not be activated when Area E was activated. This should have minimum impact as the type of operations planned to be conducted in Area E differ from those described in Area C. Similarly, a condition should be placed that ensures Area B cannot be activated at the same time as Area E. **[see Condition 4, page 21]**	

		
2.6	Are any draft Letters of Agreement and/or Memoranda of Understanding included and, if so, do they contain the commitments to resolve ATS procedures (ATSD) and airspace management requirements?	Not resolved
	There are two LOAs that are fundamental to the proposal from an airspace management perspective and a third which supports local GA activity. They are in draft format however both sides have confirmed that the LOAs are being progressed along the lines which had been discussed during the engagement process. 1. Access to D201- this is fundamental to satisfying the original intent of the ACP to provide access. This is being progressed along with similar access arrangements enabling West Wales access. 2. LOAs with RAF Valley – this is being progressed to establish a formalised notification process to provide planning meeting to provide 14 days' notice of activity and a conformation of planned activity at 7 days notification. This will also outline a degree of prioritisation afforded to the Military in enabling access. This will mirror a process that Llanbedr have established with HEMS to enable access in the event of an emergency. 3. LOA with Snowdonia Sky Sports - a third LOA which supports local GA activity has been drafted to include Snowdonia Sky Sports within a framework similar to that proposed to RAF Valley. The MoD objected to this proposal initially, outlining concern regarding Area D, lack of a DACS and lack of ATM provision. This objection was withdrawn predicated upon further liaison, which has occurred. Subject to the LOAs being approved, the MoD are content with the proposal. Llanbedr have resolved to complete the 3 LOAs prior to the planned activation date of September 2021.	

	Recommended Condition Noting LOAs 1&2 are fundamental to the airspace design and the intended application of FUA, the structures should not be permitted to be activated until the LOAs have been agreed. This should be a condition of approval. LOA3 although not fundamental to the design is a significant measure in addressing the impact. The structures should not be permitted to be activated until the LOAs have been agreed. This should be a condition of approval. **[see Conditions 1,2, 4, 5 & 6, pages 19 - 22]**	
2.7	Should there be any other aviation activity (low flying, gliding, parachuting, microlight site etc) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, what action has the change sponsor carried out to resolve any conflicting interests?	Yes
	The sponsor has designed a complex structure with agreements to limit activation to reduce the impact. These limitations are essential to this point and therefore should be a condition of the ACP. **[see Condition 1, page 19]**	
2.8	Is the evidence that the airspace design is compliant with ICAO SARPs, airspace design & FUA regulations, and Eurocontrol guidance satisfactory?	Yes
	The design is compliant with the Buffer policy. There is one surrounding structure, D201, that does not require a Buffer to be applied, however 5nm track distance is provided between Area C and D201 which would satisfy this policy if it were applicable. Area D abuts D201 but will only be activated to facilitate access to D201 or as an extended straight line testing capability. There is one notified area of airspace an AIAA, this is not a structure and therefore does not require the application of the Buffer. In all instances the DA will be activated by NOTAM where a minimum of 24 hours' notice will be provided. This is complaint with the CAA DA Policy. The DA will only be activated for the minimum amount of time required, where LOAs will be used to support other airspace users planning. This attempts to apply the FUA concepts to lower airspace, the structure itself does not interact with the network and therefore would not be considered for AMC management.	
2.9	Is the proposed airspace classification stated and justification for that classification acceptable?	Yes
	This does not propose a change to the classification of the airspace. However, this does propose the addition of an airspace restriction – DA. In accordance with Policy a DA is required to enable BVLOS operations.	

2.10	Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?	Yes
	The ACP will create a DA which will 'segregate' the airspace to some degree. This impact will be limited through LOA and airspace design. This effect would be further limited if the operator was able to provide a DACS.	
2.11	Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation.)	Yes
	It is proposed to establish the structure within the AIP. Further the design, particularly Area E has been designed to minimise impact to other users. LOAs are being established with local airspace users to enhance the notification and awareness of the airspace status.	
2.12	Is there a commitment to allow access to all airspace users seeking a transit through controlled airspace as per the classification, or in the event of such a request being denied, a service around the affected area?	N/A
	N/A Note: A DAAIS will be provided, however this is limited to providing understanding of the status of the airspace. Within the LOAs the sponsor has suggested this could be supported by provision of ADS-B information provided by the FISO from a UTM type system. The CAA ATM inspector has confirmed this is not approved at this point so would not be possible. Should this become an approved capability in the future however, Llanbedr should investigate its use to support any potential DA operations.	
2.13	Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?	N/A
	N/A	
2.14	Are any airspace user group's requirements not met?	Yes
	This will impact GA airspace users. Llanbedr are attempting to mitigate this issue however there will be a residual impact. GA will be limited in their ability to transit the coast, particularly noting the proximity of high ground and the AIAA above which starts at 6,000ft. Due to a lack of DACS this mitigation will be reliant upon pre-tactical deconfliction measures. The provision of a DACS would help to reduce this impact further.	
2.15	Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).	N/A

	N/A	
2.16	Is the airspace design of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to contain horizontal and vertical flight activity (including holding patterns) and associated protected areas in both radar and non-radar environments?	Yes
	Dimensions have been informed by previous activity and extrapolated to potential future requirement. Future use will be based on a case by case basis where the requirements of the user would be considered within the Operational Safety Case.	
2.17	Have all safety buffer requirements (or mitigation of these) been identified and described satisfactorily (to be in accordance with the agreed parameters or show acceptable mitigation)? (Refer to buffer policy letter.)	N/A
	N/A	
2.18	Do ATC procedures ensure the maintenance of prescribed separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures?	N/A
	N/A	
2.19	Is the airspace structure designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace?	Not Resolved
	There is high ground to the East of the aerodrome, with an AIAA starting at 6,000ft. The AIAA itself does not prevent airspace users from accessing it but does however indicate a 'busier piece of airspace'. There is a potential for a funnelling effect when area A is activated as traffic navigates beneath the AIAA and the high ground to the East. This is exacerbated when area E is activated. There is also a potential funnelling effect when Area D is active as this will require aircraft to travel either between surface to < 2,000ft AMSL or above 6,000ft AMSL or to the East of Llanbedr. **Recommended Condition** Area D has been extended by 1nm to enable the transit. As per section 2.5 recommended, this should be combined with a limitation that when Area D is activated Area E could not be activated. Further, noting the lack of DACS, Area D should only be activated for a maximum of 12 days per year to align with the typical activation volumes that have been included in the condition. **[see Condition 1, page 19]**	

2.20	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?	Not Resolved
	Access to D201 is currently subject to a LOA that has not yet been agreed.	
2.21	Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?	N/A
	N/A	

3.	Supporting resources and communications, navigation and surveillance (CNS) infrastructure	Status
3.1	Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:	
	• **Communication**: Is the evidence of communications infrastructure including RT coverage together with availability and contingency procedures complete and acceptable? Has this frequency been agreed with AAA Infrastructure?	Yes
	ATM have confirmed Llanbedr have an approved Radio Coverage sufficient to provide a DAAIS.	
	• **Navigation:** Is there sufficient accurate navigational guidance based on in-line VOR or NDB or by approved RNAV-derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrol standards? For example, for navaids, has coverage assessment been made, such as a DEMETER report, and if so, is it satisfactory?	N/A
	N/A	
	• **Surveillance:** Radar provision – have radar diagrams been provided, and do they show that the ATS route/airspace structure can be supported?	N/A
	N/A	
3.2	Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growth acceptable?	N/A

	There is no current intent to upgrade CNS Infrastructure. This is aligned to the limitations on activation. Llanbedr have indicated an intent to apply to become a licensed aerodrome.

4.	Maps/charts/diagrams	Status
4.1	Is a diagram of the proposed airspace included in the proposal, clearly showing the dimensions and WGS84 co-ordinates? (We would expect sponsors to include clear maps and diagrams of the proposed airspace structure(s) – they do not have to accord with aeronautical cartographical standards (see airspace change guidance), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals.)	Not Resolved
	Clear Maps have been provided. Coordinates provided were incorrect and not ADQ complaint; the sponsor is in the process of providing the correct co-ordinates. There is no significant change to the design with the expectation of only minor amendments to the coordinates.	
4.2	Do the charts clearly indicate the proposed airspace change?	Yes
	Yes	
4.3	Has the change sponsor identified AIP pages affected by the change proposal and provided a draft amendment?	Not Resolved
	No, they are not a licensed aerodrome, however due to the nature of the structure this will only require updating to ENR5.1. In addition, this may be influenced by some of the conditions suggested. We can support the development of the ENR5.1 addition as the majority of the data will be included in the WGS84 Spreadsheet.	
4.4	Has the change sponsor completed the WGS84 spreadsheet and submitted to the CAA for approval?	Not Resolved
	The data was sent back to the Sponsor as part of the document check and they are now generating the required coordinates for submission. The original data provided was marginally 'out' , therefore no significant change is expected.	

5.	Operational impact	Status
5.1	Is the change sponsor's analysis of the impact of the change on all airspace users, airfields and traffic levels, and evidence of mitigation of the effects of the change on any of these, complete and satisfactory? Consideration should be given to:	
	a) Impact on IFR General Aviation traffic, on Operational air traffic or on VFR General Aviation traffic flow in or through the area.	Not Resolved
	The Sponsor does not provide analysis on the level of current traffic (only traffic movements at Llanbedr), or an anticipated impact upon the traffic from a statistical perspective. General descriptions have been provided of the airspace as well as significant engagement with known airspace users including both the GA, local gliding clubs and the MoD, thereby qualifying the qualitative approach. Owing to the nature of the change and the airspace within which it sits, this is deemed proportionate for this ACP. The sponsor is aware this change will impact GA (IFR and VFR) and OAT and has amended the design accordingly. Specifically, this is considered to the East of the airfield through amendment of Area E and the to the west the through the extension of Area D. The anticipated activation times are critical however when considering the residual impact to both OAT and GA. Further the LOAs are critical to mitigating the impact to OAT. **Recommended Condition** Due to the lack of statistical data regarding other airspace users not based at Llanbedr it is recommended that: • The potential activation times that have been consulted on are utilised to inform the maximum number of activations per year of each Area. • When Area E is activated Area B, C, D and F should not be activated as this otherwise would create a significant re-route and funnelling effect. • Noting the proposed LOA between Llanbedr and RAF Valley will enable early planning, whilst all areas are considered in the planning process the volume of traffic seeking to use the 'tunnel' could create a funnelling effect, where MoD aircraft are likely to be the prime users of that portion of airspace. The proposed activation of Area D should require specific consent from RAF Valley through the proposed planning process outlined within the draft LOA. **[see Conditions 1, 2, 4, 5 & 6 pages 19-22]**	

	b) Impact on VFR Routes.	Not Resolved
	Considered in point above.	
	c) Consequential effects on procedures and capacity, i.e. on SIDs, STARs, holds. Details of existing or planned routes and holds.	N/A
	N/A	
	d) Impact on airfields and other specific activities within or adjacent to the proposed airspace.	Yes
	Area F has been designed to minimise impact to paragliding and hang-gliding activities where an LOA is being established to provide advanced notice of intended activations to allow groups to plan accordingly. Similar to the point above this will therefore impact their operations, where the level of impact will be proportionate to the number of activations. Whilst the sponsor highlight that the activations will mainly occur Mon-Fri there is a possibility of activating on the weekend also. **Recommended Condition** Therefore, the estimated activations used which formed the basis of the consultation should be used as the maximum number of activations permitted. **[see Condition 1, page 19]**	
	e) Any flight planning restrictions and/ or route requirements.	N/A
	N/A	
5.2	Does the change sponsor consultation material reflect the likely operational impact of the change?	Yes
	Yes, the consultation document was an accurate reflection of the proposal and generated response to influence the final design. The impact of the design will be dependent upon the number of activations where the sponsor has consistently used the following activation numbers as the estimated DA annual usage: Area A – 107 days Area B – 35 days Area C – 12 days Area D – 12 days Area E – 6 days Area F - 6 days	

	Max altitude 2000ft 71 Max altitude 6000ft 36 When considering the altitude split calculation noted above, in the case of Area A (which will be required to be activated for all operations), this is constituted of structures A1 and A2. A1 only would be activated of up to 71 days (providing sfc -2,000ft) and A1 and A2 for up to 36 days (providing sfc to 6,000ft). Areas B-F activations would be reduced in line with the figures noted above.

Case study conclusions – to be completed by Airspace Regulator (Technical)	
Has the change sponsor met the SARG airspace change proposal requirements and airspace regulatory requirements above?	Yes
The Sponsor however has produced a complex design, where the complexity of this design is directly proportional to the lack of a DACS and the geography of the area. The complexity of the structure has the potential to create a complex airspace picture, the complexity of this picture however will be directly proportionate to the number of activations and the local agreements which will underpin the operations. I would suggest therefore that the activations should be controlled to ensure the potential impact is not greater than anticipated. Noting however the value of an established test area, subject to the following conditions I would recommend approval.	

RECOMMENDATIONS/CONDITIONS/PIR DATA REQUIREMENTS	
Are there any Recommendations which the change sponsor ***should try*** to address either before or after implementation (if approved)? If yes, please list them below.	No
GUIDANCE NOTE: *Recommendations are something that the change sponsor* ***should try*** *to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.*	
Are there any Condition(s) which the change sponsor **must fulfil** either before or after implementation (if approved)? If yes, please list them below.	Yes
GUIDANCE NOTE: Conditions are something that the change sponsor **must fulfil** either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors **must observe** any condition(s) contained within the regulatory decision; failure to do so **will usually** result in the approval being revoked. Conditions should specify the consequence of failing to meet that condition, whether that be revoking the ACP or some alternative.	

Recommended Condition 1

- Due to the lack of statistical analysis, the impact proposed to stakeholders was aligned to the expected DA annual usage based upon 107 day antipcated requirements.
- The design of areas F, D and E have been specifically tailored to address this impact, the success of this impact is also aligned to the level of activations.
- In line with the Danger Area Policy each daily activation should be for the minimum amount of time required.
- The lack of a Danger Area Crossing Service (DACS) will significantly limit transit of the airspace when it is active as through a Danger Area Activity Information Service (DAAIS) the FISO is only able to provide information about the status of the airspace, not a clearance to cross.
- The consulted-on activation numbers should therefore reflect the maximum number of activations that each area can be activated within a calendar year:

  Area A – 107 days

  Area B – 35 days

  Area C – 12 days

  Area D – 12 days

  Area E – 6 days

  Area F - 6 days
- This also reflects a suggestion from Consultation regarding area E and imposing a restriction on activations. These activation figures should be reflected within the respective LOAs and would be subject to review within the PIR in 1 years-time to ensure the impact is not greater than expected. Activations will be periodically monitored by the CAA every 3 years as part of the DA audit and monthly through the Danger Area statistical returns in accordance with the DA Policy.

Condition: ***The maximum number of activations within a calendar year for each area is as follows:***

Area A – 107 days

Area B – 35 days

Area C – 12 days

Area D – 12 days

Area E – 6 days

Area F - 6 days

Activation beyond this number would require approval from the CAA where it will be necessary to demonstrate appropriate engagement with effected stakeholders and would likely require the provision of a Danger Area Crossing Service (DACS). This maximum activation numbers should be reflected within CONOPS and the respective LOAs* and will be subject to review within both the PIR and as part of the 3 yearly DA audit. The DA audit is a generic requirement of the DA Policy and not specific to this ACP. Within the DA policy the Sponsor is required to annually consider the size and requirement of the DA where this alongside the management processes are subject to a 3-yearly audit by CAA Airspace Regulation. As part of the DA policy the sponsor will also be required to provide monthly activation statistics.

Recommended Condition 2

- Linked to recommended condition 1 and noting the importance of the AIAA to MoD training, total number of calendar days the 'complex' or any element therein can be activated above 2,000ft should be not more the 36 days in line with the consulted on figures.

Condition: ***The DA complex must not be activated above 2,000ft AMSL for more the 36 days within a calendar year. Activation beyond this number would require approval from the CAA where it will be necessary to demonstrate appropriate engagement with effected stakeholders, including the MoD. This maximum activation numbers should be reflected within the respective LOAs* and will be subject to review within both the PIR and as part of the 3 yearly DA audit. The DA audit is a generic requirement of the DA Policy and not specific to this ACP. As part of the DA policy the sponsor will also be required to provide monthly activation statistics.***

Recommended Condition 3

- The ACP was specifically to enable innovative operations as analysed within the associated documentation including the Environmental and Consultation document sets. The activity that can be conducted within the DA must only be that which has been approved and reflected within the DA descriptor, whilst the DA should not be activated for activity which is not hazardous e.g. Circuits, etc. Any additionally hazardous activity, including Electo/optical type interference that may be associated with Counter-UAS Jamming etc may require a separate ACP.

Condition: ***In accordance with Danger Area Policy only activities for which the Danger Area has been approved may be conducted with the Danger Area. Any additional activity such as Electronic/Optical interference and High Energy Manoeuvres would require***

assessment through a separate ACP. In addition, the DA should not be activated for activity which does not require a DA e.g. standard circuits, etc.

Recommended Condition 4

- Within the ACP the Sponsor suggest that area E will not be activated when area B and F are activated, this should be extended to include when area when C and D are activated also as the purpose of area E was in part to mitigate the effects of activating area D.

***Condition:* Area E may not be activated when any of the following areas area activated, Area, B, C, D or F. This condition should be included within both the CONOPS and relevant LOAs*. If concurrent activation is required, then approval from the CAA would be required where it will be necessary to demonstrate appropriate engagement with effected stakeholders and would likely require the provision of a Danger Area Crossing Service.**

Recommended Condition 5

- Due to the potential effect of Area D on OAT, noting Area D can be activated to support long range trials that do not require access in to D201. The absence of a Danger Area Crossing Service against activation of floating airspace could increase funnelling within the area D tunnel. Noting the LOA enables prior planning there may however be conflicts of interest. To mimic the Collaborative Decision Making, it is recommended that this element of the complex requires the MoD's consent to activate, to ensure conflicting traffic levels can be mitigated.

***Condition:* Due to the potential impact to Military Operations consent from RAF Valley is required to activate area D. This condition should be included within both the CONOPS and relevant LOAs* and addressed through the proposed planning process.**

Recommended Condition 6

- Noting the potential impact to GA and the level of high ground to the east, and that area E will be activated with area A this could cause a funnelling effect. This is in part mitigated by recommendation 1. This could be further mitigated by ensuring area E could only be activated Mon-Fri 0900-1700 and could not be activated on weekends or public holidays where GA traffic is likely to be greater.

This would also help to reduce the overflight of Snowdonia national park by either the Danger Area users or displaced GA traffic transiting during a potentially busier period.

***Condition:* Due to the potential impact to GA and the lack of DACS provision area E should only be activated within the period Monday-Friday 0900-1700 excluding Public Holidays. This condition should be included within both the CONOPS and relevant LOAs*. If activation is required on a public holiday or weekend, then approval from the CAA would be required where it will be necessary to demonstrate appropriate engagement with effected stakeholders and would likely require the provision of a Danger Area Crossing Service.**

***Please note, LOAs must be agreed and signed prior to implementation.**

Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below.	No

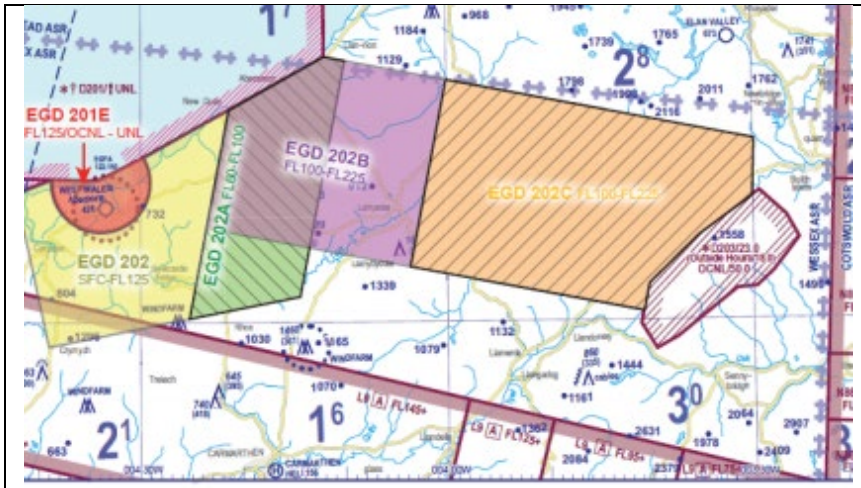
GUIDANCE NOTE: PIR data requirements concerns any specific data which the change sponsor **must** collate post-implementation, if indeed the airspace change proposal is approved. Please use this section to list any such requirements so that they can be captured in the regulatory decision accordingly.

General summary

The design proposed is very complex given the volume of airspace. This will be further complicated by the pre-tactical management of activation Ultimately if a simpler solution was proposed this could significantly impact other airspace users. I therefore believe given their lack of ability to provide a DACS, this design is the least impactful that could be created in that area although it heavily reliant on airspace management process. I believe this design has reached the limits of what can be achieved in that area without investment in a DACS capability.

Within the proposal the MoD questioned the appropriates of the creation of Area D without a DACS. An equivalent ACP was approved within the West Wales ACP which they state required the provision of an ATS and a DACS.

A DACS is not a requirement to enable BVLOS UAS in a 'floating DA'. There is no stipulated requirement for a DACS or DAAIS, however this is in a larger part due to potential impact and how to mitigate the effects of the restriction. This will clearly therefore be driven by context. When considering the West Wales example indicated below, the level and complexity of the airspace combined with no activation restrictions indicates a DACS would seem appropriate when considering mitigating the potential impacts.



When considering the ATS requirement, the ability to operate in within a DA is determined by the relevant Operational Safety Case (OSC). To operate within the proposed area D within this ACP the relevant OSC will consider the ATS requirement. When considering West Wales operations, the relevance of the ATS is likely due to the airsystem being operated, Watchkeeper, where the MAA may be the regulator. At the time of approval within MAA regulations they would likely have required a Deconfliction Service to have been applied to the aircraft as part of its Release to Service (OSC equivalent). Regardless specific ATS provision is not stipulated within the CAA decision letter.

Llanbedr's inability to provide an ATS may limit their ability to utilise area D in the future as its use will be dependent upon future OSC should this be an avenue they wish to explore. Of note other OSCs have been approved for TDA which have a floating airspace design.

Comments and observations
Nil

Operational assessment sign-off	Name	Signature	Date
Operational assessment completed by:	[redacted] Principal Airspace Regulator	[redacted]	05/05/2021

Operational assessment approved by:	[redacted] Manager Airspace Regulation	[redacted]	17/05/2021

Manager Airspace Regulation comments:

The sponsor has historically operated several TDAs in this area. The sponsor intends to conduct UAS BVLOS operations, trialling of innovative technologies, recognising that such operations should be contained within segregated airspace. The ACP therefore seeks to establish a Danger Area for UAS BVLOS taking account that sponsors should not continually establish a temporary structure in place of a permanent change. The airspace construct consists of several areas, which in turn leads to a complexity within the airspace design. This is in part due to the recognition by the sponsor through consultation and engagement for the airspace construct to be applied proportionally, taking account airspace user requirements through the application of Flexible Use of Airspace (FUA). It is therefore important that robust LOAs are in place for use of the airspace together with suitable notification of the airspace design and its status. I am content that the views of stakeholders have been considered through limiting the number of days for activation, including overland airspace structures. A number of conditions have been set furthering the need for appropriate airspace management, including further conditions on airspace activation periods and completion of LOAs with relevant stakeholders. Subject to these conditions being met prior to implementation I am content to recommend this Airspace Change for approval.

Head AAA Decision	Name	Signature	Date
Operational assessment conclusions approved by:	[redacted] Head AAA	[redacted]	04/06/2021

Head AAA Comments:

The continuous use of TDAs is unsustainable thus this ACP. It is reasonable that the UK allow competition in the civil market for UAS trials in segregated airspace, for it to be carried out largely over the sea minimises the effect on other airspace users. As has been mentioned many times in the comments above this is a complex restriction of airspace proposal, the recommendations 1 to 6 inclusive above should all be adopted as part of the approval of this ACP. In addition, clarity should be created to differentiate between areas B and C, which in part use the same airspace, thus should not be active at the same time. The lack of Danger Area Crossing Service for this area is the single weakest part of the proposal and one that is mitigated by minimising the number of days which it can be activated without further approval. Any such approval would not be guaranteed, and be based upon the provision of such a service. This ACP with the above requirements for LOAs and adoption of the recommendations is approved.