

Gama Aviation 



Kings College Hospital (KCH) - Provision of PinS Instrument Flight Procedures

AIRSPACE CHANGE PROPOSAL

CAP1616 STAGE 4

AIRSPACE CHANGE REFERENCE: ACP-2023-027

DATE: 26 APRIL 2024

RELEASE: FINAL

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Author: This document has been prepared by Future Airspace Limited on behalf of Gama Aviation Plc and Air Ambulance Charity Kent Surrey Sussex.

1 Introduction

1.1 Overview

This document is the Airspace Change Proposal for Airspace Change Procedure (ACP) ACP-2023-027 sponsored by Gama Aviation Plc. Gama Aviation operates the AW169 helicopter service for Air Ambulance Charity Kent Surrey Sussex (AACKSS) under the ring-fenced Specialist Aviation Services AOC.

This ACP concerns Kings College Hospital (KCH) which is the primary Major Trauma Centre (MTC) for AACKSS. The proposal is to introduce an Instrument Flight Procedures (IFPs) to the hospital using Helicopter Point-in-Space (PinS) criteria.

1.2 A pre-scaled ACP

This ACP is being conducted in accordance with CAP1616. The ACP is being progressed under CAP1616h (a pre-scaled ACP, level 3) which is for changes to the “notified airspace design that have the potential for a low impact to both aviation and non-aviation stakeholders”.

The pre-scaling was confirmed at the assessment meeting 15 June 2023. This required two conditions to be met:

- the introduction of the RNP IAP is not expected to increase the total number of aircraft movements at the aerodrome in the first two years after introduction, by 10% or more (by at least a minimum of 3,650 movements per year), and;
- the proposal will not change the environmental impact of aircraft utilising other aerodromes.

Both requirements were confirmed.

1.3 Compliance with CAP1616F Annex A

CAP1616F Annex A describes the structure required for airspace change proposals. Given this ACP is being progressed under CAP1616h, the headings are interpreted as follows:

Preliminary Information

- Airspace Change Reference – see cover page
- Authorship and Revision History – see cover page and Page 1
- Contents – see Page 1

Executive Summary – Summary provided in Section 10 to avoid repetition

- The Drivers for Change – see Section 2.1
- Statement of Need – see Section 2.2
- Aims of the Proposal – see Section 2.3
- Assumptions and Constraints – see Section 2.4
- Summary Description of the Current Airspace and Operation – see Section 3

- Summary Description of the Changes to Airspace Design and Operation – see Section 4
- Summary of Options Analysis – see Section 5
- Summary of Engagement and Consultation – see Section 6
- Summary of Anticipated Impacts – see Section 7
- Assessment of criteria for the Secretary of State for Transport’s Call-in Process – not required for level 3 ACP.
- Timeline for implementation – see Section 9.1

Detailed Description of the Proposal and Impacts

- Detailed Description of the Current Airspace and Operations – included in Section 3
- Detailed Description of the Changes to Airspace Design and Operation – included in Section 4
- Detailed Description of Anticipated Operational Impacts - See Section 7.3
- Supporting Infrastructure and Resilience - See Section 9.2
- Regulations, Policies and Harmonisation - See Section 9.3
- Safety - See Section 8
- Environmental Assessment - See Section 4.6
- Final Options Appraisal – included in options analysis (Section 4)
- List of Supplementary Documents – not required. **(Note: Letters of Agreement are provided in the safety assessment and the IFP package has been submitted directly to the CAA)**

Summary – see Section 10

2 Overview

2.1 Drivers for change

The driver for change is to introduce instrument procedures that will allow more patients to be transferred by Helicopter to KCH hospital in low visibility conditions.

The change is taking advantage of the availability of Point in Space (PinS) criteria for helicopter instrument procedures.

The new procedures will use instrument flight procedures which offer significant safety benefits over VFR flight in marginal conditions (as supported by a number of AAIB recommendations for the adoption of PinS¹).

2.2 Statement of need

The statement of need is available on the airspace change portal and the summary is as follows:

Kings College Hospital (KCH) in Denmark Hill is the primary Major Trauma Centre for Air Ambulance Charity Kent Surrey Sussex (AACKSS). AACKSS serves a population of 4.8 million and its helicopter service is operated by Specialist Aviation Services Ltd, the sponsor of this ACP.

KCH lies inside the London City CTR and below the London TMA. At present, operations are limited to Visual Meteorological Conditions (VMC) due to the lack of Instrument Approach and Departure Procedures.

AACKSS transports patients to KCH on average once a day but, due to the limitation to operate in VMC conditions, approximately only two thirds of these patients are conveyed by air. Transport by helicopter is faster than by road and therefore improves outcomes for critically ill patients.

The purpose of this ACP is to gain approval for the design and introduction of RNP instrument procedures using Helicopter Point in Space (PinS) criteria. These will supplement the existing VFR procedures.

In addition to patient benefits, the instrument procedures will improve safety. It has been proven that planned IFR flight offers significant safety benefits over VFR flight in marginal VMC conditions, as supported by a number of AAIB recommendations for the adoption of PINs.

Note that Specialist Aviation Services Ltd was the sponsor when the ACP was initiated but it has now been acquired by Gama Aviation Ltd.

2.3 Aims of the proposal

The aims of the proposal are to provide improved patient outcomes by increasing the number of transfers by helicopter. This will be achieved by implementing an instrument flight procedure to enable transfers in IMC conditions rather than VMC.

2.4 Assumptions and constraints

The proposal has assumed that the procedure should be a low impact change, since it will be used for a relatively small number of flights per year.

¹ Including AAIB Safety Recommendation 2021-027: "It is recommended that the Civil Aviation Authority encourage the development and deployment of Point-in-Space operations at landing sites."

It was also assumed that there will be no changes in controlled airspace required.

3 Description of the current airspace and operation

KCH is situated in the Southern portion of the London City CTR, 6nm (Nautical Miles) South West of London City, and 13nm East of Heathrow. The landing pad is available 24/7, all year around.

KCH has an elevated helideck, situated 200ft above mean sea level. The most notable permanent obstacles above the height of the helideck are a church situated approximately 225m East of the helipad which extends to 40ft above the height of the helideck, and a hospital chimney 100m SW which extends <30ft above the height of the helideck.

Whilst there is VFR traffic on known heliroutes there is no common VFR traffic in this part of the CTR. There is no visual circuit associated with KCH Helideck. There are no local aerodromes operating circuit traffic.

VFR arrivals to KCH are generally direct track under Category Alpha in coordination with Heathrow/Thames. Departures from KCH are generally due South (towards Redhill) and are conducted under Category Echo.

All operations to KCH share communications protocols with the other helipad equipped London MTCs. This provides situational awareness and ensures deconfliction of helipad movements between Gama operated aircraft and the London Air Ambulance. This is achieved using the emergency service 'TETRA' communications network.

From 1 April 2022 to 31 March 2023 there were 365 helicopter patient transfers to the hospital by AACKSS.

4 Description of the changes to airspace design and operation

The instrument procedure is shown in the following figures.



Figure 1: Approach and missed approach procedures shown on VFR 1:250000 chart



Figure 2: Easterly departure procedure via ALKIN shown on VFR 1:250000 chart



Figure 3: Easterly departure procedure via ITSUM shown on VFR 1:250000 chart



Figure 4: Westerly departure procedure via ALKIN shown on VFR 1:250000 chart

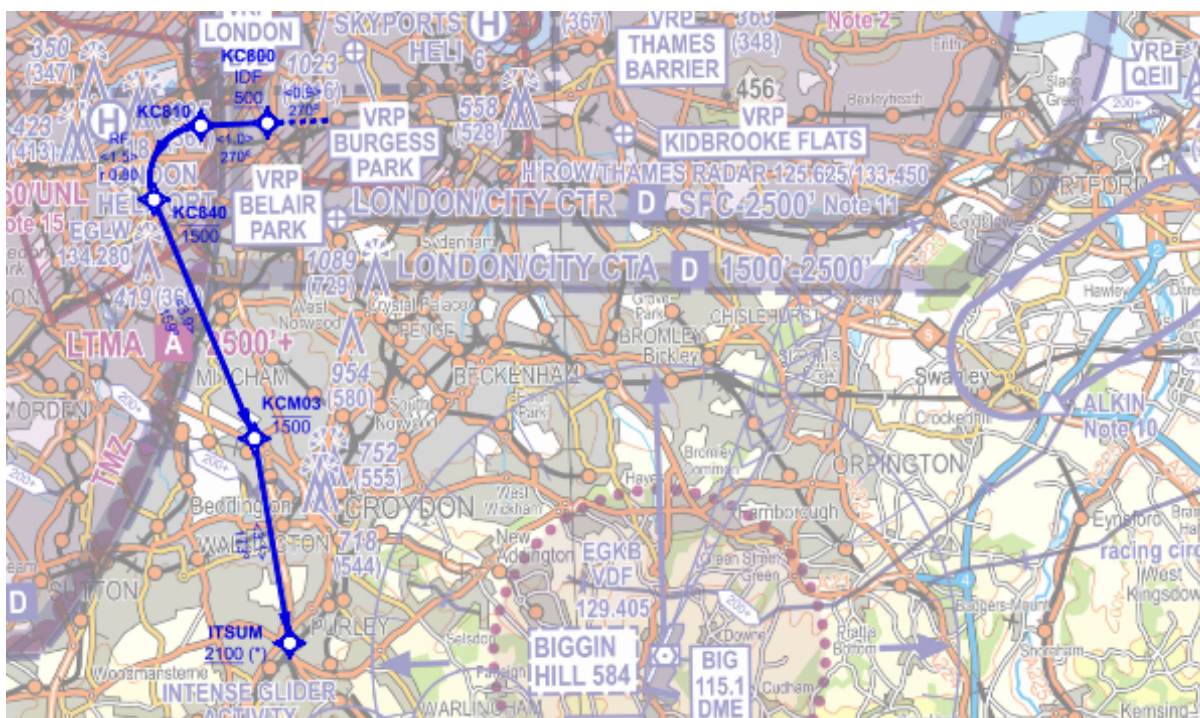


Figure 5: Westerly departure procedure via ITSUM shown on VFR 1:250000 chart

The PinS procedure is largely in controlled airspace (CAS). As today, operations in CAS will be under the ATC separation service provided by NATS. Entry into the procedure and exit will be in Class G and mostly likely under IFR.

Additionally, the new IFPs are likely to be used for training, particularly during their introduction, and then for occasional ongoing currency flights.

Deconfliction of the use of the procedure will be coordinated through the existing HEMS desk. A HEMS desk procedure has been produced for this purpose.

It was initially thought that a Letter of Agreement (LoA) would be required for coordination purposes with NATS (and possibly with other stakeholders). However, in subsequent discussions, NATS said this would not be necessary and the operations would be covered by the existing Special Flight Notifications (SFN) procedures in place with AACKSS. Once NATS confirms what services they can provide, then it will be possible to establish an LOA with Biggin Hill.

The procedure will be published in the Aeronautical Information Publication (AIP), although only operators approved by the CAA will be able to use the procedure.

The PinS procedures will be introduced and operated under the sponsor's normal Safety Management System (SMS) management of change and operational procedures.

The visual segment of the PinS IFPs will initially be in accordance with the requirement to "Proceed VFR", but with the hope of potentially using the same design with "Proceed Visually" in the future.

5 Summary of options analysis

5.1 Introduction

Since this is a scaled ACP, a single options appraisal was conducted, incorporating what are usually the initial options appraisal and final options appraisal into a single analysis.

5.2 Option development

Given the proximity of KCH to major London airports (notably London City and Heathrow) and its location inside the London City CTR, early engagement meetings were held with NATS to understand the constraints of introducing PinS in this airspace. The constraints identified were:

- The procedure should be inside the Controlled Airspace (CAS) as much as possible to benefit from an ATC separation service.
- However, it should as much as possible stay more than 3nm away from London City Airport (LCY) traffic as this is the radar separation minima in this airspace. LCY will not be able to operate independently if the PINS procedure is within 3nm or 1000ft and this will increase ATC workload and disrupt LCY operations.
- The procedure should stay out of the London CTR, or if required to enter the London CTR should do so to the minimum practical extent and remain beneath 1500ft to prevent interference with Heathrow traffic. Avoiding impacts on Heathrow traffic was a requirement stated by NATS during early engagement.
- The procedure should minimise impact on other nearby facilities (Biggin Hill and London Heliport) as far as possible.

Several options were considered and discounted:

- An approach directly from the East (ie on 270 straight to KCH), discounted because it would be within 3nm of all LCY operations.
- An approach from the South or South East, discarded because it would only be in CAS for a short period of the approach. (Approaches from South East would also impact with Biggin Hill.)
- Any approaches from the West discarded because of the proximity to LHR and entry in the London CTR.

The only option to maintain flight in CAS as long as possible but also maintain 3nm from LCY operations on runway 27 is for a westerly approach along the southern side of the London City CTR until west of the 'Isle of Dogs'. This is the option that is proposed.

It was not possible to avoid impacting LCY 09 arrivals since these pass close to KCH (within 3nm) and also within 1000ft of the minimum procedure altitude.

5.3 Option assessment

The proposed option was assessed against the following Design Principles, two of which were taken from CAP1616 (numbers 1 and 2) and two of which were proposed by the Sponsor (numbers 3 and 4). They were found to meet the Design Principles or be expected to meet them when finalised.

Design Principles	
1.	The proposal must maintain a high level of safety
2.	The proposal should avoid overflight of densely populated areas where possible
3.	The proposal should minimise impact on other airspace users
4.	The proposal should support, where possible, a transition to future more advanced concepts of PinS

Table 1: Design Principles

Evaluation of Design Principle 1

The proposed option was found to have a high level of safety from these respects:

- It is in controlled airspace for as much as possible, so it benefits from an ATC separation service to the greatest extent.
- It provides aircrew with an Instrument Procedure in place of a Visual one.
- The use of a pre-published and known procedure should reduce ATC workload.
- It is expected the design will be PANS OPS compliant and takes account of all other airspace and local constraints.
- It maintains a track away from London City and other airports in the London CTR, and from Biggin Hill as much as possible.

However, Letters of Agreement still need to be developed with relevant stakeholders and therefore the proposed option still has some outstanding safety concerns, but these are expected to be solvable. The assessment is therefore likely to be acceptable once the solutions have been determined.

Evaluation of Design Principle 2

It is not possible to entirely avoid overflight of densely populated areas in this proposal since the hospital is in London. The following figure shows the populated areas around KCH when approaching from the East.

However, the proposal avoids 2 noise sensitive areas that have been identified near to the hospital. They are avoided in current operations and will also be avoided by the PinS procedure as shown below.

The proposed option was therefore assessed as meeting this design principle.

Evaluation of Design Principle 3

Impacts on other airspace users cannot be avoided in this airspace as it is so close to other airports. Nevertheless, the proposal minimises impact on other airspace users as follows:

- The PinS approach and missed approach track are beyond radar separation (3nm) from LCY aircraft tracks as far as possible.
 - For Westerly LCY approaches (operations on runway 27), the PinS approach is further than 3nm during the final approach and departure track. LCY missed approaches can be vectored to the North so will also remain further than 3nm. This means westerly approaches should be entirely independent of the PinS procedure.
 - For Easterly LCY approaches (operations on runway 09), it is not possible to maintain radar separation from PinS. The LCY easterly approach arrives south of KCH and passes over the ODLEG waypoint, which is within 1nm from KCH, at 2000ft. In this case, the two procedures cannot be independent and ATC coordination will be required when both are used.
- The procedure maintains distance from Heathrow traffic as far as possible.
- The procedure is outside of the London (Battersea) Heliport Local Flying Area except for the initial segment of the Westerly departure. Coordination with the heliport operations will be managed by Thames/Heathrow Radar and Battersea Tower.
- The procedure crosses the Biggin Hill Approach path but remains well clear of the Biggin Hill ATZ. Coordination with Biggin Hill operations will be managed by Thames/Heathrow Radar and Biggin Tower.

This DP is therefore assessed as meeting the design principles since impacts on other airspace users are managed such that they do not require other airspace users to significantly change their operations.

Note that the impact on LCY 09 operations is unavoidable in that there is no instrument procedure to KCH that could be independent of aircraft routing via ODLEG. However, the number of HEMS movements will be low as discussed elsewhere.

Evaluation of Design Principle 4

The proposal is based on “proceed VFR” operation for both the approach and departure visual segments. In the future, this element may be developed into a “proceed visually” operation which will have lower weather minima and therefore will allow operations in lower visibility or cloud base.

“Proceed visually” PinS operations to unlicensed sites are not yet approved in the UK, but the procedure can be designed with approach and departure tracks that are compliant with both of the “visual segment” requirements. This will ease the transition from “proceed VFR” to “proceed visually”.

It should be noted that there are other requirements that will need to be fulfilled for this change to happen, although they should not alter the track over the ground.

The proposed procedure is designed to the requirements of “proceed visually” as far as possible at this stage, so the option is evaluated as meeting the Design Principle.

6 Summary of engagement

Prior to wider engagement, some early engagement was held with NATS to discuss the impact of the PinS on the London CTR operations. Meetings were held in April 2022, July 2023 and August 2023 which established the feasibility in principle of the KCH PinS operations in the CTR, subject to examining the actual proposal. This engagement was an input to the options design as discussed in Section 5.

A targeted engagement was held, aimed at aviation stakeholders, as described in the engagement strategy that lasted for 6 weeks. As part of this, engagement material was distributed to identified organisations.

The engagement was concluded successfully on 26 February 2024. The results are described below.

There were 7 replies to the engagement from a range of organisations as shown below.

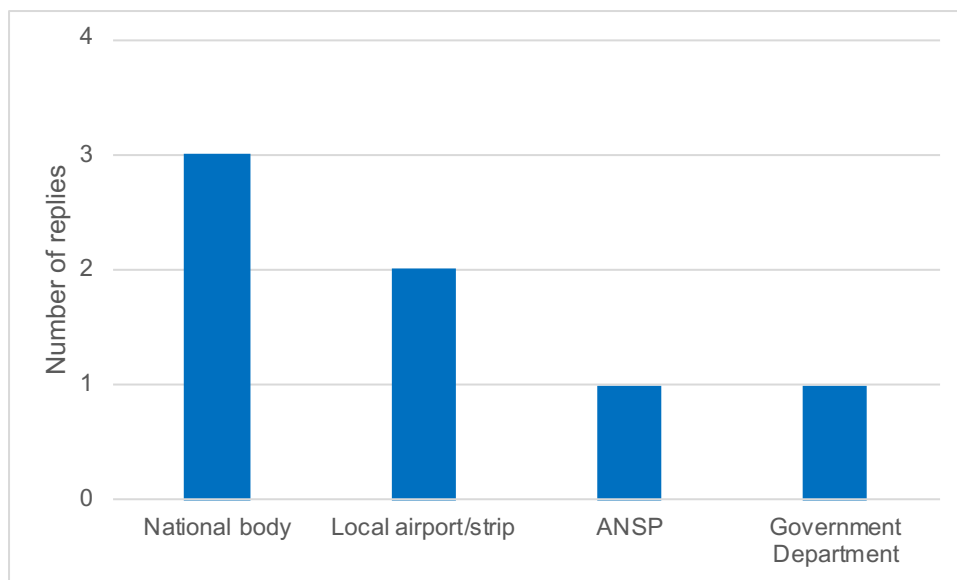


Figure 6: Number of different types of organisations replying to the engagement

There was one objection to the proposal and the following views were received.

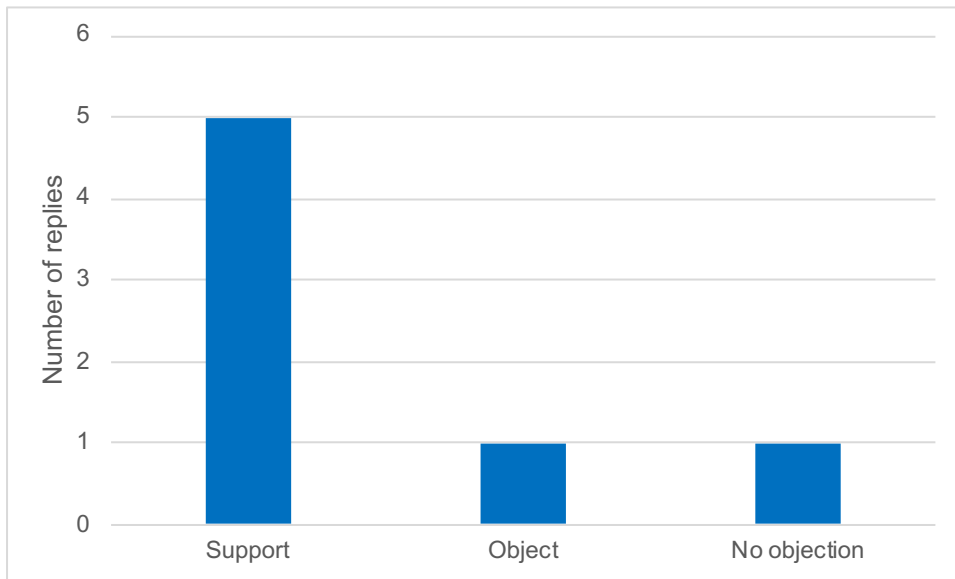


Figure 7: Number of different types of view in the replies to the engagement

As a result of engagement feedback, follow up meetings were held with LCY, NATS and Biggin Hill. London (Battersea) Heliport was also contacted directly since it had not responded to the engagement.

The 'object' reply was from LCY which was concerned at the impact of the PinS procedure on its 09 arrivals operations. As a result of the engagement with LCY and to minimise this impact, a change to the missed approach procedure was made which takes the aircraft directly south away from 09 operations and ends in a hold that is more than 3nm from the 09 arrival track.

In addition, two additional departure routes were added to allow aircraft to route directly to the south from easterly or westerly departures, and thereby reducing impact on Biggin Hill when it is busy on RWY21.

7 Summary of anticipated impacts

7.1 General impacts

It is anticipated that having PinS procedures in place could enable an additional 70-80 direct AACKSS HEMS patient transfers per year due to the enhanced utility of the aircraft. This assessment was based on 6 months weather data for AACKSS operations from Oct 22 to Mar 23, looking at occasions when weather conditions prevented current HEMS operations that might have been possible with PinS.

There may be occasions in marginal VMC when a crew might elect to fly the IFR procedure but medical flights will generally favour VFR, where possible, because of the efficiency for the patient, so it is not expected that use of the IFP will become the norm.

With other users of the procedures (these operators would need to be approved by the CAA) there could be a total of 100 additional HEMS missions to the hospital per year.

Initially, some of the current VFR flights will use the PinS procedure for training purposes. Therefore, there may be a change in track for those existing flights with these flights approaching on the PinS procedure paths instead of the current directions. Once the procedure is established, and crews are familiar with its operation, this is not expected to continue. The number of additional PinS flights during this training phase is likely to be up to 30, over a 2-month transition period.

These missions will be undertaken by the same aircraft which are currently AW169 helicopters.

7.2 Economic impacts

The new PinS procedure will improve patient medical outcomes which will have a positive economic impact. In addition, the expected economic effects are:

- Fuel burn: There will be increase fuel use as there will be more HEMS missions flown, although there is less fuel used by road ambulance.
- Greenhouse gases: There will be additional greenhouse gases (eg CO₂) caused by the additional fuel burn, although there is less fuel used by road ambulance.
- Operator training costs: There will be additional operator training required to introduce the new PinS procedure. However, longer term, the procedure will be used to maintain IFR currency which will reduce transits to other IFR training aerodromes.
- Heliport infrastructure costs: No changes have been identified to be necessary to the helipad at KCH so there are no costs expected here.

7.3 Operational impacts

It is not expected there will be any impact on General Aviation access to airspace. However, other impacts are as follows:

- Controller intervention maybe required for an arrival to London City (LCY) on Westerly operations (runway 27) that is on a missed approach if a helicopter is close to landing at KCH. In this case, the 3NM separation requirement could be infringed if controller action is not taken.
- During Easterly operations at LCY (runway 09), all operations with KCH will need to be co-ordinated as the LCY approach overflies the PinS approach. This cannot be avoided. Most departures are lower priority (Category Echo) and this will ease the co-ordination requirements with LCY.
- Arrivals to Biggin Hill will also need to be co-ordinated as the PinS procedure will cross the Biggin approach track when Biggin arrivals are 6.5nm from touchdown (at an altitude of about 2000ft).
- The use of the ALKIN hold will also have to be co-ordinated.
- The westerly departure procedure will briefly enter the London (Battersea) Heliport Local Flying Area, at an altitude of “not above 1500ft”.
- Coordination will be undertaken with Heathrow.

NATS (Thames radar) will conduct this coordination.

As a result of feedback from LCY as to the impact on RWY 09 operations, specific analysis was undertaken on this:

- For 12 months in 2023, there were 53 patient transfers by road into Kings when the aircraft didn’t fly and LCY were open. These are likely candidates for PinS operations (although the weather will not always be suitable for PinS so it is expected to be an upper bound). Since LCY operates about 1/3 of the time on RWY 09, this suggests an upper limit of 18 AACKSS HEMS Category A transfers that impact RWY 09 operations per year. There may also be a small number of flights by other operators that affect RWY09 arrivals.
- Regarding future trends, as to whether the number of HEMS operations are likely to increase, AACKSS has an ambition to increase its two helicopter operations from 12/24 hours to 18/24 hours to match the availability of the medical teams. This would extend the number of helicopter operational hours for AACKSS, but the additional hours (0600-0800 and 2000-2400) would only increase the likelihood that a patient could be flown, not the number of patients. Otherwise, AACKSS has no plans to increase operations and the sponsor is not aware of any plans by other operators to increase their hours.

NATS also agreed to investigate the impact of an arrival during 09 operations and what would be the likely additional delay on LCY arrivals.

7.4 Environmental impacts

As described in Section 1, this is a pre-scaled ACP which means a limited environmental assessment is required.

Aircraft will generally fly at similar altitudes or slightly higher under the PinS procedure than today under VFR. At present, clearances into the London City CTR are generally at

1300ft - 1500ft. The PinS procedure starts at 2100ft or 2300ft (depending on where the approach is joined) and has a final approach fix at 1500ft.

The intermediate/final approach tracks are on a heading of 283° which is consistent with the most common approach directions used in current VFR operations. As shown in Figure 1, the IF at 1500ft, the procedure passes North of New Eltham over Hither Green when it starts to descend to the Missed Approach Point, passing over Lewisham.

The two departure procedures, shown in Figures 2 and 3, merge at point KC420. The Easterly departure is slightly north of the arrival track. The Westerly departure is similar to the missed approach, but goes slightly further west, and overflies Streatham and Catford.

The infrequent use of the procedures (as noted above, approx. 100 HEMS missions per year) means that the environmental impacts will be very low.

8 Safety

During stage 1 of the ACP, an ATM Safety Questionnaire was completed by the sponsor and reviewed by the CAA. This helped identify key ATM safety elements to be considered.

The safety arguments were then prepared using the guidance given in CAP2304 based on the following seven safety goals:

- Goal 1.1: The risk of a CFIT accident is acceptably low. (CFIT)
- Goal 1.2: The risk of a helipad excursion accident is acceptably low. (REXC)
- Goal 1.3: The risk of a helipad collision accident is acceptably low. (RCOLL)
- Goal 1.4: The risk of a mid-air collision accident is acceptably low. (MAC)
- Goal 1.5: The risk of a loss of control accident is acceptably low. (LOC)
- Goal 1.6: The risk of an accident during the introduction to service of a new IAP at this Hospital Landing Site is acceptably low. (INTRO)
- Goal 1.7: The risk of an accident during the through-life operation of an IAP at this Hospital Landing Site is acceptably low. (THRULIFE)

The procedures have then been assessed in the Sponsor's safety management system. The result of this is that all risks levels are assessed as tolerable, provided the additional control measures that are identified in the safety assessment are actioned prior to the procedures being implemented.

As part of the safety work, the sponsor conducted a management of change process to ensure a safe introduction of the procedures.

The Mid-Air Collision (MAC) risk for the part of flight outside of controlled airspace was also determined taking account of snapshots of airspace traffic and local airspace operator data.

The safety analysis is contained in the safety assessment provided to the CAA. It also includes the HEMS desk procedures for management of use of the procedures.

9 Other factors

9.1 Timeline for implementation

The proposed change is expected to be implemented in AIRAC 13/2024 with AIRAC submission on 27 September 2024 and effective date on 26 December 2024.

Operational flights will start soon after.

Flight validation will occur in August/September 2024 once the CAA has reviewed the IFP and the validation plan has been agreed. Training will occur in a similar timeframe.

9.2 Supporting infrastructure and resilience

The new procedures are reliant on the availability of GNSS. In the event of GNSS outage then the procedures will not be used, and operations will return to current VFR operations. Note that the aircraft equipment has RAIM to advise of loss or corruption of GNSS.

The procedure is in coverage of London CTR and therefore reliant on the surveillance and communications services in that controlled airspace.

9.3 Regulations, policies and harmonisation

Development of the PinS procedures as taken account of:

- CAP2520: Policy and Guidance for the implementation of helicopter Point in Space operations in the UK
- CAP2304: Applications for instrument approach procedures to aerodromes without Approach Control and/or with a non-instrument runway – additional policy, guidance, and Acceptable Means of Compliance

The procedures have been developed in accordance with PANS OPS and CAA instrument design criteria.

10 Summary

In summary, an airspace change is proposed to introduce Instrument Flight Procedures (IFPs) to the Kings College Hospital (KCH) using Helicopter Point in Space (PinS) criteria.

The proposal has been developed, assessed and presented to aviation stakeholders through a targeted engagement. The engagement showed broad support for the proposal. There was one objection, and this resulted in a change to the procedure to the missed approach procedure. Two south-bound departure routes were added to reduce impacts on other stakeholders.

In addition, the proposal has been assessed to:

- minimise impacts on other airspace users as much as possible,
- have a low environmental impact, and
- be acceptably safe according to the sponsor's risk assessment process and following the guidance of CAP2304.