Title of Airspace Change Proposal	**Biggin Hill Introduction of RNAV IAP to Runway 03**
Change Sponsor	**London Biggin Hill Airport**
SARG Project Leader	[redacted]
Case Study commencement date	**14 October 2020**
Case Study report as at	**17 November 2020**
File Reference	**ACP-2013-08**

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

1.	Justification for change and "Option Analysis"	Status
1.1	**Is the explanation of the proposed change clear and understood?**	YES
	The proposal is to introduce an Area Navigation (RNAV) Lateral-navigation (LNAV) Non-precision Instrument Approach Procedure (IAP) to Runway 03 at Biggin Hill Airport.	
1.2	**Are the reasons for the change stated and acceptable?**	YES
	Currently Instrument Flight Rules (IFR) aircraft requiring to land on Runway 03 must conduct an IAP to Runway 21, then once clear of cloud and with the required visual references, perform a Visual Circling Manoeuvre to Runway 03.	
1.3	**Have all appropriate alternative options been considered, including the 'do nothing' option?**	YES
	In total 6 options including the 'Do nothing' were presented in the proposal.	
1.4	**Is the justification for the selection of the proposed option sound and acceptable?**	YES
	Biggin Hill Airport is situated in Class G airspace which is surrounded by pre-existing airspace structures and a relatively densely populated area. As well as the London Terminal Manoeuvring Area (TMA) overhead, it is in close proximity to Gatwick and Heathrow Airports, with some large towns and cities nearby. With IFR arrivals to Biggin Hill coming through the TMA from the east, some of the proposed options were deemed not viable due to their impact on Gatwick Airport or overflying heavily populated areas. The justification for the selected option is sound and acceptable.	

2.	Airspace Description and Operational Arrangements	Status
2.1	**Is the type of proposed airspace clearly stated and understood?**	N/A
	There is no new airspace in the proposal. The intention is to utilise pre-existing airspace structures, creating an IAP which commences in the TMA and continues underneath it in Class G airspace.	
2.2	**Are the hours of operation of the airspace and any seasonal variations stated and acceptable?**	N/A
	There are no proposed changes to hours of operation within the proposal.	

2.3	**Is any interaction with adjacent domestic and international airspace structures stated and acceptable including an explanation of how connectivity is to be achieved? Has the agreement of adjacent States been secured in respect of High Seas airspace changes?**	**YES**
	When the ACP was originally submitted in May 2017 the proposed IAP conflicted with Heathrow Runway 09 Detling (DET 09) Standard Instrument Departures (SID) requiring a change to the altitude attainment points. The interaction issues occurred within the TMA where Thames Radar will be controlling the Biggin Hill IAP aircraft. NATS have confirmed that suitable mitigations are in place regarding Heathrow easterly departures, and that the proposed IAP will have no impact on Heathrow Tower operations. The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations, including any infringements with Heathrow SIDs. The proximity of the proposal to Gatwick Airport has proved more problematic, with the proposed IAP heading directly towards the Gatwick Control Area (CTA) before turning away for the final element of the approach. Proposed design solutions which restricted Gatwick operations with a view to solving 'Hazards Identified' in the Biggin Hill IAP were not deemed an acceptable risk to Gatwick Airport, and on 05 November 2019 Air Navigation Solutions Limited (ANSL) (Gatwick Airports ATC provider) stated they unable give their support or approval for this approach. However, on 25 November 2019 ANSL revised their stance after further engagement with NATS and Biggin Hill. As stated by NATS and raised by Biggin Hill, ANSL have current procedures in place to deal with extraordinary events in the airspace, including infringements. On 14 December 2019 ANSL provided clarification to this revision stating that they neither support nor endorsed the proposal until additional evidence /undertakings can be provided to assure claims that there will be no reduction in current safety standards/performance. In January 2020 ANSL had a further meeting with Biggin Hill and NATS to analyse the risk associated with the effect on tower operations at Gatwick Airport should there be a controlled airspace (CAS) infringement by a Biggin Hill aircraft performing the proposed IAP. ANSL accepted the claims and undertakings made that appropriate mitigation and actions already exist for infringements, and on that basis support the use of the approach, as confirmed via letter on 31 Jan 2020. The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations, including any infringements with Gatwick CTA or SIDs.	
2.4	**Is the supporting statistical evidence relevant and acceptable?**	**YES**
	The primary statistical evidence for this proposal is the IFP data. The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written to date under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations.	

	To assess the risk in Class G statistical data could have been examined on the number of aircraft movements in the area. Whilst assistance was offered to achieve this by a third party via feedback on the Consultation, the sponsor elected not to pursue this option. This is not deemed a requirement by the CAA for the proposal. The statistical data provided regarding environmental matters is acceptable for a proposal under CAP 725.	
2.5	**Is the analysis of the impact of the traffic mix on complexity and workload of operations complete and satisfactory?**	**Partially**
	The impact on complexity and workload of operations is satisfactory when the IAP aircraft is being operated by Thames Radar within the TMA. Once descended out of the TMA the approach is flown by the pilot using the FMS (Flight Management System,) which the sponsor argues reduces cockpit workload. [Safety Case Requirement 48.] However, performing an IFR IAP in busy Class G airspace with numerous Visual Flight Rules (VFR) itinerant aircraft, whilst having no radar ATS provision to assist with traffic information or ATC tactical intervention, could create significant complexity and workload. This is not only cockpit workload for the IAP aircraft, such as performing avoiding action and then looking to regain the approach in the correct configuration, despite utilisation of the FMS; but also for the VFR aircraft operating in constrained airspace. The impact on complexity and workload of other aircraft operations is considered in greater detail in section 5 of this assessment, where further reference is made to the analysis provided.	
2.6	**Are any draft Letters of Agreement (LoA) and/ or Memoranda of Understanding (MoU) included and, if so, do they contain the commitments to resolve ATS procedures (ATSD) and airspace management requirements?**	**Partially**
	The sponsor has provided draft LoAs with RAF Kenley and Redhill Aerodrome. These resolve ATS procedure and airspace management issues. The operational impact is covered in section 5 of this assessment. The Redhill Aerodrome draft LoA has been updated and is contained in the final safety case. This differs from the draft LoA submitted with the original ACP in May 2017 by removing some operational procedures including the use of an Aerodrome Traffic Monitor (ATM) at Redhill. This was originally intended to mitigate against conflictions between Redhill aircraft and London Biggin Hill Airport (LBHA) aircraft using the proposed IAP. At the time of ACP submission in May 2017 significant dialogue was still ongoing between RAF Kenley and Biggin Hill to try and produce an acceptable draft LoA. Following the sponsor's decision in December 2018 to move Way Point KWB02 further to the south-west, thereby	

	providing additional separation between RAF Kenley and LBHA aircraft on the IAP descending out of the London TMA, a draft LoA has been agreed with RAF Kenley. An LoA/MoU with Farnborough is yet to be agreed. The sponsor provided supplementary information to the original ACP submission which details an email between Farnborough and Biggin Hill stating that once the IAP is approved, and before its implementation, "*a meeting will be held to confirm the areas of transfer of aircraft and who should retain control of transit aircraft.*" In this instance and for these means this is acceptable. Thames Radar provided draft Method of Operations (MOPS) for Biggin Hill Approaches to Runway 03.	
2.7	**Should there be any other aviation activity (low flying, gliding, parachuting, microlight site etc) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, what action has the sponsor carried out to resolve any conflicting interests?**	**Partially**
	Kenley Gliding Site is in close proximity to the proposal. Aircraft on the proposed IAP would descend out of the TMA 2nm NW abeam RAF Kenley, then track SW passing approximately 1.8nm west abeam, before turning eastbound, looping around the airfield approximately 2.5nm to the south. A draft LoA has been agreed with RAF Kenley whereby once informed the gliding site is active, Biggin Hill will inform pilots of aircraft inbound using the proposed IAP 'Kenley gliding site is active, keep a good lookout for Gliders'. To assist mitigating confliction in Class G airspace, and provide electronic conspicuity derived traffic information to pilots using the IAP, pending a successful outcome of the ACP, Biggin Hill have proposed to supply RAF Kenley gliders with mobile Mode S transponders. However, the sponsor has stated that this is not a Safety Requirement for the safety case as they do not want the use of the Runway 03 IAP dependent upon this, so this should be viewed as supplementary to the safety case mitigation, which is acceptable in this scenario. Hurley Lodge helicopter site has a good relationship with Biggin Hill and procedures already exist to cover operations to and from this site. Parascending and hang-gliding activities take place at Warlingham just outside of the Biggin Hill ATZ, and less than 1nm from the final approach track. The sponsor's original consultation states '*Appropriate procedures are to be put in place between the Green Dragons Hang Gliding Centre and LBHA ATC for the exchange of information on their operations in the vicinity of LBHA. The hang-gliding site will be marked on the IAP charts to warn pilots flying the approach of the potential of hang gliding and parascending operations in the vicinity. Thus an adequate means to pass appropriate traffic information to IFR flights conducting IAPs to Runway 03 will exist*'.	

2.8	**Is the evidence that the Airspace Design is compliant with ICAO SARPs, Airspace Design & FUA regulations, and Eurocontrol Guidance satisfactory?**	**YES**
	The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations.	
2.9	**Is the proposed airspace classification stated and justification for that classification acceptable?**	**N/A**
	There is no new airspace associated with the proposal.	
2.10	**Within the constraints of safety and efficiency, does the airspace classification permit access to as many classes of user as practicable?**	**N/A**
	The proposal does not amend existing airspace classifications. The majority of the proposed IAP is in pre-existing Class G airspace, and as such it permits access to all airspace users.	
2.11	**Is there assurance, as far as practicable, against unauthorised incursions? (This is usually done through the classification and promulgation)**	**Partially**
	Once the proposed IAP aircraft has descended out of the TMA, the rest of the procedure takes place within Class G airspace, therefore unauthorised incursions are not applicable. However, the IAP itself is surrounded by airspace within which incursions by the IAP aircraft, or another aircraft trying to avoid it, could occur. In the event of a conflict avoidance manoeuvre, such as a Traffic Collison Avoidance System (TCAS) Resolution Advisory (RA), the IFR Traffic could be instructed to climb into the TMA above, or given an avoiding turn taking it into the Gatwick CTA. Unauthorised entry into CAS is identified in the sponsor's safety case as Hazard 15. This considers the likelihood of both a VFR aircraft changing its intended course in order to avoid IFR aircraft using the IAP, and the IAP aircraft performing conflict avoidance manoeuvres. The safety case states '*it is considered unlikely that the RWY03 RNAV IAP will cause a CTA infringement by a VFR aircraft, transiting from East to West, South of LBHA, close to the Gatwick CTA. There are no plans to hold any aircraft South of LBHA, so in this scenario, LBHA having passed essential traffic information to the aircraft, the flight crew may be offered a re-route thought the LBHA Overhead*'. The safety case also states that there are safety barriers in place to prevent such a consequence with '*Gatwick surveillance coverage for its CTA*' thereby detecting and tactically managing an infringement; '*LBHA shall have two direct lines to Thames radar to inform them of CAS infringement*', and '*Thames Radar surveillance coverage for the TMA [where an] infringement is likely to detected and tactically managed*'. The safety barriers rely on tactical intervention to avoid a catastrophic event such as Mid-Air Collision (MAC); however, they do not mitigate against an infringement itself. Neither is mitigation provided against aircraft without a radio or those not willing to accept a re-routeing through the LBHA overhead.	

	The safety case states the likelihood of an unauthorised entry into CAS by the IAP aircraft is reduced owing to the limited approach speed, shallow angle of IAP convergence on the Gatwick CTA, the aircraft using the FMS to fly the approach, and in the event a conflict avoidance manoeuvre is required '*it is most likely that the flight crew will perform a climb rather than a turn into the Gatwick CTA*'. The RNAV IAP Missed Approach Procedure (MAP) remains below controlled airspace at 2,000ft. However, this does not cater for occurrences where a climb is not possible, such as the conflict, or another aircraft, being above.	
2.12	**Is there a commitment to allow access to all airspace users seeking a transit through controlled airspace as per the classification, or in the event of such a request being denied, a service around the affected area?**	**N/A**
	There is no controlled airspace associated with the proposal.	
2.13	**Are appropriate arrangements for transiting aircraft in place in accordance with stated commitments?**	**N/A**
	No arrangements are required for transiting aircraft with the proposal.	
2.14	**Are any airspace user group's requirements not met?**	**NO**
	The proposal has no airspace associated with it which would restrict other airspace users.	
2.15	**Is any delegation of ATS justified and acceptable? (If yes, refer to Delegated ATS Procedure).**	**N/A**
	There is no delegation of ATS in the proposal.	
2.16	**Is the airspace structure of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to contain horizontal and vertical flight activity (including holding patterns) and associated protected areas in both radar and non-radar environments?**	**YES**
	The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations. It is assumed that the design is of sufficient dimensions with regard to aircraft performance and manoeuvrability to contain the flight activity, including protected areas, and does not penetrate the Gatwick CTA.	

2.17	**Have all safety buffer requirements (or mitigation of these) been identified and described satisfactorily (to be in accordance with the agreed parameters or show acceptable mitigation)? (Refer to buffer policy letter).**	**N/A**
	There are no buffers associated with the proposal. The separation requirements of the IAP design, such as with the primary obstacle protection areas, will be assessed by the CAA IFP Regulator.	
2.18	**Do ATC procedures ensure the maintenance of prescribed separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures?**	**YES**
	The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations. It is assumed that the design ensures the maintenance of prescribed separation between traffic performing the IAP and those within adjacent airspace structures such as the Heathrow and Gatwick CTAs.	
2.19	**Is the airspace structure designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace?**	**YES**
	The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations. It is assumed that the design ensures adequate and appropriate terrain clearance.	
2.20	**If the new structure lies close to another airspace structure or overlaps an associated airspace structure, have appropriate operating arrangements been agreed?**	**YES**
	The proposed IAP commences in the TMA and appropriate MOPS have been agreed with Thames Radar. London Heathrow Airport have stated they '*are content to accept the assertion that the change proposed will have no impact on the Heathrow operation*'. ANSL at Gatwick Airport have stated they '*accept the claims and undertakings made and, on that basis, support the use of the approach*'	

2.21	**Where terminal and en-route structures adjoin, is the effective integration of departure and arrival routes achieved?**	**Partially**
	Whilst within the TMA integration of the IFR traffic is achieved. When descending from the TMA, because the aircraft leaves Thames Radar control and is not handed over to another radar unit, coupled with the fact the IFR aircraft will most likely be in Instrument Meteorological Conditions (IMC), then safe and effective integration of where the AIP adjoins Class G cannot be assured.	

3.	Supporting Resources and CNS Infrastructure	Status
3.1	**Is the evidence of supporting CNS infrastructure together with availability and contingency procedures complete and acceptable? The following are to be satisfied:**	
	▪ **Communication**: Is the evidence of communications infrastructure including RT coverage together with availability and contingency procedures complete and acceptable? Has this frequency been agreed with AAA Infrastructure?	**YES**
	No change to existing communication infrastructure is necessary as part of the proposed solution.	
	▪ **Navigation**: Is there sufficient accurate navigational guidance based on in-line VOR or NDB or by approved RNAV derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/ Eurocontrol Standards? EG. Navaids – has coverage assessment been made eg. a DEMETER report, and if so, is it satisfactory?	**YES**
	No change to navigational infrastructure is required for the introduction of GNSS approaches for suitably equipped aircraft.	
	▪ **Surveillance:** Radar Provision – have radar diagrams been provided, and do they show that the ATS route / airspace structure can be supported?	**YES**
	The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations. It is assumed that radar diagrams have been provided showing that the IAP can be supported.	
3.2	**Where appropriate, are there any indications of the resources to be applied, or a commitment to provide them, in line with current forecast traffic growths acceptable?**	**N/A**

4.	Maps/Charts/Diagrams	Status
4.1	**Is a diagram of the proposed airspace included in the proposal, clearly showing the dimensions and WGS84 co-ordinates?** **(We would expect sponsors to include clear maps and diagrams of the proposed airspace structure(s) – they do not have to accord with AC&D aeronautical cartographical standards (see CAP725), rather they should be clear and unambiguous and reflect precisely the narrative descriptions of the proposals. AC&D work would relate to regulatory consultation charts only).**	YES
	Whilst no new airspace construct is proposed, charts have been provided showing the current airspace and the proposed GNSS RNAV IAP, including WGS84 co-ordinates.	
4.2	**Do the charts clearly indicate the proposed airspace change?**	YES
	The charts clearly show the proposed GNSS RNAV IAP approach for Runway 03.	
4.3	**Has the change sponsor identified AIP pages affected by the Change Proposal and provided a draft amendment?**	YES
	Yes.	

5.	Operational Impact	Status
5.1	**Is the change sponsor's analysis of the impact of the change on all airspace users, airfields and traffic levels, and evidence of mitigation of the effects of the change on any of these, complete and satisfactory?** **Consideration should be given to:** **a) Impact on IFR GAT, on OAT or on VFR general aviation traffic flow in or through the area.**	NO
	The RNAV IAP routeing through the London TMA under the control of Thames Radar is nil impact on other IFR traffic within the TMA, and the sponsor has a contract with NATS for this ATS provision to continue to be provided. The safety case lists two Hazards involving IAP conflict with IFR aircraft (Hazards 11 and 12). These consider conflict against another aircraft conducting a Missed Approach Procedure from the IAP itself, and IFR aircraft departing Biggin Hill. These are mitigated accordingly as both Thames Radar and Biggin Hill are providing an ATS and have some level of control over these scenarios to assist the IAP aircraft, including co-ordinating departing traffic	

against inbound. The mitigated likelihood of a catastrophic event to 'extremely improbable' is appropriate owing to ATS intervention being available at the point of confliction, as it is at 3,000ft and therefore within CAS.

However, once descended below the TMA into Class G airspace the IFR RNAV aircraft has no Air Traffic Control (ATC) radar service and is reliant on traffic information derived from a variety of sources, but primarily on its own TCAS/collision avoidance system. The sponsor identifies '*IAP Conflict with aircraft transiting the local area*' as Hazard 14 in the final iteration of the supporting safety case, noting that a reduction in separation between aircraft is particularly acute at the point where the IAP aircraft leaves CAS at KBW02, and in the worst case this could result in MAC. The mitigation provided against this scenario is:

1) If Thames Radar observe a conflict in the vicinity of KBW02 then traffic information should be passed.
2) The presence of the IAP is depicted in the UK Aeronautical Information Publication and on aeronautical charts.
3) The IAP has a speed limit of 160kts.

The safety case states the IAP aircraft remains responsible for separation as it is in Class G airspace using 'see and avoid' rules for collision avoidance, which is in accordance with UK policy for this classification of airspace. The safety case analysis of Hazard 14 states that given the above safety requirements and contextual statements that the likelihood of this hazard resulting in a catastrophic event is 'improbable'. The mitigations above relate to publishing the procedure, possible traffic information passed by Thames Radar as the IAP aircraft descends out of the TMA, and limiting the approach speed of the IAP aircraft. Outside of this, with 'see and avoid' not possible in IMC, the aircrafts TCAS/collision avoidance system is the primary mitigation against other IFR traffic in Class G airspace, which will also be transponder equipped.

However, in marginal weather conditions GA aircraft will be constrained under a lower ceiling of cloud, only requiring to remain clear of cloud and with 5km visibility to be conforming with SERA rules of the air regulations for VFR flight. These aircraft do not need to carry transponders and therefore the TCAS level of mitigation is removed. IAP aircraft descending out of cloud on the approach could descend directly into conflict with no warning possible from an Air Traffic Control radar service. Biggin Hill have radar data provided to them from NATS, however, whilst originally proposing to develop their Air Traffic Monitor (ATM) which displays the radar information to be able to pass traffic information to the IAP aircraft, as stated in the final safety case '*the ATM is not approved for the additional (advanced) uses*' which this would come under, and their controllers are not qualified to use the equipment for this means.

The IAP will conflict with VFR General Aviation (GA) traffic flows. The proposed IAP has a Way Point on top of the M25/M23 Junction which is a Visual Reporting Point (VRP), then routes along the M25 which is a popular line feature for GA aircraft to follow, as it keeps them clear of the Gatwick CTA. The safety case does not identify a different Hazard for confliction with VFR traffic flow, other than incorporating it into Hazard 14 as detailed above.

	b) Impact on VFR Routes.	**NO**
	The proposed IAP Way Point IAWP1 is on top of the M25/M23 Junction, which is also a VRP. The proposed IAP then routes along the M25 past Godstone VRP. Whilst the sponsor correctly states that IAP aircraft should be at 2,000ft at IAWP1, and aircraft inbound to Redhill Aerodrome via the VRPs should be at 1,400ft, the proposed RNAV IAP traverses a popular VFR route which is constrained on all sides and from above, in essence causing natural 'funnelling' of traffic, in a busy airspace environment. GA aircraft regularly use this VFR route as the M25 in this location is a popular navigational line feature used to ensure an aircraft remains outside of the Gatwick CTA.	
	c) Consequential effects on procedures and capacity, ie on SIDS, STARS, holds. Details of existing or planned routes and holds.	**YES**
	When the ACP was originally submitted in May 2017 the proposed IAP conflicted with Heathrow Runway 09 Detling (DET 09) Standard Instrument Departures (SID) requiring a change to the altitude attainment points. NATS have confirmed that the revised IAP proposal will have no impact on Heathrow Tower operations as current processes are used to resolve any potential conflicts. The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations. It is assumed that the proposed design does not infringe the Heathrow DET 09 SID, despite the altitude attainment points for this SID not having been modified and the required 'not below 4,000ft' point added to the chart. In addition, it is assumed that there are no infringements with the Gatwick CTA or their departures.	
	d) Impact on Airfields and other specific activities within or adjacent to the proposed airspace.	**Partially**
	At the time of ACP submission in May 2017 significant dialogue was still ongoing between RAF Kenley and Biggin Hill to try and produce an acceptable draft LoA. Following the decision in December 2018 to move Way Point KWB02 to provide further separation from RAF Kenley against LBHA aircraft on the IAP descending out of the London TMA, a draft LoA has been agreed with RAF Kenley. The LoA details notification procedures of when gliding is taking place and when aircraft are inbound to Biggin Hill using the RNAV IAP. On 19 Oct 2020 RAF Kenley confirmed via email that they are content with the arrangement and as such support the proposal. In addition, if the ACP is successful Biggin Hill have offered to supply RAF Kenley gliders with mobile Mode S transponders to further mitigate the risk of Mid Air Collision. Whilst this will aid electronic conspicuity to IFR aircraft performing an IAP to Biggin Hill, the sponsor has stated that this is not a Safety Requirement for the safety case as they do not want the use of the Runway 03 IAP dependent upon this, which is an acceptable assertion.	

	Redhill Aerodrome is located approximately 3nm south of the proposed IAP. As previously stated the M25/M23 Junction Way Point is also a VRP for both Redhill and GA aircraft. The sponsor correctly states that IAP aircraft should be at 2,000ft whilst Redhill inbounds via the VRPs should be at 1,400ft. A draft LoA has been agreed with Redhill who will pass their opening status to Biggin Hill, and if Biggin Hill are operating on Runway 03 then this information will be added to the Redhill Airfield Air Traffic Information System (ATIS), and Biggin Hill will inform Redhill when an aircraft is using the RNAV IAP. In addition, Redhill will amend their AIP entry to warn of aircraft using the Biggin 03 RNAV approach. All aircraft operating at Redhill must have a serviceable transponder, therefore TCAS is also a level of mitigation against MAC. Parascending and hang-gliding activities take place at Warlingham just outside of the Biggin Hill ATZ and less than 1nm from the final approach track. The sponsor's original consultation states '*Appropriate procedures are to be put in place between the Green Dragons Hang Gliding Centre and LBHA ATC for the exchange of information on their operations in the vicinity of LBHA. The hang-gliding site will be marked on the IAP charts to warn pilots flying the approach of the potential of hang gliding and parascending operations in the vicinity. Thus an adequate means to pass appropriate traffic information to IFR flights conducting IAPs to Runway 03 will exist*'. Whilst annotated on a chart and therefore informed, the operations could be impacted as paragliders and hang-gliders are able to operate where the proposed IAP is planned to be located as it is Class G airspace. Rules of the Air state that the IAP aircraft should 'give way' to non-powered aircraft, therefore a partial argument exists (as posed by the sponsor) that the operations would not be impacted. The box is coloured Red to highlight that the IAP has not been assessed and approved by a CAA IFP Regulator. This assessment has been written under the assumption that there are no issues with the IFP design, and that it is fully compliant with all required regulations. It is assumed that the proposed design does not conflict with, or have a negative impact on, either Heathrow or Gatwick Airport operations or airspace.	
	e) Any flight planning restrictions and/ or route requirements.	**NO**
	There are no flight planning restrictions or route requirements associated with the RNAV IAP proposal.	
5.2	**Does the change sponsor Consultation letter reflect the likely operational impact of the change?**	**NO**
	The sponsor's Consultation Document reflected on the likely operational impact on other airspace activities taking place in Class G airspace in this area by stating that, '*Aerodromes in Class G airspace having notified IAPs are annotated on aeronautical charts so that the pilots of itinerant aircraft are aware that such procedures exist and can take them into account in planning and conducting their flights. Consequently, it is expected that good airmanship will prevail and that pilots would be vigilant and keep a good look out when transiting through the nominal flight path of a notified IAP*'. Further mitigation in the original Consultation Document, such as retaining the aircraft in	

	CAS for the maximum time possible to avoid impinging Class G airspace and especially operations at Kenley aerodrome were removed when the IAP was redesigned. The Supplementary Consultation Document focused on explaining the design changes and resolving the interactions with Gatwick (by descending out of the TMA earlier and remaining outside of the Gatwick CTA); Heathrow DET 09 SID, and resolving some environmental issues raised in the original consultation. Impact on other operators was not featured further as the original consultation statement remain extant. The consultations received significant comment on the risk of conflict in Class G airspace, indicating that the perceived likely operational impact had been understated.

6.	Economic Impact	Status
6.1	**Is a provisional economic impact assessment to all categories of operations and users likely to be affected by the change included and acceptable? (This may include any forecast capacity gains and the cost of any resultant additional track mileage).**	YES
	Whilst there is no new airspace construct and the proposal does not look to generate additional traffic, the sponsor makes a credible argument that improvements to the airport's infrastructure are a key component to delivering requisite economic growth. Whilst subjective, it is agreed that GNSS IAPs at the airport could make it a more attractive location for aircraft operators through the provision of enhanced weather operating capability. An analysis on fuel burn and emissions was provided for the proposed IFP in comparison to the extant visual manoeuvring (circling) approach. This demonstrated an increase in track miles and associated fuel burn and greenhouse gas emissions, and fuel uptake cost for the proposed GNSS approach. However, not provided, owing to its complicated subjective nature, is a comparison of costs associated with the additional track miles of the proposed GNSS approach against the current circling approach, whilst factoring in the additional costs associated with an aircraft now being more likely to be able to land when otherwise it might have had to divert to another airport. In this instance, this is an acceptable argument.	

7.	Recommendations / Conditions / PIR Data Requirements	
7.1	**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.**	**NO**
	GUIDANCE NOTE: *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.*	
7.2	**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.**	**NO**
	GUIDANCE NOTE: *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.*	
7.3	**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.**	**YES**
	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: 1) Confliction of IAP aircraft with any other aircraft (including gliders) whilst performing an approach. 2) Any reports of inadvertent penetration of CAS (e.g. weather induced, navigational error, avoiding action, TCAS resolution etc) 3) Any reports of issues in performing the approach by a pilot, whether a landing was successfully performed or a MAP is conducted. 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. ***GUIDANCE NOTE:*** *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.*	

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

Disclaimer:
There has been a significant time delay between the sponsor's ACP submission (May 2017) and Addendum submission (July 2020). During this period not only has there been a significant change in process with CAP 1616 superseding CAP 725, but also an unprecedented growth in airspace change proposals submitted, workload demands and priorities. In particular, given the current climate and impact on the aviation industry as a whole, the CAA recognises the sponsor's request for more immediate feedback. To achieve this the CAA has agreed for this Operational Assessment to be written out of sequence, and before the Instrument Fight Procedure (IFP) Regulator has had an opportunity to formally assess the final submitted design. To realise this, this assessment has been written mindful of a 'best case scenario', and makes the assumption that there are no issues with any aspect of the IFP design. This includes, but is not limited to, interactions with adjacent ANSPs, obstacle clearance, or infringement of CAS by the protection areas. As such some of the assessment boxes above are coloured 'red' yet state 'yes' to highlight that these elements have not been assessed, rather an assumption has been made that there are no issues, thereby allowing this operational assessment to be performed in a timely manner. The CAA reserves the right to amend its recommendations and decisions, or not, if or when the IFP Assessment has been performed.

The proposal looks to introduce an RNAV IAP to Runway 03 at London Biggin Hill Airport (LBHA). The intention is to provide an instrument approach capability to Runway 03 thereby enabling approaches in poorer weather conditions than can currently be achieved. At present an aircraft must perform an instrument approach to Runway 21 followed by a visual circling manoeuvre to reposition onto the final approach to land for Runway 03. Although safe the sponsor proposes that this manoeuvre is an inefficient method of operating, particularly in poor weather, and can lead to extensive delays to successive inbound flights and to aircraft awaiting departure. The minimum obstacle clearance height (OCH) at which the visual manoeuvre can be carried out is dependent on the category (size and performance capability) of the aircraft and, for smaller aircraft (Category A), may be as low as 551ft above the runway threshold. The proposed GNSS LNAV non-precision approach has an OCH of 443ft for Category A, B and C aircraft.

No new airspace constructs are required as the proposal commences the GNSS RNAV IAP in the London TMA then continues in Class G airspace. The proposed IAP has been significantly redesigned since original concept, to amongst other things take into consideration interactions with adjacent airports and gliding operations at RAF Kenley. The interactions with Gatwick airport and constrained airspace available mean that the final IAP proposed has been amended to be a non-precision approach only.

The Consultation was performed in accordance with the requirements of CAP 725 and demonstrated the Government's consultation principles. Owing to the interaction issues with the Gatwick CTA, and in response to some issues raised in the Consultation, the southern element of the proposed IAP was amended resulting in the requirement for a Supplementary Consultation. Whilst elements could have been done better, this has been assessed as a meaningful consultation which meets the required regulatory standards. Since ACP submission in May 2017 the sponsor has continued to engage with relevant stakeholders, and this was documented in an Engagement Report dated 01 July 2020. This satisfies the CAA that meaningful engagement has taken place post Supplementary Consultation, and that despite the time lapse no further consultation is required to satisfy CAP 725 process.

There is no environmental benefit from the proposal. The IAP routing is further than the current circling approach, therefore fuel burn and CO2 emissions will be higher; however, the sponsor argues that some of this will be offset by less aircraft requiring to divert to other aerodromes in poor weather. This is a subjective argument and whilst difficult to evidence, does hold some credibility. Regarding noise and environmental matters created by new tracks over the ground impacting areas that were not previously overflown, the sponsor has attempted, where possible, to modify the design to mitigate these issues.

The IAP is not proposed to look at immediately increasing capacity at the airport, however the sponsor makes a credible argument that improvements to the airport's infrastructure are a key component to delivering requisite economic growth in the region. Whilst subjective, it is agreed that GNSS IAPs at the airport could make it a more attractive location for aircraft operators through the provision of enhanced weather operations, therefore a credible argument can be made for some indirect economic gains.

LBHA submitted their ACP on 19 May 2017. In accordance with the CAA transition policy, this proposal is being considered under CAP 725 which was extant at the time, rather than its successor, CAP 1616. The supporting safety case for the proposal was submitted on 27 Jul 2017. After discussions between the CAA Inspector ATS (Operations) and the Case Officer it was decided to 'stop the clock' on the 16 week decision period to provide additional time for LBHA to respond to, and subsequently resolve, issues surrounding the safety case. Following several iterations, the CAA approved the safety case on 24 Apr 2020. Rather than require the sponsor to produce a full new ACP submission, the CAA granted that an Addendum to the original submission could be submitted. This details what changes had been made, and what engagement had been conducted with stakeholders since the original submission. LBHA submitted the ACP Addendum and some supporting documents on and after 03 Jul 2020. During this period, the CAA is satisfied that the sponsor has kept key stakeholders informed with targeted engagement, and that no further consultation is required to satisfy CAP 725 process.

The crux of this Operational Assessment and accompanying recommendation is based on the associated impacts of the proposal to introduce an RNAV IAP into a busy restricted funnel of Class G airspace, which is constrained on all sides and above by controlled airspace (CAS).

Since conception to Addendum submission this proposal has changed significantly. Whilst assessing the operational impact of the final design, and therefore to be able to draw overall conclusions and recommendations, the process and modifications that have taken place from original concept, through design development, initial ACP submission and Addendum final submission, have drawn several observations which are summarised below and explained in greater detail in the 'Comment and Observations' section of this assessment. From original concept to final submission, layers of safety mitigation have been peeled away, leaving the final proposal significantly different from that originally envisaged.

- Whilst part of the original concept, no form of 'enhanced airspace' or protection to the IAP aircraft, for example in the form of a Radio Mandated Area or Transponder Mandated Area, is part of the proposal.

- Whilst the current design of a circling manoeuvre does create delays in sequencing, it does aid safety.

- Owing to airspace constraints leading to the IAP design being amended, aircraft will descend out of the TMA earlier than originally anticipated '*impinging on the uncontrolled Class G airspace below the TMA and especially the operations at Kenley aerodrome*'.

- Supply to, or use of Mode S transponders to RAF Kenley gliders is not a Safety Requirement for the safety case as the sponsor does not want the use of the Runway 03 IAP dependent upon this.

- IFR aircraft conducting the IAP will be descended out of the London TMA by Thames Radar who will terminate their radar service at this point. At best, Traffic Information on conflicting aircraft might be passed at this point. As per the notes on the Instrument Approach Chart, an aircraft conducting an IAP to Runway 21 (including to circle to Runway 03) '*will normally be radar vectored by Thames Director to final*

approach at 1,800ft, to be established no later than [5nm]'. At this point they are handed to Biggin Tower. If a confliction is evident Thames Radar will keep the aircraft inside CAS.

- 'See and avoid' is not possible in IMC, and the IAP aircraft will be descending out of IMC into VMC where it will encounter VFR traffic. Biggin Tower currently request crossing VFR traffic to hold clear of the approach when an aircraft is inbound to Runway 21 (including to circle to Runway 03). This is not possible for the entirety of the Class G element of the proposed IAP.

- The proposed IAP routes around a gliding site in Class G airspace with no protection other than 'see and avoid' or TCAS/collision avoidance equipment.

- No radar ATC service is available for the proposed IAP once the aircraft leaves the TMA, for approximately a 12nm transit.

- The IAP conflicts with VFR traffic flows as it routes over VRPs and along a popular line feature for GA aircraft to follow.

- Class G airspace does not mandate the carriage or radios or transponders, increasing risk against aircraft utilising collision avoidance systems as their primary means of mitigation against other traffic in Class G airspace. (N.B. Noted that GAT can operate IFR in IMC in this airspace, but the aircraft would need to be equipped accordingly including having a serviceable transponder.)

- The airspace is severely restricted in this location, and avoiding action or TCAS RA by either aircraft could result in a climb into the TMA or a turn into the Gatwick CTA. (N.B. Whilst the sponsor captured this risk in the safety case, mitigating the risk of a catastrophic event after an airspace incursion to 'improbable', primarily through 'controller invention' by either Gatwick or Thames Radar ATC, this does not prevent the airspace infringement and subsequent impact on aircraft flow from Gatwick or through the TMA.)

- Unlike the 'itinerant' VFR traffic, the IAP aircraft is trying to maintain a fixed descending profile and course whilst configuring the aircraft for an approach, thereby increasing the pressure in the cockpit to maintain a stabilised approach and not stray off track.

- Paragliding and hang-gliding operations take place less than 1nm from the IAP in the final stages of the approach.

- Advanced use of the ATM is considered an 'essential enabler' for the proposed IAP by the sponsor, but has been withdrawn. Therefore, no radar derived traffic information is made available for the IAP aircraft once they descend out of the TMA.

It is the recommendation of the Case Officer, that on the grounds of the cumulative impact of safety related issues generated from the IAP as presented, and in the proposed location, that this ACP is refused. As this Operational Assessment and recommendation has been made under the

assumption that there are no IFP related issues, if the recommendation to refuse this ACP is subsequently approved, then it is further recommended that there is no requirement for the IFP Assessment to be conducted.

Comments & Observations

Observation – Original Concept
The sponsor commenced its development process for the introduction of IAPs to Runway 03 by holding a series of Focus Groups mid 2015. Here it proposed its original concept and requirements to 'Local Aerodromes and Establishments'; 'ATS units'; 'Local Aerodrome Operators and Tenants'; and 'Local Councils and Residents' to gather feedback and any concerns which could be taken into consideration and contribute to the development of design options. The concept design presented was for both an Area Navigation (RNAV) non-precision (LNAV) and a precision (LPV) instrument approach, both retained within CAS for as long as possible (utilising the London TMA and Gatwick Airport CTA,) with an ATC radar service provided by Thames Radar. This included Thames Radar providing ATSOCAS (Air Traffic Services Outside of Controlled Airspace) once below the TMA and prior to entry to the Gatwick CTA. Upon leaving the Gatwick CTA the aircraft would enter a Radio Mandatory Area (RMA) managed by LBHA using Advanced use of their Aerodrome Traffic Monitor (ATM). As stated in the Focus Group presentations, the proposed RMA was "*intended to enhance the safety of aircraft operating under Instrument Flight Rules in cramped Class G Airspace by providing appropriate Traffic Information to those aircraft and operating (predominantly) under Visual Flight Rules in lesser meteorological criteria*".

Comment
Industry feedback from the Focus Groups was that the RMA formed a 'wall' from north to south in the airspace and would not be acceptable, especially as it is known that several non-radio equipped aircraft operate regularly in the area, and the concept was dropped from the design. Manager ATC Gatwick noted that Gatwick Airport Limited (GAL) and Gatwick Flight operations Committee '*would have strong objections to any proposal which could affect GAL's operational efficiency even slightly*'. ATC complexity issues also arise from the RMA as all Farnborough LARS (Lower Airspace Radar Service) traffic would be transferred to Biggin Hill for transit of the RMA. In addition, some interaction issues with both Heathrow and Gatwick SIDs were noted which would require further detailed work to resolve.

Observation – Unresolved Interactions in the Original Consultation
In the original consultation, the proposed design is still for both a non-precision and a precision approach. It is though acknowledged that whilst '*a workable RNAV non-precision and APV [Approach with Vertical Guidance – precision] IAP has been developed…a number of airspace issues require to be addressed through consultation before it can be introduced*'. The benefits of a 'straight-in' approach to runway 03 are articulated, including an '*unwelcome side effect of the circle-to-land on Runway 03 procedure where an aircraft performing a Missed Approach Procedure or 'go-*

around' would be in confliction with any subsequent approaching aircraft. Consequently, Thames radar or Biggin Approach cannot clear another aircraft to commence its approach until the preceding aircraft has landed'.

Comment
The proposal is looking to utilise the Gatwick CTA to facilitate a precision approach in the constrained airspace available. Whilst unusual it is not unacceptable that the airspace and interactions issues are yet to be resolved at this stage of a CAP 725 ACP, modification of the design to resolve this though lead to a supplementary consultation being required. Whilst accepting that delays in sequencing are highly undesirable, it does aid safety.

Observation – Impact of Resolving Interactions
In order to identify each individual procedural interaction between the proposed IAP and the Gatwick and Heathrow procedures, an "Interactions Document" was developed to facilitate discussions between the Air Traffic Management and Airport stakeholders. As stated in the Supplementary Consultation, whilst for the Heathrow interaction issue with the DET 09 SID, '*an accord was reached on how to resolve the safety issue identified through the changes to procedures*', an outstanding issue remained with Gatwick interactions. The Interactions analysis undertaken confirmed that '*adequate lateral and vertical separation would not exist as a function of procedure design*' between aircraft carrying out the Runway 03 Precision IAP and aircraft departing from Runway 09 at Gatwick and turning left after departure. This was because of the extant airspace configuration, and rules applied to air operations in CAS. Therefore, despite the objective of the original design to keep the arriving aircraft as high as possible and within the London TMA at 3,000ft for as long as possible, it was concluded that the only resolution of the procedure interactions would be to descend the arriving aircraft on the LBHA IAP earlier than originally intended to ensure that vertical separation between the IAP and the Gatwick SIDs would be established, before lateral separation was eroded. In addition, owing to lateral separation standards the LBHA Runway 03 IAP flight path was adjusted so as not to penetrate the Gatwick CTA. As a consequence of this not only was it necessary to alter the categorisation of the IAP to an RNAV Non-Precision (LNAV) Approach only, but also after an earlier descent from the TMA the entire rest of the IAP now lies in Class G airspace with no enhanced protection or ATC radar provision as Thames Radar would no longer be providing an ATSOCAS service.

Comment
This Operational Assessment assumes all interactions are adequately resolved and instead focuses on the impact the interactions had on the original concept and design. [NB the interactions will be assessed by the CAA IFP Regulator. However, it is noted that the Heathrow 09 DET SID plate has not been amended to include the required 'not below 4,000ft' point to resolve that particular interaction issue.] The submitted design is therefore significantly altered from the original concept. Safety nets of keeping the IAP aircraft in CAS away from potential itinerant aircraft in Class G airspace, and Thames Radar providing a radar ATC service until the IAP aircraft entered an RMA for the final segment of the approach have both been removed. The design is constrained to resolve interactions with pre-existing airspace and SIDs, meaning the IAP design can only be non-

precision. In addition, the Supplementary Consultation Report highlighted one of the major points articulated from the outset by local operators, namely the potential impact of the proposed IAP on General Aviation (GA) operations in Class G airspace.

Observation – Conflict in Class G (1)
As detailed in the sponsor's Consultation Document '*although outside CAS itself, LBHA lies in very close proximity to the Class A and Class D CAS that is established around and protects: London Gatwick, London Heathrow and London City Airports…Additionally, the airspace above LBHA is designated as London TMA and is Class A CAS. Consequently, LBHA is located within a 'tunnel' of un-controlled airspace formed by the 'walls' and a 'ceiling' of CAS*'. Originally intending to ensure IFR aircraft conducting an IAP were at least made aware of the presence of other aircraft flying in their vicinity by providing an RMA, '*the feedback from the General and Sport and Recreational Aviation Focus Group sessions was such that this option has not been incorporated into this submission*'. The sponsor states that this is done '*on the basis that the change being proposed to the airspace arrangements (i.e. establish IAP within Class G airspace) is not unusual and exists at several similar airfields throughout the UK, for example at Exeter, London Oxford, Gloucester and Cranfield*'.

Comment
Whilst correct in this statement, the establishment of any GNSS IAP is assessed on its own merits and not solely on the fact that the airspace classification allows it, or that it is a procedure approved at another airfield. The location of Biggin Hill Airport is in some of the busiest Class G airspace in the UK, complicated by the surrounding airspace constructs, and is a good example of why any application for a GNSS IAP in Class G airspace should be evaluated on its own individual circumstances.

The complexity of the airspace within which the IAP is proposed is exacerbated by the surrounding and pre-existing airspace operators. Aircraft on the proposed IAP would descend out of the TMA 2nm NW abeam of the gliding site, RAF Kenley, then track SW passing approximately 1.8nm west abeam, before turning eastbound looping around the airfield approximately 2.5nm to the south. Initially strongly opposed to the proposal owing to the risk of Mid Air Collision (MAC), an LoA has eventually been agreed once one of the IAP Way Points was moved slightly further away. In addition, an offer of mobile mode S transponders has been made if the application is successful. Whilst the risk of MAC is mitigated by providing electronic conspicuity derived traffic information to pilots using the IAP, as the sponsor states, according to Rules of the Air powered aircraft, (in this case the IAP aircraft,) will have to 'give way' to non-powered aircraft. This will take the aircraft off the IAP, and the risk exists for a TCAS RA climb or turn, or turning into further confliction. In the sponsor's Consultation Document, prior to the IAP design having to be modified owing to airspace constraints, it was stated '*LBHA is conscious of the wide range of aviation activity which takes place below and in proximity to the nearby CAS and has taken this into account in the design of the proposed procedures. As noted in paragraphs 4.2.3 to 4.2.5, the Airways Direct Arrival segment of the procedure is retained at 3000ft amsl within the London TMA (with base level 2500ft amsl) for the maximum extent practical to avoid impinging on the uncontrolled Class G airspace below the London TMA CAS and especially the operations at Kenley aerodrome*'.

Observation – Conflict in Class G (2)
Once clear of RAF Kenley the proposed IAP routes over the M23/M25 Junctions, then along the M25. This Junction is a Visual Reporting Point for Redhill Aerodrome located just to the south under the Gatwick CTA and is a popular traffic flow for GA traffic. The sponsor acknowledges in the original consultation that '*VFR flights passing close to LBHA on an east/west routing may often use the M25 Motorway as a navigational line feature, keeping the Motorway on the left in accordance with Rule 5 of the Rules of the Air. The M25 motorway lies approximately 1NM outside the LBHA ATZ. Whilst there is no statutory requirement for such flights to communicate with "LBHA Approach", provided they remain outside the ATZ, good airmanship dictates that the majority of transit flights should so communicate. Therefore, it must be recognised that where the final approach flight-path of the Runway 03 IAP crosses the M25 motorway it is possible that the aircraft will cross the path of the itinerant traffic. Similar encounters exist every day in the UK, but the 'see and avoid' principle is readily employed. The IAP will be published in the authoritative document (UK IAIP) and on topographical "VFR" aeronautical charts so pilots will be able to self-brief about the possibility of such encounters and either be extra vigilant in their lookout and/or contact LBHA ATC for traffic information. Moreover, the modern business and executive aircraft are fitted with 'collision avoidance systems' which provide an additional safety aid to pilots. It is anticipated that air traffic using the 03 IAP will benefit from information regarding local traffic passed either by Thames Radar or by Biggin Approach using air traffic monitor (ATM) advance uses'*.

Comment
Utilising 'see and avoid' rules for collision avoidance as mitigation against the risk of MAC in Class G airspace is in accordance with UK policy for this classification of airspace. However, unlike the conflicting itinerant traffic who are transiting the area, the IAP aircraft is attempting to maintain a flight path and profile to conduct the final stages of an instrument approach to an airfield. In addition, IAP aircraft collision avoidance systems do not operate against non-transponding itinerant aircraft which could be encountered in this category of airspace. In this scenario, there is not only no ATC means of separating IAP traffic from VFR traffic in this busy funnel of Class G airspace, but also no means of passing the IAP aircraft 'traffic information' on conflicting aircraft, as no ATC radar service, including information passed by Biggin Approach using Advanced use of the ATM, is available. The ATS offered by Biggin Hill is Approach Control Procedural Service which separates aircraft vertically or by time intervals based on pilot position reports. As stated in the sponsor's Consultation Document, the mitigation offered is an expectation that itinerant aircraft will adhere to the notified Instrument Flight procedures and avoid the IAP aircraft through '*good airmanship*'.

Observation – Conflict in Class G (3)
Aside from RAF Kenley and Redhill Aerodrome there are other private flying strips and aviation sites near to the proposed AIP. Hurley Lodge helicopter site has a good relationship with Biggin Hill and procedures already exist to cover operations to and from this site. Parascending and hang-gliding activities take place at Warlingham just outside of the Biggin Hill ATZ and less than 1nm from the final approach track. The sponsor's original Consultation Document states '*Appropriate procedures are to be put in place between the Green Dragons Hang Gliding Centre and LBHA ATC for the exchange of information on their operations in the vicinity of LBHA. The hang gliding site will be marked on the IAP charts to warn pilots*

flying the approach of the potential of hang gliding and parascending operations in the vicinity. Thus an adequate means to pass appropriate traffic information to IFR flights conducting IAPs to Runway 03 will exist'.

Comment
Whilst the IAP may be marked on aviation charts, the sponsor states this approach will only be used 30% of the time, therefore the 'norm' would be for it not to be in use. In addition, and as also stated by the sponsor, in accordance with Rules of the Air, powered aircraft (the IAP aircraft) will have to 'give way' to non-powered hang-gliders and paragliders, thus taking them off track in the final stages of their approach. The IAP is in Class G airspace therefore the hang-gliders and paragliders are permitted to operate there, they have no requirement to avoid where the proposed IAP is located, and they rarely have radios or transponders. In this scenario the safety barriers of the aircrafts collision avoidance system, and radar derived ATC information, are both removed owing to a lack of transponders and no radar ATS provision.

Observation – Advanced use of the ATM
The sponsor's Supplementary Consultation Report details changes to the procedure design which were necessary to resolve operational interactions, and to revisit some environmental concerns. This also documented the enablers required for the introduction of the proposed IAP. As well as runway infrastructure; integration with Heathrow DET SID; LoAs; provision of air traffic service by Thames Radar, and flight validation, the report stipulates Advanced use of the Aerodrome Traffic Monitor. It states, '*LBHA ATC is not equipped with radar. It provides a Procedural Approach Control Service (APC) and Aerodrome Control Service (ADC or TWR). However, to assist the controllers in spatial awareness of the surrounding traffic situation LBHA ATC is equipped with an Aerodrome Traffic Monitor (ATM). This provides a radar-derived 'air picture' of the local area using NATS onward-routed radar data (provided under contract by NATS). The use and operation of the ATM is detailed in the Manual of Air Traffic Services (MATS) Part 1 and it must not be used to provide radar services. No radar rating is required for its use by TWR controllers. LBHA is making application to CAA SRG ATS Regulation to permit advanced use of the ATM by LBHA ATC controllers in order that meaningful traffic information can be passed to aircraft carrying out an IAP or to transiting VFR flights in proximity to the IAP and to assist in the sharing of traffic information with Redhill ATC. Once approval is given by the CAA the LBHA controllers will require specific training in the advanced use procedures. Advanced use of the ATM is considered an essential enabler for the proposed IAP*'.

Comment
After the original ACP submission, but before the Addendum submission, the sponsor has withdrawn its application for Advanced use of the ATM. Listed as provided from the original concept, this was proposed as essential mitigation, facilitating the provision of radar derived traffic information of itinerant aircraft to IAP aircraft and to monitor and warn IAP aircraft of the risk of infringement of the Gatwick CTA. This has also had a consequential impact on the Redhill LoA, which has been re-written for the Addendum and was submitted as a revised annex in the final safety case. The original intention was for the sponsor to provide their current ATM to Redhill whilst they acquired a new one for Advanced use, but now all reference to use of an ATM has been removed. Redhill SATCO/Aerodrome Manager has subsequently agreed to the new LoA. The agreement

now states LBHA will inform Redhill of an aircraft inbound for Runway 03 IAP at approximately 20nm, and Redhill will make a general broadcast of this on their frequency.

Conclusion and Recommendations:

It is disappointing that a sponsor considered 'essential enabler' for the proposed IAP in the form of Advanced use of the ATM, introduced in the original concept and maintained through to and including ACP submission, has subsequently been withdrawn in the Addendum. This also means stakeholders have only been consulted on the presence of this 'essential enabler', and not on the impact with its removal. However, notwithstanding this, and looking at the other summary items listed above, whilst no individual element in its own right is significant enough to recommend the ACP is rejected, the operational impacts of the proposal must be considered collectively.

The sponsor is correct that the CAA accepts the concept of instrument flight procedures in Class G airspace, and some IAPs do currently exist and operate safely in Class G airspace. However, each application is assessed on its own individual circumstances and merit, considering in particular both its supporting safety mitigation (not just the 'see and avoid' principle applied to Class G airspace,) and its holistic impact on all airspace users from both an operational and safety perspective. Just because an airspace construct or design is appropriate in one location does not automatically mean it can be applied elsewhere. It is noted that the original concept and design looked to keep the IAP aircraft in controlled airspace for as long as possible to avoid the risk of conflict with itinerant aircraft; however, the final proposal is far removed from the original, and several of the initial safety nets have been removed. In isolation, each risk identified can be mitigated, however collectively, the overall risk is significantly compounded, and the mitigation provided is appreciably reduced from that originally proposed. The proposal compares itself to other airfields with GNSS IAPs in Class G airspace, but none of these have the complexity and constraints surrounding and affecting them that are afforded at Biggin Hill.

Therefore, owing to the cumulative impact of safety related issues surrounding the final design of the proposed RNAV IAP, in a constrained funnel of Class G airspace, enclosed on all sides and above by CAS, and the subsequent 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, it is the recommendation of the Case Officer that this ACP is refused.

This Operational Assessment and recommendation has been made under the assumption that the final submitted design is fully compliant with all IFP regulations and requirements, including, but not limited to, interactions with adjacent ANSPs, obstacle clearance, or infringement of CAS by the protection areas. Therefore, if the recommendation to refuse this ACP is subsequently approved, it is further recommended that there is no requirement for the IFP Assessment to be conducted.

Operational Assessment Sign-off/ Approvals	Name	Signature	Date
Operational Assessment completed by:	[redacted] **AR Case Officer**	[redacted]	17 November 2020
Operational Assessment approved:	[redacted] **Mgr AR**	[redacted]	26 November 2020

Mgr AR Comments:
I concur with the Airspace Regulator (Technical) such that, as it stands, I could not recommend the proposed Instrument Approach Procedure (IAP) for notification in the AIP. Whilst I am content with Biggin Hill's justification for the IAP (I agree with their need), as I am also with their consultation activities and environmental considerations (even though they could have been done better), I don't however think there has been sufficient consideration to the impacts of this proposal on autonomous VFR traffic transiting in the Class G gap between the London CTRs and Gatwick CTR; primarily the risks of emerging from cloud in a known transit area. Mitigations are in place, or provisionally agreed, with third parties for Redhill's Visual Reference Points, a Kenley Gliders LoA (that includes the potential provision of Mode S Transponders), direct access phone lines to other Controlling Authorities to allow rapid coordination of any off-track IFR arrivals with the potential to infringe Controlled Airspace (laterally or vertically) and potential interactions with either Gatwick and/or Heathrow Standard Instrument Departure routes (although these need to be confirmed once the finalised IFP design has been CAA reviewed/validated and set against a final confirmation in regard of the Heathrow Departures not below 5,000ft amsl). In regard of autonomous VFR the original intent of Biggin Hill was to include 'Advanced Use of the [VCR] Air Traffic Monitor (ATM)' as a mitigation, but they dropped this from the final [supplementary] submission. I accept that currently arriving IFR traffic for RWY03 will fly the RWY21 ILS to break cloud in Class G, (somewhere along the localiser track south of the London City CTA) to go VMC below cloud and conduct a visual circling manoeuvre around to RWY03; but this is not done in the vicinity of a known feature used regularly by autonomous, transiting VFR traffic – namely the M25. I would be content to recommend this IAP if the mitigation of Advanced Use of the ATM was reintroduced and successfully

incorporated into Biggin Hill's supporting Safety Argument. I think it would better support the already agreed provisions for CAS infringement and those in regard of EGLL and EGKK departing IFR traffic, but more importantly it would be a mitigation against the arriving IFR traffic emerging from the base of cloud near the M25 to find itself quickly in conflict with an autonomous, transiting, non-transponding VFR aircraft, legitimately, just clear of cloud. The CAA should also consider additional ATM oversight measures as this procedure beds in. It should also be noted that my recommendation is also conditional on the final, approved RNAV IAP IFP design matching the proposal as consulted and agreed with other stakeholders.
Conclusion: Recommended if 'Advanced use of ATM' can be reintroduced as a mitigation, primarily in regard of autonomous, transiting, non-transponding VFR aircraft in the Class G gap, and successfully incorporated into Biggin Hill RWY03 IAP's supporting Safety Argument. Otherwise not recommended.

Hd AAA Comment/ Approvals/Decision	Name	Signature	Date
Operational Assessment Conclusions approved:	[redacted] **Hd AAA**	[redacted]	29/11/2020
Hd AAA Comments: This application is approved in accordance with the caveats articulated by Mgr AR above. The need for the IAP is coherent, the mitigations currently are not.			