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London Biggin Hill Airport RWY 21 RNAV(GNSS) IAP

Safety Case Report Part 4

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Executive Summary

London Biggin Hill Airport (LBHA) is seeking to undertake an airspace change in order to update the means of navigation used by aircraft, in line with the overall United Kingdom (UK) airspace modernisation.

LBHA is proposing to introduce an Area Navigation (RNAV) (Global Navigation Satellite System (GNSS)) Instrument Approach Procedure (IAP), with Lateral Navigation and Vertical Guidance Minima to Runway 21 (RWY21).

During Stage 2 of the ACP process, LBHA also considered the introduction of PBN to ILS . This would provide resilience that was effectively removed by the unavailability of European Geostationary Navigation Overlay Service (EGNOS) agreement. This procedure was considered feasible and LBHA are also proposing to introduce an RNP to ILS IAP with ILS and LOC/DME Minima as part of this ACP.

Both LBHA and the Civil Aviation Authority (CAA) Safety and Airspace Regulation Group (SARG) require assurance that the introduction of the RWY21 RNAV(GNSS) IAP at LBHA will result in safe air operations at all stages of its implementation lifecycle. The form of this assurance is an operationally focused Safety Case, as recommended by the LBHA Safety Management System (SMS) Manual [Ref. 01], this will be structured in four parts.

This document is the Part 4 Safety Case Report which provides assurance evidence that the operation and maintenance arrangements of the IFPs meet the Safety Requirements defined for this Airspace Change Proposal (ACP).

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1 Introduction

1.1 Background to the ACP

London Biggin Hill Airport (LBHA) has embarked on this airspace change to introduce new Instrument Approach Procedures (IAPs) which includes the Missed Approach Procedure (MAP), as the current existing IAP and associated MAP will shortly be removed from use, as they use conventional navigational facilities on the ground that are reaching the end of life and will no longer be available. In addition, the current procedures are only available whilst the Biggin (BIG) Doppler Very High Frequency (VHF) Omnidirectional Range (DVOR) is available and this navigational aid is only available through a contractual agreement with National Air Traffic Services (NATS), on a temporary basis. It has been agreed that as soon as the Runway 21 Area Navigation (RNAV) Approach has been approved by the Civil Aviation Authority (CAA) and implemented, the BIG DVOR will be removed from service by NATS.

If the Runway 21 RNAV Approach Airspace Change Proposal (ACP) is successful, it will also add a layer of resilience to the airport operation by providing a second instrument approach procedure that may be used in the event that the Instrument landing System (ILS) is unavailable.

The proposed procedures can be integrated into United Kingdom (UK) airspace, which is currently being modernised to incorporate new technologies, such as satellite navigation. This proposal will therefore meet the requirements within the CAA Airspace Modernisation Strategy (AMS).

The new IAPs, will not be required for over 99% of the time, as inbound aircraft usually receive radar vectors from Air Traffic Control (ATC), until established on final approach using the ILS. As radar vectoring is the most efficient way for the radar service provider to sequence air traffic, it would usually be available from the Thames Director radar unit for the operational hours of LBHA under contract. On the rare occasion that a radar service is not available, LBHA ATC will use the new Runway 21 RNAV Approach as a procedural recovery.

1.2 Purpose

The Civil Aviation Authority (CAA) Civil Aviation Publication (CAP) 1616 [Ref. 02] provides detailed guidance on the airspace change process. It requires a robust Safety Management (SM) process to be an integral part of any proposed airspace change.

Moreover, the CAA Safety and Airspace Regulation Group (SARG) requires assurance that the changes introduced by the ACP will result in safe air operations at all stages of the project lifecycle; this will be true of LBHA and any other stakeholders impacted by the changes. The form of this assurance is an operationally focused Safety Case, structured in four parts as required by LBHA SMS Manual.

The purpose of this Part 4 Safety Case Report (SCR) is to provide assurance evidence that the Operation and Support of the proposed introduction of the IAPs will allow

for continued satisfaction of the Safety Argument and Safety Requirements set out in the Part 1 SCR [Ref. 03].

1.3 Scope

The scope of this document, and the activities described within, is limited to air operations at LBHA and the proposed RWY 21 RNAV IAP. The focus of the activity in this Safety Case is the operational safety of the new IAPs at LBHA. However, whilst the project work is focussed on the delivery of the new procedures, the safety assurance activities are being carried out with due reference and consideration to the complete end-to-end Air Traffic Service (ATS) provided by LBHA.

1.4 Document Structure

The structure of this SCR Part 4 is as follows:

- Section 1 – Introduction.
- Section 2 – Operation and Maintenance Arrangements.
- Section 3 – Organisation and Safety Management.
- Section 4 – Limitations.
- Section 5 – Conclusions and Recommendations.
- Section 6 – References.

2 Operation and Maintenance Arrangements

2.1 Overview

This section sets out the Operation and Maintenance arrangements necessary to ensure the continued safe operation of the proposed IFPs at LBHA.

The ACP introduces new Instrument Approach Procedures which includes the Missed Approach Procedure, as the current existing IAPs and associated MAP will shortly be removed from use, as they use conventional navigational facilities on the ground that are reaching the end of life and will no longer be available.

The following support arrangements are necessary to ensure the continued safety of the proposed IFPs throughout their operational life

2.2 Operational Interface

The LBHA MATS Part 2 [Ref. 03], specifies the procedures for:

- The routine management of the proposed IFPs.

Whilst the LBHA SMS Manual specifies the procedures for:

- Reporting of safety observations and irregularities.

2.3 Availability of GNSS

The Global Positioning System (GPS) signal-in-space (SiS) that supports the use of RNAV IFPs has no internal monitoring system to give timely warning of incorrect guidance being transmitted. There is no manufacturer's evidence to support the approval of an approach using GPS guidance, however the UK CAA makes available historical monitoring data to allow the assessment of the integrity and continuity of service.

Compliance with the Safety Objective relating to the performance of GNSS SiS is validated in Safety Case Part 2 and 3 [Ref. 04].

2.4 IFP Safety Performance Monitoring

2.4.1 Regulatory Requirements

In compliance with CAP785B [Ref. 05], UK certified aerodromes are required to safeguard and maintain their procedures.

2.4.2 Maintenance of IFPs

The maintenance process for IFPs is aided by, and achieved through, a full review of the procedures on a 5-yearly basis and includes managing updates due to magnetic variation changes, changes in State design guidance, new survey information and changes to the UK airspace structure. The LBHA Aerodrome Manual [Ref. 06], Section: 2.2.1, makes reference to this requirement.

2.4.3 Safeguarding of IFPs

The LBHA Aerodrome Manual, Section: 2.1.4 and 2.2.1, contains the process for ensuring that the IFPs are safeguarded from any proposed development or construction, or planned temporary obstacle.

2.5 Airspace Safety Performance Monitoring

2.5.1 Incident Response Process

The performance of the IFP shall be monitored through the LBHA Incident Reporting Process.

The LBHA SMS Manual, Section 3 Safety Management System, outlines the procedures for recording, reporting and investigating all accidents or incidents that occur at LBHA. This includes accidents and incidents relating to ATC and the provision of ATS.

LBHA use the CENTRIK Reporting System for Mandatory Reports, voluntary incident reports, confirmed wildlife/bird strike, and dangerous goods incidents. The CENTRIK reporting process is described in detail in the LBHA SMS Manual.

LBHA implements a positive Safety Management Culture and staff are encouraged to voluntarily report Safety Observations (where an incident did not occur, but the activity has the potential to lead to an accident or incident) through an internet-based reporting system.

3 Organisation and Safety Management

3.1 Change Control

3.1.1 Change Management

The LBHA SMS Manual, Section 9, defines the LBHA process for Change Management, and the ACP has followed this process. A Change Management Record has been created for the project [Ref. 07] to document the process and facilitate future reviews.

Notwithstanding the requirement to consult with the relevant Authority (Section 5.4), before making any changes to the airspace or IFPs, all changes to the implemented configuration, or use, shall be subject to a Risk Assessment in accordance with the LBHA SMS Manual (Section 5.5).

3.1.2 Document Control

The implementation of IFPs requires updates to operational manuals.

The LBHA SMS Manual, Section 9, defines the process for Document Amendment. Paragraph 9.8.2 details the amendment of documents that do and do not require CAA approval.

3.2 Training and Competence

3.2.1 ATC

TBC

3.3 Organisation and Responsibility

3.3.1 Overview

LBHA has responsibility for:

- Obtaining all the certification and licensing necessary for the operational introduction of the new IFPs, in accordance with UK Regulation and Legislation
- Facilitation of all simulation and assessment activities associated with the development of the new airspace and revised IFP.

LBHA has sub-contracted Osprey Consulting Services Ltd (OCSL) to complete the SCR, however in accordance with the LBHA SMS Manual, LBHA will retain ownership and remain accountable for all SCRs.

LBHA has sub-contracted the design of the IFPs to:

- **OCSL** for the design of the new LBHA Instrument Approach Procedures.

OCSL is a UK CAA certified Design Organisation.

3.3.2 Implementation Authority

The LBHA Senior Air Traffic Control Officer (SATCO) will identify any changes in the operational or regulatory environment that may affect the suitability for service of the LBHA IFPs.

Should any engineering changes be required e.g. implementation of map data, the SATCO will seek the advice of the NATS Senior Engineering Manager at LBHA.

4 Limitations

4.1 Overview

This Section details any Limitations on the use of the proposed LBHA IFPs or Shortcomings in their implementation.

4.2 Limitations

There has been no limitations identified that will affect the operation of the new IAPs, and no knock-on effect to other procedures offered at LBHA.

5 Conclusions and Recommendations

5.1 Overview

This Part 4 SCR demonstrates that the LBHA ATS will achieve an acceptable level of safety, subsequent to the introduction of the proposed IFPs into operational use and throughout their in-service usage.

This is achieved by way of a Safety Argument and compliance with derived Safety Objectives and Requirements that are summarised in then following sections.

5.2 Satisfaction of the Safety Argument

Claim	Satisfied?
Claim 1: The extant operation at LBHA is acceptably safe.	Yes, current LBHA Certificate issued by CAA. Safety related procedures are set out in the LBHA Aerodrome Manual (Section 3, Chapter 10), the Management Manual and the MATS Part 2.
Claim 2: The use of the RWY21 RNAV(GNSS) IAP at LBHA will be acceptable safe.	See Sub-Claims Below
Claim 2.1: All hazards pertaining to the introduction and use of the RWY21 RNAV(GNSS) IAP have been identified and understood, including those associated with other airspace users, adjacent airports and aviation organisations.	Yes, evidence presented in: • Part 2 & 3 SCR
Claim 2.2: The submitted design for the RWY21 RNAV(GNSS) IAP is deemed acceptably safe and agreed by the CAA.	Yes, evidence presented in: • Part 2 & 3 SCR
Claim 2.3: The Programme for transitioning the RWY21 RNAV(GNSS) IAP into operational use is planned and acceptably safe.	Yes, evidence presented in: • Part 2 & 3 SCR

Claim	Satisfied?
Claim 2.4: The use of the RWY21 RNAV(GNSS) IAP will remain acceptably safe during use.	Yes, evidence presented in: • Part 4 SCR • The LBHA SMS Manual states (Section 5.9) that risks that have been identified as 'Review' will be reviewed periodically, indicated to be 1 year.

Table 1 - Satisfaction of Safety Argument

5.3 Compliance with Safety Objectives

Compliance with the Safety Objectives that were derived in the Part 1 SCR is demonstrated in section 4.2 of the Part 2 & 3 SCR.

5.4 Compliance with Safety Requirements

Compliance with the Safety Requirements that were derived in the Part 1 SCR is demonstrated in Annex 4 of the Part 2 & 3 SCR.

5.5 Conclusion

To ensure that the safety claims remain valid, the Part 4 SCR sets out how the proposed LBHA IFPs will be maintained and supported throughout the operational life of the designs.

This Part 4 SCR, in conjunction with the corresponding Part 1 SCR and Part 2 & 3 SCR, supports the claim that the implementation of the proposed IFPs at LBHA is acceptably safe when introduced into service and will continue to be so.

To ensure that the hazards that have been identified as 'Review' are assessed periodically, the LBHA SMS Manual (Section 5.9) states that these risks will be reviewed periodically, not exceeding 1 Year.

6 References

Reference	Title	Origin
[Ref. 01]	LBHA, Safety Management System (SMS) Manual BHAL-MAN-009 v4	LBHA
[Ref. 02]	CAP 1616: Airspace Change Process (4th Edition published March 21)	CAA
[Ref. 03]	LBHA Safety Case Part 1 (71372 014 - Issue 3 – 23rd Sept 2024)	Osprey
[Ref. 04]	LBHA Manual of Air Traffic Services Part 2 Edition 3.2 / March 2024	LBHA
[Ref. 05]	LBHA Safety Case Part 2&3 (71372 014 - Issue 1 – 23rd Sept 2024)	Osprey
[Ref. 06]	CAP 785B: Implementation and Safeguarding of IFPs in the UK (2nd Edition version 2 published Sep 22)	CAA
[Ref. 07]	LBHA Change Management Record Title – 0017-2:21 RNAV Approach – ILS Overlay 26/09/2018	LBHA

Table 2 - References