CAELUS2

NHS ORKNEY and NHS SHETLAND
ACP-2022-105
TARGETED AVIATION STAKEHOLDERS ENGAGEMENT

CAELUS

PROJECTCAELUS.CO.UK

NATS NHS SCOTLAND ags University of Strathclyde Glasgow

Skyports Commonplace ARUP

DRONAMICS CATAPULT Connected Places ATKINS

INTELSIUS planefinder ANRA TECHNOLOGIES

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Introduction

- With approximately 26% of Scotland's population living in remote or rural areas spread across 69% of the land mass, service delivery can encounter constraints which contributes to treatment inequity. NHS Scotland encompassing the Territorial Boards and Scottish Ambulance Service (SAS) views the adoption of Unmanned Aircraft Systems (UAS) or drones as an opportunity to transform the patient experience and reduce the impact of traffic congestion and CO2 emissions.

- Key to this is the driver of the NHS Scotland Recovery Plan (2021) which highlights the essential need for research, innovation and redesign as integral to the recovery of NHS Services. For both SAS and NHS Scotland equity in the delivery of healthcare is a key driver for involvement in this project as NHS Scotland considers how to remobilise and redesign services to address the needs of Scotland's health and social care challenges.

- A current strategic directive for the Chief Scientist Office (CSO) is to grow the economy (community wealth building) and support remobilisation, accelerating the adoption of Innovation into NHS and Social Care (Life Sciences in Scotland, 2022). A drone-based network has the potential to reduce mileage and produce significant time saving opportunities improving patient experience, outcomes and equity in care delivery.

- As a formal partner of the consortium, NHS Scotland via lead board NHS Grampian, are providing a joined-up approach bringing input and expertise from health boards and SAS under the "Once-for Scotland" banner. The NHS will define and support at ground level the clinical use cases that will be flown or simulated in the live and digital demonstrations.

Statement of Need

ACP-2022-105: Project Overview

- Today, most beyond visual-line-of-sight (BVLOS) UAS operations can only be conducted within segregated airspace.
- The most common way to achieve this is to establish temporary danger areas (TDAs) for the UAS to operate within.
- Current regulation is designed to consider on a per flight basis without means to provide a scalable solution.
- CAELUS intend to a develop concept of operations around airspace structure and use that is scalable and sustainable which could be used to inform the CAA in development of CAP1711 Airspace Modernisation Strategy.

Statement of Need

ACP-2022-105: Healthcare opportunity

- We aim to utilise volumes of segregated airspace across Scotland in a total of 5 locations to enable us to prove elements of our proposed future concept of integrated airspace. For this proposal, we intend to fly in the Grampian and Highlands region representing use cases for the NHS North of Scotland Innovation Hub.

- The use cases will require volumes of segregated airspace to be in place for a maximum of 5 Days over a 10 week period. Our proposal is that we activate this for limited duration. The segregated airspace dimensions and duration of activation will be informed by stakeholder feedback. This segment of flying will be undertaken by DRONAMICS

- A system of ADS-B Receivers will be deployed to demonstrate an additional layer of situational awareness to the UAV pilot along the flying routes and contribute to the Detect and Avoid solutions that will form part of the demonstrations.

CAELUS2 Background

Part-funded by Innovate UK Future Flight Challenge

16 Partners

Led by AGS and supported by NHS-Scotland.

Airspace Integration

ConOps created by NATS and will be validated through trials and aims to gather data that could be used for safe integration of RPAS in the future.

NHS Need

Serve real-life use cases across urban and rural environments. Improve equality of healthcare in remote and rural areas.

"Once for Scotland"

Access differing service delivery models provides the ability to more rapidly spread learning and benefits across the regions.Explore reducing the need for patient travel in 3 NHS innovation regions.

NHS Use Cases

CAELUS would enable samples and supplies to be delivered rapidly, within a time controlled window with medical grade, temperature controlled and monitored packaging

- **Medications**
- Quicker delivery of medications for routine and emergency situations
- Better ability to stock control and receive non standard medications in a more responsive way

Blood Products

- Faster emergency treatment.
- Better patient outcomes.
- More efficient use of blood products.

Lab Samples

- Quicker diagnostic decision
- Earlier start of targeted medications in a patient's treatment.
- Potential improvement to patient outcomes.
- Potential improvement in Length of Stay

Equipment

- Delivery of just in time equipment items
- Greater efficiency of stock control items
- Facilitate earlier discharge from hospital
- Assist teams with planning for operations/treatments

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BLACK SWAN UAV AIRCRAFT

Air Vehicle Type	Fixed-wing aircraft
Engine	Rotax
Max range*	1000 Km
Cruise Speed*	66 to 74 kts
Max Operating Altitude*	4,000 m 13,000 ft
TYPE OF OPERATION	BVLOS
Met VISIBILITY*/ Wind Limitations*	– Good conditions/daylight – 5kts tailwind for TO, 0 kts tailwind for landing –5kts crosswind.
PRECIPITATION/ LIGHTNING / ICING	NONE*
AMBIENT TEMPERATURE(oC)*	0 to +30
LIGHTS	As standard on crewed aircraft
NAVIGATION	Redundant GNSS systems + ADS-B MODE S Transponder

*Values are specific to the authorisations for project CAELUS only

Time Line

Stakeholder Engagement	11 March 24	26 April 24
ACP Submission	3 May 24	
CAA Response	31May 24	
AIC Published		25 July 24
Flight Trials	28 July 24	11 October 24

N4 (ORKNEY and SHETLAND) ROUTE

PROPOSED ROUTING

Kirkwall – Kirkwall (Check Test Flying) x 3 (1 Hour Duration)

Kirkwall – Sumburgh (Route Check and Objective Validation) plus Return Flight as Required to position aircraft back to base.

REQUIRED AIRSPACE AND DIMENSIONS

Kirkwall – TDA 6nm semi-circle based on a position 1nm south of Airfield Reference Point aligned on Runway Heading and to the North of Aerodrome. Surface to 5000ft AMSL
Kirkwall – Sumburgh TDA in the form of a corridor. Up to 10nms wide and Surface to 7000ft AMSL. Drone to Cruise at 5000ft AMSL
Sumburgh TSA within CTR Surface to 5000ft AMSL
TDA Split into 4 sectors to enable DACS(FUA)

REQUIRED WINDOW OF OPPORTUNITY

5 Days total flying (Test flying and route Flying) within a 10 week window of opportunity.

ACTIVATIONS

3 Times 1hr activations of Kirkwall TDA.

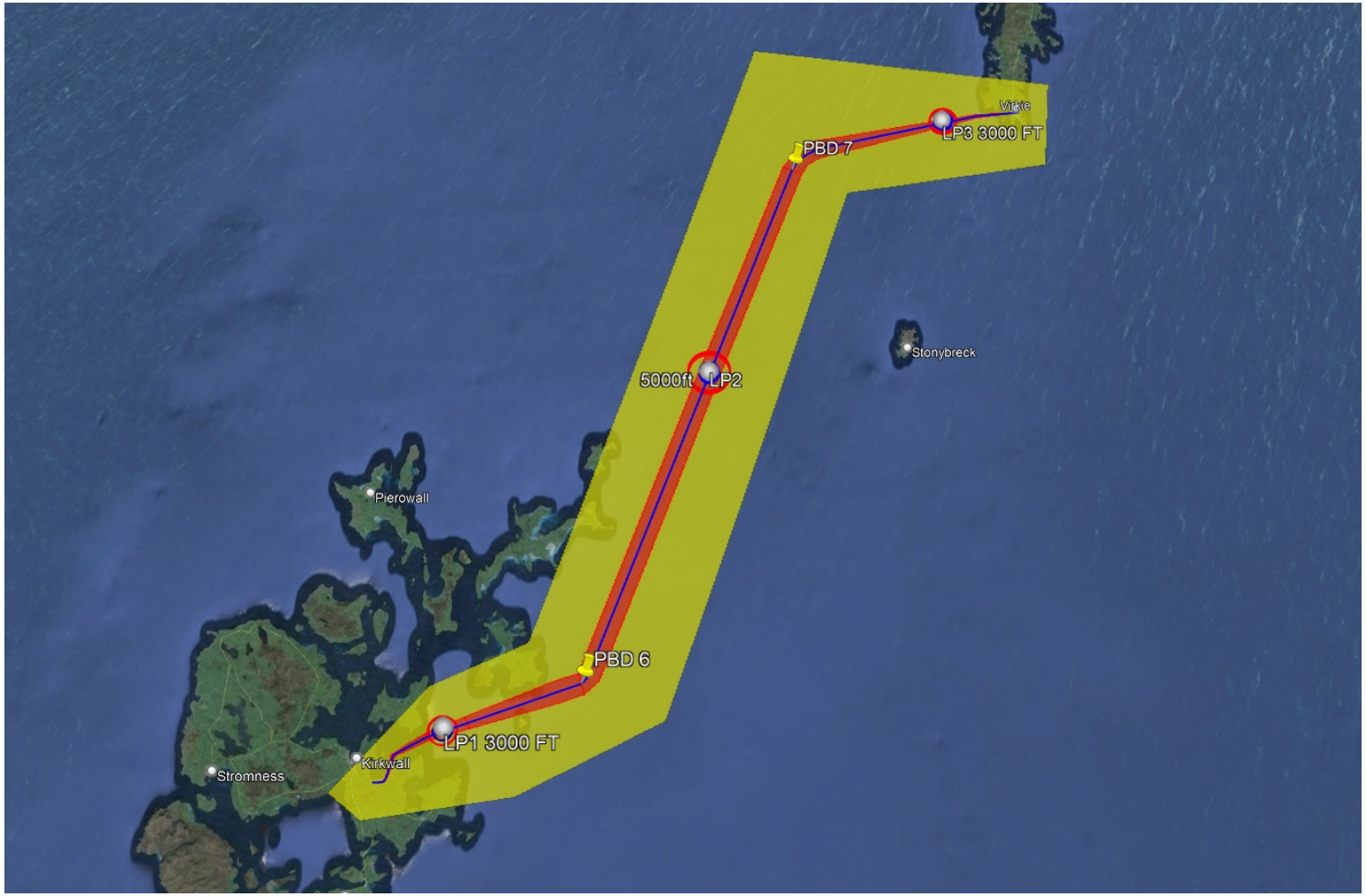
2 Times 2hr activation Kirkwall – Sumburgh TDA and associated TSA within Sumburgh CTR.

Activation by NOTAM as required

N4 FLIGHTS FOR BLACK SWAN UAV

KIRKWALL - KIRKWALL

N4 FLIGHTS FOR BLACK SWAN UAV



KIRKWALL - SUMBURGH

LOCAL STAKEHOLDERS IDENTIFIED

N4: Kirkwall and Kirkwall to Sumburgh

Aerodromes and ANSPs	GA Airfields, clubs and Unlicensed Sites	Other Aviation Stakeholders	Other Non-Aviation Stakeholders
Aberdeen ATC (NATS) Sumburgh Radar	Lamb Holm		NHS Grampian Region
Kirkwall (HIAL)			
Kirkwall ATC (HIAL)			
Sumburgh (HIAL)			
Sumburgh ATC (HIAL)			
Tingwall			

NATIONAL STAKEHOLDERS(CAA NATMAC LIST)

GA (NATMAC) 1/2	GA (NATMAC) 2/2	GA (NON-NATMAC)	Defense and safety critical organisations	COMMENT
GAA	ACOG	BHPA	DAATM	
LAA	AOPA	BMFA	UKFSC	
HCGB	AOG	SHPF	UKAB	
HCAP	AOA	GASCO	NATS	
GATCO	PPL/IR Europe		BAE	
BRITISH SKYDIVING	DRONE MAJOR		MAA	VIA DAATM
BMAA			NAVY COMAND HQ	VIA DAATM
BHA			USVF	VIA DAATM
BGA			AIR COMMAND	VIA DAATM
BBGA				
BBAC				
BALPA				
ARPAS-UK				

NATIONAL STAKEHOLDERS

Babcock		PDG Helicopters			
BRISTOW SAR		CHC Helicopters			
GAMA HELIMED		Airtask			
UK Police		2Excel			
OHS Rescue Helicopter		NHV			
Maritime and Coastguard Agency		PDG			
Gama					
Police Scotland					

How to Respond

ACP-2022-105

- If you received this briefing pack directly from CAELUS2AIRSPACE@TRAXINTERNATIONAL.CO.UK over email, then please respond in the same thread before 26 April 2024 or if you were forwarded this briefing pack by somebody else – please email us your comments, but also do not forget to include your name and whether you are representing an organisation (if so – what organisation) or if you are an individual.
- We would really appreciate if in your response you confirm if:
  – You have no objections to the proposal.
  – You feel that you will be impacted by the proposal – if so, please say how and any mitigations that could help.
  – Any comments/concerns/suggestions that are relevant to the ACP-2022-105 and the operations described in this pack.
- Depending on your feedback, we will either reply to questions via email or schedule an online conference call.
- Also, please feel free to propose additional stakeholders that you think are relevant to this engagement

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PRIMARY CONTACT

CAELUS2AIRSPACE@traxinternational.co.uk

Abbreviations

AGL	Above Ground Level
ATZ	Aerodrome Traffic Zone
BVLOS	Beyond Visual Line of Sight
CAT	Commercial Air Traffic
CTR	Control Zone
EVTOL	Electric Vertical Take off and Landing
FFC	Future Flight Challenge
FRZ	Flight Restriction Zone
GA	General Aviation
NATS	National Air Traffic Services
MTOW	Maximum Take Off Weight
RPAS	Remotely Piloted Aircraft System
UA	Unscrewed Aircraft
UAV	Unscrewed Aerial Vehicle
UKRI	UK Research and Innovation
SAS	Scottish Ambulance Service
TDA	Temporary Danger Area
TOLP	Take off and Landing Point
TSA	Temporary Segregated Area