CAP 1616 STEP 2A – AIRSPACE CHANGE DESIGN OPTIONS

VERSION 1.0

7TH JUNE 2019

HELIOS

an egis company

INTRODUCTION

- Bournemouth Airport has initiated a CAA CAP1616 Airspace Change Process (ACP) in 2018.
- The Bournemouth Airspace Change Proposal successfully passed the ACP Stage 1 Define Gateway on Friday 26 April.
- These slides form our output for CAP1616 Stage 2A Airspace Change Design Options.

CONTEXT FOR THE CHANGE

1. Bournemouth Airport currently has ILS on both RWY ends
   - 08 (Cat I) – 25% of landings
   - 26 (Cat III) – 75% of landings
2. RWY 08 ILS is obsolete
   - Installed second hand in 1984/5
   - Maintenance support at end of life
   - Irrecoverable failure will have serious operational consequences
3. There is a legal requirement to implement RNP approaches by 2024
   - Could provide 3D capability to both RWYs
   - Could improve resilience to Runway 26 operations.

FIRST COMPREHENSIVE LIST OF OPTIONS

CURRENT STATEMENT OF NEED

Bournemouth Airport has RWY 08 and RWY 26, both providing precision approach capabilities via ILS. The preferential runway is RWY 26 handling 75% of all arrivals with the remainder utilising RWY 08. The ILS on RWY 26 is CAT III.

The ILS (CAT I) serving RWY 08 is obsolete and needs to be replaced. The ILS was installed second hand in 1984/85 and the equipment and maintenance support is at end of life. Unrecoverable failure of the ILS on RWY 08 will have serious operational consequences denying easterly Precision Approaches and increasing dependence on RWY 26. In addition, the publication of EU Implementing Rule (IR) 2018/1048 stipulates the implementation of PBN approach procedures to both RWY 08 and RWY 26 by 2024. By 2030 the IR emphasises the preference for PBN over conventional ILS CAT I.

DESIGNED PRINCIPLES

Design Principles
1. The new procedures should not increase the number of people overflown by aircraft participating in the approach
2. The new procedures should not increase the noise footprint of the existing airport operation, for similar aircraft types and traffic levels, as detailed in the LAeq 16 Hr map in the current Noise Action Plan.
3. Implementation should minimise disturbance to the Moors River System Site of Special Scientific Interest (SSSI).
4. The new approaches shall be standardised by ICAO and acceptable to EASA and CAA and the implementation shall be in compliance with all applicable legislation and regulations
5. The design shall be fully compliant with the design criteria stated in ICAO Doc 8168 (PANS OPS) and be flyable by all aircraft types in approach Speed Categories A through D.
6. The approach procedures shall be of a type for which the majority of Bournemouth aircraft operators are equipped and authorised to fly.
7. The designs shall seamlessly integrate with extant instrument approach procedures at Bournemouth International Airport
8. The procedures should address the needs of flight training operators at Bournemouth
9. The design shall support continued use of existing radar vectored arrival procedures provided by Solent Radar.
10. The new procedures shall be implemented in a cost-effective manner.

FIRST COMPREHENSIVE LIST OF OPTIONS

- The Options have been developed with the aim to be align with Designed Principles identified at Stage 1B and compliant with technical criteria specified in CAP1616.
- During this stage of CAP1616 process the Options are described more generally but on the next Stage 2B - Initial Options Appraisal more detailed information will be provided.

IDENTIFIED OPTIONS

The following table contains all identified Options at Stage 2A:

Options	
Option 1	Do Nothing
Option 2	Install new CAT I ILS on RWY 08
Option 3	RNP IAP Missed Approach conventional or RNAV to be confirmed during ACP Stage 3
a)	Full T-bar comprising Initial, Intermediate and Final Approach Fixes
b)	Limited T-bar with 1 Initial, Intermediate and Final Approach Fixes
c)	Straight-in with combined Initial/Intermediate and Final Approach Fixes

OPTION 1: DO NOTHING

- The 08 ILS is obsolete and well beyond its economic lifetime and at some stage it will fail and will be unrepairable, most likely preceded by reduced availability. With failed ILS the RWY will:
  - Lose 3D precision approach capability (no vertical guidance),
  - Higher obstacle clearance compared to ILS:
    - ILS 200 ft
    - NDB/DME 470 ft
    - SRA 472 ft
  - Higher workload for pilots and ATC.
- RWY 08 operations will revert to the existing non-precision 2D NDB and SRA procedures, which are less precise procedures, have higher aircraft minima, do not provide vertical guidance, will increase rates for Go-Arounds and diversion and require aircraft to operate with higher levels of engine thrust and increased engine noise on approach.
- This option does not provide resilience to RWY 26 neither does it meet the requirements of PBN Implementing Rule (IR) 2018/1048 for PBN Approaches with Vertical Guidance with 3 lines of minima by January 2024.
- Minor Environmental impact, from Localiser decommissioning in SSSI.
- Minor Cost for ILS decommissioning, including work in SSSI.

OPTION 2: INSTALL NEW CAT I ILS ON RWY 08

- New ILS CAT I will provide 3D approach (with vertical guidance) to RWY 08.
- RWY 08 operations and aircraft minima will be the same as currently achieved.
- This option does not provide resilience to RWY 26 neither does it meet the requirements of PBN Implementing Rule (IR) 2018/1048 for PBN Approaches with Vertical Guidance with 3 lines of minima by January 2024.
  - PBN IR does not support Business case for CAT I ILS beyond 2030.
- The replacement of the ILS will require a significant civil works within the Site of Special Scientific Interest and there is possibility in loss of service/disruption during installation of the new system.
- Very expensive to install and maintain:
  - Replacement estimated cost > £1.5 m
  - Annual revenue costs (maintenance, power, communications, WT Act licenses, 6 monthly flight inspection): estimated > £25k per annum.

OPTION 3: IMPLEMENT RNP IAP

- This option provides 3D approaches to RWY 08 and RWY 26:
  - LNAV
  - LNAV/VNAV; and
  - LPV.
- This option is cost effective:
  - Estimated Implementation cost circa £100k;
  - No annual operating costs (no infrastructure at the airport);
  - Will incur ILS decommissioning costs, including work in SSSI.
- This option addresses increased resilience for RWY 26.
- Compliant with requirements of PBN Implementing Rule (IR) 2018/1048 for PBN Approaches with Vertical Guidance with 3 lines of minima by January 2024.
- There are sub-options relating to the Initial and Missed Approaches that need to be considered in detailed procedure design process, during ACP Stage 3.