MINUTES OF MORECAMBE BAY UAS TRANSIT ROUTE ASSESSMENT MEETING HELD ONLINE ON 26/04/21

26/04/21@11:00am Local

Present	Appointment	Representing
• ELECTRIC 1	Director	Electric Aviation Limited
• FLYBY1	Consultant	Flyby Technologies Ltd
• CAA1	Airspace Regulator	Civil Aviation Authority
• CAA2	Airspace Regulator	Civil Aviation Authority
• CAA3	Principal Airspace Regulator	Civil Aviation Authority
• CAA4	Flight Operations Training Inspector	Civil Aviation Authority
• CAA5	RPAS Sector team	Civil Aviation Authority
• CAA6	RPAS Technical Sector Team	Civil Aviation Authority
• CAA7	RPAS Technical Inspector	Civil Aviation Authority

CAA Assessment Meeting Opening Statement

The CAA has received the documents listed below in advance of this Assessment Meeting and can confirm that the documents are required to be published together with the minutes of this meeting on the airspace change portal.

The purpose of the Assessment Meeting as set out CAP1616 is for the Change Sponsor to present and discuss their Statement of Need, provide information on how it intends to fulfil the requirements of the airspace change process and present its provisional timescales. Lastly, the sponsor is required to provide information on how it intends to meet the engagement requirements of the process.

Documents Received:

- DAP1916V2ACP-2021-022-Redacted
- DAP1916V2-Updated-ACP-2021-022-Redacted
- ACP-2021-022 - Temporary Airspace Change Assessment Meeting Agenda

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	ACTION
Item 1 – Introduction The meeting commenced with the Civil Aviation Authority team introducing themselves: • CAA1 introduced himself as the lead from the ACP side of the CAA for the application. • CAA2 introduced herself as the Airspace Regulator for the Civil Aviation Authority who will lead this application from the engagement perspective. • CAA3 introduced himself as the Principal Airspace Regulator (Airspace utilisation) for the Civil Aviation Authority. • CAA4 introduced himself as a Flight Operations Training Inspector (rotary) for the Civil Aviation Authority. • CAA5 introduced himself as a member of the RPAS Sector team for the Civil Aviation Authority. • CAA6 introduced himself as a member of the RPAS Technical Sector Team for the Civil Aviation Authority • CAA7 introduced himself as an RPAS technical Inspector for the Civil Aviation Authority responsible for OSC matters. • ELECTRIC1 of Electric Aviation Limited introduced himself and the company. • FLYBY1 introduced himself as a consultant for FlyBy Technologies Limited advising Electric Aviation on regulatory process compliance. The CAA standard statement was then read: *The CAA has received the Sponsor's Statement of Need in advance of this Assessment Meeting and can confirm that it is required to be published together with the minutes of this meeting on the airspace change portal.* *The purpose of the Assessment Meeting as set out CAP1616 is for the Change Sponsor to present and discuss their Statement of Need, provide information on how it intends to fulfil the requirements of the airspace change process and present its provisional timescales. Lastly, the sponsor is required to provide information on how it intends to meet the engagement requirements of the process.*	

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Item 2 – Statement of Need (discussion and review)

ELECTRIC 1 proceeded to explain the ACP statement of need.

Driven by partnership with University Hospitals Morecambe Bay NHS Foundation Trust (UHMBNHSFT) who operate three key hospitals that lie in a triangular pattern across the geographic area of Morecambe Bay.

The bay cases causes transport problems for the Hospital Trust.

The hospitals lies in three different local authorities and are spread across two counties and multiple Clinical Commissioning Groups controlling the Primary Care Aspects around the Morecambe Bay Area.

The complexity of the NHS Transport network serving the three hospitals has been compounded by the pandemic.

Politicians have mooted building a bridge across the bay, but this has never come to fruition.

Pandemic saw pathology sample testing focus by the government, but before RPAS could be deployed as an optimised transport solution the hospitals were equipped with testing machines thus negating the need for pathology samples to be flown from remote locations.

Irrespective of pandemic there is still a considerable amount of driving that has to be undertaken by UHMBNHSFT owing to the geographic location of Morecambe Bay.

UHMBNHSFT are applying to build a new hospital to serve the community at Lancaster better and are actively interested in designing a new hospital that can utilise RPAS vehicles for logistics purposes.

Lessons have been learned from the pandemic with regards logistics.

Being able to fly direct across the bay will dramatically improve their pandemic response in the future and reduce transit times for UHMBNHSFT services across the bay.

Item 3 – Issues or opportunities arising from proposed change

ELECTRIC1 continued:

The plan for the Morecambe Bay UAS Transit route is therefore to

- Establish the technical possibilities of running a regular service between the three hospitals of Lancaster Royal Infirmary, Furness General and Westmoreland General Hospitals

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- Provide operation efficiency gains in terms of both pandemic and also general use.
- Reduction of Carbon Footprint.
- Enable planning for next phase of pandemic.

Key aspect is to cut down on the amount of travel undertaken.

This is a unique situation owing to the three hospitals being located in three different "tiers" during the time between lockdown 1 and lockdown 2.

And a unique opportunity as light utilised class G airspace, but nuances regards Hovercraft operate

This is an opportunity for hospitals to evaluate RPAS transfer of pathology samples, nuclear and chemotherapy medicine samples, post and patient records.

Electric Aviation are currently undertaking Sustainable Innovation Fund evaluation of the impact that RPAS systems could have on the business models for UHMBNHSFT.

CAA1 (CAA) thanked ELECTRIC1 for his review of the statement of need and opened the floor to questions and raised the first question.

CAA1 asked if:

UHMBNHSFT had undergone a tender process to establish Electric Aviation as a potential supplier.

ELECTRIC1 responded by saying that the opportunity had arisen through other medical device works undertaken by another of his ventures working closely with the innovation lead for UHMBNHSFT throughout the pandemic.

It was also discussed how the other works being undertaken with the UK government's sustainable innovation fund were focussed on providing the business models for using RPAS within a multi hospital environment and that these works were due to close shortly presenting the business modelling, carbon saving evidence for RPAS services across Morecambe Bay.

Working with UHMBNHSFT, Electric Aviation have also been working through how the NHS staff interface with the RPAS from an HSE perspective.

ELECTRIC1 concluded that the next logical step is therefore to submit this ACR and to move onto operating RPAS across the bay.

CAA1 thanked ELECTRIC1 and took a question from CAA7, who asked:

If Electric Aviation were aware that a separate OSC would be required and if that would be appearing soon?

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ELECTRIC1 responded by stating that Electric Aviation were working with a number of RPAS operating companies and it was anticipated that an already advanced stage OSC would be utilised. The decision as to which RPAS operating company would be guided by the business modelling of the mass and balance of the payload transported. CAA1 then fielded two questions from CAA6: *1 - About Dangerous Air Cargo requirements and how Electric Aviation will handle the engagement process regarding DAC.* *2 – There might be an enduring requirement for this routing and thus it might be a case that a TDA is not the right vehicle for airspace change.* ELECTRIC1 responded by stating: That for the DACS the company has connections with BAe at Warton and that he envisaged Warton Radar providing a DACS service for the Morecambe Bay UAS Transit Route. CAA3 then corrected ELECTRIC1 as ELECTRIC1 had misheard DACS to mean Danger Area Crossing Service, when CAA3 had meant Dangerous Air Cargo. ELECTRIC1 then responded that the monte carlo simulations being undertaken as part of the Sustainable Innovation Fund works would conclude shortly and would advise the UHMBNHSFT as to which cargo type to fly. ELECTRIC1 mooted that there may well be a future scenario where Electric Aviation advise UHMBNHSFT to simply put the dangerous goods into an Electric Van to reduce the risk accordingly. ELECTRIC1 explained there was a key overriding factor regarding time criticality deliveries between the hospital sites which would influence the business model design of any RPAS service. ELECTRIC1 also mentioned that Electric Aviation were involved in the Future Flight Challenge and were able to model all the routes with regards historical weather data thus allowing cross wind component analysis for the RPAS service indicating what percentage of the days that the RPAS flights would not be able to fly. With regards CAA3's comments about going straight for permanent air change, ELECTRIC1 concluded that, that would indeed be beneficial if the maths added up from the simulations currently being undertaken. ELECTRIC1 also commented that the TDA may well be needed to ensure proper interfacing between hospital staff and the RPAS system before a permanent solution can be implemented. It was stated that there is the need to test the systems to make sure that from an HSE perspective as well as an operational perspective and an airspace perspective that all these aspects were considered thus the need for the TDA.	

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CAA1 mooted that:

"rather than have an unmanned system go across the bay between the three hospitals, is the possibility of using a carbon free land vehicle whereby you reduce the amount of time to say, if you have a stand alone vehicle used for these services potentially to 40 minutes, compared to 11 minutes by going across the bay, again then it presumably it just comes down to cost between the two scenarios for the trust and the potential flexibility they have for having those two systems."

ELECTRIC1 responded that there was the cost and risk between the land transport in a non-timely scenario versus the cost and risk of air transport in a timely scenario.

ELECTRIC1 suggested that there was an awful lot of RPAS activity within the NHS that has just flown face masks and been potentially for publicity rather than significant NHS operational benefit.

ELECTRIC1 stated that land EV vehicle adoption was happening at a much faster rate than electric air vehicles for obvious reasons. But that the fact remained that an RPAS vehicle in unrestricted airspace with appropriate permissions could always fly in a straight line as opposed to the electric land vehicles which will be stuck to the pre-defined road.

CAA1 then stated that as there was no detect and avoid system proposed that segregated airspace, i.e. TDA would be required and asked if Electric Aviation had considered other options to enable the flights to occur in unsegregated airspace.

ELECTRIC1 primarily responded that the Electronic Conspicuity (EC) concept had not received enough attention to date and that secondarily that he believed that TDA's were a blunt instrument and that ADS-B mandatory zones may well be a more favourable solution for the Morecambe Bay UAS Transit route.

ELECTRIC1 expressed a desire for all Electric Aviation systems to be ADS-B compliant as well as informing the meeting that another one of his companies was an Inmarsat and Iridium reseller.

ELECTRIC1 expressed that with a fixed weight limit on the aircraft that the appropriate avionics was eating into the permitted payload to the detriment of the supporting business model.

CAA1 then moved the meeting onto "process requirements"

CAA1 asked ELECTRIC1 to confirm that he was aware of the policy statement on airspace and TDA's and that the annex at the back of that policy details the process that Electric Aviation will be going through now with regards to the airspace change and temporary airspace change process the main points being:

The proposal for the temporary danger area should be for the minimum duration required, minimum size required, and that comes down to the Operational Safety Case, where you can demonstrate that the activity can be safely contained within the airspace structure being proposed and the timing of the activity can be controlled and appropriately promulgated.

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With regards to the airspace change process after this meeting, next Electric Aviation will move onto developing the stakeholder engagement and go through that activity using the feedback to amend the proposal before submitting the proposal back to the CAA at the end of the engagement process thus enabling the CAA to make their decision. Electric Aviation were then invited to ask questions or ask for clarification regarding the policy statement ELECTRIC1 confirmed that he was aware of the process and that he had access to FlyBy Technologies consultant to guide them through the process and that they had been involved in other projects requiring TDAs.	
Item 4 – Options to exploit opportunities or address issues identified CAA1 then invited CAA2 to talk through the stakeholder engagement. CAA2 then confirmed that Electric Aviation would then need to engage with aviation stakeholders including ANSP's Airports, aviation users, flying schools, clubs, MOD, SAR, HEMS etc. CAA2 provided an oversight of the National Air Traffic Management Advisory Committee (NATMAC) distribution list and advised that a standard period for the engagement activity was 6 weeks, but that the process allows for it to be scaled. If the sponsor wished to reduce the period for engagement on their proposal, they must provide a rationale to the CAA to approve prior to undertaking engagement on their proposal. CAA2 confirmed that post this meeting there is nothing that requires approval and Electric Aviation may start their stakeholder engagement process. At the end of the stakeholder engagement process the CAA expect to see a report summarising results of engagement activity. The report also should highlight how any complaints will be handled and reported to the CAA. It was also explained that if there is any traffic below 7000' over residential property that there should be a brief impact analysis and a process to inform any relevant community stakeholders. Once it is all submitted it needs to be uploaded onto the portal. CAA2 concluded the stakeholder engagement process. ELECTRIC1 proceeded to moot the idea of using a synthetic environment to enable the stakeholders to fully understand the impact of the proposed TDA and mooted the idea of going around and doing briefing evenings regarding the TDA plans. ELECTRIC1 asked for clarification if allowing people to fly through the TDA using Virtual Reality systems and headsets was a permissible means of stakeholder engagement.	

CAA2 informed ELECTRIC1 that there is no prescriptive way of engagement with stakeholders. CAA1 inferred that Electric Aviation need to ensure that the systems used need to be appropriate to engage with the stakeholders, but also need to represent accurately the physical boundaries of the TDA. ELECTRIC1 commented that it was important to receive the stakeholder feedback and suggested that the aviation stakeholder engagement needs to run parallel with engagement with the NHS stakeholders as well. CAA3 commented that the onus is on Electric Aviation to identify affected stakeholders within the geographic areas and should not solely rely upon the NATMAC distribution. It is upon Electric Aviation to demonstrate that effective engagement has been undertaken. CAA3 commented that previously Electric Aviation had already commented on the use of a DACS (Crossing service) and that all such associated efforts must be included in the stakeholder engagement. He also commented that he would be very interested to see the VR system in action. FLYBY1 then asked for clarification such that were there any grounds upon which An Airfield could demand payment for engaging in the stakeholder process? ELECTRIC1 interjected that without one particular operator at that specific airfield, the airfield would be housing by now, but that they do seem to operate a monopoly on the airfield. CAA1 stated that any airspace user has the responsibility to ensure that their use of the airspace is safe and that they must take into consideration any change to airspace. The attitude of an aerodrome operator towards changes to airspace does not negate their responsibility to operate safely. ELECTRIC1 informed the call that consideration had been given to basing the RPAS systems at a specific airfield, thinking that they would be keen to see more utilisation of the airfield. Other options for the basing of the RPAS have been considered. ELECTRIC1 said that he had reviewed other TDA applications on the ASC portal and had been shocked at the vociferous nature of some of the responses to other TDA proposals by airspace users. FLYBY1 again asked for clarification as to how you should take into account an airspace user who refuses to engage with the process unless they are paid? CAA1 replied to suggest that you cannot force people to respond, all that you can do is demonstrate that you have attempted to engage with all stakeholders, using appropriate methods. CAA1 commented that seasonal variation may cause more airspace users to utilise UK airspace and the geographic location of the proposed TDA to the south of the	

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Lake District may well see an increase in operations and these should be taken into consideration when proposing planned operations. ELECTRIC1 agreed and commented that there was an equal number of RAF flights out of RAF Valley that must be considered when exploring airspace utilisation in the geographic area. ELECTRIC1 reported that he flew the route at 9am on April the 12th, the first day of recreational GA post lockdown, as an evaluation and reported that when over the TDA locations he was the only airspace user on frequency. ELECTRIC1 reported that perhaps the biggest season variation in traffic would be from rotary craft going up to Windermere etc. ELECTRIC1 advised that with the old rule 5 prevent flight below 500' that he was confident that the proposed TDA would not impact too much any seasonal variance increase in airspace users. CAA1 then invited CAA4 to comment, being from a rotary background. CAA4 then followed up regarding the stakeholder engagement suggesting that Electric Aviation submitted the stakeholder contact list to him, to ensure that Electric Aviation were connected with the correct emergency service personnel to ensure efficient communications. ELECTRIC1 thanked CAA4 for the offer and stated that they had connections with North West Air Ambulance through Dr Malcolm Russell and that they had other connections through the NHS trust through to North West Ambulance Service. ELECTRIC1 also mentioned that they had contacts with Maritime & Coastguard Agency, but that they did not have all the connections and there were stakeholders out there that they obviously would not know of at this stage. CAA1 invited any other questions regarding stakeholder engagement. ELECTRIC1 interjected that one of the weirder stakeholders that they planned on engaging with was the Queen's Guide to the Sands, who is the Duchy of Lancaster's representative for Morecambe Bay and who is responsible for leading the public across the sands at low tide.	
Item 5 – Provisional indication of the scale level and process requirements* CAA1 then moved the meeting on to the Safety Assessment side of the process and invited CAA7 to comment. CAA7 commented that: • With regards the OSC application Electric Aviation had the option of using another RPAS operating companies OSC or developing their own. Depending on which company Electric Aviation partner with, the Dangerous	

Goods application has to be submitted by the company that has submitted the OSC.

- With regards the EC activities that he strongly advised that the company apply for their 24 bit ICAO code and provided the email address for this service.

- It was also mentioned that liaison with OFCOM should be started.

- It was stated that the airspace dimensions of the TDA need to be kept to a minimum but that they should fit the performance of the RPAS being flown.

- The UAS sector email address was provided.

ELECTRIC1 then responded that if Electric Aviation opted for a satellite/satellite C2 solution that he believed that no liaison with OFCOM would be required.

CAA7 confirmed this to be the case but suggested that if this was undertaken then the CAA would need sight of evidence to state that this service is provided by a nominated service provider and that the service must be added to the OSC.

ELECTRIC1 confirmed that his company is already the reseller for the systems and thus they are the service provider.

CAA1 thanked CAA7and then fielded a question from CAA3.

CAA3 asked if Electric Aviation was happy with the process to activate and de-activate the TDA? He continued that if the TDA was approved it would likely in the first instance be notified in the AIC.

He continued that AIC notification does not provide activation and this has to be done via NOTAM and that NOTAM needs to originate from Airspace Regulation. Liaison must be done with the CAA 24 hours in advance to activate the TDA via NOTAM.

On the subject of de-activation CAA3 also commented that ordinarily deactivation is done through the CAA but they are looking at a mechanism to deactivation directly with the NOTAM office.

ELECTRIC1 responded that he had experience of submitting NOTAMS and had recently put in a NOTAM from Earls Colne Airfield regarding the test operations of multiple RPAS and prior to that had submitted a NOTAM for multiple RPAS operations off Portland Bill regarding the search for a body post a tragic drowning.

CAA3 remembered that NOTAM.

CAA7returned the conversation to EC and asked that only approved ADS-B devices be used on RPAS.

ELECTRIC1 confirmed the use of a SkyEcho device that was on the approved suppliers list.

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Item 6 – Provisional process timescales*

CAA1 thanked CAA7and concluded the Safety side of the call by stating that the OSC would need to be submitted alongside the TDA and the draft AIC and that the activation/deactivation aspects information would be supplied to Electric Aviation for at a later stage.

CAA1 indicated that the decision based around one of these proposals usually took 28 days but that some degree of flexibility was available should there be a required starting date.

CAA1 asked ELECTRIC1 if he had the list of AIC publication dates and understood the process to which ELECTRIC1 confirmed that he did.

CAA1 asked ELECTRIC1 if he had a timescale for the submission of the next stages of the process to which ELECTRIC1 responded that he did not have that information at this stage, but that he would have an indication of timescales within the next 10-14 working days as the monte carlo simulations being run for the NHS trust had not concluded to confirm the payload, coupled with the weather modelling and then eventually guide the decision for the most effective utilisation of the RPAS deployment within the target geographic area.

CAA1 then asked ELECTRIC1 to provide that timescale which could then be agreed internally by the CAA. Once this documentation was received and an agreement reached then this could go onto the portal thus enabling stakeholders to understand the time scales of the process.

ELECTRIC1 agreed to send this in.

Item 7 – Next steps

CAA1 then summarised the next steps as being:

- Electric Aviation will be working with chosen operator to build OSC
- Electric Aviation will start the stakeholder engagement process
- The CAA are happy to receive and provide pointers on the engagement materials developed prior to the start of the engagement process otherwise Electric Aviation are free to commence the engagement process.
- Electric Aviation upon completion of the engagement process will need to provide the documents outlined in the Annex of the Policy Statement
- Then there will be a 28 day period for a decision to be made by the CAA
- Then there is the publication process for the AIC
- The establishment of the structure and subsequent notification to activate and then appropriate deactivation in accordance with the proposal developed.

ELECTRIC1 then confirmed he understood this and commented that he had access to the publications and the consulting team to guide them through the process.

CAA1 offered to be the point of contact and to deal with any further questions.

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Item 8 – Any other business CAA1 then asked if there were any more questions or comments CAA3 commented that the CAA, from an airspace perspective had both a Trial Process and a Temporary Process. What was described would not constitute a trial from an airspace perspective but instead a temporary change, although acknowledging this may be a business trial. He highlighted it would be important to ensure that this distinction is made clear in the engagement - that this proposal would be following the process as set out in Part 1a of CAP 1616 (Temporary changes to the notified airspace design) and the CAA's Policy Statement on Policy for Permanently Established Danger Areas and Temporary Danger Areas. CAA1 thanked everyone for their time as did ELECTRIC1 and the meeting ended.	
Post-meeting note CAA1 emailed ELECTRIC1 with the NATMAC distribution list as well as a point that he had not remembered to make during the meeting. This was that the sponsor should examine the suitability of using EVLOS as a mitigation to the requirement of having a TDA as part of the proposal.	

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ACTIONS ARISING FROM MORECAMBE BAY UAS TRANSIT ROUTEASSESSMENT MEETING

Subject	Name	Action	Deadline
OSC	Chris ELECTRIC1 ELECTRIC AVIATION	Decide on RPAS operating company and inform decision to CAA	14th May 2021
Timeline	Chris ELECTRIC1 ELECTRIC AVIATION	Complete monte carlo simulations and report back to NHS Trust, share findings with CAA and propose timeline	14th May 2021
Engagement	Chris ELECTRIC1 ELECTRIC AVIATION	Commence stakeholder engagement period	14th May 2021

Dr Chris ELECTRIC1, for and on behalf of Electric Aviation Limited.

ACP Sponsor

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