

Applications for instrument approach procedures to aerodromes without Approach Control and/or with a non-instrument runway – additional policy, guidance, and Acceptable Means of Compliance

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Revision history and effective pages

Preface

Aim

The purpose of this document is to set out additional Civil Aviation Authority (CAA) policy, guidance and Acceptable Means of Compliance (AMC) to support the safety arguments and mitigations required for applications in accordance with [CAP1616](#) Part 1c¹ to be considered for approval by the CAA for the establishment of Instrument Approach Procedures (IAPs) to aerodromes without an Approach Control service and/or with a non-instrument runways.

Context

In addition to any safety case and specific mitigations associated with an application under this policy, the introduction of a new IAP does not negate the need to follow existing CAA requirements regarding the design of an Instrument Flight Procedure (IFP). [CAP 785](#)² and the “[Validation of Instrument Flight Procedures](#)” [Policy Statement](#)³ provides CAA guidance on approval requirements for Instrument Flight Procedures (IFPs).

Approval fees

Fees associated with obtaining CAA approval to design IFPs for use in United Kingdom (UK) airspace are available from the CAA website at: www.caa.co.uk/ors5.

¹ CAP 1616 – Airspace Change

² CAP 785 - Approval Requirements for Instrument Flight Procedures for Use in UK Airspace

³ DAP Policy - Validation of Instrument Flight Procedures

Chapter 1

General

Introduction

Current CAA policy requires that the operator of a UK licensed aerodrome wishing to offer an instrument approach⁴ must provide a runway which meets the criteria laid down in [CAP 168](#)⁵ (i.e. a precision or non-precision instrument runway). A further requirement is that, in accordance with Air Navigation Order (ANO) 2016 Article 183, an Approach Control service must be provided to aircraft making an instrument approach to a UK aerodrome. Compliance with these regulatory requirements guarantee an acceptable level of safety management of the main risks associated with making approaches under Instrument Flight Rules (IFR).

The use of conventional IAPs at aerodromes has traditionally been limited by the associated need for relatively costly ground-based navigation system infrastructure; however, the availability of satellite-based navigation systems means that IAPs serving smaller and less well-equipped aerodromes is now possible.

The ability to provide an IAP into a smaller aerodrome without an Approach Control service and/or with a non-instrument runway may contribute to improvements in the overall safety of operations at the aerodrome along with supporting the viability of the aerodrome. This document provides policy, guidance and AMC⁶ to assist those aerodromes to apply for the implementation of an Required Navigation Performance (RNP) approach using a risk-based approach to mitigate the deficiencies in runway and/or service provision.

⁴ Air Navigation Order 2016 Article 187 requires that an IFP must not be notified (i.e. published) unless it has been designed or approved by the CAA.

⁵ CAP 168 Licensing of Aerodromes.

⁶ AMC may not be used in the design of an IAP; it is only applicable to the safety arguments addressing potential deficiencies in air traffic services and runway provision.

Chapter 2

Policy

Introduction

Historic policy

Instrument and non-instrument runways

Instrument runways may be classified as precision instrument or non-precision instrument depending on whether both lateral and vertical guidance or lateral guidance only is provided. As IAPs to these runways permit descent in Instrument Meteorological Conditions (IMC) to very low altitudes the runways have to meet minimum standards for runway strip dimensions, obstacle limitation surfaces, holding points, signs, markings and Aeronautical Ground Lighting (AGL). Runways which are required to meet less onerous standards within CAP 168 are known as non-instrument runways to which IAPs may be flown but only to a point beyond which the approach may continue in Visual Meteorological Conditions (VMC).

Approach control

Currently the Air Navigation Order (ANO) Article 183 requires an Approach Control service to be provided at UK aerodromes for which there is 'equipment for providing aid for an approach to landing by radio or radar'. At such aerodromes, the Approach Control service provides safety mitigation to reduce the risk of, for example, mid-air collision.

RNP approaches

RNP approaches using a Global Navigation Satellite System (GNSS) have been approved for use at a number of UK aerodromes in conformance with a specific set of policy requirements: the aerodrome must be licensed, the RNP approach must be to an instrument runway, an Approach Control service must be provided, aerodrome survey information must be current and appropriate, compliant meteorological information must be made available, the aircraft conducting such an approach must be suitably equipped and the pilot qualified to conduct the flight procedure. RNP APCH approaches are currently categorised as follows:

- Non-Precision Approaches (NPAs) with lateral only guidance where the minima is published as Lateral Navigation Obstacle Clearance Altitude (Height) (LNAV OCA(H)).
- Approach with Vertical guidance (APV); these approaches provide lateral and vertical guidance as follows:
 - Barometric Vertical Navigation (BaroVNAV), where the vertical advisory is provided by the aircraft's barometric system against a

position generated in the aircraft's navigation/flight management system, and the minima is published as LNAV/VNAV OCA(H).

- Satellite-Based Augmentation System (SBAS) where the vertical guidance is provided against a geometrical path in space rather than a barometric altitude. In Europe the augmentation is provided by the European Geostationary Navigation Overlay System (EGNOS), and the minima is published as Localiser with Precision Vertical Guidance (LPV) OCA(H).

As both BaroVNAV and SBAS elements of RNP IAPs take account of height loss in the design, a pilot can utilise the published OCA(H) as a decision altitude/height DA(H) rather than a minimum descent altitude MDA(H). It is to be noted that LPVs are not in use in the UK.

The case for change

The case for change is driven not only by safety considerations but also commercial efficiency. Current policy, combined with the associated costs, renders provision of an IAP outside of the financial reach of many smaller aerodromes. Only a relatively small number of UK aerodromes offer any form of instrument approach. Moreover, much of the ground-based infrastructure required to provide a conventional approach, such as Non-Directional Beacon (NDB) and Very high frequency Omnidirectional Radio range (VOR), are being phased out. The lower costs associated with use of GNSS technology make it more financially attractive to aerodrome operators, to develop an RNP IAP. At smaller aerodromes this will facilitate some continuation of operations in conditions of reduced visibility and lower cloud-base and enhance overall safety by providing accurate navigational information that reduces the risk of Controlled Flight Into Terrain (CFIT).

Legal considerations

Sponsors should note Regulation (EU) 73/2010 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018. This legislation deals with Aeronautical Data Quality (ADQ) which applies to aerodromes which have an IAP and would therefore require sponsors under the arrangements outlined in this document to comply with requirements in this field. To assist all parties involved in the data chain, understanding of, and compliance with the requirements pertaining to origination and processing of aeronautical data and aeronautical information published in Aeronautical Information Products, the CAA published [CAP 1054](#)⁷.

⁷ CAP 1054 Aeronautical Information Management

Required regulatory approach

Implementation of this policy requires a change in regulatory approach from one based upon standards to one based on risk. Such an approach requires a sponsor to consider the mitigations against risk which are provided by the current standards. Safety assurance arguments specific to the aerodrome and airspace environment must then be provided that show how the associated risks can be mitigated locally by other means where the current requirements are not achieved.

The instrument runway requirement, for example, includes provisions for markings and lighting which aid visual detection and which together with a protected 'runway strip' provide some mitigation of the risk of CFIT and, to a degree, the risk of runway excursions and overruns. Approach Control provides some mitigation of the mid-air collision and other risks and IAP OCA(H) restricted to a minimum value per aircraft category mitigates the lack of runway infrastructure in a non-instrument runway.

Use of the safety case methodology is considered the appropriate way to present the safety assurance arguments and guidance material on the conduct of such safety assessments is available to sponsors in [CAP 760](#)⁸. Guidance on the broad boundaries of what may reasonably be considered in scope for a risk-based approach from sponsors in terms of aerodrome licensing status, level of Air Traffic Service (ATS), meteorological service provision and runway facilities, is provided later in this document.

Such a case-by-case approach offers scope for approval of IAPs at aerodromes without Approach Control and/or with non-instrument runways in those circumstances where it can be shown that the risks of CFIT, collision on the runway, runway excursion, mid-air collision etc. can be managed to an acceptable level of safety. Unlike a process which requires the demonstration of predetermined standards, a risk-based method offers the sponsor no guarantee that alternative safety arguments will be successful until the process had been completed. An equally possible conclusion to the process could be that the most appropriate safety assurance could only be met by providing both runway facilities to instrument standards and Approach Control.

A risk-based methodology and process is outlined later in this document that may assist sponsors in structuring their safety assurance arguments. It is not intended that this process should be used to modify arrangements retrospectively at aerodromes where IAPs have been established and which already mitigate safety risks by complying with extant regulations. The guidance provided in this document reflects, for a given requirement, the circumstances under which an effective, alternative mitigation means and/or restrictions may be applied as part of the sponsor's safety assessment process.

⁸ CAP 760 - Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases: For Aerodrome Operators and Air Traffic Service Providers.

Legacy issues

As a result of this revised policy and the development of a more progressive risk-based process to deal with applications, the relatively small number of IAPs that still exist today under 'non-standard' arrangements are progressively being approved and published in the UK Aeronautical Information Publication (AIP). These 'Discrete' IAPs (DIAPs) have operated predominantly in remote locations of the UK for several years with some of the procedures effectively 'owned' by the aircraft operators and approved under private conditions of use. It will be necessary for these ownership arrangements to be regularised and for risk-ownership to be transferred to the respective aerodrome operators and the procedures published in the UK AIP with suitable caveats in terms of Prior Permission Required (PPR) and how the procedures may be used. The term 'Discrete' will no longer be accepted and these procedures will operate as approved IAPs promulgated in the UK AIP. Therefore, a 5-year periodic review of DIAPs will need to be carried out as part of the CAP 1616 Pt 1c process for these IAPs to be approved and published in the UK AIP.

For ATS and meteorological aspects, these will form part of the Air Navigation Service Provider's (ANSP) safety assurance and associated documentation developed in support of European Certification and subsequent CAA oversight; this documentation may form the basis of the new safety arguments for approval.

The advice of the CAA should be sought prior to commencing any work in order to ensure the correct process and procedures are followed to enable the approval and promulgation of the IAP and termination of the Discrete status.

Chapter 3

Implementation

The assessment and management of safety risk

An sponsor seeking to implement an instrument approach without an Approach Control service and/or which will terminate at a non-instrument runway will need to present an acceptable safety case to the CAA which demonstrates that relevant safety risks have been adequately assessed and mitigations put in place to minimise the risk of accident as far as reasonably practicable. Such IAPs will have an OCH of 500ft for CAT A and B aircraft, 600ft for CAT C and 700ft for CAT D applied as a minimum in all cases. In assessing the effectiveness of the proposed alternatives to a runway configured to instrument standards and/or to the provision of an Approach Control service, the sponsor will, as owner of the risk, need to be satisfied that the proposed alternative arrangements will provide a degree of residual risk which is sufficiently low to be acceptable. This process should be completed in accordance with, and managed through, the sponsor's Safety Management System (SMS).

The safety assessment by the sponsor is a key step toward gaining CAA approval for an IAP to be established under these terms and which will require carefully argued safety assurance documentation to be submitted to the CAA in accordance with the process described in CAP 1616, Pt 1c. Each sponsor will face a different set of local circumstances and the alternative safety arrangements will also vary from one aerodrome location to the next. The sponsor's assessment of proposed safety assurance will, therefore, be a most important step.

It is important for sponsors to note that approvals for the establishment of IAP under the arrangements outlined in this publication will be made on the basis of risk-based judgement. Where the sponsor has failed to provide acceptable safety assurance, via the safety case and the IAP design submission the CAA will be unable to accept the proposal.

Safety assurance process and documentation

As part of the Airspace Change Process (ACP), the sponsor will be required to carry out a safety assessment and produce a Safety Case in support of the application. Further guidance for sponsors is available in CAP 760.

Guidance in developing and assessing the merit of alternative safety mitigations which could be considered by sponsors and subsequently put forward to the CAA is provided at Chapters 4 and 5 to this document. Chapter 4 indicates where each part of the existing regulations currently provides mitigation against a specific accident type or types and Chapter 5 provides examples of potential alternative safety arguments for sponsors. These Chapters are intended to act as a guide to sponsors and CAA staff but should not be

considered to be the sole means of assessing and reviewing the safety risk associated with proposed alternative arrangements for the establishment of an IAP and the preparation and consideration of the associated Safety Case.

Post implementation continuing safety assurance

If an IAP is approved and, under this process has entered operational service, safety assurance activity must continue and will form part of the post implementation review which will normally be undertaken 12 months after the implementation of the IAP. The requirements for the post implementation review will be set out in the decision document published by the CAA.

Post-implementation review is part of routine CAA risk-based oversight activities at licensed aerodromes and certified ANSPs.

Sponsors of the IAPs need to ensure that IAP safeguarding, and 5-year periodic reviews are all completed by an Approved Procedure Design Organisation (APDO), as nominated by the sponsor, to maintain the safety during the lifespan of the IAP, in respect of the obstacle environment and any changes in procedure design criteria.

Chapter 4

Baseline Safety Arguments

Figure 1: Baseline top level strategy and goals

Goal 1						
The IAP at (aerodrome name) will be operated with an acceptable degree of safety						
Strategy 1						
Argument that the standards-based approach which requires approach control (iaw ANO Art 183) and a runway equipped to CAP168 Instrument Runway standards when used in combination with other risk-reduction measures, provides an acceptable degree of safety.						
The risk of a CFIT accident is acceptably low. (CFIT)	The risk of a runway excursion accident is acceptably low. (REXC)	The risk of a runway collision accident is acceptably low. (RCOLL)	The risk of a mid-air collision accident is acceptably low. (MAC)	The risk of a loss of control accident is acceptably low (LOC)	The risk of an accident during the introduction to service of a new IAP at this aerodrome is acceptably low. (INTRO)	The risk of an accident during the through-life operation of an IAP at this aerodrome is acceptably low. (THRULIFE)
Goal 1.1	Goal 1.2	Goal 1.3	Goal 1.4	Goal 1.5	Goal 1.6	Goal 1.7

The table above reflects the safety goals which are satisfied within the extant standards-based approach to the approval of IAPs at UK aerodromes. These and the underpinning safety statements in the table which follows form a baseline that describes the current approach for aerodromes providing Approach Control and a runway meeting CAP 168 Instrument Runway standards.

The IAP at (aerodrome name) will be operated with an acceptable degree of safety.

The argument that the standards-based approach which requires Approach Control iaw ANO Art 183 and a runway equipped to CAP 168 Instrument Runway standards, when

used in combination with other risk-reduction measures will provide an acceptable degree of safety.

Goal 1.1: The risk of a CFIT accident is acceptably low. (CFIT)	
CFIT 1 CAP 168 Instrument Runway Standards are met.	CFIT 1.1 CAP168 compliant instrument runway strip reduces the risk of a CFIT accident by an inaccurately positioned aircraft in the immediate aerodrome environment through provision of an area free from infrangible obstacles.
	CFIT 1.2 Instrument runway marking and lighting assists crews in visually detecting the runway by day and night and subsequently following an appropriate approach path to touchdown which will keep them clear of terrain and obstacles. In particular, AGL provides flight crew with location, orientation and alignment information in adverse visibility conditions and at night.
CFIT 2 ANO 183 Requirement for Approach Control is met.	CFIT 2.1 An ANSP with certification that includes Meteorological provision reduces the risk of CFIT by enabling Approach controller to provide accurate Altimeter setting (QNH) instructions, and Approach controller provides a confirmatory check of pilot readback.
	CFIT 2.2 An ANSP with certification that includes Meteorological provision reduces the risk of CFIT by enabling Approach controller to provide accurate meteorological information in the form of cloud base and visibility information.
	CFIT 2.3 Provision of Approach Control with surveillance reduces the risk of CFIT as the Approach Controller assumes some responsibility for terrain safety.
CFIT 3 The Aerodrome operator provides and maintains aerodrome terrain and obstacle data.	CFIT 3.1 All aerodromes in the scope of CAP 1616, Pt 1c are also in the scope of CAP1732⁹ , CAP 738¹⁰ , CAP 785¹¹ , which reduce the risk of CFIT by providing and maintaining aerodrome terrain and obstacle data. The aerodrome survey will be used by the APDO to design, safeguard and conduct 5-year periodic review of the IAP on behalf of the Aerodrome operator. This work is to ensure the ongoing safety of the aerodrome and the IAP as promulgated in the AIP.
CFIT 4 The IAP design has been conducted iaw PANS- OPS 8168 Vol II and the procedure	CFIT 4.1 Use of PANS-OPS IAP Design criteria reduce the risk of CFIT by permitting the aircraft to fly to an altitude and position from which either a landing or missed-approach may be flown whilst remaining terrain-safe.
	CFIT 4.2 The established procedures for designing and approving IAP designs (including simulator or flight validation process) provide participating aircraft with a flightpath which, if followed in flight, will keep them clear of terrain and obstacles.

⁹ CAP 1732 Aerodrome Survey Guidance

¹⁰ CAP 738 Aerodrome Safeguarding

¹¹ CAP 785 Approval Requirements for Instrument Flight Procedures for use in UK Airspace

notified in the UK AIP.	
CFIT 5 The integrity and accuracy of the navigation aids used for the instrument approach meet the required standards.	CFIT 5.1 The integrity and accuracy of the navigation aids used for instrument approaches are such that they will provide the crew of participating aircraft with sufficiently reliable and accurate guidance to enable them to follow the published IAP within the tolerable limits required to avoid flight into terrain or obstacles.
CFIT 6 The crew members of participating aircraft are suitably qualified and proficient to safely execute an IAP with sufficient accuracy to remain clear of terrain and obstacles.	CFIT 6.1 The flight crew training and qualification standards which must be met are sufficient to provide for IAPs to be flown safely and accurately, remaining clear of terrain and obstacles.
CFIT 7 The integrity and accuracy of the meteorological information provided by Approach and/or Aerodrome Control meets the required standards.	CFIT 7.1 At aerodromes that provide an Approach and /or Aerodrome Control service the risk of CFIT is reduced by the provision of meteorological information of the required integrity and accuracy including QNH, cloud base and visibility. As an ANSP with certification that includes Meteorological provision there is a requirement to ensure that all meteorological equipment used on the aerodrome shall meet the specifications stated in CAP 746¹² and shall ensure that staff providing meteorological information have and maintain Meteorological Observing competency in accordance with CAP 746.

¹² CAP 746 Requirements for meteorological observations at aerodromes

Goal 1.2: The risk of a runway excursion accident is acceptably low. (REXC)	
REXC 1 CAP 168 Instrument Runway Standards are met.	REXC 1.1 CAP 168 compliant Runway Dimensions, Markings, and lighting assist pilots in reducing the risk of runway excursion by enhancing visual determination of runway boundaries and touchdown area, thereby aiding early visual detection and stable approach to safe touchdown in the correct position.
	REXC 1.2 CAP 168 compliant instrument runway strip and Runway End Safety Area (RESA) assist in mitigating the effects should a runway excursion occur.
REXC 2 ANO 183 Requirement for Approach Control is met.	REXC 2.1 Approach control provides crew with information on runway condition which will assist in reducing the risk of a runway excursion accident.
	REXC 2.2 An ANSP with certification that includes Meteorological provision reduces the risk of REXC by enabling Approach controller to provide accurate surface wind information which will assist in reducing the risk of a runway excursion accident.
REXC 3 The IAP design has been conducted iaw PANS OPS 8168 vol II and Appendix B of this document and the procedure notified in the UK AIP. The AIP is used as the source data for RNP coding of the RNP approaches in aircraft navigation databases and brings the required degree of data integrity.	REXC 3.1 Use of PANS-OPS IAP Design criteria reduces the risk of runway excursion by permitting the aircraft to fly to an altitude and position from which the pilot can decide whether it is either safe to land or may execute a missed approach.

REXC 4 The integrity and accuracy of the navigation aids used for the IAP meet the required standards.	REXC 4.1 The integrity and accuracy of the navigation aids used for IAPs are such that they will provide the crew of participating aircraft with sufficiently reliable and accurate guidance to enable them to follow the published IAP within the tolerable limits required to allow a safe landing to be made on the runway or a safe missed approach to be executed.
REXC 5 The crew members of participating aircraft are suitably qualified and proficient to safely execute an IAP with sufficient accuracy to allow a safe landing to be made on the runway or to execute a safe missed approach.	REXC 5.1 The flight crew training and qualification standards which must be met are sufficient to provide for IAPs to be flown safely and accurately, to a position in space from which a safe landing can be made on the runway or a missed approach can be executed safely.
REXC 6 Runway excursions include runway overruns, where an aircraft is unable to stop before it reaches the end of the runway. They can also happen because of, for example pilot error, poor weather or a	REXC 6.1 Pilots have the time available to fly the IAP including the missed approach (MAP) should it be required to be flown, to ensure the approach is stabilised and not rushed. (Runway excursions can occur because of an IAP being continued when the MAP should have been flown.)
	REXC 6.2 IAP designs are standard and straight forward to enable pilots to understand the requirements of the IAP as published in the AIP.