SLOANE HELICOPTERS

CONCEPT OF OPERATIONS

FOR

POINT IN SPACE (PinS) PROCEDURES

SERVING

PENZANCE HELIPORT (EGHK) AND TRESCO (EGHT)

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CONTENTS

SECTION 1

Glossary

ABAS	Aircraft based augmentation system
AOM	Aerodrome operating minima
APD	Approved procedure designer
APV	Approach procedure with vertical guidance
ARP	Aerodrome reference point
ATM	Air traffic management
ATS	Air traffic services
Baro-VNAV	Barometric VNAV
BRNAV	Basic area navigation
CAT	Commercial air transport
DA(H)	Decision altitude (height)
DME	Distance measuring equipment
DVOF	Digital vertical obstructions file (MOD)
EASA	European aviation safety agency
EGNOS	European geostationary navigation overlay service
FAF	Final approach fix
GA	General aviation
GBAS	Ground based augmentation system
GNSS	Global navigation satellite system
GPS	Global positioning system
IAC	Instrument approach chart
IAP	Instrument approach procedure
ICAO	International civil aviation organisation
IFP	Instrument flight procedures
ILS	Instrument landing system
IMC	Instrument meteorological conditions
IFR	Instrument flight rules
IR	Instrument rating
LNAV	Lateral navigation
LNAV/VNAV	Lateral navigation with barometric vertical guidance
LPV	Localiser precision with vertical guidance
MDA(H)	Minimum descent altitude (height)
MSA	Minimum sector altitude
MOC	Minimum obstacle clearance
NAVSTAR	Navigation satellite timing and ranging
NDB	Non-directional beacon
NPA	Non-precision approach
MAP	Missed approach
MAPt	Missed Approach Point
OCA(H)	Obstacle clearance altitude (height)
OCH	Obstacle clearance height

PRNAV	Precision area navigation
RNAV	Area navigation
RNP	Required navigation performance
PBN	Performance based navigation
SBAS	Satellite based augmentation system
TAA	Terminal arrival altitude
UK AIP	United Kingdom aeronautical information publication
VOR	Very high frequency omnidirectional radio range
VMC	Visual meteorological conditions
WAAS	Wide area augmentation system

SECTION 2

Reference Documents

Reference	Title
CAP1122	Application for Instrument Approach Procedures to Aerodromes without an Instrument Runway and/or Approach Control
CAP725	Airspace Change Process Guidance Document
CAP1616	Airspace Design: Guidance on the Regulatory Process for Changing Airspace Design
CAP168	Licencing of Aerodromes
CAP393	Air Navigation: The Order and Regulations
CAP785	Approval Requirements for Instrument Flight Procedures for use in UK Airspace
CAP760	Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases: For Aerodrome Operators and Air Traffic Service Providers
PANS-OPS	IAP Design Criteria

SECTION 3

Introduction and Statement of Need

This document provides a Concept of Operation for RNAV Point In Space (PinS) Procedures for helicopter traffic transiting between Penzance Heliport in Cornwall, and Tresco in the Scilly Isles.

Statement of Need

Sloane Helicopters are restarting operations between Penzance and Tresco, providing a vital lifeline link to the Isles of Scilly.

There are existing fixed wing operations from Lands End to St Mary's but no direct link to Tresco is currently operated. Sloane has identified that Penzance Heliport offers a better location than Lands' End, primarily due to its location situated at a lower elevation, therefore making it less susceptible to poor visibility conditions. This was one of the key reasons why the operation moved to Penzance during the early 1960s.

In order to support this new operation, Sloane has looked to the relatively new RNAV PinS procedures to provide arrival and departure routes at both sites. These have the primary advantage of not being dependent on ground based navigation aids, which are expensive to install and maintain. The ground-based navigation aid that would most likely have been considered as an alternative is the NDB. This is now considered outdated technology with limited capability and accuracy.

The new PinS procedures will allow a greater degree of accuracy, and allow the helicopters to descend to a lower minima, compared to an NDB. This means that helicopters will be able to operate in poorer weather conditions than could previously have been achieved. For the islands this means a more reliable service that is less prone to disruption. There are additional benefits for Search and Rescue operations and ambulance flights, as they can also take advantage of these new procedures.

Designing and Introducing PINS

The procedures have been designed by a CAA Approved Procedure Designer and are in compliance with ICAO PANS-OPS criteria. In order for these procedures to be safely brought into service, an extensive programme of work has been carried out.

This document details the Safety Criteria that had to be met in order to prove the procedures are safe to operate. The criteria were developed using existing CAA guidance documents and through Hazard ID workshops, to identify the 5 key risks to operations as follows:

1 – CFIT or risk of Controlled Flight Into Terrain
2 – MAC or risk of Mid-Air Collision
3 – LOC or risk of Loss of Control
4 – INTRO or risk of Introduction into Service
5 – THRULIFE or risks Through the life of the Procedures

These risks, together with their mitigations, are analysed at Section 4. In addition, the highlighted risks and mitigations were tested during a trial that took place in October 2018, (the details of which are contained in Section 5.)

After analysing the results of the trial, and through extensive consultation with adjacent Air Traffic Service Units, a working procedure has been developed. In order to ensure safe integration with both the operations of the adjacent units, and the existing procedures in the area, a series of Letters of Agreement have been developed that will support these new operations.

SECTION 4

Safety Criteria

The safety criteria for PinS has been developed from the general criteria set out in the CAA CAP1122 document. A full review of this was carried out, and the relevant criteria refined, for the specific requirements of PinS.

In addition, a series of Hazard ID sessions were carried out to identify any risks and requirements for this particular project.

Areas of Risk identified

There were 5 main areas of risk identified. These are:

1 – CFIT or risk of Controlled Flight Into Terrain
2 – MAC or risk of Mid- Air Collision
3 – LOC or risk of Loss of Control
4 – INTRO or risk of Introduction into Service
5 – THRULIFE or risks Through the life of the Procedures

These will be fully detailed in the sections below.

4.1 **CFIT**

	High Level Requirement
CFIT 1	ANO Art 172 requirement for Approach Control is met.
CFIT 2	The IAP design has been conducted in accordance with PANS-OPS and the procedure notified in the UKAIP, which, where appropriate, is used as the source data for coding the approaches in navigation databases and brings the required degree of data integrity.
CFIT 3	The integrity and accuracy of the navigation aids used for the instrument approach meet the required standards.
CFIT 4	The crew members of participating aircraft are suitably qualified and proficient to safely execute an IAP with sufficient accuracy to remain clear of terrain and obstacles.
CFIT 5	An Aerodrome ATS is provided.

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.1 The Risk of a CFIT accident is acceptably low (CFIT)	
CFIT 1 ANO 172 Requirement for Approach Control is met. Provision of an Approach Control would be inappropriate as the IAP being provided is a helicopter Point In Space (PinS) approach not linked to an aerodrome. PinS would be limited to approved users and would be restricted to one helicopter at a time so there would be no sequencing of traffic involved. When available, the most suitable level of service should be obtained from the nearest ATSU (ATC, AFISO or AGCS) to mitigate the risk of collision.	
CFIT 1.1 Approach controller reduces the risk of CFIT by providing accurate Altimeter setting (QNH) instructions and obtaining a confirmatory check of pilot read-back.	CFIT 1.1.1 Altimeter setting where neither ATS or AGCS is available (for example at night when nearby aerodromes are closed, or at a remote landing site) a Regional Pressure Setting (RPS) obtained, with read-back, from an ATSU (such as London or Scottish Information) should be considered where no suitable adjacent aerodrome QNH is available, on the basis that the RPS would provide a 'lowest forecast' setting and would therefore provide CFIT mitigation. The local airspace environment would, however, need to be considered particularly where such an approach might increase the risk of a vertical infringement of CAS.
	CFIT 1.1.2 Altimeter Setting – nearby Aerodrome providing ATS. Where a PinS approach is to a landing site within an ATZ or CTR where an aerodrome ATS is provided, the altimeter setting instructions and associated readback should be provided by the controller or AFISO. Where the nearest aerodrome met observation equipment does not meet ICAO standards, the derived pressure settings may need to be relayed as 'advisory QNH'. The distance between the adjacent aerodrome and the IAP location would be of relevance, because in certain meteorological conditions there can be significant variations in local conditions and between neighbouring observation points. Local topography would also need to be addressed in any such safety argument. If any doubt exists, the RPS should be used. This ensures that the ATSU is informed to mitigate against any loss of separation with traffic in the vicinity.

	CFIT 2.1.3 Altimeter Setting – nearby Aerodrome with AGCS. Where a PinS approach is to a landing site close to an aerodrome where only AGCS is provided, an 'advisory' altimeter setting could be provided to the helicopter commander by the AGCS operator. The distance between the adjacent aerodrome and the IAP location would be of relevance, because in certain meteorological conditions there can be significant variations in local conditions and between neighbouring observation points. Local topography would also need to be addressed in any such safety argument. If any doubt exists, the RPS should be used. This ensures that the AGCS is informed to mitigate against any loss of separation with traffic in the vicinity.

CFIT 2 The IAP design has been conducted in accordance with PANS-OPS and the procedure notified in the UK AIP which, where appropriate, is used as the source data for coding the approaches in navigation databases and brings the required degree of data integrity.	
CFIT 2.1 Use of PANS-OPS IAP design criteria reduces the risk of CFIT by permitting the helicopter to fly to an altitude and position, from which either a landing or missed approach may be flown, whilst remaining terrain-safe.	CFIT 2.1.1 PinS terminate at a Point In Space after which the aircraft proceeds visually or VFR. Consideration could be given to increasing the minima to maximise the visual portion of the flight. However, this should be balanced against the VFR rules which allow helicopters to operate with lower minima than fixed wing, due to their ability to fly slower and carry out more contained manoeuvres.
CFIT 2.2 The established procedures for designing and approving IAP designs provide participating helicopters with a flightpath which, if followed in flight, will keep them clear of terrain and obstacles.	CFIT 2.2.1 PinS terminate at a Point In Space after which the aircraft proceeds visually or VFR. Consideration could be given to increasing the minima to maximise the visual portion of the flight. However, this should be balanced against the VFR rules which allow helicopters to operate with lower minima than fixed wing due to their ability to fly slower and carry out more contained manoeuvres.

CFIT 3 The integrity and accuracy of the navigation aids used for the instrument approach meet the required standards.	
CFIT 3.1 The integrity and accuracy of the navigation aids used for instrument approaches are such that they will provide the crew of participating helicopters with sufficiently reliable and accurate guidance to enable them to follow the published IAP within the tolerable limits required to avoid flight into terrain or obstacles.	CFIT 3.1.1 The integrity of navigation aids is a measure of the reliance that can be put on the aid in radiating a correct signal. The integrity depends on the ability of the aid to radiate an in-tolerance signal, and also of the inbuilt monitoring systems to recognise when the signal is out of tolerance and shutdown the faulty system. The integrity of a ground-based navigation aids is assessed when the aid is first approved for use, with manufacturers evidence of reliability of all parts of the system being taken into account. The ongoing reliability of those parts of the system will give confidence that the integrity requirements continue to be met. Cross checking of Other Sources of Information by the helicopter Commander. As a mitigation for rare integrity failures, when systems radiate incorrect information, Pilots will cross check other systems to give confidence that all is as it should be or to alert them that there is a problem with the guidance being used. For example, a pilot making an ILS approach will check the height of the helicopter at a certain DME range to be sure the glide path information is correct. CFIT 3.1.3 GPS has no internal monitoring system to give timely warning of incorrect guidance being transmitted. Instead, integrity monitoring relies on augmentations such as the use of receivers equipped with RAIM (Receiver Autonomous Integrity Monitoring). In lieu of manufacturers evidence to support the approval of an approach using GPS guidance, CAA makes available historical monitoring data to allow the assessment of the integrity in conjunction with the certified reliability of the RAIM algorithm. Note that Pilot cross checks as above are still required to mitigate against integrity failures in the system

CFIT 4 The crew members of participating aircraft are suitably qualified and proficient to safely execute an IAP with sufficient accuracy to remain clear of terrain and obstacles.	
CFIT 4.1 The flight crew training and qualification standards which must be met are sufficient to provide for IAPs to be flown safely and accurately, remaining clear of terrain and obstacles.	No alternative safety argument is considered appropriate for this baseline safety solution.

CFIT 5 An Aerodrome ATS is provided	
CFIT 5.1 Aerodrome ATS reduces the risk of CFIT by providing local meteorological information in the form of cloud-base and visibility information.	CFIT 5.1.1 Weather Reporting setting where neither ATS or AGCS is available (for example at night when nearby aerodromes are closed or at a remote landing site) a Regional Pressure Setting (RPS) obtained, with read-back, from an ATSU (such as London or Scottish Information) should be considered where no suitable adjacent aerodrome QNH is available on the basis that the RPS would provide a ‘lowest forecast’ setting and would therefore provide CFIT mitigation. The local airspace environment would, however, need to be considered particularly where such an approach might increase the risk of a vertical infringement of CAS. Some locations could also be based upon the use of VOLMET or neighbouring ATIS broadcasts. Such arguments would again carry more weight if used in the context of an IAP with Higher Minima approach. The distance between the adjacent aerodrome and the IAP location would be of relevance, because in certain meteorological conditions there can be significant variations in local conditions and between neighbouring observation points. Local topography would also need to be addressed in any such safety argument.

	CFIT 5.1.2 Weather Reporting - Aerodrome with AGCS. Where only AGCS is provided, and in the absence of an approach control service, or an initial service from a neighbouring ATSU, an argument could be made that ‘unofficial weather observations’ could be provided to the aircraft commander by the AGCS operator. Such arguments could be strengthened by the use of ICAO compliant meteorological equipment. However, the more limited qualifications and privileges of the AGCS operator would mean that additional mitigation is likely to be needed in the form of the use of higher minima for an IAP. Where an IAP with Higher Minima type of approach, as described at Appendix 1, is to be used, an argument could be made that the use of an unofficial weather observation provided by an AGCS operator could be acceptable on the basis that with this type of approach more conservative aerodrome operating minima would be applied which would leave an adequate safety margin. Nearby Aerodrome providing ATS. Where a PinS approach is to a landing site within an ATZ or CTR where an aerodrome ATS is provided, the observations should be provided by the controller or AFISO. Where the nearest aerodrome met observation equipment does not meet ICAO standards, the derived pressure settings may need to be relayed as ‘unofficial weather observations. The distance between the adjacent aerodrome and the IAP location would be of relevance as in certain meteorological conditions there can be significant variations in local conditions between neighbouring observation points. Local topography would also need to be addressed in any such safety argument.
	CFIT 5.1.3 Weather Reporting where there is a nearby Aerodrome With AGCS. Where a PinS approach is to a landing site close to an aerodrome where only AGCS is provided ‘unofficial weather observations’ could be provided to the helicopter commander by the AGCS operator. The distance between the adjacent aerodrome and the IAP location would be of relevance, because in certain meteorological conditions there can be significant variations in local conditions between neighbouring observation points. Local topography would also need to be addressed in any such safety argument.

4.2 **MAC**

	High Level Requirement
MAC 1	ANO Art 172 requirement for Approach Control is met.
MAC 2	An Aerodrome ATS is provided.
MAC 3	The aerodrome location and presence of an IAP are depicted in the UK AIP and, where appropriate, on aeronautical charts.
MAC 4	Visual lookout by aircraft crews and the 'see and avoid' principle provides some protection against mid-air collision during relevant portions of flying an IAP.

Safety Baseline	**Candidate Alternative Safety Arguments**
Goal 1.2 The Risk of a Mid-Air Collision Accident is acceptably low (MAC)	
MAC 1 ANO 172 Requirement for Approach Control is met Provision of an Approach Control would be inappropriate as the IAP being provided is a helicopter Point In Space (PinS) approach not linked to an aerodrome. PinS would be limited to approved users and would be restricted to one helicopter at a time so there would be no sequencing of traffic involved. When available, the most suitable level of service should be obtained from the nearest ATSU (ATC, AFISO or AGCS) to mitigate the risk of collision.	

MAC 1.1 Approach control reduces the risk of mid- air collision between participating instrument traffic and other traffic operating in the vicinity by providing separation. * *This statement describes the mitigation provided by an Approach Control service as currently mandated by ANO Art 172 and which is provided without the use of data from surveillance sensors – it is known as 'Approach Control Procedural'.	MAC 1.1.1 Separation from other traffic in the vicinity inside Controlled Airspace. A local agreement whereby helicopters intending to use the PinS procedure make initial contact and receive a suitable form of ATS from the controlling ATSU which would ensure separation from other traffic in the vicinity. Such arrangements would need to be reflected in the ATSU MATS Pt 2 and supported, where appropriate, with modifications to controller qualifications, local training arrangements, local competency schemes, SMS and LoAs. Local procedures would need to make adequate arrangements for dealing with potential conflicts between helicopters making an approach and following the missed approach procedure and other traffic in the vicinity. PinS would be limited to approved users and would be restricted to one helicopter at a time. Other users would be aware of the presence of an IAP by promulgation in the AIP (MAC 5.1)
	MAC 1.1.2 Separation from other traffic in the vicinity outside Controlled Airspace with ATS available. Where it is proposed to introduce an IAP at a location where ATS is available. Helicopters intending to use the PinS procedure would make initial contact and receive a suitable form of ATS (such as an ATSOCAS deconfliction service) from an adjacent ATSU. Traffic information and/ or deconfliction advice appropriate to the level of ATSOCAS could be provided on conflicting aircraft. This would be further strengthened where surveillance data is available. PinS would be limited to approved users and would be restricted to one aircraft at a time. Other airspace users would be aware of the presence of an IAP by promulgation in the AIP (MAC 5.1)

	MAC 1.1.3 Separation from other traffic in the vicinity outside Controlled Airspace without ATS. Where it is proposed to introduce an IAP at a location where no ATS is available, PinS would be limited to approved users and would be restricted to one aircraft at a time. Other airspace users would be aware of the presence of an IAP by promulgation in the AIP (MAC 5.1) Details of the flight should be held by the operator and notified to the parent ATSU (Scottish or London FIR) for information. A safety comm frequency could be promulgated and a lost communications protocol developed.
MAC 3 The landing site location and presence of an IAP are depicted in the UKAIP and, where appropriate, on aeronautical charts.	
MAC 3.1 Marking the instrument approach area on aviation charts assists pilots of non-participating aircraft in avoiding these areas, thereby reducing the risk of mid-air collisions with non-participating traffic.	MAC 3.1.1 Marking of IAP Locations on Aeronautical Charts. In the same way that some safety mitigation is provided for existing IAPs, (through making other airspace users aware of the presence of instrument approach paths so they can be avoided), such action could also be used to strengthen arguments for the introduction of a new IAP under the policy outlined in this CAP. The safety benefit of this measure would need to be argued in the context of the parallel need to reduce the associated risk of map clutter. A threshold value would probably need to be established, centred around anticipated numbers of movements, which would trigger the creation of appropriate symbology. As PinS procedures are restricted to helicopters, only the landing site and the approach area should be promulgated. The approach itself would only be promulgated to approved users, and should not be promulgated in the AIP so as to avoid non-approved, particularly fixed wing aircraft, from attempting to fly the procedure. Reduced symbology should also help reduce the risk of map clutter.

MAC 4 Visual lookout by aircraft crews and the ‘see and avoid principle’ provides some protection against mid-air collision during relevant portions of flying an IAP.	
MAC 4.1 During any portion of the procedure where a helicopter flying the IAP is in VMC the ‘see and avoid’ principle provides a degree of mitigation against the likelihood of collision with other aircraft.	MAC 4.1.1 PinS terminate at a Point In Space after which the aircraft proceeds visually or VFR. Consideration could be given to increasing the minima to maximise the visual portion of the flight. However, this should be balanced against the VFR rules which allow helicopters to operate with lower minima than fixed wing. This means helicopters flying a PinS approach in poor conditions are less likely to encounter fixed wing traffic operating in the vicinity. Therefore, the overall prevailing traffic environment for the PINS location should be considered.

4.3 **LOC**

	High Level Requirement
LOC 1	ANO Art 172 requirement for Approach Control is met.
LOC 2	Flight crews training and examination covers the effects of Wake Turbulence and the associated operational countermeasures, which they should apply in order to avoid Wake Turbulence encounters, which could lead to a loss of control.

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.3 The Risk of a Loss of Control Accident is acceptably low (LOC)	
LOC 1 ANO 172 Requirement for Approach Control is met Provision of an Approach Control would be inappropriate as the IAP being provided is a helicopter Point In Space (PinS) approach not linked to an aerodrome. PinS would be limited to approved users and would be restricted to one helicopter at a time, so there would be no sequencing of traffic involved. When available, the most suitable level of service should be obtained from the nearest ATSU (ATC, AFISO or AGCS) to mitigate the risk of collision.	
LOC 1.1 Approach control reduces the risk of a loss of control accident arising from Wake Turbulence by sequencing participating instrument approach traffic	LOC 1.1.1. PinS would be limited to approved users and would be restricted to one helicopter at a time. Other users would be aware of the presence of an IAP by promulgation in the AIP (MAC 5.1)
LOC 2 The crew members of aircraft participating in the IAP are suitably qualified and proficient to fly the IAP safely and under control.	
LOC 2.1 The flight crew training and qualification standards which must be met are sufficient to provide for IAPs to be flown safely and accurately, with appropriate training/ awareness of wake turbulence considerations.	No alternative safety argument is considered appropriate for this baseline safety solution.

4.4 **INTRO**

Goal - The Risk of an accident during the introduction into service of a new IAP at this location is acceptably low.
An argument that the introduction to service of the IAP together with all the required safety mitigations and notifications to airspace users and other stakeholders will be conducted in a structured and carefully managed way which may, where deemed appropriate, include a period of trial operation with additional safety mitigations in place to provide further risk reduction and provide safety evidence in support of key safety arguments presented. Such arguments should be suitably comprehensive, and include as a minimum, arrangements for the safe introduction of the IAP in the context of training, testing and validation of: a) The people who will be involved or affected by the introduction of the IAP, their training and any associated communication activities for awareness purposes. b) The procedures which are to be followed by ATSU personnel or participating flight crews and any associated organisational arrangements which need to be put in place before the IAP can be put into use. c) Equipment which will be associated with the operation of the IAP, its suitability, fitness for purpose and availability

4.5 **THRULIFE**

Goal - The Risk of an accident during the through-life operation of an IAP at this location is acceptably low.
An argument that a safety monitoring and feedback process will be put in place by the operator which will provide feedback on safety information regarding the operation of the IAP which will be used to monitor the continued validity of the alternative safety arguments used and provide a trigger for additional safety management activity if new hazards are discovered or the level of risk is deemed to have changed. A certified ANSP will oversee the management of the IAP in accordance with their SMS and the procedures will be reviewed at least every 5 years in accordance with EASA regulations

SECTION 5

Trial and Meeting the Safety Criteria

5.1 Trial

The Concept of Operations (COO) trial for PinS approaches to the lowest achievable minima into Tresco and Penzance, and for the connecting Low Level IFR route took place on Monday 8th October 2018.

The trial generally followed the timings and routes as specified in the Pre-Trial briefing, and any amendments to those timings and routes had no impact on the ability to collect the required data to enable a post-trial analysis. The trial was carried out in VFR conditions.

Trial Requirements

These following requirements were to be evaluated by the trial:

1. Identify where the proposed IFR procedures interact with current operations in the area
2. Confirm ATC at St Mary's and Culdrose can offer services to mitigate issues surrounding separation of PinS and other traffic
3. Identify what service will be provided by St Mary's (Procedural or Basic)
4. Test RT limitations for a number of frequencies
5. Identify any areas where a Habitat Regulations Assessment (HRA) might need to be carried out
6. Utilise the existing validated procedures at PZE and TRS down to 500ft to test the feasibility of the MAPt. In addition, test the feasibility of reducing the minima to 250ft together with the MAPt and the RT coverage at the lower level

Analysis of Data Collection

Interactions between adjacent ATSUs

As stated in the Pre-Trial brief, the intention of the trial was not to test procedures or agreements to mitigate any interaction issues. The intention of the trial was to highlight where interaction issues might occur, and to develop formal mitigations off the back of the analysis of the findings of the trial.

The trial was successful in identifying where interactions with St Mary's and Culdrose will require the development of mitigations (LOA and/or other arrangements).

RT Blindspots

Numerous RT checks were undertaken. Only one area was found to be a blind spot (on the ground at Penzance- RT between helicopter and Culdrose). However, full 2-way communications became available when the helicopter was at approx. 25' AGL; consequently, this is not seen as an issue and requires no mitigation process.

Missed Approach Point Feasibility

The trial proved that both 500' and 250' minima were safe and feasible to attain VFR/Visual at the MAP for both Penzance and Tresco operations. Currently, the procedures have been designed and validated to a minima of 500' as part of a GSA funding project. A minima of 500' was chosen as an interim measure for expediency; GSA project funding constraints required early flight validation of the approaches to enable funding streams to be completed. The intention is to design the minima to lowest attainable at both places as soon as possible and the necessary design work for this is underway.

5.2 Meeting the Safety Criteria

A Hazard ID and Safety analysis was carried out pre-Trial. The experiences from the trial are included in that analysis and are detailed in Section 4. The trial proved that all identified hazard issues can be mitigated, and that these PinS operations at Tresco and Penzance can be conducted safely.

CFIT

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.1 The Risk of a CFIT accident is acceptably low (CFIT)	
CFIT 1 CAP 168 Instrument Runway Standards are met. In the case of this example both ends of the helicopters flight are intended to terminate at heliports, so these procedures are intended to take the helicopter to a point in space where it can then continue visually to land. **Trial Evidence**: The operations to the MAPs for both PinS (Penzance and Tresco) will enable the pilot to continue visually from both MAPs to the heliport.	

CFIT 2 ANO 172 Requirement for Approach Control is met.

PinS procedures would be limited to approved users and would be restricted to one helicopter at a time so there would be no sequencing of traffic involved.

Operations will be in Class G airspace and for the purposes of the trial will be conducted in VFR conditions. Culdrose and St Mary's provide ATC services during published hours and are in the vicinity of the route. This trial will identify where the points of conflict are between this procedure and the operations at these units. It will also test the extent of radio coverage from each unit at various points on the route.

St Mary's could provide a procedural control service to deconflict traffic on the approach from its own traffic. A procedure or letter of agreement would have to be developed once the conflicting points have been worked out. Similarly, at Culdrose there is a possibility the procedures may overlap with some of their activities. It is however unlikely that operations at Culdrose or St Mary's will be taking place in the conditions where this PinS approach is likely to be being used.

Trial Evidence: An Approach Control service is not necessary to enable the PinS approaches at Tresco and Penzance to be undertaken. Radio coverage with both St Mary's ATC and RNAS Culdrose ATC was excellent in all areas that the PinS operations will be conducted. There are interactions with the current operations at both St Mary's and Culdrose, but all participants agreed that all interactions can be safely mitigated by LOA development.

CFIT 2.1 Approach controller reduces the risk of CFIT by providing accurate Altimeter setting (QNH) instructions and providing a confirmatory check of pilot readback.	CFIT 2.1.1 Altimeter setting where neither ATS or AGCS is available The operation will be carried out at low level in Class G airspace in an area where there is little CAS. RPS would be set where no other local pressure setting is available.
	CFIT 2.1.2 Altimeter Setting – nearby Aerodrome providing ATS. Culdrose and St Mary's can be used during publish hours of operation. Otherwise RPS will be set.
	CFIT 2.1.3 Altimeter Setting – nearby Aerodrome with AGCS.

CFIT 4 The IAP design has been conducted iaw PANS-OPS and the procedure notified in the UK AIP which, where appropriate, is used as the source data for coding the approaches in navigation databases and brings the required degree of data integrity.	
CFIT 4.1 Use of PANS-OPS IAP Design criteria reduces the risk of CFIT by permitting the helicopter to fly to an altitude and position from which either a landing or missed approach may be flown whilst remaining terrain-safe.	CFIT 4.1.1 PinS terminate at a Point In Space after which the aircraft proceeds visually or VFR. The feasibility of the lower minima will be tested during the trial. **Trial Evidence**: The procedures had already been validated down to 500' in previous validation flight trials. The trial proved that both 500' and 250' minima's were safe and feasible at Tresco. The 500' minima at Penzance was safe and feasible but more investigation is required with regard to a 250' minima at Penzance, due to the rising ground to the north of Penzance Heliport. Mitigations will be discussed with the IFP designers.
CFIT 4.2 The established procedures for designing and approving IAP designs provide participating helicopters with a flightpath which, if followed in flight, will keep them clear of terrain and obstacles.	CFIT 4.2.1 PINS terminate at a Point In Space after which the aircraft proceeds visually or VFR. **Trial Evidence**: The procedures have been designed by CAA approved IFP designers in accordance with PANS-OPS design criteria and provide participating helicopters with a flightpath which, if followed in flight, will keep them clear of terrain and obstacles.

CFIT 5 The integrity and accuracy of the navigation aids used for the instrument approach meet the required standards.	
CFIT 5.1 The integrity and accuracy of the navigation aids used for instrument approaches are such that they will provide the crew of participating helicopters with sufficiently reliable and accurate guidance to enable them to follow the published IAP within the tolerable limits required to avoid flight into terrain or obstacles.	CFIT 5.1.1 CFIT 5.1.2 CFIT 5.1.3 **Trial Evidence:** Sloane has developed a course for PBN approval training for delivery to their staff pilots as well as external customers. This training is already being carried out for external pilots, with a programme for staff training also in place. In addition, pilots to be employed at Penzance are not expected to join until later in 2019 and the Captains will already have PBN approval on their licences. Pilots recruited without AW139 type ratings will have PBN endorsed on their licences during their type rating training and any non PBN endorsed pilots will have PBN endorsement completed during their operator's conversion course.
CFIT 6 The crew members of participating aircraft are suitably qualified and proficient to safely execute an IAP with sufficient accuracy to remain clear of terrain and obstacles.	
CFIT 6.1 The flight crew training and qualification standards, which must be met, are sufficient to provide for IAPs to be flown safely and accurately, remaining clear of terrain and obstacles.	No alternative safety argument is considered appropriate for this baseline safety solution.

CFIT 7 An Aerodrome ATS is provided.	
CFIT 7.1 Aerodrome ATS reduces the risk of CFIT by providing local meteorological information in the form of cloudbase and visibility information.	FIT 7.1.1 Weather Reporting setting where neither ATS or AGCS is available Weather reports from either St Mary's or Culdrose can be used during published hours. Otherwise regional reports will be used. **Trial Evidence**: Communications with St Mary's and Culdrose were excellent at all times and the provision of airborne weather reports is not a factor.
	CFIT 7.1.2 Weather Reporting - Aerodrome with AGCS. **Trial Evidence**: Not Applicable
	CFIT 7.1.3 Weather Reporting where there is a nearby Aerodrome With AGCS. Weather reports from either St Mary's or Culdrose can be used during published hours. Otherwise regional reports will be used. The procedures terminate over the sea with the aim that the pilot will gain visual reference at that point. If this is not achieved there is a missed approach procedure which will keep the aircraft terrain safe. **Trial Evidence**: Communications with St Mary's and Culdrose were excellent at all times and the provision of airborne weather reports is not a factor.

MAC

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.2 The Risk of a Mid-Air Collision Accident is acceptably low (MAC)	
MAC 1 ANO 172 Requirement for Approach Control is met Provision of an Approach Control would be inappropriate as the IAP being provided is a helicopter Point In Space (PinS) approach not linked to an aerodrome. PinS would be limited to approved users and would be restricted to one helicopter at a time so there would be no sequencing of traffic involved. When available, the most suitable level of service should be obtained from the nearest ATSU (ATC, AFISO or AGCS) to mitigate the risk of collision.	
MAC 1.1 Approach control reduces the risk of mid- air collision between participating instrument traffic and other traffic operating in the vicinity by providing separation* *This statement describes the mitigation provided by an Approach Control service as currently mandated by ANO Art 172 and which is provided without the use of data from surveillance sensors – it is known as 'Approach Control Procedural'.	Operations will be in Class G airspace and for the purposes of the trial will be conducted in VFR conditions. Culdrose and St Mary's provide ATC services during published hours and are in the vicinity of the route. This trial will identify where the conflicting points are between this procedure and the operations at these units. It will also test the extent of radio coverage from each unit at various points on the route. St Mary's could provide a procedural control service to deconflict traffic on the approach from its own traffic. A procedure or letter of agreement would have to be developed once the conflicting points have been worked out. Similarly, at Culdrose there is a possibility the procedure may overlap with some of their activities. It is however unlikely that operations at Culdrose or St Mary's will be taking place in the conditions where this PinS approach is likely to be being used. **Trial Evidence**: An Approach Control service is not necessary to enable the PinS approaches at Tresco and Penzance to be undertaken. Radio coverage with both St Mary's ATC and RNAS Culdrose ATC was excellent in all areas that the PinS operations will be conducted. There are interactions with the current operations at both St Mary's and Culdrose, but all participants agreed that all interactions can be safely mitigated by LOA development.

	MAC 1.1.2 Separation from other traffic in the vicinity outside Controlled Airspace with ATS available. Where it is proposed to introduce an IAP at a location where ATS is available. Operations will be in Class G airspace and for the purposes of the trial will be conducted in VFR conditions. Culdrose and St Mary's provide ATC services during published hours and are in the vicinity of the route. This trial will identify where the conflicting points are between this procedure and the operations at these units. It will also test the extent of radio coverage from each unit at various points on the route. St Mary's could provide a procedural control service to deconflict traffic on the approach from its own traffic. A procedure or letter of agreement would have to be developed once the points of conflict have been worked out. Similarly, at Culdrose there is a possibility the procedure may overlap with some of their activities. It is however unlikely that operations at Culdrose or St Mary's will be taking place in the conditions where this PinS approach is likely to be being used. **Trial Evidence**: An Approach Control service is not necessary to enable the PinS approaches at Tresco and Penzance to be undertaken. Radio coverage with both St Mary's ATC and RNAS Culdrose ATC was excellent in all areas that the PinS operations will be conducted. There are interactions with the current operations at both St Mary's and Culdrose, but all participants agreed that all interactions can be safely mitigated by LOA development.
	MAC 1.1.3 Separation from other traffic in the vicinity outside Controlled Airspace without ATS. **Trial Evidence**: An Approach Control service is not necessary to enable the PinS approaches at Tresco and Penzance to be undertaken. Radio coverage with both St Mary's ATC and RNAS Culdrose ATC was excellent in all areas that the PinS operations will be conducted. A Basic Service (FIS) is available from both St Mary's and Culdrose

MAC 4 The landing site location and presence of an IAP are depicted in the UKAIP and, where appropriate, on aeronautical charts.	
MAC 4.1 Marking the instrument approach area on aviation charts assists pilots of non-participating aircraft in avoiding these areas, thereby reducing the risk of mid-air collisions with non-participating traffic.	MAC 4.1.1 Marking of IAP Locations on Aeronautical Charts. **Trial Evidence**: **TBC – not actually trialed**
MAC 5 Visual lookout by aircraft crews and the 'see and avoid principle' provides some protection against mid-air collision during relevant portions of flying an IAP.	
MAC 5.1 During any portion of the procedure where a helicopter flying the IAP is in VMC the 'see and avoid' principle provides a degree of mitigation against the likelihood of collision with other aircraft.	MAC 5.1.1 PinS terminate at a Point In Space after which the aircraft proceeds visually or VFR. It is however unlikely that operations at Culdrose or St Mary's will be taking place in the conditions where this PinS approach is likely to be being used. **Trial Evidence**: An Approach Control service is not necessary to enable the PinS approaches at Tresco and Penzance to be undertaken. Radio coverage with both St Mary's ATC and RNAS Culdrose ATC was excellent in all areas that the PinS operations will be conducted. A Basic Service (FIS) is available from both St Mary's and Culdrose

LOC

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.3 The Risk of a Loss of Control Accident is acceptably low (LOC)	
LOC 1 ANO 172 Requirement for Approach Control is met Provision of an Approach Control would be inappropriate as the IAP being provided is a helicopter Point In Space (PinS) approach not linked to an aerodrome. PinS would be limited to approved users and would be restricted to one helicopter at a time so there would be no sequencing of traffic involved. When available, the most suitable level of service should be obtained from the nearest ATSU (ATC, AFISO or AGCS) to mitigate the risk of collision.	
LOC 1.1 Approach control reduces the risk of a loss of control accident arising from Wake Turbulence by sequencing participating instrument approach traffic	LOC 1.1.1. PinS would be limited to approved users and would be restricted to one helicopter at a time. Other users would be aware of the presence of an IAP by promulgation in the AIP (MAC 5.1) Operations will be in Class G airspace and for the purposes of the trial will be conducted in VFR conditions. Culdrose and St Mary's provide ATC services during published hours and are in the vicinity of the route. This trial will identify where the conflicting points are between this procedure and the operations at these units. It will also test the extent of radio coverage from each unit at various points on the route. St Mary's could provide a procedural control service to deconflict traffic on the approach from its own traffic. A procedure or letter of agreement would have to be developed once the points of conflict have been worked out. Similarly, at Culdrose there is a possibility the procedure may overlap with some of their activities. It is however unlikely that operations at Culdrose or St Mary's will be taking place in the conditions where this PINS approach is likely to be being used. **Trial Evidence**: An Approach Control service is not necessary to enable the PinS approaches at Tresco and Penzance to be undertaken. Radio coverage with both St Mary's ATC and RNAS Culdrose ATC was excellent in all areas that the PinS operations will be conducted. A Basic Service (FIS) is available from both St Mary's and Culdrose.

LOC 3 The crew members of aircraft participating in the IAP are suitably qualified and proficient to fly the IAP safely and under control.	
LOC 3.1 The flight crew training and qualification standards which must be met are sufficient to provide for IAPs to be flown safely and accurately, with appropriate training/ awareness of wake turbulence considerations.	No alternative safety argument is considered appropriate for this baseline safety solution.

INTRO

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.4 The Risk of an accident during the introduction into service of a new IAP at this aerodrome is acceptably low. (INTRO)	

INTRO 1

An argument that the introduction to service of the IAP together with all the required safety mitigations and notifications to airspace users and other stakeholders will be conducted in a structured and carefully managed way which may, where deemed appropriate, include

a period of trial operation with additional safety mitigations in place to provide further risk reduction and provide safety evidence in support of key safety arguments presented. Such arguments should be suitably comprehensive, and include as a minimum, arrangements for the safe introduction of the IAP in the context of training, testing and validation of:

a) The people who will be involved or affected by the introduction of the IAP, their training and any associated communication activities for awareness purposes.

b) The procedures which are to be followed by ATSU personnel or participating flight crews and any associated organisational arrangements which need to be put in place before the IAP can be put into use.

c) Equipment which will be associated with the operation of the IAP, its suitability, fitness for purpose and availability

The trial has a comprehensive Safety Plan, which addresses all of the above points. The trial will be conducted in Class G airspace under VFR conditions in accordance with the Rules of the Air. The trial will identify any points of interaction with adjacent ATSUs. Following the trial appropriate procedures or Letters of Agreement will have to be developed with adjacent ATSUs to manage any interactions safely.

THRULIFE

Safety Baseline	Candidate Alternative Safety Arguments
Goal 1.5 The Risk of an accident during the through-life operation of an IAP at this aerodrome is acceptably low. (THRULIFE)	
THRULIFE 1 An argument that a safety monitoring and feedback process will be put in place by the aerodrome operator, which will provide feedback on safety information regarding the operation of the IAP. This will be used to monitor the continued validity of the alternative safety arguments used and provide a trigger for additional safety management activity if new hazards are discovered or the level of risk is deemed to have changed. A certified ANSP will oversee the management of the IAP in accordance with their SMS, and the procedures will be reviewed at least every 5 years in accordance with EASA regulations. An ANSP or management organisation will oversee the management of the procedures, limiting their availability which reduces the risk of unauthorised use. The presence of these procedures will be published in the AIP to alert other users that aircraft may be carrying out an instrument procedure. These procedures are most likely to be used when weather conditions likely preclude fixed wing VFR flight, further reducing the risk that there will be conflicting traffic in the vicinity of the procedure. The organisation will also oversee the continued validation of the procedures and look after any safeguarding issues.	

SECTION 6

Summary of Procedures

During normal VFR conditions, flights will be expected to operate under the conditions described within the Lands' End Transit Corridor Letter of Agreement (see section 8.1).

When operating in IFR conditions, flights will operate under the conditions described within the Letters of Agreement with Culdrose and St Mary's (see sections 8.2 and 8.3).

In summary:

1. Any requirement to fly IFR must be notified to ATC by the pilot or coordinated by an adjacent ATSU:

    a) prior to departure from Tresco or Penzance
    b) if in flight, prior to entering the Lands' End Transit Corridor

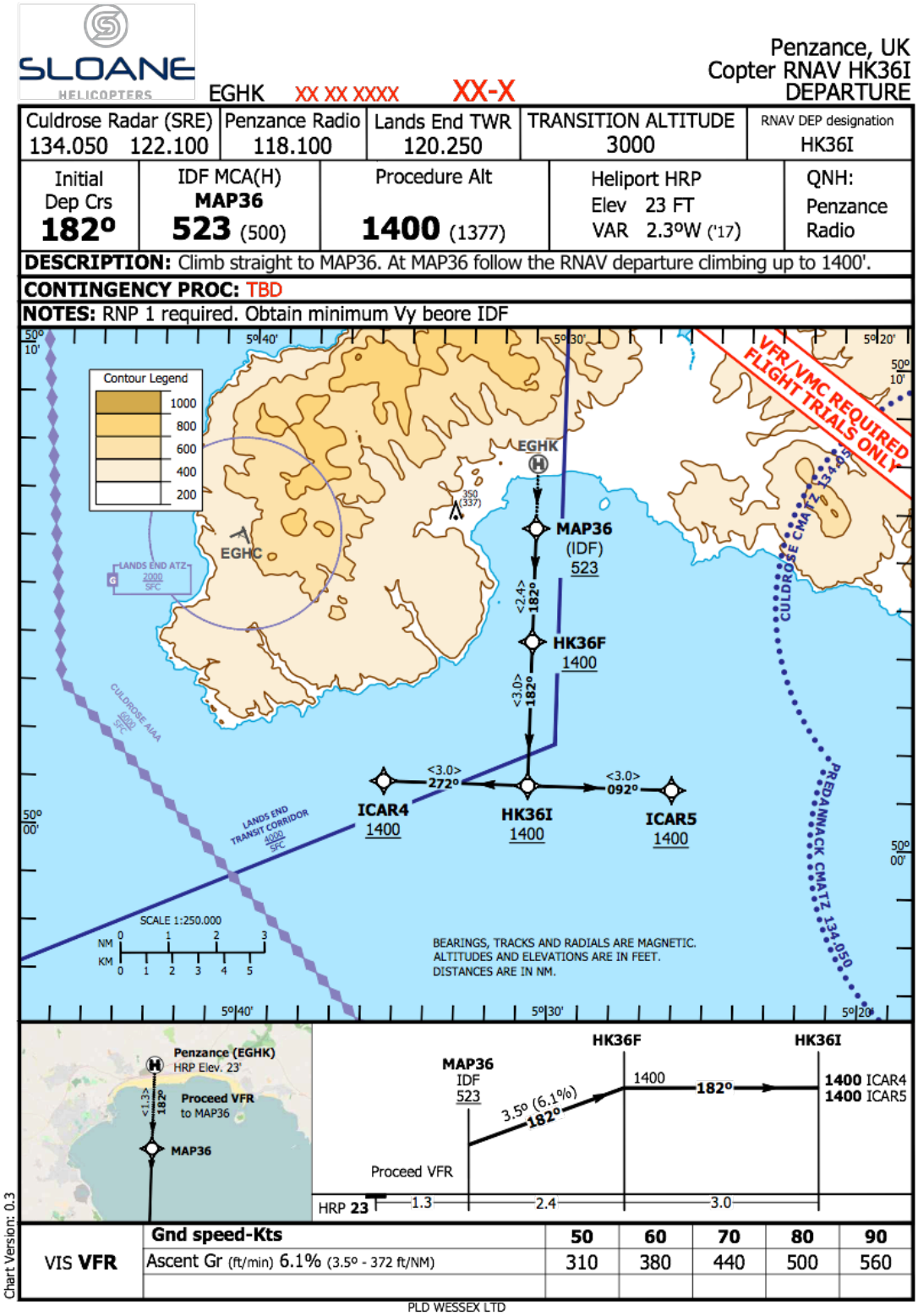
2. Aircraft inbound to Tresco from the east, intending to fly any of the PinS procedures, will be pre-noted to St Mary's by Culdrose ATC with type and call sign of inbound aircraft. Aircraft inbound to Tresco from the east intending to fly the PinS procedure will contact St Mary's Approach.

3. Aircraft inbound to Penzance from the west intending to fly any of the PinS procedures, will be pre-noted to Culdrose by St Mary's ATC with type and call sign of inbound aircraft. Aircraft inbound to Penzance from the west intending to fly the PinS procedure will contact Culdrose ATC.

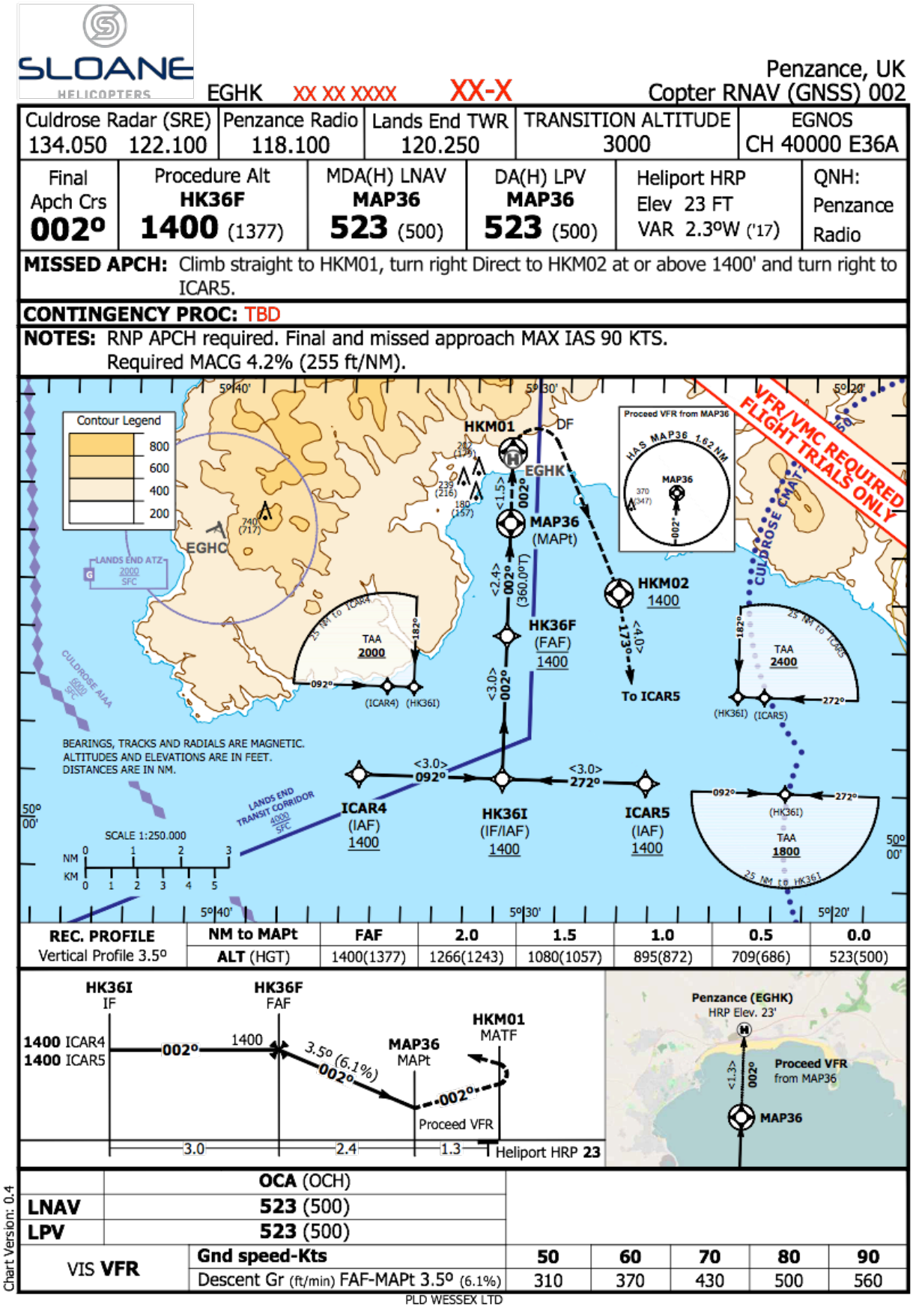
SECTION 7

Procedure Plates

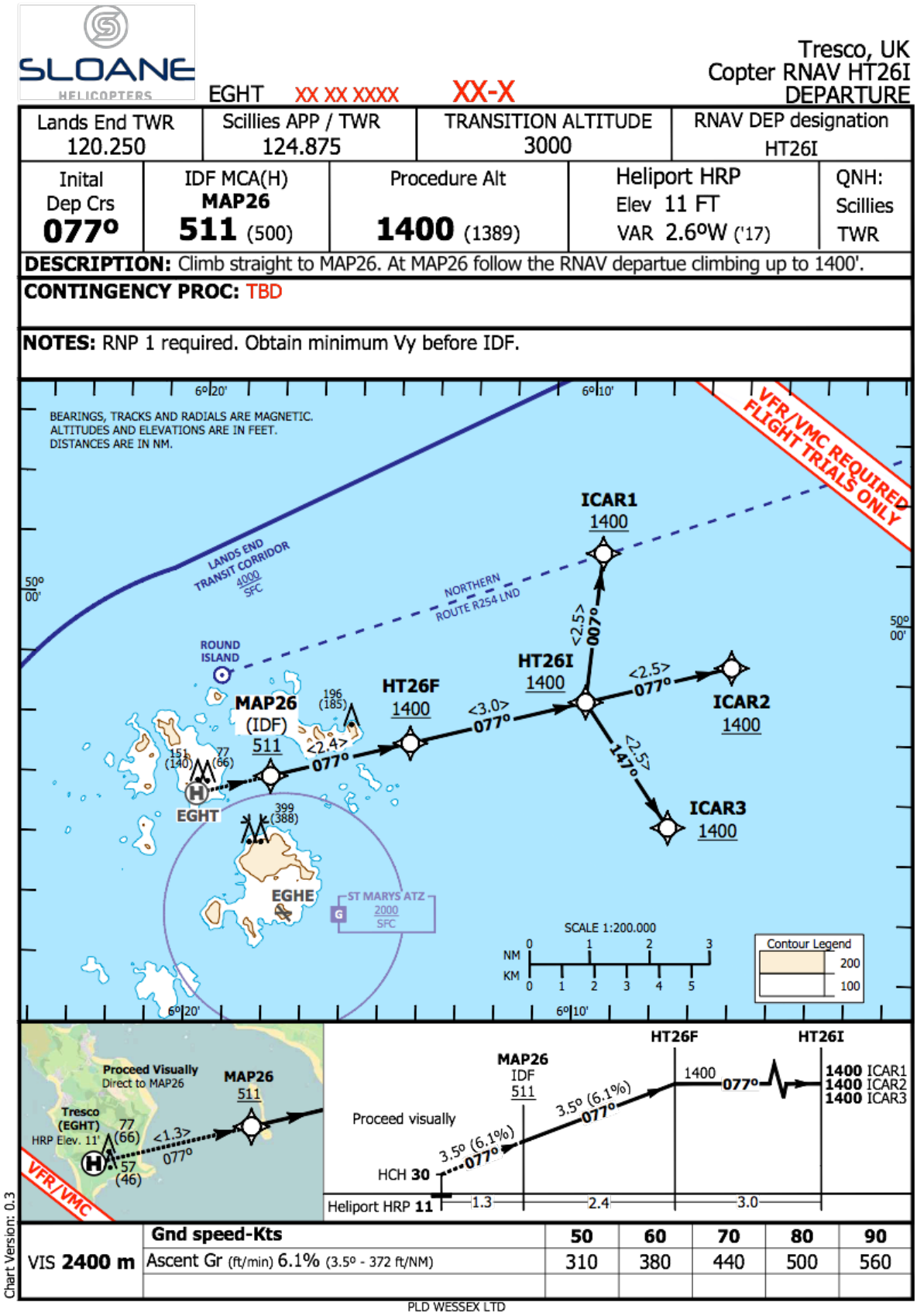
7.1 **EGHK Departures**



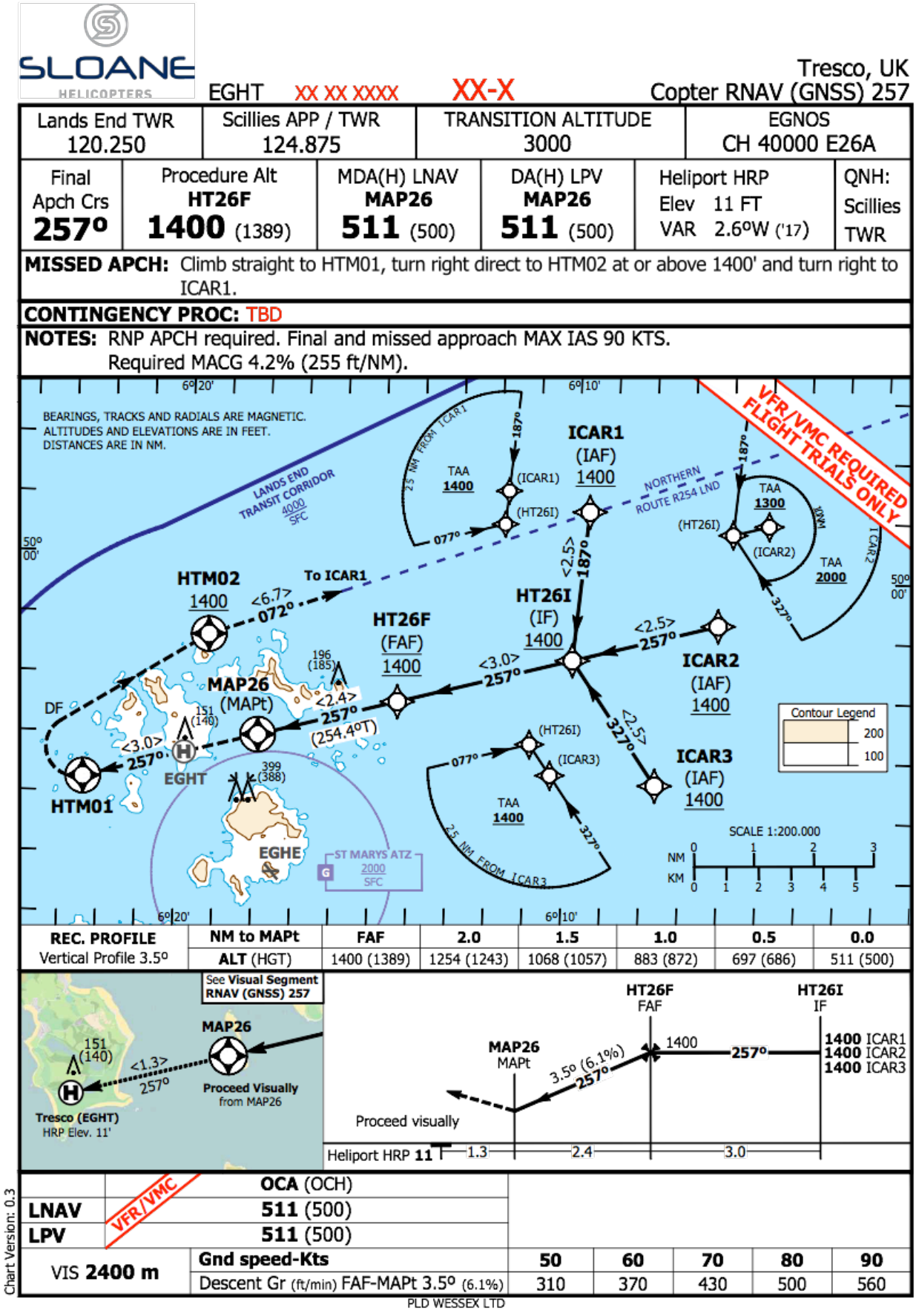
7.2 **EGHK Arrivals**



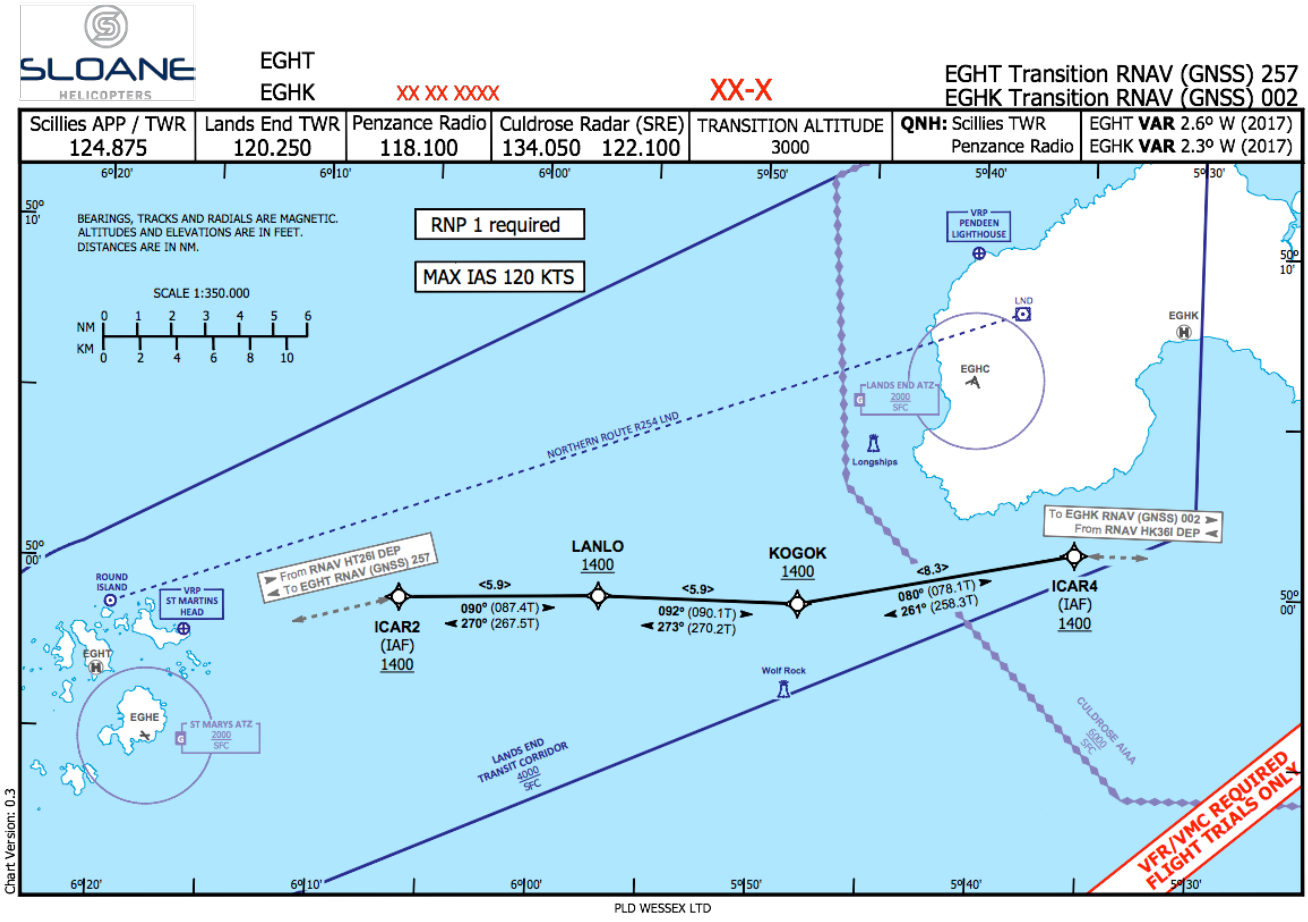
7.3 **EGHT Departures**



7.4 **EGHT Arrivals**



7.5 **Transitions**



SECTION 8

Letters of Agreement

8.1 Lands' End Transit Corridor

LETTER OF AGREEMENT LANDS END TRANSIT CORRIDOR

The purpose of this letter is to provide locally agreed and CAA approved procedures within the Land's End Transit Corridor (LETC), in order to achieve an expeditious flow of Traffic consistent with safety.

Document References:
1. UK AIP AD2 EGHC (Text and IAP Charts) / EGHE 1.2.22 (Text) and 3.1 (Chart), 8.1 (Chart)

2. CAP 774 (UK Flight Information Service)

3. CAP 493 (Manual of Air Traffic Services Part 1)

The following is a record of the agreement between the representatives of the Air Traffic Service providers at St. Mary's Airport, Land's End Airport and the aircraft operator Isles of Scilly Skybus.

PDG Helicopters (Trinity House Operations at Land's End), Specialist Aviation Services (Cornwall Air Ambulance at Newquay Airport & Island Helicopters based at Land's End), Bristow Helicopters (HM Coast Guard Rescue at Newquay Airport), and Sloane Helicopters as regular users of the LETC, are included in the distribution list of this document for information purposes only as their specific type of operations may preclude them from complying fully with the procedures.

Background Information

1. Types of Air Traffic Services (ATS) available within and adjacent to the LETC:

a) EGHE/ISC – BASIC Service routinely provided – PROCEDURAL Service routinely provided to aircraft carrying out Instrument Approach Procedures unless another service has been requested.
b) EGHC/LEQ – BASIC Service routinely provided;
c) EGDR – BASIC / TRAFFIC / DECONFLICTION Services routinely provided;
d) EGHQ/NQY – BASIC / PROCEDURAL / TRAFFIC / DECONFLICTION Services routinely provided.

2. Agreement should be reached between the Pilot and Controller regarding the type of Service being provided.

3. Pilots should be aware of the types of ATS available and the responsibilities of the Pilot and Controller for each type of service:

a) Provision of separation is dependent upon the type of service, not the Flight Rules.
b) In Class G airspace, the pilot is ultimately responsible for terrain clearance.

Air Traffic Control (ATC) Responsibilities within the LETC

1. Land's End ATC is responsible for routinely providing a BASIC Service for participating VFR & IFR flights within the LETC, EAST of Point CHARLIE (10 DME west of LND VOR);

2. St. Mary's ATC is responsible for:

a) Routinely providing a BASIC Service for participating VFR & IFR flights within the LETC, WEST of Point CHARLIE;
b) Routinely providing a PROCEDURAL Service for participating flights under IFR, carrying out holding, Instrument Approach Procedures (IAPs) or transiting St. Mary's Airport, subject to any necessary co-ordination with Land's End Tower, Newquay Radar or Culdrose Radar.

3. During St. Mary's ATSU closure periods, ATS will be provided by Land's End ATC throughout the LETC and vice versa when Land's End ATSU is closed.

4. Newquay & Culdrose ATSUs will endeavour to provide Air Traffic Services Outside Controlled Airspace (ATSOCAS) to participating flights within the LETC when:

a) requested by Land's End or St. Mary's ATSUs or any aircraft operator; and
b) subject to co-ordination with Land's End or St. Mary's ATSU as appropriate.

Pressure Settings

1. The following pressure settings will be used within the LETC up to and including altitude 4000 feet:
   a) Flights West of point C will use the St. Mary's Airport QNH;
   b) Flights east of point C will use the Land's End Airport QNH

2. If St. Mary's ATSU is closed, the Land's End Airport QNH will be used throughout the LETC.

3. If Land's End ATSU is closed, the St. Mary's Airport QNH will be used throughout the LETC.

Achieving an Expeditious Flow of Traffic consistent with safety within the LETC

1. The participants to this agreement will achieve a safe and expeditious flow of traffic by:
   a) Whenever possible, Land's End and St. Mary's ATC will allocate the following levels, with agreement, to participating VFR flights:
      i) Land's End to St. Mary's flights - generally flown at altitude 1500 ft.
      ii) St. Mary's to Land's End flights - generally flown at altitude 1000 ft.
      iii) Transit flights - generally at altitude 2000ft and above.
   b) Where appropriate, segregating participating flights within the LETC; (See segregated route below)
   c) Endeavour to agree routes and/or levels with the pilots of other aircraft receiving an ATS within the LETC;
   d) Aiming to achieve a Deconfliction Minima between flights participating in a Procedural Service or a Deconfliction Service;
   e) Ensuring appropriate and timely co-ordination between local ATSU's;
   f) Reducing communications workload for both ATCOs and Pilots.

   - **NOTE***: In Class G Airspace separation between aircraft is ultimately the Pilots responsibility. However, when providing a Procedural Service, Controllers will provide information and advice aimed at achieving the Deconfliction Minima, and when providing a Deconfliction Service will provide Deconfliction minima.*

Flight Rules

1. All Scheduled Public Transport flights within the LETC will be conducted under VFR unless precluded by Meteorological Conditions.

(Aircraft with an IAS of 140kt or less at or below 3000ft by Day – clear of cloud and with the surface in sight, flight visibility of not less than 1500 meters – not below 500ft above the surface except on departure and final approach to land. By Night at or below 3000ft– Distance from cloud 1500 meters Horizontal, 1000 feet Vertical and with the surface in sight and a flight visibility 5 KM.)

2. Any requirement to fly IFR must be notified to ATC by the Pilot or coordinated by an adjacent ATSU:

   a) prior to departure from Land's End or St. Mary's or
   b) if in flight, prior to entering the LETC.
   c) prior to departure from Tresco or Penzance

3. For aircraft requiring an IAP into St. Mary's:

   a) For an aircraft in flight – Cleared Level at the IAF and EAT based on the aircrafts' ETA should be obtained by the Pilot prior to entering the LETC.
   b) For a flight from Land's End –Cleared Level at the IAF and EAT based on the aircrafts' ETA should be requested through Land's End Tower prior to start-up.

4. For aircraft requiring an IAP into Land's End:
   a) For an aircraft in flight – Skybus, Island Helicopters and Flight Priority Category A & B can request airborne PPR for the IAP's at Land's End. All other airborne requests will be refused and aircraft must continue VFR or divert.
   b) For an aircraft departing St. Mary's - Start up clearance must be requested due to the limitations of the ATC service at Land's End, sequential departure times from St. Mary's shall not be permitted at less than 15-minute intervals.

5. Pilots inbound to St. Mary's should be prepared to delay departure from Land's End or be instructed to take up a hold until an IFR/IAP clearance has been issued.

6. Pilots inbound to Land's End should be prepared to delay departure from St. Mary's until PPR has been granted and an expected release time has been obtained from Land's End.

7. Rapidly changing weather conditions may preclude the above notice being achievable. If this occurs, Scillies Approach will endeavour to achieve the Deconfliction Minima under a Procedural Service, and allocate levels and EATs appropriate to the aircraft's current position and ETA.

Segregated Routes

1. In conditions of limited visibility (5000m or less) pilots may be requested to enter into an agreement or elect to fly the Northern Route. (LND VOR R254 between Round Island and the LND VOR).

2. It is recommended that pilots follow this procedure when the meteorological conditions reported in flight or by Land's End or St. Mary's ATSU are as follows:
   a) Visibility 5000m or less; and/or
   b) Cloud ceiling less than 1500 feet.

Instrument Approach Procedures – St. Mary's Airport

1. When the prevailing visibility is less than 1500m, St. Mary's ATC will inform Land's End ATC that weather conditions necessitate the use of IAP's into St. Mary's Airport for scheduled operators. The following procedures will then come into force:
   a) St. Mary's ATC will telephone Land's End ATC to advise that all departures to St. Mary's are subject to release by Scillies Approach;
   b) Land's End ATC will request engine startup and IFR clearance from St. Mary's ATC;
   c) When the aircraft is ready for departure Land's End ATC will request a release from St. Mary's ATC. A release will only be withheld if safety is likely to be compromised or for deconfliction purposes. In such cases a Release restriction may be issued;
   d) Inbound flights from Newquay and Exeter will call Scillies Approach for a weather update at least 10 minutes flying time East of the LND VOR, and, if IAPs are in operation should be in receipt of an IFR clearance (Cleared Level at the IAF and EAT based on the aircrafts' ETA) prior to entering the LETC;

- ***NOTE:*** *Rapidly changing weather conditions may preclude the above notice being achievable. If this occurs Scillies Approach will endeavour to achieve the Deconfliction Minima under a Procedural Service, and allocate levels and EATs appropriate to the aircraft's current position and ETA.*

e) Pilots wishing to continue receiving a Radar service from Culdrose or Newquay radar within the LETC must ensure that they are transferred to St. Mary's ATC in sufficient time to enable the safe change from a radar-based service to a Procedural service i.e. before reaching LANLO

2. During periods where the weather criteria require IAPs and IFR departures from St. Mary's, St. Mary's ATC will:

a) Request the type of ATS Service required by the Pilots of departing flights;
b) Endeavour to provide the service requested;
c) Issue a departure clearance aimed at achieving the Deconfliction Minima.

Instrument Approach Procedures – Land's End Airport

1. IAP's at Land's End are restricted to Isles of Scilly Skybus, Island Helicopters and Flight Priority Category A & B aircraft *only.* (Other flights may be authorised by the CAA).

2. When a pilot elects to fly an IAP into Land's End from St. Mary's, the following procedures will apply:

a) Prior to start approval, St. Mary's ATC will telephone Land's End ATC and either confirm or request PPR for the inbound aircraft stating their request for which type of approach and to which runway.
b) Land's End will either confirm or issue the approval – with no delay expected if no other IFR aircraft are booked in or issue an appropriate start-up time if other IFR aircraft are expected.
    - ***NOTE****: The CAA requires a minimum 15-minute departure interval for aircraft requiring IAP's at Land's End when departing St. Mary's (unless the preceding aircraft has landed or has diverted and is in contact with Culdrose or Newquay radar and the prescribed deconfliction minima can be ensured).*
c) St. Mary's ATC will advise the aircraft to squawk 4501.
d) Once de-conflicted from other participating traffic, the aircraft will be transferred (control and communication) by St. Mary's ATC as follows:
        i. Aircraft inbound for the IAP for runway 07: To Land's End ATC at point SIVBO.
        ii. Aircraft inbound for the IAP for runway 34: To Land's End ATC at point GEVSI.
        iii. Aircraft inbound for the IAP for runways 16 & 25: To Culdrose* ATC at point Charlie.
    - ***NOTE:*** *If Culdrose ATC is closed, aircraft shall be transferred to Land's End ATC at point Charlie*

e) Land's End shall co-ordinate all missed approaches with Culdrose (during their hours of operation) and Scillies Approach to deconflict against possible IFR traffic. If Culdrose are closed, Land's End ATC shall retain the aircraft unless another IFR aircraft is on frequency. In this scenario, traffic information shall be passed without delay to either St Mary's ATC or Newquay ATC and the aircraft transferred (control and communication).
f) Land's End ATC shall co-ordinate traffic intending to fly the 16 and 25 IAP's with Culdrose (during their hours of operation). Land's End ATC will expect first contact with such aircraft at the IAF.

3. When a pilot elects to fly an IAP into Land's End *except from* St. Mary's, the following procedures will apply:

a) Land's End ATC can only accept Skybus, Island Helicopters, Flight Priority Category A & B flights or any other flight categories authorised by the CAA. If these requirements have not been met, the pilot will be advised they cannot be accepted and will be transferred to an appropriate Approach Control Unit to Divert; or if conditions allow, to continue inbound VFR (if the aircraft is in IMC, the MSA and any traffic information should be passed before transfer to an alternative ATSU).
b) Land's End ATC will ensure that only one airborne IFR aircraft is on frequency at any time. If more than one IFR aircraft is on frequency and airborne, traffic information must be passed immediately to the most appropriate Approach Control Unit and control and communication transferred.
c) Land's End ATC shall confirm with St. Mary's ATC that no aircraft are flying IAPs at St Mary's (the approaches are not currently deemed separated).
d) Once the above three conditions have been confirmed, Land's End ATC will co-ordinate the IAP traffic with St. Mary's ATC and Culdrose ATC (Newquay ATC when Culdrose ATC is closed).
e) Land's End ATC will advise the aircraft to squawk 4501 and provide a Basic Service
    - ***NOTE**: The swift and concise co-ordination between units during IAPs is critical to the safe and expeditious flow of traffic*

Co-ordination between EGHC and EGHE

1. Traffic Information on all flights likely to enter the LETC will be exchanged using the dedicated Tie- Line telephone, including flights being transferred to Culdrose or Newquay ATSU's and flights transiting between Tresco and Penzance

2. If it is not possible to pass the information before the aircraft is less than 3 minutes from the transfer point, pilots are to be instructed to free-call the next ATSU as soon as possible with their position, level and POB.

3. Traffic Information on Scheduled Flights should include the following: Inbound/Over-flight

- Abbreviated call-sign
- Departure / Coasting out / Setting Course Time ETA (Long haul flights only)
- Level Route
- POB (passengers + crew + livestock)
- Type of ATS required, if other than BASIC Service

4. Traffic Information on Non-Scheduled Flights within the LETC should include the following:
    - IFR or VFR
    - Inbound/Over-flight
    - Registration or call-sign Aircraft Type
    - Point of Departure / Destination ETA
    - Level
    - Route – e.g. Northern route, via Pendeen, overhead, South abeam LEQ or LND VOR POB
    - Type of ATS required
    - The means by which the Pilot is navigation e.g. DME, GPS

5. St. Mary's ATC will inform Land's End ATC of any traffic making an IAP to St. Mary's Airport and/or holding over LND VOR or LANLO.

6. Land's End ATC will inform St. Mary's ATC of any traffic making an IAP to Land's End Airport and/or in the UMBOB or NUTMU holds.

7. Land's End ATC and St. Mary's ATC shall co-ordinate closely before any aircraft commences an approach at either airport as the IAP's are NOT currently deemed horizontally separated.

Co-ordination with EGDR or EGHQ

1. Flights receiving a Service from Land's End ATC:
    a) VFR
        i. Eastbound flights via the North Coast to Newquay will be instructed to Free-Call Newquay Radar at St. Ives;
        ii. All other Eastbound flights will be instructed to Free-Call Culdrose Radar (Newquay Radar when Culdrose is not available) on leaving the LETC;
        iii. Any flights which may be potentially problematic e.g. language difficulties, formations etc. will be pre-noted to the relevant ATSU whenever possible.
    b) IFR
        i. Eastbound IFR departures will be pre-noted to Culdrose Radar (Newquay Radar when Culdrose is not available) prior to departure. Culdrose or Newquay Radar may then issue an SSR Code;
        ii. Over-flights are to be pre-noted to Culdrose Radar (Newquay Radar when Culdrose is not available) before entering the AIAA;
        iii. If Land's End ATC becomes aware of Traffic Holding over the LND VOR e.g. Training flights, Culdrose Radar is to be notified.

2. Flights receiving a Service from St. Mary's ATC:
    a) Eastbound departures climbing above the LETC (4000 feet) will be pre-noted to Culdrose Radar (Newquay Radar when Culdrose is not available), where possible prior to departure. When Land's End IAP's are in use, Eastbound scheduled traffic will climb to FL50 to assist in providing vertical separation from any aircraft that may be in the Land's End holds.

i. Culdrose Radar (Newquay Radar when Culdrose is not available) may issue an SSR Code and the aircraft should be transferred when passing altitude 4000 feet or Flight Level equivalent;
ii. Over-flights are to be pre-noted to Culdrose Radar (Newquay Radar when Culdrose is not available) before entering the AIAA;

b) St. Mary's ATC will inform Culdrose Radar of any Aircraft holding above altitude 4000 feet over LANLO and/or the STM NDB;
c) When Land's End ATC are closed St. Mary's ATC will inform Culdrose Radar (Newquay Radar when Culdrose is not available) of any aircraft holding above altitude 4000 feet at the LND.

3. Flights receiving a Service from Culdrose ATC or Newquay ATC:
   a) Pilots expecting to continue receiving a service from Culdrose or Newquay Radar within the LETC should ensure that they contact Land's End or St. Mary's ATC, according to their Corridor entry position:
      i. VFR prior to entry of the LETC;
      ii. IFR inbound to Land's End: 10 mins prior to ETA for the IAF of the Land's End IAP's …or…
      iii. IFR inbound to St. Mary's: before reaching LANLO
   b) There is a separate Letter of Agreement between Land's End and Culdrose ATC for aircraft inbound to Land's End from the East intending to fly the IAP's at Land's End, and for aircraft inbound from the West intending to fly the runway 16 or 25 IAP's at Land's End. When co- ordinating such traffic, Culdrose ATC must be issued with the runway-in-use, Land's End QNH and any other Essential Aerodrome Information.

General Aircraft Operations within the LETC

1. Position Reporting.
   a) Routine position reports shall be made at the points designated on the attached chart to:
      i. Land's End ATC – East of Point Charlie;
      ii. St. Mary's ATC – West of Point Charlie.
   b) If flights are unable to report at Point Charlie promptly, the Pilot should contact the next agency with an accurate position report and request them to inform the previous agency of the frequency change.

2. In the interest of R/T brevity the following items are to be omitted from reports:
      i. Actual Time of Departure;
      ii. Time of crossing a reporting point, unless a late report is made;
      iii. Estimate for next reporting point;

3. It is imperative that position reports are accurate. If a routine point is missed an accurate late position report, using the LND DME or GPS where appropriate, should be made.

4. Routine Reports should consist of:

a) Westbound aircraft on entering the LETC

i. *Initial call to establish contact:*

- Callsign
- Type of ATS required

ii. *Initial report after contact is established:*

- Position
- Level
- Next reporting point with ETA e.g. North or South abeam or overhead Land's End
- ETA St. Mary's
- Route (if requesting the Northern Route)

iii. *Subsequent Reports:*

- Position
- Level (if changed from previous call)

b) Eastbound aircraft (route and level passed to Land's End by St. Mary's ATC on departure)

i. *Initial call to establish contact:*

- Callsign;
- Position
- Type of ATS required

ii. *Initial report after contact is established:*

- Next reporting point e.g. North or South abeam or overhead Land's End
- Route (if requesting the Northern Route)

iii. *Subsequent Reports:*

- Position
- Level (if changed from coordinated level)
- Next Reporting Point

5. Aircraft should also report if they wish to change an agreed level or route, *prior to doing so*, for relevant traffic information to be relayed.

8.2 Culdrose LOA

Letter of Agreement – Penzance Helicopter Point in Space (PinS) Approaches

Between

Royal Naval Air Station Culdrose **and** ***Sloane Helicopters***

Effective: **XX March 2019**

Revised:

CONCERNING PROCEDURES BETWEEN RNAS CULDROSE (EGDR) AND PENZANCE HELIPORT (EGHK)

Purpose

1. The purpose of this Letter of Agreement (LoA) is to provide locally agreed procedures for the interaction of air systems conducting Point In Space (PinS) approaches to Penzance Heliport, in order to achieve an expeditious flow of traffic consistent with safety.

Background

2. Penzance Heliport has implemented PinS approaches to the Heliport. The hold for each approach is up to 1500ft amsl and based on an Initial Approach Fix at 3nm from the heliport.

3. These holds fall within the Culdrose Area of Intense Aerial Activity SFC - 6000ft amsl and within Mounts Bay. Culdrose also has an established helicopter Instrument Flying area extending out to the south over Mounts Bay, at a height of 2500ft - 5500ft based on Culdrose QFE.

Application and Review of the Letter of Agreement

4. Permanent amendment to, or withdrawal of, this LoA is to be effected only with the written consent of the signatories or their successors.

a. This LoA becomes effective at 0001 on XX March 2019.

b. This LoA is effective during Culdrose ATC known hours of operation.

c. This LoA shall be reviewed annually from the date of signing. The method of review shall be acceptable to both parties.

d. This LoA shall be re-signed on change of SATCO at either unit.

Unit ATC Responsibilities

5. Culdrose ATC responsibilities are:

a. Inform Penzance Heliport when opening and closing outside of published operating hours.

b. Aircraft inbound to Penzance Heliport from the West, intending to fly any of the PinS procedures, will be pre-noted to Culdrose by St Mary's ATC with type and call sign of inbound air systems. Aircraft inbound to Penzance from the West intending to fly the PinS procedure will contact Culdrose Approach on the ICF.

c. Culdrose will instruct the approaching air system to squawk an assigned 704X code within 20nm of EGHK.

d. Culdrose will, whenever possible, provide the air system with an appropriate Air Traffic Service (ATS) whilst the aircraft is approaching and during the procedure.

e. Culdrose will instruct air systems to continue with EGHK when the aircraft reports visual with the required visual references at EGHK.

Cancellation

7. Cancellation of this LoA by either party is possible at any time, provided that the cancelling party declares its intention to cancel the LoA with a minimum pre-notification time of 1 month before the date the cancellation is to take effect.

Interpretation and Settlement of Disputes

8. Should any doubt or diverging views arise regarding the interpretation of any provision of this LoA, or in case of dispute regarding its application, the parties shall endeavour to reach a solution acceptable to all.

Parties to the Agreement

9. It is hereby declared that the parties to the said Agreement are Sloane Helicopters and Air Traffic Control at Royal Naval Air Station Culdrose.

Signed on original

G Stringer
Lt Cdr Royal Navy
Officer Commanding Air Traffic Control
RNAS Culdrose

Dated:

Signed on original

XXXX
XXXX
Sloane Helicopters

Dated:

8.3 St Mary's LOA

Letter of Agreement – Isles of Scilly Helicopter Point in Space (PinS) Approaches

Between

Scilly Isles/St Mary's (EGHE) **and** ***Sloane Helicopters***

Effective: **XX March 2019**

Revised:

CONCERNING PROCEDURES BETWEEN ST MARY'S AERODROME (EGHE) AND TRESCO (EGHT)

Purpose

1. The purpose of this Letter of Agreement (LoA) is to provide locally agreed procedures for the interaction of air systems conducting Point In Space (PinS) approaches to Tresco, in order to achieve an expeditious flow of Traffic consistent with safety.

Background

2. Tresco has implemented a PinS approach to the Heliport. The approach is up to 1500ft AMSL based on an Initial Approach Fix at 3nm from the heliport.

3. The procedure lies close to the edge of the St Mary's ATZ. St Mary's have published Instrument Flight Procedures serving the aerodrome also up to 1500ft AMSL.

Application and Review of the Letter of Agreement

4. Permanent amendment to, or withdrawal of, this LoA is to be effected only with the written consent of the signatories or their successors.

a. This LoA becomes effective at 0001 on XX March 2019.

b. This LoA is effective during St Mary's ATC known hours of operation.

c. This LoA shall be reviewed annually from the date of signing. The method of review shall be acceptable to both parties.

d. This LoA shall be re-signed on change of SATCO at either unit.

Unit ATC Responsibilities

5. St Mary's ATC responsibilities are:

a. Inform Tresco when opening and closing outside of published operating hours.

b. Aircraft inbound to Tresco from the East, intending to fly any of the PinS procedures, will be pre-noted to St Mary's by Culdrose ATC with type and call sign of inbound air systems. Aircraft inbound to Tresco from the East intending to fly the PinS procedure will contact St Mary's Approach.

c. St Mary's will, whenever possible, provide the air system with an appropriate Air Traffic Service (ATS) whilst the aircraft is approaching and during the procedure.

d. St Mary's will instruct air systems to continue with EGHT when the aircraft reports visual with the required visual references at EGHT.

Cancellation

7. Cancellation of this LoA by either party is possible at any time, provided that the cancelling party declares its intention to cancel the LoA with a minimum pre-notification time of 1 month before the date the cancellation is to take effect.

Interpretation and Settlement of Disputes

8. Should any doubt or diverging views arise regarding the interpretation of any provision of this LoA, or in case of dispute regarding its application, the parties shall endeavour to reach a solution acceptable to all.

Parties to the Agreement

9. It is hereby declared that the parties to the said Agreement are Sloane Helicopters and Air Traffic Control at St Mary's Aerodrome.

Signed on original

R Sheilds
SATCO
St Mary's

Dated:

Signed on original

XXXX
XXXX
Sloane Helicopters

Dated:

SECTION 9

Requirements in CAP1616

The following are extracts from the CAP1616 requirements on Airspace Change Proposals. Each key requirement has been looked at and examined, to see whether compliance has been achieved or is necessary for this particular project.

Requirement 1

The CAP1616 (Page 27, Table 2) defines a Level 1 Airspace Change as:

Typically, a large-scale change which alters lateral aircraft tracks or dispersion, or changes aircraft height, below 7000ft (amsl) over an inhabited area, such as

- changes to departure and arrival routes at airports
- changes which have a significant impact on other aviation stakeholders

Does the procedure fit the criteria?

These procedures are a small-scale change which formalise existing VFR routes to improve safety and reliability in marginal weather conditions. The procedures are outside CAS and almost completely over water, so do not affect any inhabited areas.

To comply with the safety case the procedures will not be published for general use so tight controls on usage will be imposed. These are Point In Space Approaches (PinS) so by their very definition they are not providing an arrival or departure route at an airport, they terminate at a point in space.

Through the trial that was conducted a consultation was carried out with other aviation stakeholders in the area. Any interactions with other stakeholders can be safely managed through Memorandums of Understanding or Letters of Agreement which will safely manage any points where the procedure interacts with such operations. It should be pointed out once again, that these procedures are outside CAS, so any aviation operations in the area are governed by the rules of the air.

In Summary: Compliance not required for the following reasons:

a) Tracks are over water, not inhabited areas
b) The routes are not directly linked to an airport
c) There is little or no impact on other aviation stakeholders' operations

Requirement 2

The CAP1616 (page 96) lays down the criteria for PPR, or a planned, permanent redistribution of air traffic through changes in air traffic control operational procedures by an ANSP (within the existing airspace design).

Does the procedure fit the criteria?

These routes are Outside CAS, therefore, outside the scope of PPR. In addition, the routes are not owned, operated or overseen by an ANSP, nor are they being provided with an ATC service.

These are discreet procedures that are not for general publication but which will be overseen by a third party as there is no ANSP involvement.

The oversight of these procedures in these circumstances is likely to be provided by either an independent management organisation or an individual helicopter operator. The oversight would involve the maintenance, safeguarding and licensing of these procedures. The CAA have stated that the oversight would not fall under the remit of the ANSP EASA regulations as they stand.

In Summary: Compliance not required for the following reasons:

a) The procedures are not within Controlled Airspace
b) The procedures are not owned or operated by an ANSP

Requirement 3

The CAP1616 (Page 27, Table 2) defines a Level 0 Airspace Change as:

Changes to nomenclature or qualifying remarks of the notified airspace design. A change that will not alter traffic patterns

Does the procedure fit the criteria?

As stated above, these procedures are outside CAS so do not interfere with existing airspace designs or procedures. To comply with the safety case, the existence of the procedure would have to be notified to users for awareness whilst operating in Class G airspace under the rules of the air. This would simply be an annotation on the airspace chart and an explanatory note in the appropriate section.

These procedures are formalising VFR routes that are already flown. By allowing IFR traffic to use them, the safety of the routes in marginal conditions for both commercial and non-commercial operations is increased. These are lifeline services and any increase in the reliability and safety of the operations can only be of benefit to quality of life for the residents.

In summary: Compliance not required for the following reasons:

a) The procedures are outside CAS, therefore do not affect any airspace designs.
b) There are no published IFR routes in the area so no traffic patterns are being altered.

In conclusion

The specific nature of the PinS procedures discussed, terminating at a point in space, and in this case operating outside CAS, preclude them from the conditions of a Level 1 Airspace Change because:

- they are outside CAS, essentially an unregulated environment
- they are not being provided with an ATC service. There is no regulated service being provided, only advisory services where available
- they are not being overseen by an ANSP; the ownership of the procedures is not by a regulated ANSP. They will not published in the AIP; although the presence of a procedure MAY be published in the AIP, the whole procedure will not be published.
- they do affect the airspace structure or associated procedures and are completely contained in unregulated airspace.
- they are not directly connected with an aerodrome or heliport – they merely provide a method to obtain VFR/Visual reference at the lowest safe minima.
- the approaches are wholly contained over the sea, away from any residential habitation.

The only part of the entire process that is currently regulated under any of the CAP1616 requirements is the actual design of the procedures themselves. The procedures to be implemented have been fully designed by a CAA approved IFP designer, thereby meeting the requirements of this regulation.

For all of the above operational and regulatory reasons, these procedures do not fall under the conditions laid out in the CAP1616, therefore, should not be subject to a full Airspace Change Process.