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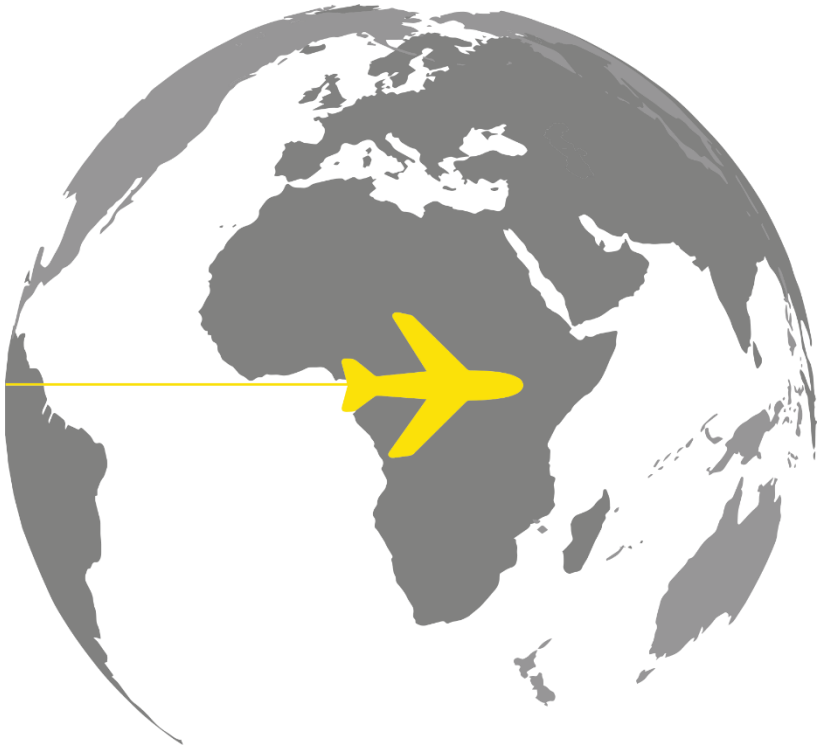
Leeds Bradford Airport Airspace Change Proposal

Safety Assessment Summary



Leeds Bradford Airport ACP – Safety Assessment Summary

Overview

The Leeds Bradford Airport (LBA) Airspace Change Process (ACP) concerns the modifications to the LBA Control Zone (CTR) and Control Areas (CTAs) in order to provide the requisite level of protection to aircraft during critical stages of flight, i.e. Departure and Final Approach.

Although the change is required to support the extant Instrument Flight Procedures (IFP) at LBA, the Airport's IFPs will also be updated to include aRea NAVigation (RNAV) IFPs to further enhance safety and to better meet the needs of their users.

Any change to airspace arrangements is subject to Civil Aviation Authority (CAA) scrutiny. A permanent change to the use of airspace requires an ACP submission to be made, which for the LBA ACP follows the process detailed within CAP 725.

Safety Case Overview

A Safety Case has been developed to demonstrate that the LBA ACP is acceptably safe, by way of a Safety Argument and compliance with a set of derived Safety Objectives and Requirements.

The Safety Case has been developed in four parts in accordance with the LBA Safety Management Manual (SMM).

The scope of the LBA ACP Safety Case is limited to the operational safety of the introduction of RNAV IFPs and the new design of Class D CAS. However, whilst the project work is focussed on the delivery of the new airspace arrangements, it is imperative that the safety requirements are set with due reference and consideration to the complete end-to-end Air Traffic Service (ATS) provided by LBA.

Safety Argument

The overarching, top-level Safety Claim (Claim 0) is that the proposed airspace changes and new IFPs at LBA will be acceptably safe when introduced into operational use and throughout their in-service usage.

In the context of this project 'acceptably safe' means a Risk Classification that is "Acceptable" as defined by the Severity Classification Scheme presented in LBA SMM.

In order to demonstrate Claim 0 is valid, it is necessary to support it with three subsidiary claims, namely:

- Claim 1: The provision of an ATS at LBA, using the extant airspace and flight procedures is acceptably safe;
- Claim 2: The provision of an ATS at LBA, using the revised airspace will be acceptably safe;
- Claim 3: The use of the new flight procedures at LBA will be acceptably safe.

Claims, Arguments and Evidence have been developed that demonstrate how these Claims are supported and will be achieved, with much of the evidence being presented in the four-part Safety Case.

Hazard Identification

A Hazard Identification (HazID) was held at LBA on 7th November 2018. The aims of the HazID were to:

- Identify the hazards associated with the revised LBA airspace arrangements and IFPs;
- Identify the causes of the identified hazards;
- Identify potential consequences (incidents/accidents) which may arise from the identified hazards;
- Identify potential mitigations/controls to limit identified hazards occurring or the likelihood of their occurrence.

In order to identify the hazards, the HazID drew upon the knowledge and experience of a broad spectrum of stakeholders (LBA staff, LBA based commercial pilots and local general aviation pilots). The HazID considered deviations in function/behaviour of IFP dependencies (e.g. communications and navigation) and contextual factors (e.g. terrain and meteorological conditions). These were then applied to a range of operational scenarios including instrument approaches to each runway and subsequent missed approaches.

Safety Case Part 1

The Safety Case Part 1 sets the Safety Objectives and derives a set of Safety Requirements that aim to reduce the level of risk associated with the implementation of the proposed airspace changes and new IFPs at LBA to an acceptable level.

It is not practical to derive numerical Safety Objectives for design of airspace or IFPs due to the many unpredictable and unquantifiable factors in the operational environment. However, the successful use of the IFPs is reliant upon the Global Navigation Satellite System (GNSS) providing the assurance, credibility and confidence that the Signal in Space (SiS) continues to meet the requirements listed in ICAO Annex 10 Volume 1 Radio Navigation Aids table 3.7.2.4-1 to be able to support APV operations.

The derived Safety Requirements primarily took the form of Air Traffic Control (ATC) procedures and agreements between LBA and other stakeholders that are needed to be implemented prior to the proposed airspace changes and new IFPs at LBA becoming operational.

The Safety Case Part 1 also determined the applicable Statutory and Regulatory Requirements pertaining to the ACP. For LBA, a key element of the ACP is the need to demonstrate that the proposed changes comply with the Airspace and Infrastructure requirements in Appendix A, sections 11 to 14 inclusive of CAP 725.

Any change or revision in the design of the Controlled Airspace proposed by the ACP must take into consideration the design of the IFPs, specifically those that require to be completely contained within CAS, e.g. Section 5, Chapter 3 of CAP 778 details the airspace containment considerations

Further, CAP 785 provides guidance on the approval of IFP produced by the approved procedure designers and the criterion for IFP design in UK Airspace is based on ICAO Document PANS-OPS 8168. CAP 785 also provides detail on the format and content of an IFP Design Submission (see sub-Sections 2 to 4 of Section 3, Chapter 1 of CAP 785).

Finally, CAP 670, Air Traffic Services Safety Requirements, section NAV07 details ATS Requirements for RNAV (GNSS) Instrument Approach Procedures.

Safety Case Part 2

The Safety Case Part 2 presents assurance evidence that the Design of the new airspace and IFPs at LBA meet the Safety Objectives and Requirements derived in Safety Case Part 1.

The GNSS SiS that supports the use of the new IFPs has no internal monitoring system to give timely warning of incorrect guidance being transmitted. In lieu of manufacturers evidence to support the approval of an approach using GNSS guidance, the UK CAA makes available historical monitoring of GPS data to allow the assessment of the integrity and continuity of service. The data shows that the applicable requirements of ICAO Annex 10 are met, with the exception of the achieved availability in Quarter 2, 2014. This was down to a planned outage that was notified to users, and for this reason the availability figure can be discounted.

At this stage of the project, full compliance to the safety requirements cannot be demonstrated, since the evidence of compliance is not yet available. Compliance with the Safety Requirements will be demonstrated during the Transition into Service and the continued safe Operation and Maintenance phases of the project. Data currently available indicates that;

- LBA has followed the ACP process defined in CAP 725 including compliance with Airspace and Infrastructure requirements in Appendix A, sections 11 to 14 inclusive of CAP 725. This is demonstrated in the ACP Proposal Document.
- The IFPs have been designed in accordance with CAP 785, CAP 778 and ICAO Document PANS-OPS 8168 by a UK CAA approved design organisation.
- Compliance with the Safety Objective for GNSS demonstrates compliance with ATS Requirements for RNAV (GNSS) Instrument Approach Procedures in CAP 670, section NAV07.

The information provides confidence in the progress to satisfying the overall Safety Requirements.

Safety Case Part 3

The Safety Case Part 3 presents assurance evidence that the Transition into Service of the airspace changes and new IFPs at LBA meet the Safety Objectives and Requirements derived in Safety Case Part 1.

The Transition phase has been divided into specific transition elements to ensure that the introduction of the proposed airspace changes and new IFPs at LBA is planned. The transition elements will ensure that appropriate control measures and mitigations are confirmed to be in place as detailed within the individual Safety Requirements. LBA has developed a Transition Implementation Plan that will ensure these elements are captured.

Satisfaction of the Safety Requirements within each specific transition element will provide assurance that demonstrates that the identified hazards, within the Safety Case Pt 1 have been either eliminated or that the residual risks are deemed acceptable and ALARP.

At this stage of the project, compliance to the safety requirements cannot be fully demonstrated, since the evidence of compliance is not yet available. Full compliance with the derived Safety Requirements will result in all identified hazards being assessed as acceptably safe, such that there are adequate lines of defence available to prevent any identified hazards occurring, or to limit the consequences of the hazards should they occur.

The Safety Case Part 3 identified the following limitations associated with the proposed airspace changes and new IFPs at LBA:

- The CAS/IFPs are limited to IFR operations only. IFPs are limited to suitably equipped (RNAV) aircraft operating at LBA.

- Any further changes to the airspace structure around LBA or to the IFPs must be subject to a separate safety assurance programme.

Safety Case Part 4

The Safety Case Part 4 demonstrates how compliance with the Safety Objectives and Requirements derived in Safety Case Part 1 will be assured throughout the in-service life of the airspace changes and new IFPs at LBA.

The Safety Case Part 4 focuses on Organisational Safety Management and details the following key topics:

- Roles and Responsibilities
- LBA Class D CAS and RNAV IFP Authorities
- LBA Staff Training
- LBA Occurrences Log
- Change Control
- Safety Performance Monitoring

This aspect of the Safety Case will be completed prior to entry of the ACP into operational service.

Recommendations

It is recommended that the Safety Case is reviewed and updated prior to promulgation of any future airspace changes and new IFPs at LBA to ensure that all Safety Requirements continue to be complied with, and the Safety Argument remains fully satisfied.