

Our Reference: 20210215_ Air-Cap-Del-ISTAR-Protector _ ACP-2020-100 for SkyGuardian to UK

Headquarters Air Command

Room 1W27, Spitfire Block Royal Air Force High Wycombe Buckinghamshire HP14 4UE

15 Feb 2021

ACP-2020-100 Summary of Webex Engagement Meeting held 9 Feb 21

This document forms part of the Airspace Change Proposal process as defined in CAP 1616. It is a summary of the engagement meeting held via Webex on 9 Feb 21 to be posted on the CAA ACP Portal for ACP-2020-100. All identified stakeholders were invited to join the Webex.

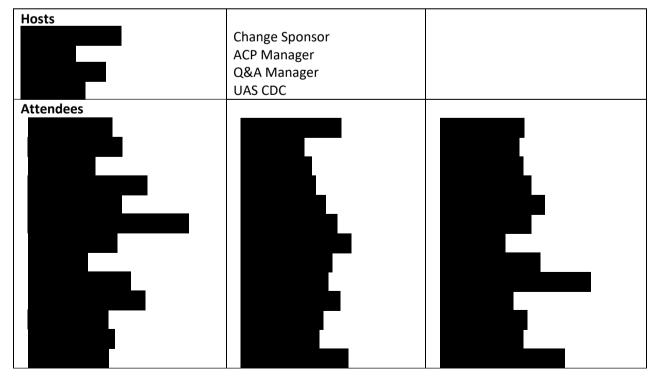
Meeting Agenda

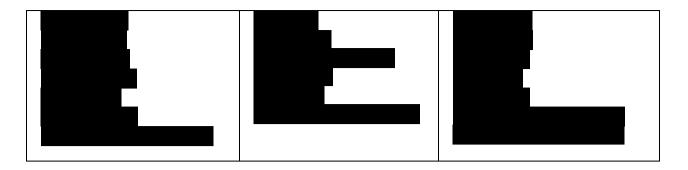
The meeting had the following agenda which was sent to stakeholders on 8 Feb 21:

- 1. Introductions & Webex protocols
- 2. Protector v SkyGuardian (different ACPs)
- 3. ACP process for a TDA
- 4. Brief on TDA requirement, design and operation
- 5. TDA Management
- 6. Draft flying schedule
- 7. Questions received to date

Meeting Summary

Present:





Brief & Discussion:

Item	Summary
1. Introductions & Webex protocols	 The hosts introduced themselves. Integration for the RAF Protector Programme, which the SkyGuardian programme is supporting. He is change sponsor for both ACPs. QinetiQ employee seconded in to the Defence Unmanned Air Systems Capability Development Centre (UAS CDC) which is on contract to deliver the ACPs for Protector and also SkyGuardian. Note - Reference to Protector and SkyGuardian was made referring to them as RPAS. RPAS = Remotely Piloted Air System. The Webex protocols were run through. It was outlined that: Attendees were requested to remain on mute unless invited to unmute. In order to ask a question, attendees were asked to use the "raise hand" function Questions would be answered as fully as possible. If answers could not be presented due to the classification of the material, attendees would be informed. Likewise, i the information was not to hand today, the sponsor would endeavour to get it and update attendees. All information to be shared was within the public domain. Nothing of a sensitive nature would be shared today A summary of the Webex would be posted on the ACP portal with a link sent to all stakeholders as soon as possible. It was not possible to take comments during the Webex as formal feedback. Feedback that stakeholders wished to be formally recorded must be sent in writing as per the engagement letter. This is a requirement of the CAA process.
2. Protector v SkyGuardian (different ACPs)	 Protector and SkyGuardian are variants of the same aircraft. Protector is the designation for the RAF's version; SkyGuardian is the name of the manufacturer's version. The MOD has commenced an ACP for Protector operations at RAF Waddington when it comes into service in 2023. The SkyGuardian ACP is completely separate from the Protector ACP. SkyGuardian and Protector are similar platforms, but this summer SkyGuardian will benefit from an on-board detect and avoid (DAA) capability. When Protector comes into service in 2023 it will not have a DAA capability. SkyGuardian and Protector will require different airspace constructs and procedures from each other to operate in the UK. This is why there are 2 different ACPs for the 2 activities.

Item	Summary		
	Protector ACP identifier is ACP-2019-18 and more details can be found on the CAA ACP portal www.airspacechange.caa.co.uk		
3. ACP process for a TDA	6. The airspace change process is outlined in CAP 1616 and all changes to UK airspace are legally required to follow the process as laid down within it. 7. However for this Temporary Airspace Change, a targeted engagement has been approved by the CAA such that only aviation stakeholders are required to be engaged with. The recommended engagement period is 6 weeks. The MOD has allowed for the full 6 weeks engagement, at the end of which stakeholders' feedback will be considered and a formal submission made to the CAA for its decision. No further engagement or consultation is required. 8. The MOD will submit its proposal by 26 March 21; a decision will be anticipated mid-April for implementation early July. 9. A CAA Policy Statement is also available detailing policy for Permanently Established Danger Areas and Temporary Danger Areas¹. 10. ACP progress so far: • Statement of Need posted on the ACP Portal • Assessment Meeting completed • CAA directed that the means by which to provide segregated airspace iaw its policy (CAP 722) is via implementation of Temporary Danger Areas (TDAs) • TDA designs presented in engagement letter dated 29 Jan 2021		
4. Brief on TDA	11. TDA requirement:		
requirement,	a. Regulation for enabling the flight of RPAS beyond visual line of sight		
design and	(BVLOS) in the UK. This is covered in CAP 722 and states that to fly outside		
operation	segregated airspace an RPAS must have a DAA capability that has been accepted as at least equivalent to the ability of a pilot to see and avoid, and ensures compliance with the Rules of the Air. b. SkyGuardian has a DAA capability. SkyGuardian is fitted with an on board DAA capability, which has been approved for use in the USA by the Federal Aviation Administration (FAA) on an experimental certificate with some caveats. In the USA the use of SkyGuardian's DAA currently requires the additional use of visual observation below 3000ft above ground level (agl). It has been assessed that that this mitigation is not suitable in the UK (due to weather etc). Instead the implementation of a TDA up to 3000ft agl mitigates the limitations of the DAA as imposed by the FAA and is in accord with CAA regulation for the operation of an RPAS BVLOS. In the USA SkyG is allowed to fly without restriction between 3000ft agl and FL100, except that it must do so as expeditiously as possible (i.e. straight ahead or spiral up from 3000ft to FL100 without pause to conduct any other activity and , therefore, minimising the time within that level band. It may fly above FL100 without any restrictions. c. CAA approvals. Bi-lateral agreements are in place between the CAA & FAA it is hoped that similar approvals, as are employed in the USA, could be given to SkyGuardian to operate in the UK this summer. However, there are differences between how we operate within the same classes of airspace either side of the Atlantic, so a gap analysis will be required to determine		

 $^{^{1}\} http://publicapps.caa.co.uk/modalapplication.aspx?catid=1\&pagetype=65\&appid=11\&mode=detail\&id=9702$

Item	Summary		
	how much read across there is between the regulations in the USA versus		
	here.		
	Such differences between airspace in the UK and the USA might mean that the CAA is unable to approve the reliance on the DAA at all below FL100, but this is not yet known. The manufacturer has delivered the required application to the CAA and we await its analysis. If it is not possible, another layer of segregated airspace will be required hence Area B (see diagram on the slide 12 of the presentation). This could be superfluous to requirements but the MOD needs to engage with stakeholders about it to cover all		
	eventualities.		
	Note – a question was posed regarding system capabilities for VFR flight by		
	SkyGuardian. Both SkyGuardian and Protector would be flown IFR only in the UK.		
	12. TDA Design:		
	 a. The design is the same for both RAF Lossiemouth and RAF Waddington. b. Several stakeholders have expressed concern about the volume of airspace proposed. The size and shape of the TDAs are largely based on various airspace designs under consideration for the Protector ACP for its operation at RAF Waddington. These designs are still in development but have been developed via close communication with the air vehicle manufacturer (who will be operating SkyGuardian this summer) and the RAF subject matter experts at Waddington and an embedded team in the USA. 		
	c. Whilst SkyGuardian could operate in a slightly smaller volume of airspace we are aiming to emulate the Protector flight profiles in order to see if the airspace can cater for typical Protector departure and arrivals in the manner which the RAF intends to train its crews. Protector will have a wider range of flight profiles and is likely to carry different sensors and equipment which will affect its flight performance.		
	d. The TDA's shown in the engagement material are the worst case scenario structures and the MOD will be continuing to define the shape prior to the final submission going to the CAA towards the end of March.		
	e. If it can do so without compromising safety or operational aims the MOD will endeavour to reduce the size both laterally and vertically. This could mean reducing the length of the TDA with reference to the distance extending along the extended runway centrelines into the approach or departure lanes, or the amount of buffer required either side of the extended centreline. Note that operations in both runway directions are being supported in the one TDA design. SkyGuardian has a long endurance (20hrs+) and whilst it is not the aim to be airborne for such durations routinely, the MOD needs to cater for the event of a runway change in the TDA design.		
	f. Continued dialogue with military aviation stakeholders week commencing 15 Mar 21 will concentrate on the airspace management, interaction with other airfields and potential options to reduce the TDA where possible.		
	g. In addition if the design can dispense with Area B (3000ft agl – FL100) it will. This is entirely dependent on the CAA flight authorisations which are being worked at the moment.		
	h. The manufacturer General Atomics – Aeronautical Systems Incorporated (GA-ASI) has currently submitted the data required for an Operating Safety Case IAW CAP 722A. No estimate for completion of that task is yet available, which is why Area B remains an option along with any to understand any requirement for an additional HAZID / risk analysis for flight above FL100.		

Item	Summary
5. TDA Management 6. Draft flying schedule	13. The items below are all being currently worked and solutions are being agreed asap but in principle: • TDA activity will be notified at least 24 hrs in advance Weekend activity can be notified at least 7 days in advance. • A Danger Area Crossing Service (DACS) is anticipated to be provided to enable access to the TDAs when active. The term "anticipated" in terms of DACS provision has been used and caused some concern amongst stakeholders. Owing to the timescales involved in trying to get this proposal out and to provide a 6 week period of engagement, the formal request had not been made to the ATC units. Stakeholders will be advised as soon as an agreement has been reached. Post meeting note - DACS has been formally requested to be provided by RAF Lossiemouth and RAF Waddington as appropriate • SkyGuardian will not routinely remain/operate in the TDA – it will climb out or recover through it as expeditiously as possible • General Aviation will not need to carry a transponder to access the DA • Calls for crossing service will be accommodated as far as possible 14. TDA Occupation Times: • Approximate climb times would be: • Under 3mins to 3,000ft agl; under 10mins to FL 100. • Descent times depend upon the selected airspeed, but worst case would be: • About 15mins from FL 100; about 6mins from 3,000ft agl. 15. Draft flying schedule • Arrives UK 1 July 2021 • First flight 5 – 9 July 2021 • First flight 5 – 9 July 2021 • First flight 5 – 9 July 2021 • 20 - 22 July NATO days (probably in the vicinity of EG D323) • 26 – 27 July Military Aid to Civil Authorities (MACA) demos (as above) • 2 – 6 Aug Royal Navy activity in South West Danger Areas (DAs) • 9 – 27 Aug Protector de-risking activity (~3 flights per week) • 6 – 10 Sep South West DAs (back-up) • 13 Sep – 8 Oct fly at Lossiemouth in support of military exercise • Weekend activity possible 17/18 July (RIAT)
7. Questions received to date	 Flying programme likely to be finalised by 31 Mar 21 16. Questions received to date and those that were posed during the Webex are at Annex A to this document.
8. Closing Remarks	thanked all stakeholders for their time, not only to listen to the presentation but also for presenting questions, which were very important and would be valuable to clarify the MOD's thinking. He stressed that this was an open and transparent activity. 18. will engage directly with specific stakeholders as indicated during the brief and the MOD will continue engagement and maintain communication throughout the process.

 $^{^{2}\,}$ Post-Meeting Note – the live RIAT airshow has been cancelled

Next Steps

Feedback on the proposed design must be received by 12 Mar 21. Please send feedback to UASCDC-ACP@qinetiq.com. The MOD will submit its proposal to the CAA by 26 Mar 21.

The MOD will use the CAA ACP portal to provide updates to the process and design work and will endeavour to advise all stakeholders by email when anything new is uploaded to the portal.



ACP Sponsor

Action	Role	Date
Produced	ACP Manager UAS CDC	15 Feb 21
Reviewed & Released	ACP Change Sponsor	15 Feb 21

Publication History

Issue	Date	Change Summary
Issue 1.0	15 Feb 21	Original Issue

Annexes:

A. Questions received before and during the Webex

A Questions received before and during the Webex

A1. a. We are concerned about the capabilities of the detect part of the detect and avoid. The UK has a considerable quantity of non-electronically conspicuous manned aviation that is known to paint poorly on radar, e.g. gliders, hang gliders, paragliders, etc. What information is available as to the testing against such targets that has been verified as part of the FAA certification? (General Aviation Alliance (GAA))

The manufacturer has supplied information on this to the CAA as part of its submission for flight authorisation. An independent validation was conducted by NASA on its variant of the platform, Ikhana, when small intruders were successfully tracked as defined in DO366. GA-ASI analysis is that the radar would be able to detect small targets such as those listed in the question and the FAA has accepted their analysis. However, this is currently being reviewed by the CAA, which has asked for more information to determine its level of acceptance for the UK. It is the CAA, not the MOD, which will make the decision.

b. Is the MOD aware that manned aircraft with small or effectively no radar signatures are routinely allowed above FL100 without transponders? (GAA)

The MOD is aware and a HAZID will be conducted by the MOD to ensure that the CAA's requirements are met.

A2. Why is the volume of airspace needed down to the surface over 8nm from the touchdown point in use? (GAA)

It may not be required. A workshop is planned for the week commencing 15 Feb 21 with military stakeholders where refinements to the design will be discussed.

A3. Will a non-functioning ADSB out facility be a no go item? (GAA)

A non-functioning ADS-B out capability on board SkyGuardian will constitute a no-go.

A4. The documents on the CAP1616 portal talk about a visit to Yeovilton, how can it operate there without a TDA? (GAA)

The air display at Yeovilton has been cancelled.

A5. The documents on the CAP1616 portal talk about a visit to RIAT, will all activity be within RIAT's TDAs? (GAA)

Yes, effectively although the airspace around Fairford is usually in the form of Restricted Airspace (Temporary) as opposed to TDAs³.

A6. What are the deemed differences between operating at say 2,000ft and 3,500ft that necessitates the TDA ceiling of 3,000ft? (GAA)

The potential limitations of the DAA capability make the operation different above and below 3000ft

- A7. What will typical sorties look like, and what will the associated TDA notifications look like? (GAA) Flypro discussed in the briefing. TDAs will be notified by NOTAM a minimum of 24hrs in advance
- A8. Accepting that the flying programme has not yet been decided what will be a typical number of flights per week? (GAA)

Probably no more than 3 flights per week.

³ Post-Meeting Note – the live RIAT airshow has been cancelled

A9. The document says, "it is envisaged that the majority of SkyGuardian flying will take place Monday – Friday". Other than for flights at RIAT can any weekend\Bank Holiday flying be notified at least a week in advance? (GAA)

The MOD is supportive of this.

A10. The Engagement Letter states it is anticipated that ATC will be active anytime SkyGuardian flies, is this likely to be nailed down to a more mandatory requirement? Such as the TDA only being active if ATC are manned? (GAA)

The MOD sees the provision of a DACS as an essential requirement for the duration of an active TDA.

A11. At what height AGL would the SkyGuardian need to be to satisfy ATC should it be operating inside Part A when Helimed 29Alpha requests departure. "(Lincs & Notts Air Ambulance)

Procedures will be put in place to minimize impact on Helimed operations (and other Cat A/B flights). To be discussed at the workshop with MOD stakeholders. Clarification will be forthcoming. This will also encompass Search and Rescue, Police and other emergency operations.

A12. Why not just simply use the existing MATZ/ATZ; complicating airspace with more overlays seems like overkill. (Temple Bruer operator)

The presentation provided rationale for the volume of airspace required and also indicated that the volume would be reduced if possible. The TDA design is based on the DAA limitations, SkyGuardian and Protector flying profiles and the CAA approvals. In addition existing MATZ and ATZ constructs do not constitute segregation for RPAS flying BVLOS without DAA.

A13. There are at least 4 farm strips within the existing MATZ what arrangements will be made to support their continued operation. (Temple Bruer operator)

You will be provided with as much immediate access to the airspace as possible bearing in mind the safety considerations. Communications with Waddington will be key. This will be further considered during the MOD workshop week commencing 15 Feb 21.

A14. A MATZ penetration service should surely ensure continued separation as with other air traffic, why is this any different? (Temple Bruer operator)

It is hoped that this was answered during the briefing, but to be specific, a MATZ does not provide the required segregation for an RPAS flying BVLOS without DAA.

A15. What consideration has been made regarding Temple Bruer and the proposed TDA and what procedures will be developed to allow continued activity from it, with the minimum of disruption? (Temple Bruer operator)

As Q13 & Q14, every effort will be made to provide ready access for Temple Bruer aircraft. Likely to be only restricted during the short time periods when SkyGuardian is in the TDA. DACS is anticipated to enable access.

A16. What climb and descent profiles, will SkyGuardian use for arrivals and departures? (Temple Bruer operator)

The MOD will provide more information on this in due course, but as stated in the briefing SkyGuardian will climb and descend without delay, in the most expeditious manner to vacate the airspace as soon as possible. This is likely to be via a spiral climb and descend. The MOD workshop week commencing 15 Feb 21 will begin to determine how to integrate with other airfields and their patterns.

- A17. The TDA's marked on both the Lossiemouth and Waddington charts, contained in the engagement letter are bounded by solid red lines. This suggests they will be permanently active and only deactivated when notified by NOTAM. Is that the case? (Temple Bruer operator)

 Apologies if that was misleading. As explained in the briefing it is hoped that the areas will be activated only when flying is due to take place.
- A18. Will the Waddington ATCU always be manned, when the danger area is active? The word anticipated in the engagement letter leaves some doubt regarding this. (Temple Bruer operator) It is anticipated that Waddington and Lossiemouth (as appropriate) ATCUs will be open throughout the TDAs' hours of activation.
- A19. A DA crossing service is envisaged, what level of service will be provided? (Temple Bruer operator)

It is hoped to be a full radar service. To be confirmed during the MOD workshop week commencing 15 Feb 21.

- **A20.** How often will the TDA be activated? (Temple Bruer operator) Covered during the briefing.
- A21. How long prior to launch and after recovery, will activation and deactivation of the TDA occur? (Temple Bruer operator)

TDA activation likely to be immediately prior to the launch of the air vehicle. The MOD would like to be able to deactivate the TDA straight after landing. However, there is a little bit more work to be done to determine the best means of activation and deactivation without compromising safety. It is our intention to be as flexible as possible with regard to handing back of the TDAs.

A22. Will the two segment parts of the TDA be Notamed and activated separately? (Temple Bruer operator)

Yes, it is thought so. However, if it is determined via the CAA approvals that segregated airspace is required all the way up to FL100 and time permits, the submission will describe just one area from SFC to FL100.

- A23. What oversight will be applied to ensure, that the TDA is only activated for its stated purpose and that it is not used, to exclude other airspace users for any other reason? (Temple Bruer operator)

 The CAA decision letter will make it clear that the TDAs are to be activated only for the purpose of SkyGuardian operation. The MOD is quite clear on this.
- A24. Has Skyguardian been permitted by the FAA to operate over densely populated areas in the USA including San Diego yet? (Temple Bruer operator)

The MOD is not aware what is in the FAA approval regarding flight over population density. The MOD awaits to hear any specifications in the CAA's approval.

A25. How would the DACS work for aircraft that originate within the TDA? (unknown)

Procedures will be developed with the ATCUs at RAF Waddington and RAF Lossiemouth to enable flight from those airstrips situated within the TDAs.

A26. There are likely to be occasions when SkyGuardian is operating at significant distance from RAF Waddington / Lossiemouth. Why does the TDA need to remain active for the whole duration of the sortie in these cases? (unknown)

The MOD is keen to explore this scenario with the CAA and the airspace management cells to see if there is a more dynamic means of managing the TDA activation. The method of safe and effective NOTAM'ing is governed by the systems that are currently in place; best use of these systems will be made.

A27. If a DACS is not agreed by Waddington ATC, will this delay the TDA submission? (British Hang Gliding and Paragliding Association (BHPA))

The MOD is anticipating that a DACS will be available during the full hours of TDA activation and will work to accommodate any manpower availability issues at RAF Waddington and RAF Lossiemouth to achieve this. The MOD does not anticipate any delay to the TDA.

- A28. CAA has issued grants to the GA community for the purchase of Electronic Conspicuity (EC).

 Paragliders and Hang gliders carry FLARM. Does Protector / SkyGuardian carry FLARM? (BHPA)

 The system on board SkyGuardian is probably not compatible with FLARM, but the host will clarify and confirm asap.
- A29. Will the RPAS operators have access to Glidernet? (BHPA)

Answer unknown - will check and confirm

A30. How will the datalink failure be managed if the TDA is deactivated between departure and recovery? (BHPA)

The MOD believes that deactivating the TDA in between departure and recovery is a difficult option to pursue. It will be explored with the airspace managers and the CAA.

A31. Will the contents of the Chat and the Presentation be made available to all participants after the meeting? (GAA)

The presentation will be placed on the ACP portal along with a summary of the brief. Answers to the questions posed will also be provided. The ability to download the chat will be investigated although identifying names will have to be redacted prior to sharing

A32. Can the approach profile of SkyGuardian/Protector be made steeper than a conventional approach in order to reduce the lateral airspace requirements? In addition could information be provided regarding the flight profiles that would be flown in the TDA? (GAA)

Slightly different profiles can be flown. However, the MOD is hoping to emulate the types of profiles being developed by the RAF for its enduring operation at RAF Waddington with Protector from 2023 onwards. It is the intention to design the TDA to enable testing for Protector to ensure the minimal dimensions are put in place through the Protector ACP. Whilst it had not been the MOD's intention to share specifics about the flight profiles, there might be an opportunity to do this. The host would investigate and report back asap.

A33. Question posed regarding changes required to the LOA between the MOD and Doncaster airport regarding the Class E airspace to the east of Gamston. (Air Traffic Services Manager – Liverpool Airport)

To be confirmed via the MOD workshop week commencing 15 Feb 21.

A34. How will any meaningful changes be made to the TDA design in the 2 week period between deadline for feedback received and the TDA submission? Does that mean that changes are highly unlikely? (British Gliding Association)

The MOD will be actively considering any options to reduce the TDA volume throughout the engagement period and will endeavour to feedback any proposed reduction to stakeholders as they become apparent. In addition as the means by which it will be managed are firmed up, the MOD will make these known to stakeholders. Changes will be made if at all possible.

A35. Is it correct that when Protector comes into service in 2023, it will require more segregated airspace than SkyGuardian requires this summer? (unknown)

The difference is caused by the fact that Protector will not have a DAA when it comes into service in 2023.

A36. Could the MOD consider a different volume of airspace for Lossiemouth from Waddington rather than the "one-size-fits-all" approach? (unknown)

The MOD explained that as it was trying to emulate the Protector profiles within the TDAs it was thought appropriate to present both TDAs of the same dimensions. It was acknowledged that it might be possible to vary the size between the 2 locations and the MOD agreed to look into the possibility.

A37. Is spiral up and spiral down the standard mode that you are anticipating for SkyGuardian? (Derbyshire Soaring Club)

For SkyGuardian, yes.

A38. How will you deal with the loss of datalink for flights between 3000 ft and FL100? (Aircraft Owners and Pilots Association (AOPA))

The MOD will provide an answer in due course.

A39. Can non-radio/non-radio licensed or non-transponder aircraft gain a DACS? ((Lincolnshire Gliding Club & UK Airprox Board (UKAB))

The MOD will investigate if any procedures can be put in place for non-radio aircraft to obtain a DACS. A transponder is not necessary to gain a DACS.

A40. How will SkyGuardian react to an infringing aircraft? (AOPA)

SkyGuardian has TCAS II, an air-to-air radar and ADSB. It will be up to the pilot of the aircraft in conjunction with ATC to take the necessary action.

A41. Will the table-top exercise with the MOD include members of the GA community or will it simply be CAA interpretation of GA operations and requirements? (Lincolnshire Gliding Club)

The MOD workshop would not include the GA community. It is the initial piece of formal military engagement, where procedures will be agreed about the management of the local airspace. However, it will include discussion about how to minimise the impact on all airspace users.

A42. What are the buffer distances used between flight paths and TDA boundaries? (GAA)

Historically the MOD had employed 0.5nm laterally and 500ft vertically within its danger area boundaries when operating RPAS BVLOS without DAA.

A43. What level of civilian airworthiness certification does SkyGuardian have? (Association of Remotely Piloted Aircraft Systems UK (ARPAS-UK))

SkyGuardian has an FAA certificate as an experimental aircraft for flight in the USA. In accordance with CAP 722A the manufacturer has submitted its Operating Safety Case for its operation in the UK. The CAA will determine level of certification is appropriate.

A44. How much of the operation will be autonomous? (AOPA)

None of SkyGuardian's flight will be autonomous.

A45. Will there be holding areas? (AOPA)

There is no intention at the moment to hold the aircraft, unless in response to an air traffic management incident, which is likely to affect manned aviation alike.

A46. What happens if there is an incident and a runway closure at Waddington whilst SkyGuardian is airborne? (Lincs & Notts Air Ambulance)

There are 2 options available in the event of the runway becoming unavailable:

- The air vehicle's long endurance allows for the option to hold off until the runway is available again;
- At both aerodromes SkyGuardian will have access to alternative landing strips for use in emergency.

A47. Will we see the submission to the CAA? (GA/Glider pilot)

Yes, the submission will be uploaded to the ACP portal once it has been delivered to the CAA (26 Mar 21).