

## Safety and Airspace Regulation Group

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Airspace Change Proposal – FINAL Operational Assessment

Version: 1.1/ 2019

<b>Title of Airspace Change Proposal</b>	<b>Biggin Hill Introduction of RNAV IAP to Runway 03</b>
<b>Change Sponsor</b>	<b>London Biggin Hill Airport</b>
<b>SARG Project Leader</b>	<b>[REDACTED]</b>
<b>Case Study commencement date</b>	<b>17 August 2022</b>
<b>Case Study report as at</b>	<b>22 November 2022</b>
<b>File Reference</b>	<b>ACP-2013-08</b>

### Instructions

In providing a response for each question, please ensure that the 'Status' column is completed using the following options:

- **Yes**
- **No**
- **Partially**
- **N/A**

To aid the SARG Project Leader's efficient Project Management it may be useful that each question is also highlighted accordingly to illustrate what is:

resolved  **not resolved**  **not compliant**  as part of the AR Project Leader's efficient project management.

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<b>1.</b>	<b>Recommendations / Conditions / PIR Data Requirements</b>	
<b>1.1</b>	<b>Are there any Recommendations which the change sponsor <u>should try</u> to address either before or after implementation (if approved)? If yes, please list them below.</b>	<b>NO</b>
	<i><b>GUIDANCE NOTE:</b> Recommendations are something that the change sponsor <u>should try</u> to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same 'weight' as a Condition.</i>	
<b>1.2</b>	<b>Are there any Condition(s) which the change sponsor <u>must fulfil</u> either before or after implementation (if approved)? If yes, please list them below.</b>	<b>NO</b>
	<i><b>GUIDANCE NOTE:</b> Conditions are something that the change sponsor <u>must fulfil</u> either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors <u>must</u> observe any condition(s) contained within the regulatory decision; failure to do so <u>will usually</u> result in the approval being revoked. Conditions should specify the consequence of failing to meet that condition, whether that be revoking the ACP or some alternative.</i>	
<b>1.3</b>	<b>Are there any specific requirements in terms of the data to be collected by the change sponsor for the Post Implementation Review (if approved)? If yes, please list them below.</b>	<b>YES</b>
	<p>If the ACP is approved the sponsor is to ensure that all instances of the following are recorded and reported regardless of severity or outcome:</p> <ol style="list-style-type: none"> <li>1) Conflict of IAP aircraft with any other aircraft (including gliders) whilst performing an approach.</li> <li>2) Any reports of inadvertent penetration of CAS (e.g. weather induced, navigational error, avoiding action, TCAS resolution etc)</li> <li>3) Any reports of issues in performing the approach by a pilot, whether a landing was successfully performed or a MAP is conducted, or not.</li> </ol> <p>Any MOR or AIRPROX data related to these or any other IAP approach related issues, including conflict in Class G airspace, are to be provided.</p> <p><i><b>GUIDANCE NOTE:</b> PIR data requirements concerns any specific data which the change sponsor should be instructed to collate post-implementation, if indeed the airspace change proposal is approved. Please use this section to list any such requirements so that they can be captured in the regulatory decision accordingly.</i></p>	

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Case Study Conclusions – To be completed by SARG Project Leader	Yes/No
Has the change sponsor met the SARG Airspace Change Proposal requirements and Airspace Regulatory requirements above?	YES
The change sponsor has met the CAP 725 SARG ACP and AR process requirements and provided the required documentation.	

Third Party Approval	Yes/No
Is the approval of the SoS for Transport required in respect of the Environmental Impact of the airspace change?	NO
Is the approval of the MoD required in respect of National Security issues surrounding the airspace change?	NO

### General Summary

The purpose of this Addendum is to finalise the Operational Assessment for ACP ACP-2013-08 Biggin Hill Introduction of RNAV (Area Navigation) to Runway 03. At the request of the sponsor for more immediate feedback, and cognisant of the Covid-19 climate and its devastating impact on the aviation industry as a whole, the CAA recognised the sponsor's request for more immediate feedback on the progress of their proposal and the original Operational Assessment was completed on 17 Nov 2020. This was undertaken out of sequence and before the Instrument Flight Procedure (IFP) Regulator had an opportunity to formally assess the final submitted design. To realise this the assessment was written mindful of a 'best case scenario', and made the assumption that there were no issues with any aspect of the IFP design. This included, but was not limited to, interactions with adjacent Air Navigation Service Providers (ANSPs), obstacle clearance, or infringement of Controlled Airspace (CAS) by the protection areas. Mindful of this the CAA stated that any recommendation or decision could be amended once the IFP Assessment had been completed.

The original Operational Assessment states that owing to the cumulative impact of safety related issues surrounding the proposed Instrument Approach Procedure (IAP) in a constrained funnel of Class G airspace, and the consequential impact and risk to other airspace users, mitigated to a much lesser degree than that originally envisaged by the sponsor or appropriate in this scenario and location, that it is recommendation of the Case Officer that the ACP is refused regardless of the outcome of the IFP assessment.



However, pursuant to The Civil Aviation Authority (Air Navigation) Directions, Direction 5(2)<sup>1</sup> ‘the CAA may make its approval of a proposal subject to such modification and conditions as the CAA considers necessary’. To that end the CAA was content to recommend the proposed IAP if the mitigation of Advanced Use of the Air Traffic Monitor (ATM) was reintroduced and successfully incorporated into Biggin Hill’s supporting Safety Argument. Advanced Use of the ATM would be considered suitable mitigation, primarily in regard of autonomous, transiting, non-transponding Visual Flight Rules (VFR) aircraft in the Class G airspace, and would support already agreed provisions for CAS infringement in regard of Heathrow and Gatwick Airports departing Instrument Flight Rules (IFR) traffic.

This recommendation was relayed to the sponsor as part of their request for more immediate feedback in November 2020. Of note the recommendation was conditional on the final approved RNAV IAP design matching the proposal as consulted and agreed with other stakeholders, and remained conditional that the IFP Regulator’s assessment of the IAP was yet to be performed, and as such the design itself had not been approved.

The original IAP design package was submitted to the CAA on 22 May 2017. Initial feedback from an overview, rather than formal assessment, raised queries over the technical nature of the design and interactions with adjacent controlled airspace. CAA IFP Regulation maintained dialogue with the sponsor’s Approved Procedure Design Organisation (APDO), providing feedback and comment when requested, and raising queries and asking for mitigations and rationale to address concerns be provided in future IAP design iterations.

Following design changes leading up to the ACP Addendum submission, the CAA received Addendum IFP Assessment package V3.2 on 09 Sep 2020. CAA IFP Regulation assessed V3.2 providing a CAA technical report, along with the APDO IAP chart, coding table, and feedback form to the sponsor’s APDO on 09 Mar 2021. This provided considerations on the way ahead and clarification on how design criteria should be implemented, in particular to the intermediate segment. Several concerns were highlighted including a request for the non-compliant segment to be redesigned. The sponsor’s APDO responded to the CAA technical report on 24 Sep 2021, submitting V3.3. In this the CAA concerns over the complexity and non-standard nature of the proposal, including the request for the non-compliant segment to be redesigned, had not been addressed. The sponsor was informed of this in a meeting on 14 Jan 2022 prior to being informed in writing.

Post-meeting, following a request from the sponsor, the CAA created Draft Safety Conclusions summarising the outstanding issues, why the current proposal cannot be approved and the CAA’s reasons for those conclusions and shared these with the sponsor in a meeting on 03 Mar 2022. As per the sponsor’s request, they were afforded a period to reflect on the conclusions and provided an opportunity to inform the CAA if there was any reason why they believed the conclusions to be wrong. The sponsor provided the CAA with feedback to these conclusions on 30 Jun 2022.

The CAA has considered this feedback and incorporated it into this Final Operational Assessment where the CAA has reached its final recommendation which is that the ACP cannot be approved. The reasons behind the recommendation are provided in more detail below.

<sup>1</sup> [Air Navigation Guidance 2017](#)

**Comments & Observations**

The sponsors APDO submitted Addendum IFP Assessment Package v3.3 as a final iteration looking to address CAA concerns highlighted in feedback on V3.2. In this the CAA concerns over the complexity and non-standard nature of the proposal, including the request for the non-compliant<sup>2</sup> segment to be redesigned have not been addressed. The following list summarises the outstanding issues. The CAA acknowledges that this is of a technical nature and has attempted to make these more accessible for the reader.

- a) The IAP as proposed is non-standard<sup>3</sup> in content. The norm in the UK for an RNP (Required Navigational Performance) IAP is a T-Bar, Y-BAR or straight-in runway aligned IAP, whereas this IAP is presented as a figure of eight (8). This design and its presentation will increase the workload for pilots in ensuring the IAP is understood and flown correctly.
- b) The segments lengths from ITSUM<sup>4</sup> are all of a minimum length which means there is no flexibility available should the many variables which can cause a procedure to breakdown occur, e.g., weather conditions, aircraft/flight management system (FMS) issues, pilot actions when correcting FMS discontinuities<sup>5</sup>, waypoint (WP) bypass etc.
- c) With descent mandated after ITSUM into an area of busy General Aviation (GA) traffic the extensive track miles of the procedure, west of Kenley down to and along the M25 while routing east to Biggin Hill, will exacerbate the issues of pilot workload, interactions with other airspace users, and create possible conflicts in Class G<sup>6</sup>.
- d) The segment length between KEW02 and GOBVI does not support stabilised flight in all circumstances e.g. a strong tailwind on the downwind section.
- e) The intermediate segment (IF) is non-compliant as the length is less than that required to support a stabilised approach by all aircraft.

<sup>2</sup> ICAO PANS OPS Doc 8168 Vol II, Part III, Section 3 Chapter 2 Arrival and Approach Procedures, 2.4 Intermediate Approach Segment, 2.4.2 Intermediate Approach Length

<sup>3</sup> ICAO PANS OPS Doc 8168 Vol II, Part III, Section 2 Chapter 3 RNAV T or Y BAR Procedure Construction

<sup>4</sup> ITSUM, KEW02 and GOBVI are waypoints along the proposed IAP design.

<sup>5</sup> Discontinuities are when the IAP is no longer presented to the pilot in their navigator/FMS as a continuous path. A route discontinuity can occur if the end of a leg is indetermined by the navigator/FMS due to impossible geometry of the path.

<sup>6</sup> Class G is the least restrictive classification of airspace and therefore is accessible for all types of airspace users including but not limited to balloons, kites, gliders, Uncrewed Aerial Systems, pilots of aircraft with or without radios and/or any form of electronic conspicuity.

- f) The use of a step-down fix (SDF) to achieve a lower procedure minimum adds further complexity to an already complex non-standard IAP.
- g) The visual segment surface (VSS) penetrations have not been removed. The assessment of an OCS (obstacle clearance surface) does not remove the requirement of the sponsor to remove the VSS penetrations. VSS penetrations would need to be removed to ensure any IAP to runway 03 can be viable in the future.
- h) Chart clutter is caused by the complex and non-standard nature of the IAP.

It is important to note that it is the cumulative impact of the concerns raised above which led to the CAA's conclusion that the proposal cannot be approved.

The sponsor has provided detailed feedback on the concerns raised above and these have been fully considered by the CAA. CAA rationale relating to this feedback is outlined below.

The initial design submission concentrated on only advising that the nominal tracks of the IAP were outside of Gatwick Airport's Controlled Airspace (CAS) whilst the primary protection areas clearly infringed the CAS. The latest changes, designed to provide greater avoidance to some villages to the southwest of Kenley has exacerbated the proximity of the IAP protection areas to Gatwick Airport's CAS. These changes have also reduced the segment lengths to the absolute minimum where the IAP could experience discontinuities under tailwind conditions. The CAA acknowledges that the latest changes to the proposed approach are for environmental reasons; however, whilst achieving these benefits the changes have exacerbated the proximity of the IAP protection areas to Gatwick Airport's CAS, and multiple segments are not likely to support stabilised flight in all wind conditions. The issues also highlight the constrained airspace, enclosed on all sides and from above by CAS, within which the sponsor is looking to place the proposed approach. The sponsor acknowledges the inability to design a T-bar, Y-Bar or straight-in runway aligned IAP owing to the airspace constraints, in particular the location of the Gatwick Controlled Area (CTA). The CAA accepts that in a different environment a non-standard IAP, such as the proposed figure of 8, could be considered; however, in this instance this is one of several issues which cumulatively lead to safety concerns.

Whilst not a primary safety concern listed above, the sponsor provided feedback on Class G airspace. The CAA does not agree with the sponsor that the proposed IAP brings important safety benefits as compared to the current circling approach as it will be actively monitored by the Biggin Hill controller using Advanced Use of the ATM, as this use is not limited solely to the proposal.

The sponsor states that the procedure is flyable from a pilot perspective and cites two simulator reports as supporting material; however, these reports were rejected by the CAA as the procedure was not coded correctly. The sponsor was informed of this in the CAA IFP Technical Report dated March 2021. In addition, the procedure has not been validated, something usually provided prior to approval, and therefore the impact of the



IAP being flown using an aircrafts flight management system (FMS) and the potential for discontinuities or waypoint bypass has not been addressed and remains a concern. The minimal segment lengths have also been created utilising reduced speeds which could exacerbate the likely impact in tailwind conditions.

The intermediate segment is non-compliant as the length is less than that required to support stabilised approach by all aircraft, despite being calculated on the restricted speed. The sponsor accepts that this segment is non-compliant but states that simulator and live flights demonstrate stabilised flight can be achieved. The CAA rejected the simulator reports in March 2021. The CAA did not endorse the live flights, and whilst acknowledging the limitations of manually entering the waypoints into the aircraft FMS, and unaware of other settings including the course deviation indicator sensitivity, the CAA notes the aircrew comments that support the approach for night or Instrument Meteorological Conditions (IMC) and that they 'can't envisage many circumstances when we would elect to use this procedure in VMC (visual meteorological conditions), preferring instead the circle from a runway 21 approach'.

The CAA maintain that the use of a step-down-fix to achieve a lower procedure minima adds further complexity to an already complex non-standard IAP. This view is supported by one of the live flight reports where it is stated 'ideally it would be removed'.

The CAA acknowledges the sponsors statement that VSS penetrations would be removed by way of their Tree Management Plan prior to implementation.

### Conclusion and Recommendation


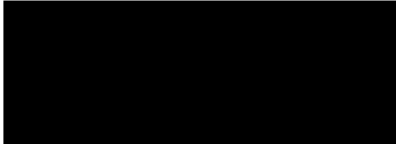
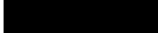

Due to the number of issues raised above, the CAA does not accept that the impacts on human factors and pilot workload have been suitability mitigated within this proposal. Additionally, the workload will be increased for pilots arriving from outside of the UK, who are used to flying IAPs which are wholly contained within controlled airspace.


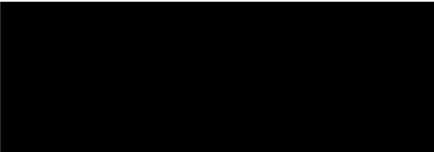
In the respect of the Air Navigation Order (2016) Article 187(2)<sup>7</sup> 'the CAA must not notify or approve an instrument flight procedure unless it is satisfied that the procedure is safe for use by aircraft'. The LBHA Runway 03 IAP as proposed diverges from the International Civil Aviation Organisation (ICAO) principles for the design of IFPs, namely safe, simple, and economical of both time and airspace. The use of minimum segment lengths, non-compliant intermediate segment, procedure complexity and chart clutter will result in increased pilot workload and are a cause for concern. The cumulative effect of the issues raised above amounts to an IAP with serious safety issues which have not been addressed by the sponsor.

<sup>7</sup> [Air Navigation Order \(2016\)](#)

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The CAA's primary duty is to maintain a high standard of safety in the provision of air traffic services, which takes priority over all other duties<sup>8</sup>. To that end it is the recommendation of the Case Officer that this ACP is refused.

<b>Operational Assessment Sign-off/ Approvals</b>	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>Operational Assessment completed by:</b>	 AR Case Officer		22 November 2022
<b>Operational Assessment approved by:</b>	 Mgr AR		16 December 2022
Mgr AR Comments: Case Officers comments are noted and my overall recommendation is set out in the Decision Log			

<b>Hd AAA Comment/ Approvals / Decision</b>	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>Operational Assessment Conclusions approved by:</b>	 Hd AAA		19 December 2022

<sup>8</sup> [Transport Act 2000 \(legislation.gov.uk\)](http://legislation.gov.uk)



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Hd AAA Comments: The Case Officers comments are noted and my decision and reasons for it are set out in the Decision Log