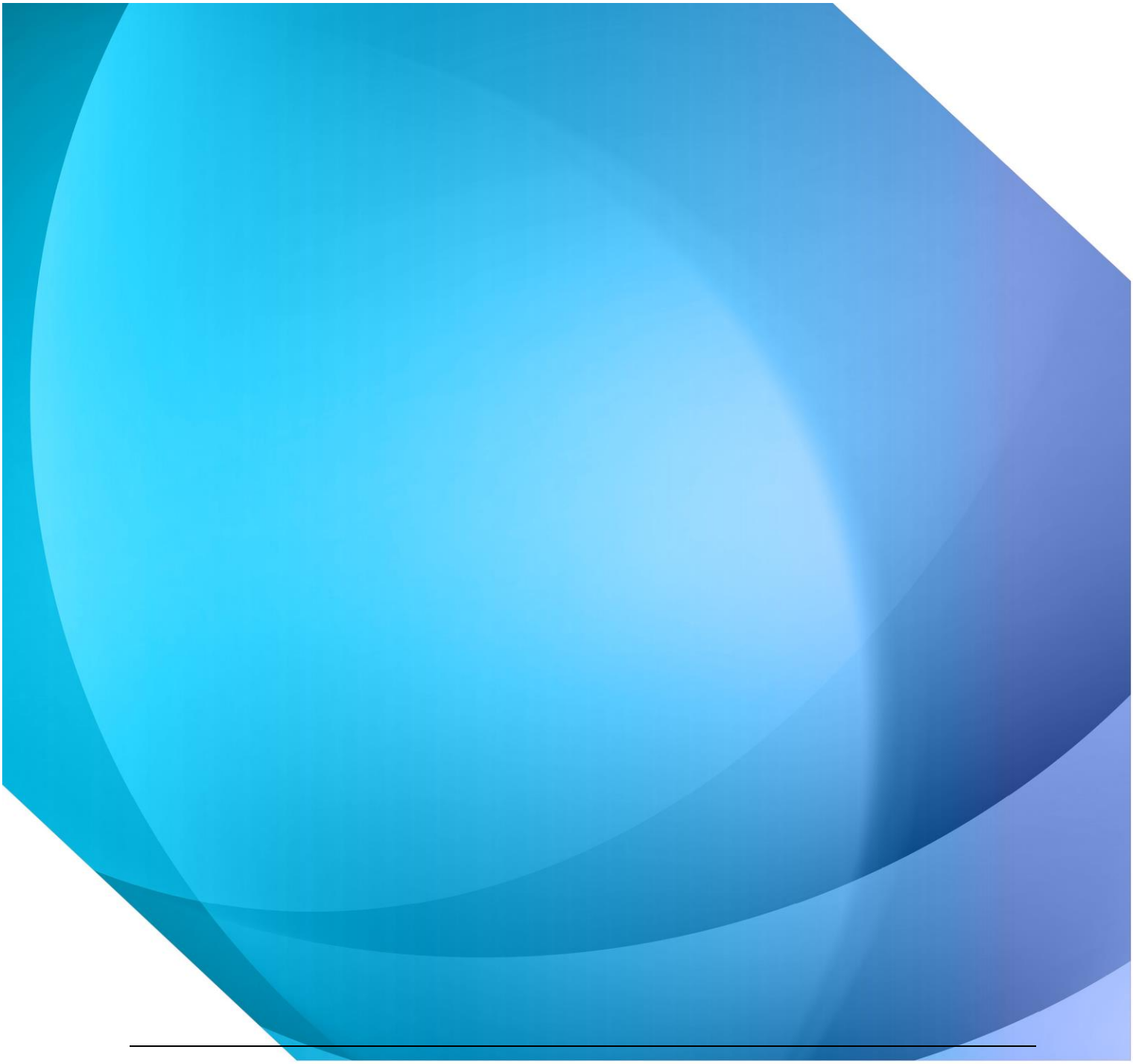
Safety and Airspace Regulation Group

CAP 785B: Implementation and Safeguarding of Instrument Flight Procedures (IFPs) in the UK.



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Revision History and effective page

Edition 1 Published in 2010

The first edition of CAP 785 was published in 2010 after the outsourcing of the IFP design service to the industry. This document explained the process to become an Approved Procedure Design Organisation for the delivery of IFP design and provided clarification on the CAA process to approve IFP designs before their implementation in the UK AIP.

Edition 2 version 1 Published in August 2022

CAP 785 was fundamentally revised between 2020-2022 to reflects the changes introduced by the implementation of the UK Reg (EU) 2017/373 for service providers and to describe the CAA regulatory functions. Therefore, the edition 2 is split in two volumes, CAP 785A “Oversight of Approved Procedure design Organisation” and CAP 785B “Implementation and Safeguarding of IFPs in the UK”.

Edition 2 Version 2 Published in September 2022

CAP 785B version 2 addresses linguistic inconsistencies and ensures uniformity with CAP 785A “Oversight of Approved Procedure Design Organisation” references.

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Content

Foreword

The CAP 785B is based upon national legislation and non-legislative regulatory material, such as ICAO Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS). It is published in order to provide UK CAA Approved Procedure Design Organisations (APDOs) with:

a. guidance and clarification on the means of achieving compliance with UK regulatory requirements, ICAO SARPs and PANS; and,

b. details of any additional national requirements, including appropriate supporting administrative procedures.

Two strands of UK aviation related legislation now exist. That made under the Air Navigation Order (which includes the Rules of the Air Regulations) and that made under The Basic Regulation (UK Reg (EU) No 2018/1139 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018) and its Implementing Rules.

Some EU aviation law was accompanied by acceptable means of compliance (AMC) and guidance material (GM) published by EASA. The CAA has adopted the version of AMC and GM that was in force on 31 December 2020 as its policy with regard to compliance with the relevant UK law from 1 January.

In publishing the CAP 785B, the CAA satisfies the obligations placed upon it by the Transport Act 2000[1], Chapter 1 Article 2 'CAA's general duty', which in paragraph 2(a) requires the CAA to exercise its functions under the Act in the manner it thinks best calculated, to further the interests of operators and owners of aircraft, owners and managers of aerodromes, persons travelling in aircraft and persons with rights in property carried in them. The only interests to be considered under subsection (2)(a) are interests regarding the range, availability, continuity, cost and quality of air traffic services.

Publication of the CAP 785B additionally satisfies the requirements set out by the Civil Aviation Authority (Chicago Convention) Directions 2007[2] to ensure that it acts consistently with the obligations placed on the UK under the Chicago Convention. The CAA is obliged to consider whether it is necessary to amend United Kingdom aviation legislation to ensure the appropriate implementation of an ICAO provision.

Where (a) the CAA considers it inappropriate to transpose an ICAO provision into domestic legislation and (b) the CAA has discretionary power to enforce the requirements of such a provision through a certificate, licence, or other means of approval, the Civil Aviation Authority (Chicago Convention) Directions 2007 obliges the CAA to develop and publish

[1] http://www.legislation.gov.uk/ukpga/2000/38/contents or http://www.legislation.gov.uk/ukpga/2000/38/data.pdf

[2] https://webarchive.nationalarchives.gov.uk/20100422174722/http://www.caa.co.uk/docs/286/CAA(ChicagoConvention)Directions2007(asamended).pdf

such requirements as are necessary to implement the ICAO provision and shall ensure that it is able to verify adherence to those requirements.

The CAP 785B is subject to periodic revision to take account of changes to source regulatory material, feedback from industry, and recognised best practices. The CAP 785B provides applicable guidance and clarification relating to – and is to be read in conjunction with - the regulatory material referenced below. **Non-inclusion of source regulatory material within this CAP does not preclude the end user from either the need to be aware of, or the need to comply with, the requirements contained within the source regulatory materials unless otherwise exempted from those requirements.**

It is the policy of the UK government that, unless a Difference from an ICAO Standard has been established, compliance with the relevant international (i.e. ICAO and applicable equivalents such as the International Telecommunications Union) provisions is required to the extent mandated in law. Moreover, unless an alternative 'Means of Compliance' (AltMoC) (related to a CAA 'Acceptable Means of Compliance' (AMC)) has been approved for use, then compliance with the relevant AMC is required to the extent mandated in the law as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018. Finally, compliance with other national requirements that are not addressed by international requirements or retained EU regulations is also required.

The words 'must', 'shall' and 'will' indicate that compliance with applicable regulatory requirements is necessary. In the case of AMC the word 'should' indicates that compliance is required, unless acting in compliance with an approved AltMoC

Regulatory References:

The CAP 785B is published to assist APDOs' understanding of, and compliance with the requirements laid down in:

ICAO:

- Annex 4 to the Convention of International Civil Aviation – Aeronautical Charts.
- Annex 11 to the Convention of International Civil Aviation – Air Traffic Services.
- Annex 14 to the Convention of International Civil Aviation – Aerodromes.
- Annex 15 to the Convention of International Civil Aviation – Aeronautical Information Services.
- ICAO Doc 8168 Procedures for Air Navigation Services – Aircraft Operations – Volume I "Flight Procedures" Sixth Edition, 2018.
- ICAO Doc 8168 Procedures for Air Navigation Services – Aircraft Operations – Volume II "Construction of Visual and Instrument Flight Procedures" – Seventh Edition, 20202.
- ICAO Doc 8697 Aeronautical Chart Manual – Third Edition 2016.

- ICAO Doc 9368 Instrument Flight Procedures Construction Manual – Second Edition, 2002.
- ICAO 9613 Performance Bases Navigation Manual – 4th Edition, 2013.
- ICAO Doc 9906 Quality Assurance Manual for Flight Procedure Design – Volume1– Flight Procedure Design, Quality Assurance System – 1st Edition, 2009. Amendment No 1 2013
- ICAO Doc 9906 Quality Assurance Manual for Flight Procedure Design – Volume 2– Flight Procedure Designer Training – 1st Edition, 2009. Amendment No 1 2013
- ICAO Doc 9906 Quality Assurance Manual for Flight Procedure Design – Volume 3– Flight Procedure Design, Software Validation – 1st Edition, 2010. Amendment No 1 2013
- ICAO Doc 9906 Quality Assurance Manual for Flight Procedure Design – Volume 5– Validation of Instrument Flight Procedures – 1st Edition, 2012.
- ICAO Doc 9906 Quality Assurance Manual for Flight Procedure Design – Volume 6– Flight Validation Pilot Training and Evaluation – 1st Edition, 2012.
- ICAO Doc 10066 Aeronautical Information Management – 1st Edition 2018.
- ICAO Doc 10068 Manual on the Development of a Regulatory Framework for Instrument Flight Procedure Design Service – 1st Edition, 2018.

UK:

- UK Reg (EU) No 2017/373 Laying down the common requirements for providers of air traffic management/air navigation services and other air traffic management network functions.
- UK Reg (EU) No 73/2010 updated by the UK Reg (EU) 2014/1029 and amended by the UK Statutory Instrument 2019 No.459.
- Official Record Series 5 – CAA Scheme of Charges (Instrument Flight Procedures).

Introduction

The UK Civil Aviation Authority (CAA) is the competent authority for the United Kingdom for the approval of Instrument Flight Procedures (IFP).

The Air Navigation Order 2016 as amended requires the CAA to approve IFPs for the use in the UK and enables us to approve suitable organisations to submit designs for approval.

The design of IFP was outsourced from us to Industry in 2010, subsequently we have adopted the role of a regulator rather than a service provider in respect of IFP design activities.

Standards specified in this publication shall be read in conjunction with International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs) and any nationally filed differences. Where there is a difference between this document and the standards defined by ICAO, the standard in this document shall prevail.

The provision of IFP design services is regulated in the UK by the oversight of Approved Procedure Design Organisations (APDOs) who deliver IFP services to the industry and by the approval of IFPs before their implementation in the UK Aeronautical Information Publication (AIP).

The specific requirements for the implementation of IFPs are described in this volume while the requirements to oversee APDOs are described in CAP 785A “Oversight of UK Approved Procedure Design Organisations”.

The development of IFP is a process by which Instrument Flight Procedure Designers will apply design techniques and knowledge referring to numerous published international and/or national publications. The list of references in this Civil Aviation Publication (CAP) is voluntary conservative and IFP designers also must refer to all applicable publications not mentioned in this CAP for the design of IFPs.

Definitions

- **Aeronautical Information Publication (AIP)** – A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.
- **Approved IFP designer (APD)** – An Instrument Flight Procedure (IFP) Designer who has been approved (with or without restricted privileges) by the CAA to design IFPs within an Approved Procedure Design Organisation. (CAA)
- **Approved Procedure Design Organisation (APDO)** – An IFP Design Service Provider approved in the UK for the provision of IFP Design Service.
- **Independent Approved IFP designer (IAPD)** – An Approved IFP Designer who is involved in any IFP design validation activities, operating within the same QMS as the designing APD. (CAA)
- **Instrument Flight Procedure Quality Management System (IFP QMS) -** A set of processes and procedures, mainly described in a manual, required for the planning and execution of Instrument Flight Procedure activities to ensure that quality assured procedures are provided in support of ATM operations.
- **Instrument Flight Procedure Design Service (IFP DS) -** A service established for the design, documentation, validation, maintenance, safeguarding and periodic review of IFPs necessary for the safety, regulatory and efficiency of air navigation.
- **Instrument Flight Procedure Design Service Provider (IFP DSP)** – An IFP DSP is a body that provides an IFP Design Service.
- **Instrument Flight Procedure (IFP) –** A Standard Instrument Departure (SID), a Standard Instrument Arrival (STAR), an approach transition, an initial approach procedure or an Instrument Approach Procedure (IAP)
    - **Standard Instrument Departure (SID)** – A designated IFR departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences.
    - **Standard Instrument Arrival (STAR)** – A designated Instrument Flight Rules (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published IAP can be commenced. (ICAO – Annex 11 ‘Air Traffic Services’)
    - **Omni-Directional Departure** – A departure which provides a quantitative level of safety to aircraft departing IFR for those aerodromes in the UK which accommodate such operations which do not normally have notified SIDs in the UK AIP.
    - **Approach Transition** – A PBN flight procedure that links the Standard Instrument Arrival (STAR) to the Initial Approach Fix (IAF) or Intermediate Fix (IF) of an Instrument Approach Procedure (IAP).

- **Initial Approach Procedure** – A stand-alone conventional initial approach procedure following the completion of an existing STAR terminating at the intermediate fix (IF) or final approach fix (FAF). This can typically be used to facilitate RCF procedures.
- **Instrument Approach Procedures (IAP)** – series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, a missed approach to a position at which holding and/or an altitude which ensures en-route obstacle clearance criteria is met.
- **APV/Baro-Vertival Navigation (VNAV)** – An IAP which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations. (ICAO PANS-OPS DOC 8168)
- **Performance Base Navigation (PBN) T- or Y- Bar Procedure** – A PBN non-precision approach or APV incorporating a T- or Y- bar arrangement. It is based on a runway aligned final segment preceded by an intermediate segment and up to three initial segments arranged on either side of, and along, the final approach track to form a T or Y. The lateral initial segments are based on course differences of 70° to 90° from the intermediate segment track.
- **Holding** – a predetermined manoeuvre which keeps an aircraft within a specified volume of airspace. (CAP 393)
- **ATCSMAC** – The Air Traffic Control Surveillance Minimum Altitude Chart shall provide information that will enable flight crews to monitor and cross-check altitudes assigned by a controller using an ATS surveillance system.

- **Authorised Source** – Person ultimately accountable for aeronautical information published in the UK AIP. (CAP 1054)
- **Data originator** – Person or persons authorised to originate aeronautical information and data on behalf of the ‘Authorised Source’. (CAP 1054)
- **Flyability of an IFP** – Determined by an assessment completed in a full flight simulator (ground validation) or an aircraft (flight validation) to check that the IFP is flyable by the anticipated range of aircraft types in various weight, speed and centre of gravity configurations, and in various weather conditions (temperature, wind effects and visibility). It is also designed to assess that the required aircraft manoeuvring is consistent with safe operating practices, and that flight crew workload is acceptable (CAA)
- **Sponsor** – An aerodrome operator or representative from an aerodrome acting on the operator’s behalf, or an ANSP, who proposes a new IFP design, changes to, or withdrawal of an existing IFP.

Chapter 1
IFP Roles and Responsibilities

INTRODUCTION

1.2 This chapter defines the sponsors' responsibilities with regard to Instrument Flight Procedure (IFP) design activities and identifies interactions during the development of IFP designs and implementation of IFPs in the UK AIP. This Chapter also clarifies the differences in responsibilities between IFP sponsors (Aerodrome Operators and ANSPs) and APDOs.

RESPONSIBILITIES

1.3 UK Civil Aviation Authority (CAA).

a. The CAA is responsible for the oversight of APDOs as described in the Civil Aviation Publication (CAP) 785A "Oversight of UK Approved Procedure Design Organisations" and for the regulatory approval of Instrument Flight Procedures before their implementation in the UK AIP and/or AIP Supplement.

1.4 IFP Sponsor.

a. The CAA considers that the sponsorship of IFP depends on the type of procedures, also influenced by their starting point located below or above the transition altitude (3000ft, 5000ft or 6000ft) and is identified as follows:

Aerodrome Operator	En-Route Air Navigation Service Provider (ANSP)
IAPs and associated hold (both conventional and PBN)	STARs
Conventional Initial Approaches	PBN approach transition[3]
Conventional Direct Arrival	Holding procedure at the end of the STAR, and any contingency hold associated with a PBN Approach transition
SIDs	N/A
Omni-directional Departures	N/A

Table 1 - IFP sponsors responsibilities

[3] Occasions may exist where it is appropriate for the aerodrome operator to sponsor either or both procedure types

b. A change in the airspace structure impacting both the IFPs above and below 6000ft should be coordinated by the Airspace Change Process sponsor.

1.5 IFP sponsors are responsible for:

a. Initiating any new design or changes to an IFP via the CAP 1616 process in compliance with all applicable Civil Aviation Publications (CAPs) or CAA policies.

b. Ensuring that the IFP Periodic Review and IFP safeguarding are completed in accordance with the requirements published in CAP 785A and CAP 785B and all applicable IFP policies.

c. Ensuring that the validation activities are conducted as part of the development IFP Process for any new or changed IFP.

d. Ensuring that the payment of IFP regulatory charges as detailed in the CAA Scheme of Charges (Instrument Flight Procedures) is made via the DAP 1917 form and submitted to the CAA along with the IFP design submission. The CAA recommends that sponsors should liaise with their APDO to ensure that the DAP 1917 form reflects the number of procedures included in the IFP design package being submitted for CAA approval.

e. Ensuring that the Aeronautical Information Publication Change Request is submitted to AIS following approval by the CAA either at Stage 6 of CAP1616 or after a periodic review approval.

f. Ensuring that the contracted APDO is carrying out IFP design activities in compliance with the design privileges identified in the certificate.

g. Ensuring that the aeronautical dataset published in the relevant sections of the UK AIP is correct, valid, and reflects the current aerodrome information (survey and other information).

1.6 Approved Procedure Design Organisation.

a. They are responsible for ensuring the following as a minimum:

- The provision of all IFP design activities (IFP Design, periodic reviews and safeguarding) are in accordance with their IFP Quality Management System and the privileges for their designers as detailed in their APDO certificate.
- The delivery of IFP design service is provided in accordance with the requirements set up in CAP 785A and CAP 785B.
- Engaging with the CAA (Airspace Regulation) if they seek clarification

concerning IFP design activities.

- Ensuring that the aeronautical dataset as published in the relevant UK AIP sections is correct, valid and reflects the current aerodrome information (particularly the survey) as part of their contractual arrangement with sponsors.
- Ensuring that the aeronautical data and dataset are compliant with the aeronautical data requirements as detailed in CAP 1054.

Chapter 2
Validation of Instrument Flight Procedures

Air Navigation Order 216 article 187:

(2) The CAA must not notify or approve an instrument flight procedure unless it is satisfied that the procedure is safe for use by aircraft.

INTRODUCTION

2.1 The purpose of this chapter is to set out the criteria for the validation of IFPs before approval and implementation to ensure that a procedure developed by an APDO is safe for use by aircraft.

2.2 ICAO PANS-OPS Doc 8168 Vol II, Part I, Section 2, Chapter 4; ICAO Doc 8071 Volume 1 Chapter 8 and Volume II Chapter 5 and ICAO Doc 9906 Vol 1 “Flight Procedure Design Quality Assurance System” alongside the UK differences to ICAO form the provision for the development and the validation of IFPs in the UK.

2.3 Consequently, the UK CAA considers that the validation activities (ground and/or flight validation and, in the case of PBN IFPs, an additional navigation database validation) become part of the package of IFP design activities that the industry will be required to complete.

SCOPE

2.4 This chapter addresses:

a. The ground validation of IFPs.

b. The flight validation of IFPs.

c. The database validation of PBN IFPs.

d. The flight validation crew and simulator/aircraft requirements.

e. The meteorological conditions required for conducting flight validations

VALIDATION

2.5 The validation of IFPs is the final step in the procedure design process, before approval for publication in the AIP. The purpose of validation is to confirm the accuracy and completeness of all relevant obstacles and navigation data, reveal any errors in the application of IFP design criteria, and assess the flyability of the IFP. It comprises a ground validation ("compliance check" element to be completed by an APD and a flyability check typically using a simulator) and may also comprise a flight validation element. It is to be noted that if sponsors wish to implement PBN procedures, a database validation is also required.

2.6 As part of the ground/flight validation flyability assessment, the validation pilot will provide a detailed assessment of the human factors element of each procedure e.g. crew workload and charting issues. These activities (proposed ground (simulator) and/or flight validation) shall be detailed in a plan submitted for agreement with the CAA Airspace Regulators (IFP). The CAA considers that these activities should be conducted objectively by the validation pilots and that IFP sponsors shall not take part in the validation activities.

2.7 Where deemed appropriate by the sponsor and in conjunction with the APDO, a rationale can be submitted to the CAA for a flight validation to be conducted in place of a ground validation in a simulator. For example, validations at smaller aerodromes may be more cost effective/efficient to carry out via a flight validation as opposed to ground validation (simulator).

VALIDATION PLAN

2.8 The purpose of the validation plan is to ensure that the proposed timings, scope, service provider/equipment and objectives of the validation activities are identified and agreed between the sponsor, the APDO, the validation pilot(s), and the CAA prior to the activities being carried out.

2.9 A validation plan is required to be submitted for all simulator/flight validation activities and shall be submitted to the CAA at the time of IFP submission. Agreement from the CAA is required prior to any validation activities being carried out. The validation plan will form the basis of the validation activities conducted by the validation pilots.

2.10 As a minimum the validation plan shall include the following items:

a. Information relating to the Validation Pilots including qualifications.

b. Aircraft/simulator to be used including avionics.

c. Name of the navigation database provider (DAT provider).

d. Planned date and time of the validation activities to identify the potential impact on the ACP (this is for project planning purposes).

e. Where applicable the plan shall include the detail for the validation of VM(C) area and night validation, making sure to specify if there are no existing IFPs or if the use of night operations is new at the aerodrome.

f. The documentation containing each sequence of the validation runs i.e. which procedure, wind velocity, weight, low/high temperature.

g. The details of any IFP/elements of the procedure/segments that require the assessment of the IFP flyability under varying wind conditions.

h. The details of any IFPs with minimum segment lengths which will need to be flown at maximum speeds in varying wind conditions identified as appropriate to the aerodrome, e.g. this will include average wind and extreme wind conditions experienced at the aerodrome in the previous 5 years;

i. The IFP APDO draft charts, coding tables and FAS DBs as applicable in order to facilitate the validation.

j. While the default is for all IFP segments to be assessed, if a segment within a SID/STAR is considered by the sponsor to not need validation, the CAA will consider and assess the rationale and the evidence provided by the sponsor and the APDO.

k. Provide a clear explanation of the expected output from the validation activities.

l. For validation at aerodromes with no existing IFPs:

- A plan view of the final approach obstacle evaluation template, drawn on an appropriate topographical map of scale 1:50,000 or appropriate aeronautical chart to demonstrate safe use for navigation, the elevated terrain analysis and the obstacles and obstructions evaluation.
- All completed documents identifying the associated terrain, obstacles and obstructions as applicable to the procedure. The controlling terrain/obstacle should be identified and highlighted on the appropriate chart.

m. Details of how the navigation database validation will be completed and by whom (refer to Appendix H).

GROUND VALIDATION

2.11 The overall objective of the ground validation is to reveal any errors in the application

of the IFP design criteria, the production of the associated design documentation and to assess the flyability of the IFP. There are two elements to the ground validation both of which are essential for the approval of IFPs:

a. **The compliance check:** An independent and approved IFP designer (APD) performs the compliance check to ensure the IFP designs are developed in accordance with the APDO IFP QMS and in compliance with the ICAO PANS-OPS criteria and the UK differences and ensure that the IFP designs are fit for purpose and meets the IFP Sponsor's requirements.

b. **Flyability check:** A validation pilot performs a flyability assessment using a full flight training simulator which can be used to evaluate a range of aircraft types in various weight, speed and centre of gravity configurations, and in various weather conditions (temperature, wind effects and visibility). This step is also the opportunity to evaluate the flyability of most procedures and any human factors impacts, particularly if the IFPs create additional work for the crew.

2.12 Where a flyability assessment is conducted using a full flight training simulator, the following elements shall be evaluated as a minimum:

a. All segments of the IFPs shall be assessed, except in exceptional cases if justified.

b. SIDs - all segments of the procedure from the departure end of the runway (DER) to the en-route structure or termination point shall be assessed.

c. STARs – all segments of the procedures shall be assessed including the entry and exit of any holds to the next IFP (this may be an existing IFP).

d. Conventional initial approach and Area Navigation (RNAV) approach transitions - all segments of the procedure shall be assessed ensuring that that the previous STAR is selected to ensure they can be selected together and have no disconnect/by-pass issues.

e. IAPs - all segments of the procedure from the arrival/initial fix through to the missed approach shall be assessed at least once. The final approach and missed approach segments for each line of minima will be required to be assessed. The assessment shall include an approach to a successful landing at least once.

f. The sponsor in conjunction with the IFP designer and the validation pilot may put forward a case via the validation plan to reduce some elements of the SIDs or STARs validation where they believe there is a valid justification and supported

by evidence.

g. At an aerodrome where more than one aircraft type will use the proposed SIDs and STARs e.g., Boeing 738 and Airbus A320, both types will need to be included in the validation activities.

2.13 In the case of PBN IFPs, a navigation database for testing purposes in the full flight training simulator produced by an appropriate navigation data provider for use in the flight management system/computer (FMS/C) shall be used.

2.14 Where a ground (simulator) validation cannot fully verify the flyability of the IFP, the CAA may decide a flight validation is required by considering various factors. These include, but are not limited to the following:

a. Deviations from ICAO PANS-OPS Doc 8168 IFP design criteria.

b. For steep approaches of 4.5° or steeper.

c. Procedures designed for use in complex airspace where close coordination between ANSPs is required to mitigate risks, mountainous terrain area and/or a dense obstacle environment.

d. The introduction of new procedures at an aerodrome. For example, PinS or Required Navigation Performance (RNP) approaches or IFPs for use at an aerodrome with a non-instrument runway with or without approach control.

e. A procedure type that is new to the UK.

f. Special crew procedures and/or operational techniques that are likely to be necessary to fly the procedures.

g. As recommended by the validation pilot and/or the approved IFP designer (APD).

FLIGHT VALIDATION

2.15 Flight Validation is a flyability assessment conducted in an aircraft and shall be carried out in cases where ground (simulator) validation determines that flight validation is necessary or as specified in 2.14.

2.16 The objectives are:

a. Obstacle verification.

- Verify the obstacle that is identified as the controlling obstacle for each segment and check that no new obstacles have been erected since the design was undertaken, or that no existing obstacles have been charted with grossly incorrect heights along the designated track.

- The Obstacle verification is carried out in daylight hours in Visual Meteorological Conditions (VMC) and is flown at the minimum published altitude. The final approach segment should be flown at an altitude of 30m (100ft) below the proposed minimum descent altitude on a non-precision approach and should be flown ½ scale deflection low, evaluated according to the decision altitude on a precision approach.

b. Flyability Assessment.

- The following elements shall be evaluated as a minimum:
  - All segments of the IFPs shall be assessed except in exceptional cases if justified (see 2.10 j).
  - SIDs - all segments of the procedure from the departure end of the runway (DER) to the en-route structure or termination point shall be assessed.
  - STARs – all segments of the procedures shall be assessed including the entry and exit of any holds to the next IFP (this may be an existing IFP).
  - Conventional initial approach and RNAV approach transitions -all segments of the procedure shall be assessed ensuring that the previous STAR is selected to ensure they can be selected together and have no disconnect/by-pass issues.
  - IAPs - all segments of the procedure from the arrival/ initial fix through to the missed approach shall be assessed at least once. The final approach and missed approach segments for each line of minima will be required to be assessed. The assessment shall include an approach to a successful landing at least once.
  - Visual Manoeuvring (Circling) area shall also be assessed at an aerodrome where IFPs are introduced for the first time.
  - The sponsor in coordination with the IFP designer and the validation pilot may put forward a case to reduce some elements of the SIDs or STARs validation where they believe there is a valid justification and supported by evidence.
  - If the IFPs are expected to be used at night at an aerodrome with no existing night IFR operations or any existing IFR procedures, validation is also required at night **following the successful**

validation of the procedures during daytime in accordance with the met conditions (2.20). An example would be IFPs to aerodromes without approach control wishing to implement RNP approaches at night in uncontrolled airspace. This activity will assess if the IFP is flyable and if visual references can be obtained by pilots during night operations on reaching the IAP minimums.

c. In the case of PBN IFPs, a navigation database for testing purposes produced by an appropriate DAT provider for use in the navigation system shall be used.

- However, for aerodromes where only **Category (CAT) A/B Lateral navigation (LNAV) ONLY IAPs** which are standard T/Y Bar designs (i.e. no reduced segment length, no turns at the Missed Approach Point (MAPt), or fly over waypoints after the MAPt with Track to Fix (TF) and Fly-By waypoints (not including the MAPt), manual entry of the procedure into the onboard navigation system in use may be acceptable and will be considered by the CAA on a case by case basis. In this scenario, the validating pilot will need to manually activate the Course Deviation Indicator (CDI), scaling changes during the different phases of the flight. Note: This option is not applicable for Ground (simulator) Validation or procedures involving a turn at the MAPt waypoint or where a Course to Fix path terminator has been used within the design.

VALIDATION PILOT/CREW REQUIREMENTS

2.17 Ground Validation (simulator)

a. Commercial Pilot's Licence or Airline Transport Pilot's Licence (A) or (H) as applicable.

b. Instrument Rating.

c. Flight Instructor Rating with applied instrument instruction privileges or Instrument Rating Instructor Rating.

d. The minimum crew requirements for the use of a simulator shall be met. e.g. two pilots with appropriate ratings is required.

e. The CAA considers that knowledge in ICAO PANS-OPS Doc 8168 Volume II is beneficial for one of the pilots conducting the validation activities, and in the case of PBN procedures, knowledge and understanding of ARINC 424 path terminators/coding.

2.18 Fight Validation (Aircraft)

a. Commercial Pilot's Licence or Airline Transport Pilot's Licence (A) or (H) as applicable.

b. Instrument Rating.

c. Flight Instructor Rating with applied instrument instruction privileges or Instrument Rating Instructor Rating.

d. The minimum crew requirements for the aircraft shall be met e.g. one pilot flying and one pilot as the observer to assist the pilot in the validation process while observing the “out of cockpit” environment for a Single Engine Piston (SEP) or a Multi Engine Piston (MEP).

e. It is desirable for one of the pilots to have ICAO PANS-OPS Doc 8168 Volume II knowledge, and in the case of PBN procedures, knowledge and understanding of ARINC 424 path terminators/coding.

SIMULATOR/AIRCRAFT REQUIREMENTS

2.19 The simulator/aircraft to be used for ground/flight validation of an IFP shall have the appropriate performance capabilities to meet the categories for which the IFP has been designed. E.g. a SEP cannot be used to validate a procedure up to CAT D aircraft.

METEOROLOGICAL CONDITIONS

2.20 All IFP validation flights shall be conducted during daylight hours in visual meteorological conditions (VMC), which allow the flight to be carried out with a flight visibility of not less than 8KM, and in sight of the surface throughout the flight validation of the procedure. When required, validation flights conducted at night shall also be carried out in VMC, which allows the flight to be carried out with a flight visibility of not less than 8KM, and in sight of the surface throughout the flight validation of the procedure.

NAVIGATION DATABASE VALIDATION

2.21 The validation of the database, which is developed using ARINC 424, is only required for PBN IFPs and intends to define the specific nominal tracks which are defined by waypoint location, waypoint type, path terminator and, where appropriate, speed constraint, altitude constraint and course.

2.22 This step is a gross error check to ensure an IFP approved and published in the AIP can be correctly coded in an aircraft navigation database (which will be effective on the applicable AIRAC date). The key element of this validation is to ensure that the coding

of the procedure in the Flight Management System/Computer (FMS/C) navigation system does not compromise the flyability of the IFP.

2.23 Once an IFP is approved, the procedure enters the AIS promulgation process and distributed to the navigation database providers. When the database is available with the IFP included (normally available 7-10 days before the effective date of the IFP), the navigation database can be validated in the aircraft FMS/C or an appropriate desktop trainer with the navigation database containing the IFP for the applicable AIRAC. The IFP does not need to be flown for the purposes of this validation step.

2.24 This validation shall be conducted using the charts and coding tables approved by the CAA and published in the UK AIP. The elements to be checked are set out in the navigation database validation report in Appendix HH.

2.25 This activity shall be carried out by a validator who has the appropriate competency to operate the validation tool i.e. FMS/C in a simulator/aircraft or appropriate desktop trainer.

2.26 If issues are raised or the validation is unable to be completed until after the effective IFP implementation (AIRAC), an appropriate NOTAM action shall be required to resolve the issues or delay the effective date (AIRAC) until the issues are addressed.

REPORTS

2.27 The result(s) of ground validation shall be documented in the following reports with supporting evidence:

a. **APDO validation report** (Document/form within APDO QMS)

- A report to capture the ground validation (commonly known as compliance check) completed by both the approved IFP designer and the independent IFP designer in accordance with the organisation's IFP QMS.

b. **Ground (SIMULATOR) validation report** (Appendix F) and the supporting evidence:

- A form to capture the ground validation (simulator) by the validation pilot who assessed the IFPs.
- Video of the Navigation Display (ND)/Primary Flight Display (PFD) within the simulator whilst the procedure is being flown.
- A snapshot of the navigation database being used within the aircraft FMS/C.

- The validation plan parameters, chart coding tables and Final Approach Segment Data Block (FAS DB as applicable) used during the validation.
- Any additional items assessed to be documented in the report.
- Any issues encountered relating to the IFPs shall be documented in the report.

2.28 The result of the Flight Validation shall be documented in the following reports with supporting evidence:

a. **Flight Validation Report** (Appendix G) and supporting evidence:

- A form to capture the flight validation by the validation pilot who assessed the IFPs.
- A Track Log of the IFPs flown provided in .gpx or .kml format.
- A snapshot of the navigation database being used within the aircraft (FMS/C).
- Validation plan parameters, charts, coding tables and Final Approach Segment Data Block (FAS DB as applicable) used during the validation.
- Any additional items assessed to be documented in the report.
- Any issues encountered relating to the IFPs shall be documented within the report.
- METARs and TAFs applicable for the duration of the validation activities.
- In the case of PBN procedures, a snapshot of the Receiver Autonomous Integrity Monitoring (RAIM) check ahead of the validation activities.

b. All completed validation forms and supporting evidence shall be submitted to the CAA prior to the final approval of the IFPs and before the implementation in the UK AIP with the exception of the Navigation Database Validation form.

2.29 The result of Navigation Database Validation shall be documented in the following report:

a. **Navigation Database Validation Report** (Appendix H)

- A form to capture the navigation database validation by the validator who completed the validation.
- This form shall be completed and submitted to the CAA prior to the effective date of the IFP (AIRAC). Failure to do so will result in the IFP

being NOTAM'd unavailable. The NOTAM can be cancelled once the validation has been completed and approved by the CAA.

Chapter 3
Approval of Instrument Flight Procedures

Air Navigation Order 216 article 187:

(1) An instrument flight procedure within the United Kingdom must not be notified unless that procedure has been designed or approved by the CAA.

INTRODUCTION

3.1 As legally required by the Air Navigation Order, the CAA only accepts IFPs designed by CAA APDO and considers two scenarios for the approval of IFPs: The Airspace Change Process (ACP) and periodic review. This chapter describes the processes and the requirements applicable to these scenarios.

NEW or AMENDED IFPs

3.2 The introduction of new IFPs or amendments to existing IFPs shall be carried out in accordance with the process as set out in CAP 1616 – 'Airspace Change: Guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information'.

3.3 As part of an ACP, the output of the IFP design assessment feeds into the operational assessment which, alongside the other assessments, informs the final ACP decision as detailed in CAP 1616 stage 5B: Decision.

3.4 While the IFP technical design element may be accepted, it is possible that a decision is made not to approve an ACP in which case the procedure will not be notified within the UK AIP.

WITHDRAWING AN IFP

3.5 Withdrawing an IFP should be initiated alongside the development of an impact assessment on the airspace structure containing the procedure if necessary, to ensure that the amount of controlled airspace is the minimum required to maintain a high standard of air safety as defined in the Civil Aviation Authority (Air Navigation) (Amendment) Direction 2019.[4] Sponsors and their APDOs must contact the CAA for guidance at ifp.policy@caa.co.uk .

[4] The Civil Aviation Authority (Air Navigation) (Amendment) Direction 2019

PERIODIC REVIEWS

3.6 Once approved by the CAA and promulgated in the UK AIP, all IFPs are subject to periodic reviews to ensure they continue to be safe, fit for purpose, obstacle clear and meet the current edition of ICAO PANS-OPS Doc 8168 Vol II design criteria, UK filed differences to ICAO and national requirements as applicable. A periodic review also assesses all the potential changes and impacts to operations at the aerodromes, environment and noise objectives, navaid infrastructure and airspace structure design. This assessment ensures that the IFPs are usable and safe for Air Traffic Management (ATM) operations and do not create a risk of Controlled Flight into Terrain (CFIT).

3.7 If a periodic review results in changes that create a new, significant or adverse impact on local communities, CO^2 emission or airspace structure, the CAA will require to be engaged for guidance at the earliest opportunity via email to: ifp.policy@caa.co.uk.

3.8 A periodic review of IFP is required **at least once every 5 years,** as per ICAO Annex 11 Appendix 7, and shall be submitted to the CAA for approval. The CAA considers that a periodic review validity starts once the periodic review is approved and published in the AIP.

3.9 It is the IFP sponsor's responsibility to ensure that the periodic review for IFPs is arranged in time. The CAA recommends that the timeline should be discussed prior to the initiation of the IFP design activities, to ensure the risks (resource, surveys, costs, and any other identified risks) are mitigated. Once submitted, the CAA acknowledges receipt within 1 week of the submission and the completion will be dependent on the previously agreed timeline.

3.10 It is expected that the APD will check with the aerodrome to ensure that, from an ATC perspective, the IFP is fit for their current requirements. Where necessary, amendments may be required to the procedure in which case, APDOs should engage with Airspace Regulation (IFP) for guidance to ensure any proposed amendment is permitted. For example:

a. Where applicable, check that any alternative procedures provided via text on IAP charts are still required.

b. Confirm that the requirements for base-turns/racetracks course reversals are still valid and required.

c. Confirm if all procedure types are still required.

d. Check whether the CATs published on the charts are appropriate for all aircraft operating in and out of the aerodrome.

e. Confirm that the procedure types/navigation specifications are appropriate for all aircraft operating in and out of the aerodrome e.g. RNAV 1 or RNAV 5 for STARs.

3.11 Once the above discussions have taken place, the review should be conducted using the following list as a guide:

a. Assess latest aerodrome survey to determine if there are any changes required based on Aerodrome infrastructure and navigation aids.

b. Confirm aerodrome and threshold elevations and co-ordinates from the latest survey.

c. Construct all IFP protection areas including VM(C), MSA, TAA, Holds, and any references to alternative procedures on the IAP chart.

d. Assess the latest obstacle data sets for the impact on all IFPs and amend the MOCAs and procedure altitudes to reflect the current review.

e. Ensure any impact to MSA/TAA is reflected on the ATCSMAC.

f. Assess the latest obstacle data set for its impact on the published SMAAs and FAVAs published on the ATCSMAC chart.

g. For Baro-VNAV procedure, check the average minimum temperature to be applied.

h. Check and amend speed restrictions as appropriate.

i. Review the applicability of step fixes. An SDF may only be applied if the reduction of OCA/H is 50ft or more and removed as appropriate.

j. Check validity and alignment of the final approach track.

k. Amend the current AIP charts with the calculated procedure MOCA and procedure altitudes.

l. Check currency and applicability of all notes/warnings and amend/delete/add as required.

m. Add/amend recommended profiles/ROD tables as required.

n. Check if procedures and segments are compliant with the ICAO provision described in PANS-OPS and if not, be prepared to amend to achieve compliance if possible. If this is not possible, consult with the CAA IFP Section before continuing with the design review.

o. Ensure that the intermediate segment minimum of 3NM is met for ILS procedures.

p. Check that the designs/charts are in line with the CAA guidance.

q. Check and confirm the true track values as published in the IFP chart against the AIS true track spreadsheet. Any amendments will need to be made to a separate copy with the changes highlighted to AIS when the review has been approved by the CAA IFP Section.

r. Check the AIS true track spreadsheet for correctness and completeness.

s. The above list is not exhaustive and should be seen as a minimum requirement.

t. Where further guidance is required, the CAA IFP Section should be contacted at the earliest opportunity.

DESIGN REQUIREMENTS (New or Amended IFPs / Periodic reviews)

3.12 The use of additional UK specific design guidance based on best practices and feedback from the industry is published on the CAA website and should be consulted.

3.13 An IFP design rationale is required to be documented in the IFP design report. Any differences to ICAO standards shall be clearly justified and also documented in the IFP design report. When the proposed IFP design is part of an ACP, it is expected that the design rationale is aligned with the ACP documentation submitted by the sponsor.

3.14 The use of all current data at the time of the IFP design submission is required. If a new survey is conducted prior to the time of the approval, the proposed IFPs will require safeguarding and a justification submitted to the CAA to ensure there is no impact on the procedures. This situation can be mitigated by an early engagement as aforementioned in this document.

3.15 Aerodrome survey data used for the IFP design purposes shall comply with CAP 1732.

IFP SUBMISSION PACKAGE REQUIREMENTS

3.16 APDOs will compile an instrument flight procedure submission package, compliant with their IFP QMS, which shall include:

a. All data used in the design process must be submitted in source format, as well as any modified formats created during the design process e.g. obstacle data, charts, maps including an amended copy of the NATS AIS conventional True Track Spreadsheet as well as the original AIS version as part of the IFP design submission. The amended version should incorporate the design being

proposed.

b. Any discrepancies with the data used during the IFP design process between the AIP and the latest survey data to be detailed in the IFP Design report.

c. The original electronic design files in *native format. AutoCAD (.dwg or .dxf) is the CAA preferred format to receive files, but all other files type will be considered where agreed with the APDO as part of their APDO approval.

d. A record of all calculations including formulae to be provided to prove compliance with, or variation from the criteria and IFP QMS.

e. The context and the operational requirements of the IFP proposal and a comprehensive IFP Design report (including design rationale).

f. Any deviation from the ICAO PANS-OPS Doc 8168 IFP Design criteria, UK differences (as detailed in GEN 1-7) and CAA policies should be clearly identified and justified.

g. A chart and PBN coding table/FAS DB (for PBN IFPs) and a separate table showing all track degrees true to 1/100th degree for conventional IFPs.

h. Annotated AIP Published Charts. PBN Coding tables may be accepted for periodic review however a new FAS DB will be required.

i. Where FAS DBs are included in the submission, all three FAS DB files as produced by the latest version of the Eurocontrol tool will be required.

j. IFP Compliance check form(s) in accordance with the APDO QMS.

k. Validation plan to address all validation activities (as applicable).

l. A completed and signed DAP 1917[5] form (not required for Crown Dependencies).

IFP APPROVAL

3.17 The CAA is responsible for assessing the technical aspects of the IFP design submitted for approval, ensuring the proposed procedures are safe to be flown by aircraft. A report will be sent to the APDO and the sponsors which could include all potential issues requiring corrective actions or items requiring further discussion.

3.18 This is typically an iterative process, and the CAA will be available for further guidance.

3.19 Once all issues raised have been addressed by the Sponsor and APDO and closed by the CAA, the following steps can occur.

[5] Once received the sponsor will be contacted for payment

a. The CAA will recommend the draft chart, conventional true tracks, coding tables and FAS DB (if applicable) to be submitted to AIS via the AIP Data Originators Portal (Aurora) for the creation of AIP ready proofs. Refer to the Annex B **Error! Reference source not found.** “Charting and Publication of IFP”.

b. The CAA will assess the validation plan before the validation activity is conducted.

3.20 Upon successful validation of the IFPs, a recommendation for approval will be made to the CAA decision maker. The timeline for approval is depending upon the process (CAP 1616 or Periodic Review) agreed timeline.

Chapter 4
IFP Safeguarding

INTRODUCTION

4.1 The obstacle environment surrounding an aerodrome is constantly changing (e.g. temporary cranes, new developments, changes to an aerodrome survey) and IFPs need to be safeguarded against both temporary and permanent obstacles.

4.2 The objective of the safeguarding activity is to determine whether obstacles have any impact on the IFPs and allows the IFP sponsor to determine the most appropriate mitigations in collaboration with their APDO to ensure their IFPs remain safe.

4.3 The Aerodrome Operator has a responsibility to monitor and manage the obstacle environment in the vicinity of an aerodrome and this is managed via the safeguarding of Obstacle Limitation Surface (OLS).

4.4 Due to the differences between the IFP protection areas and the OLS both laterally and vertically, obstacles that do not penetrate the OLS may have an impact on IFPs. Hence the need for separate safeguarding of IFPs.

4.5 The UK requirement of obstacle safeguarding stems from CAP 738 which also refers to UK (Reg) (EU) No 139/2014 in which other surfaces are defined as “those that need to be established when operating in accordance with ICAO PANS OPS Doc 8168”. Therefore, this chapter describes the technical requirements and the process by which IFPs safeguarding shall be carried out.

4.6 It is the aerodrome’s responsibility to ensure that the contracted APDO and APD are competent with respect to the delivery of an IFP safeguarding service.

IFP SAFEGUARDING PROCESS

4.7 Approved Procedure Design Organisation.

a. As each APDO employs different design software and design processes, the CAA does not mandate a specific process for the safeguarding of IFPs. APDOs are required to establish their own processes, documented within their IFP QMS, detailing how they perform and deliver IFP safeguarding activities. These processes will form part of the organisation’s approval and any restrictions to the IFP safeguarding capabilities will be listed on the APDO certificate.

b. APDOs shall ensure that approved IFP Designers (APDs) involved in IFP

safeguarding services have the required design privileges for the procedures being safeguarded.

c. If the APDO carrying out the IFP safeguarding assessment is the same APDO as that who designed or carried out the periodic review for the IFP which is approved and published in the AIP, then the safeguarding assessment can be conducted using the existing (approved) IFP constructions/calculation methodology/tools without the drawings/constructions being re-checked by an IAPD; a “compliance check” of all IFP safeguarding assessments will still be required. Then this process applies to all subsequent safeguarding assessments as long as the IFP remains to be the current IFPs published in the AIP.

d. If the APDO carrying out the IFP safeguarding assessment is not the APDO who designed or carried out the periodic review for the IFP that is approved and currently published in the AIP; they will need to re-construct the IFPs and carry out a compliance check on the calculations and constructions of the IFPs in accordance with the organisation’s QMS. Once completed, all subsequent IFP safeguarding activities will only require a “compliance check” of the safeguarding assessments. This process ensures that all IFP design areas are fit for safeguarding purposes. The CAA IFP Section may request evidence from an APDO of their IFP design construction areas for oversight purposes. If a concern is raised, the CAA IFP Section will inform the APDO and may limit the APDO safeguarding activities.

e. IFP Safeguarding reports do not need to be submitted to the CAA but are required to be made available upon request.

f. IFP safeguarding of each obstacle or group of obstacles will need to be documented in a report either as a rationale for the necessary changes to procedures or as evidence that the obstacle was assessed to have no impact to IFPs. This report, including the details of the obstacle/obstacles being safeguarded, should be provided to the Aerodrome Operator and retained as a record within the APDO.

4.8 Aerodrome Operator.

a. Depending on the size, complexity and the structure of each aerodrome, different methodologies and processes can be employed to safeguard IFPs and these methodologies and processes shall be documented as part of the aerodromes’ QMS/SMS as appropriate. This is subject to aerodrome oversight by the aerodrome section of the CAA.

b. The IFP safeguarding processes shall include a formal arrangement with an APDO to carry out IFP safeguarding assessments and/or provision of IFP Safeguarding Filtering Tools as applicable.

c. The Aerodrome Operator is required to retain a record of all IFP Safeguarding reports as provided by their APDO.

IFP SAFEGUARDING FILTERING

4.9 It is possible for an aerodrome operator to work with an APDO to develop a filtering process that would enable the aerodrome safeguarding staff to ascertain if the obstacle is within the “IFP obstacle protection areas” and therefore needs to be separately assessed.

4.10 The application of IFP Safeguarding Filters is typically via “tools” developed by APDOs. We are aware that there are various “tools” available in the industry that facilitate some elements of IFP safeguarding filtering. To ensure an appropriate consistency with the production of the tools, the design processes employed are required to be documented within an APDO’s IFP QMS and approved by the CAA. Despite the above, the CAA does not approve the IFP Safeguarding Filtering tools, only the process. Aerodrome Operators should assess, understand and accept the risks of using such tools and ensure that these risks are identified within the Aerodromes QMS and SMS as appropriate. Where appropriate, aerodrome operators are advised to carry out and document an analysis to ensure the tools deliver the expected safety outcome.

4.11 A process detailing how the tool will be used by the aerodrome operator shall be documented as agreed between the aerodrome operator and the APDO to ensure a common understanding of the tool’s capabilities, usage and outcomes.

4.12 IFP Safeguarding Filtering can be applied in two ways:

a. Lateral Filter:

- Obstacles which are located wholly outside of the IFP protection areas may be considered to have no impact to the IFPs.
- Once the above has been established, recorded and documented the obstacle does not need to be assessed separately by an APDO.
- The IFP protection areas used to filter out obstacles will need to be provided by an APDO.

b. Lateral and Vertical Filter:

- Obstacles which are located wholly outside of the IFP protection areas may

be considered to have no impact to IFPs and therefore do not need to be separately assessed by an APDO.

- Obstacles which are located inside the protection areas but do not penetrate the IFP surfaces may be considered to have no impact to IFPs and therefore do not need to be separately assessed by an APDO.
- The IFP protection areas used to filter out obstacles will need to be provided by an APDO.

4.13 Where a periodic review of an IFP has not been carried out for more than 5 years, IFP safeguarding filtering cannot be applied by an aerodrome operator. IFP safeguarding filtering will be permitted after a periodic review has been carried out and approved by the CAA.

4.14 The scenarios describing how IFP Safeguarding and IFP Safeguarding Filtering can be applied are detailed in the table below:

Scenario	IFP safeguarding	IFP Safeguarding Filtering	Outcome
Scenario 1 Provision of safeguarding by the APDO who designed/reviewed the current procedures published in the AIP which have been approved by the CAA.	APDO will use their files of the current published IFPs. All IFP safeguarding assessments will need to be compliance checked. No CAA approval is required.	Lateral and vertical filtering can be applied	Ensure that the provision of IFP safeguarding delivers a safe outcome while minimising the impact for aerodromes.
Scenario 2 Provision of a safeguarding by an APDO who did not design/review the current procedures published in the AIP.	Construct and compliance check IFP protection areas/surfaces in accordance with the APDO QMS. All IFP safeguarding assessments will need to be compliance checked. No CAA approval is required.	Construct and compliance check IFP protection areas/surfaces in accordance with APDO QMS. These protection areas/surfaces can be used for Safeguarding Filtering both Lateral and Vertical. All IFP safeguarding assessments will need to be compliance checked. No CAA approval is required.	Ensure that the provision of IFP safeguarding delivers safety outcomes in compliance with the IFP design development requirements.
Scenario 3 If the IFPs have not been reviewed within the last 5 years (i.e. outside of the timeframe of periodic review)	The IFPs shall be reviewed immediately and submitted to the UK CAA for approval. Prior to the approval of the periodic review the “Transition Period” below will apply.	The IFPs shall be reviewed immediately and submitted to the UK CAA for approval. Prior to the approval of the periodic review the “Transition Period” below will apply.	Ensure that all corrective actions have been identified and initiated to minimise or eliminate the risk of CFIT.

Table 2 - IFP safeguarding tool requirements

IFP SAFEGUARDING/FILTERING TOOL TRANSITION PERIOD

4.15 To allow for a period of implementation, the above IFP Safeguarding requirements shall be met by aerodromes and APDOs by Q4 2023.

4.16 During the implementation period and prior to the IFP constructions/calculations being reviewed per the table above, the following will apply:

a. If the APDOs carrying out ***IFP safeguarding assessment*** are not the originator of the periodic review for the IFP that is published in the AIP; they will need to re-construct the IFPs in accordance with the organisation's QMS. During the construction of the IFP protection areas, associated calculations will need to be compliance checked by an independent and approved IFP designer. Subsequent IFP safeguarding reports based on these protection areas are to be submitted to the CAA IFP Section when completed.

Note: The CAA may review the reports and sample as part of ongoing oversight activities and take all appropriate actions if we believe the safety of the IFP is compromised.

b. If the APDO developing an aerodrome ***IFP safeguarding filtering tool*** is not the originator of the periodic review for the IFPs published in the AIP; they will need to re-construct the IFPs in accordance with their QMS. During the construction of the IFP protection areas, associated calculations will need to be compliance checked by an independent and approved IFP designer. Vertical and Lateral filtering is permitted, however, where vertical filtering is applied to an obstacle which did not need to be individually assessed, the filtering report is to be submitted. This is applicable to the Final, Initial missed approach and intermediate missed approach of the following procedures:

- Instrument Landin System (ILS).
- RNP LNAV/VNAV.
- RNP Localizer performance with vertical guidance (LPV).
- PinS.

IFP SAFEGUARDING TOOL – MINIMUM REQUIREMENTS

4.17 The Aerodrome Operator is required to retain a record of all IFP Safeguarding reports as provided via the IFP safeguarding filtering tool.

4.18 Effective Date and Expiry Date.

4.19 User Manual.

4.20 Report:

a. User.

b. Time and date of assessment.

c. Record number.

d. IFP Type and whether there is an impact on IFP.

e. Whether a separate IFP Safeguarding assessment is required by the APDO.

f. Reason for “no impact” – i.e. outside of lateral protection area or below IFP surface.

4.21 Obstacle Data

a. Co-ordinate.

b. Elevation (Above Mean Sea Level (AMSL) or above ground level (AGL) depending on the IFP Safeguarding Filtering tool).

c. Length of time the obstacle will be in situ or permanent.

IFP SAFEGUARDING RESULTS

4.22 IFP safeguarding reports and IFP safeguarding Filtering reports shall be recorded and stored by the APDO and made available to the CAA upon request. The aerodrome operator shall also document and store all records relating to IFP Safeguarding and IFP Safeguarding Filtering Reports irrespective of impact to the IFPs at the aerodrome. Reports should be presented to the CAA as part of the regulatory oversight activities conducted by relevant sections of the CAA.

4.23 If impacts on IFPs are determined during the process, the applicable NOTAM actions described in table 3 will be required.

4.24 While an obstacle may not have any impact on the IFP at the aerodrome, despite the above table, aerodrome operators should consider other airspace users (e.g. VFR traffic, close in obstacles) and determine whether a NOTAM/SUPP is required and/or AIP change request to be submitted to include the obstacle in the AD 2.10 section of the AIP.

Temporary Obstacle	
Obstacle which is erected for **less than 90 days**	**NOTAM** to be issued providing information of the structure/obstacle and changes to OCA/H.
Obstacle which will be erected for **more than 90 days**	AIP change request to be submitted to **amend the IAC OCA/H or MOCA/H**. When the obstacle is verified to be removed, a separate assessment shall be carried out and submitted to the CAA IFP Section for approval. However, if deemed appropriate, the aerodrome operator may leave the increased OCA/H until the next periodic review.
Permanent Obstacle	
Obstacle already erected or to be erected **before the next AIRAC deadline**	**Permanent (PERM) NOTAM** to be issued providing information of the structure/obstacle and changes to OCA/H. **AIP change request** to be submitted to **amend the IAC OCA/H and/or MOCA/H**. Where appropriate, AIP change request to be submitted to include the obstacle in the AD 2.10 section of the AIP.
Obstacle which will be erected **after the next AIRAC deadline**	**AIP change request** to be submitted to **amend the IAC OCA/H or MOCA/H**. Where appropriate, AIP change request to be submitted to include the obstacle in the AD 2.10 section of the AIP.

Table 3 - NOTAM list of actions

Chapter 5
Aeronautical Data Quality Requirements

INTRODUCTION

5.1 IFP Design activities are part of the aeronautical chain and shall maintain the integrity of the aeronautical data ends to ends of the implementation process. APDOs are considered to be data originator for the IFPs designed and approved for publication in the UK AIP. In this context, APDOs shall meet the requirements of the aeronautical data quality rules in accordance with the UK Reg (EU) 2014/1029 transposed in CAP 1054.

5.2 This chapter intends to highlight the core aeronautical data quality requirements for Aerodrome License Holders and APDOs.

5.3 Although the CAA is required to approve IFPs prior to the procedure being published in the UK AIP, the CAA will not directly take part in IFP design activities. Therefore, the CAA is not expected to be part of the Aeronautical data chain.

AERODROME LICENSE HOLDERS

5.4 Aerodrome Operators are required to ensure that aerodrome surveys are carried out in accordance with the requirements detailed in CAP 1732.

5.5 Aerodrome Operators are required to ensure that the data published in the UK AIP (e.g. AD 2.10 aerodrome obstacles, AD 2.12 Runway Physical Characteristics, AD 2.13 Declared Distances, 2.17 ATS Airspace, 2.18 ATS Communication Facilities, 2.19 Radio Navigation and Landing Aids) is correct and reflects the latest aerodrome survey data.

APPROVED PROCEDURE DESIGN ORGANISATION

5.6 APDOs shall implement a system to ensure that the integrity of data is controlled, managed and maintained as defined in CAP785.

5.7 During the process of IFP design activities, if discrepancies are identified between the data found in the AIP and the latest survey data used for IFP design activities, APDs shall inform the Aerodrome Operator who will investigate and take the necessary steps to rectify the issue. These discrepancies will need to be included in the IFP design report.

Appendix A
UK CAA Technical Design Guidance

INTRODUCTION

A.1 IFP Design is a complex subject incorporating the application of design criteria in accordance with ICAO PANS-OPS Doc 8168 as well as taking into consideration the operational aspects of the IFPs both from a pilot and a controller's perspective. Ultimately, APDs need to take a holistic approach to IFP design to ensure that the IFPs are safe and fit for purpose in the location of their intended use.

A.2 The UK airspace construct can make the design of IFPs challenging therefore there are times when departure from standard design criteria may be necessary. This chapter is intended to provide further guidance on IFP design criteria which should be applied as much as practicable.

GENERAL

A.3	Speed	IFPs should be designed to the standard speeds as stated in ICAO PANS-OPS Doc 8168 Part 1, Section 4 Chapter 1 Table I-4-1-2. Where standard speeds cannot be achieved, the restricted speed shall be annotated on the AIP chart/coding table at the applicable DME fix (conventional)/waypoint (PBN) or for the entire IFP.
A.4	Wind	Use of standard winds as found in ICAO PANS-OPS Doc 8168. For SID designs incorporating turns in excess of 120°, historical wind data must be taken into account to ensure that the procedure remains fit for purpose.
A.5	Charting Requirement	It is not necessary to have an AIP ready chart for approval submission. Validation activities are carried out using draft charts, therefore the content of the charts will need to be the same as that on an AIP chart. i.e. MSA, TAA, THR/AD elevations, frequencies, Plan View, Profile View, Recommended Profile, OCA (H), RDH/TCH, rates of descent, notes, Mag Var etc…

A.6	Magnetic Variation	For IFP Design and draft chart creation purposes, US National Oceanic and Atmospheric Administration (NOAA) value specific to the aerodrome lat/long for the time of design or forecast promulgation date. Alternatively, the magnetic variation value can be confirmed with NATS AIS. AIS is responsible for the application of the mag var value on the IFP charts and coding tables during the publication process.
A.7	IAP RCF	The IAP RCF is an ATS separate procedure not to be confused with the missed approach procedure. The RCF procedure where provided will be in textual form only and promulgated in the aerodromes ATCSMAC and IAC as applicable. APDs shall ensure the RCF is obstacle assessed in accordance with ICAO PANS-OPS Doc 8168 obstacle clearance criteria.
A.8	IAP RCF	For RNP IAPs, the RCF is based on conventional navigation aids only and will not be coded into the navigation database.
A.9	Validation of IFP	A 5-yearly periodic review of IFPs would not normally necessitate a validation. However, if significant changes are introduced into the IFPs during the review process then the CAP 1616 process may be required, and the validation requirement will be assessed on a case-by-case basis.
A.10	Waypoint Naming	Where a PBN waypoint is located overhead an existing operational ground-based navigation aid, even though the ground-based navigation aid will not form part of the IFP/airway, the waypoint shall adopt the same 3LNC of the ground-based navigation aid.

A.11	Waypoint near location	If required, a 5LNC may be “near located” to a ground-based navigation aid. The methodology of near location is to ensure that the co-ordinate of the waypoint differs to that of the ground-based navigation aid. The use of near-location waypoints is currently limited to Free Route Airspace (FRA) only and to be considered on a case-by-case basis. APDs/sponsors should make early contact to the CAA to discuss if/when this option is being considered.
A.12	Truncations	In the event an IFP is being truncated to a fix which was allocated with a 5LNC, the APD shall ensure that a minimum of two suitable fix formations (Radial/DME) are identified and published on the chart.
A.13	FMS discontinuity	When designing RNAV IFPs, aside from standard IFP design considerations as detailed in ICAO PANS-OPS Doc 8168 Vol II, APDs should take note of any altitude/speed restrictions of waypoints either preceding or succeeding the IFP being designed to ensure that there are no connectivity issues. E.g. if the last waypoint of a STAR is at 7000ft with a speed restriction of 210KIAS, the connecting waypoint (first waypoint) of the approach transition or IAP will need to also have an altitude restriction of 7000ft and speed restricted to 210KIAS. The principles of the above should be taken into account when reviewing/designing conventional STAR/IAPs as well.
A.14	Waypoint data	For the purposes of IFP design, APDs shall use co-ordinates to its highest available resolution to ensure data integrity is kept. This information is available via Aurora.
A.15	Airspace Consideration	As standard, restricted and danger areas will need to be considered during the IFP design process. These areas are normally treated like obstacles with standard MOC applied vertically. Exceptions may be considered with rationale and evidence detailed within the IFP Design report.

Table 4 - General Technical Guidance

STANDARD INSTRUMENT DEPARTURES (SIDS)

A.16	Location of earliest turn	A SID commences from the DER, no turns (including track adjustments of up to 15°) are permitted before the DER. For obstacle and/or environmental reasons the earliest turning point/track adjustment point may be considered at the DER. In the case of an RNAV SID, this will need to be reflected in the coding table.
A.17	Max altitude	All SIDs will terminate at a hard altitude e.g. “At 6000ft”.
A.18	Protection areas	The protection areas for turns in a SID shall be based on a 10% climb gradient e.g. (based on standard speeds only) or appropriate designed climb gradient up to the capped altitude.
A.19	Climb gradients	For RNAV SIDs, altitude requirements/restrictions shall be published at the relevant waypoints on the SID to provide obstacle clearance, noise abatement and airspace containment as applicable. Climb gradients are not required to be published in the plan view. *Note: where applicable the initial climb gradient (close in obstacles) for obstacle clearance purposes in accordance with ICAO PANS-OPS Doc 8168 Vol II Part I-Section 3 Chapter 5 is required.*
A.20	Close in obstacles	Close in obstacles shall be declared by the APD to be published in the AD 2.10 section of the AIP. Where there are duplicate entries i.e. where an obstacle is captured in the survey data and DVOF data, only the survey data shall be published. If a DVOF only entry exist within the close in obstacles, the APD/sponsor should check and confirm the validity of the entry.
A.21	DME/DME and GNSS	All RNAV SIDs should include DME/DME and GNSS navigation specifications as standard. Exceptions will be considered on a case-by-case basis with rationale and supporting evidence provided in the IFP Design report. Therefore, all submissions should be accompanied by evidence demonstrating sufficient DME/DME coverage.
A.22	UK design guidance	Further guidance for design of SIDs can be found in CAP 778 – this is currently under review

A.23	Turn Restrictions	In the UK for all SIDs there is a requirement for “No turns below 500ft QFE”. In general, if the early turn point for the first waypoint is before the point at which an aircraft would reach 500ft AAL following a 3.3% climb gradient from 5m above DER then a CA leg would be required.

Table 5 - Design guidance for SIDs

STANDARD INSTRUMENT ARRIVAL (STAR)

A.24	Descent planning	In designing a STAR, APDs should engage with ATC to determine the altitudes expected at each waypoint. These waypoints will then be published with “at” altitudes for descend planning purposes only. An “at” altitude shall also be applied to the STAR termination/clearance limit point. Actual descend clearance will be as directed by ATC. A “Descent Planning” warning box will be provided on the STAR charts to advise pilots the published STAR Level Restrictions are for descent planning only. Pilots are not to commence descent without ATC clearance.
A.25	Descent planning	For the purposes of descent planning, target altitudes prior to the commencement of the STAR may be promulgated textually in the descent planning area within the route descriptor box on a STAR chart. In such cases, altitude restrictions may be published referencing a distance prior to the STAR’s first waypoint. References to waypoints which are not part of the STAR will not be accepted. E.g. if an aircraft is expected to be at FL100 10NM before DESIG (first waypoint on a STAR), the following can be published in the route descriptor box on the chart: “at FL100 10NM before DESIG” Please note the altitude restriction prior to the commencement of the STAR will not be included in the coding tables.

A.26	Hold speed (intermediate)	Where applicable, holds may be located at an "intermediate waypoint" within a STAR where a speed limit is applicable. In this case, APDs shall engage with the ATSU to understand if aircraft are expected to enter the hold without a specific clearance. If aircraft are expected to hold without a specific clearance to do so, then the speed limit for the hold shall be applied to the waypoint. If aircraft are not expected to enter the hold without a specific clearance, the waypoint is not required to have the same speed limit applied.
A.27	Floating holds	Where applicable, en-route "floating holds" may be published on a STAR chart on a waypoint which is not along the STAR. These are tactical holds which may be used "as directed by ATC". In these instances, the floating hold is not part of the procedure, therefore the waypoint will not be included on the waypoint list on the chart. Chart "inset boxes" are not permitted.
A.28	Holds	All STARs are required to terminate with a hold. Exceptions may be considered on case-by-case basis with rationale and supporting evidence provided in the IFP Design report.
A.29	Hold speed (Clearance limit point)	Where a hold located at a clearance limit point is speed restricted, the waypoint where the hold is based shall have the same speed limit promulgated.
A.30	Clearance Limit Point (CLP)	APDs should engage with ATC to understand how the STAR is managed and understand where clearance limiting points are located within the IFP. The following note shall be applied to the clearance limit points: "Do not proceed beyond XXXXX without ATC clearance"
A.31	Nav spec	STARs should be designed to RNAV 1 navigation specification as standard. Exceptions may be considered on a case-by-case basis where rationale and supporting evidence will be required as part of the IFP design package.

A.32	Nav spec	Where an RNAV 5 procedure is introduced terminating at a hold which is currently published to RNAV 1 navigation specification or vice versa, the APD will be required to ensure that the protection area is sufficient and that there will be no impact to ATC operations. Additionally, the hold coding table will also need to be amended to reflect both navigation specification.
A.33	DME/DME and GNSS	All RNAV STARs should include DME/DME and GNSS navigation specifications as standard. Exceptions will be considered on a case-by-case basis with rationale and supporting evidence provided in the IFP Design report. Therefore, all submissions should be accompanied by evidence demonstrating sufficient DME/DME coverage.
A.34	B-RNAV STARs	All current B-RNAV STARs or STARs which do not have an associated coding table found in the AIP shall be converted to RNAV 5 either via a periodic review or CAP 1616 process. Coding tables will be required for all RNAV STAR submissions.

Table 6 - Design guidance for STARs

INSTRUMENT APPROACH PROCEDURES (IAPS)

A.35	MSA	MSA should be derived as follows: Calculate the MSA for each facility used and then combine each specific sector using the highest calculated value. On the individual chart use the combined values but reference the MSA to the primary facility used for that individual instrument flight procedure Or Where appropriate, MSAs may be referenced to the ARP for all procedure types in accordance with ICAO PANS-OPS Doc 8168 Vol II Part I Section 4 Chapter 8. APDs shall ensure that the highest MSA/TAAs are combined into the ATCSMAC as applicable.

A.36	Aerodrome elevation	Aerodrome elevation point (AEP)/(AE) may be declared within the aerodrome surveys. The CAA acknowledges the following definition as the Aerodrome elevation: The highest point on the landing area. Where landing area is defined as The part of movement area intended for the landing or take-off of aircraft. It is expected the APDs will confirm this value is correct or calculate this point if not declared/incorrect as part of the IFP design activities and document this in the IFP design report.
A.37	Recommended Profile	Recommended Profiles shall be calculated as follows: Calculate the exact altitude then round to the nearest 10ft. To calculate the height, subtract THR elevation from the rounded altitude. This height figure is not rounded.
A.38	Recommended profile	Recommended profile and procedure altitudes on the IACs do not take into account the curvature of the earth. e.g. the values calculated for the recommended profile for an ILS and LOC procedure will be the same.
A.39	Vertical Datum	Vertical datum for Precision, Non-precision and APV procedures shall be THR elevation.
A.40	Missed Approach obstacle analysis	In the missed approach segment, secondary assessment cannot be used in conjunction with extension of the MAP surface for reduced MOC.
A.41	Step Down Fix (SDF)	A step-down fix can only be included in an IAP when a minimum of 50ft benefit can be achieved in the calculated OCA/H.
A.42	Step Down Fix (SDF)	To promulgate an SDF in the profile view of an IAC: The SDF is marked by a diamond at the level of the MOCA for the segment prior to the SDF and published on the profile view. The MOCA value is to be published as an “at or above” value in a grey MOCA box prior to the SDF. In addition “(SDF)” shall be added at the appropriate distance in the recommended profiled table.

A.43	Construction of protection areas	Construction of IFP protection areas will always be required. If obstacle analysis is deemed not required by the APD, the rationale for this shall be documented in the IFP Design report.
A.44	HOLD	Holds in the UK can be time based or distance based. APDs need to consider the original design of the hold when applying RNAV “replications” to ensure the new procedure reflects the original design definitions.
A.45	ILS – use of radar ranges when DME is U/S	To facilitate continued use of the ILS/DME procedure when the DME fails, practice has evolved in which the local Air Traffic Unit (ATSU) passes an equivalent radar range to threshold to the pilot. This can only be done where the local ATSU has formally agreed and is able to pass such ranges. This will be notified on the appropriate IAP chart in the following format: Aircraft unable to receive DME I-XX: Advice ATC. ATC will pass an equivalent position at X.X and Y.Y NM outbound and 4NM inbound.
A.46	ILS	GP check points are only required at 4NM from THR, 1NM check points may be removed as part of the periodic review process.
A.47	SRA	SRAs shall be designed to a minimum of 3° with ranges published relative to touchdown assuming a 15m (50ft) height at the runway threshold. Exceptionally, where local constraints dictate, ranges will be notified as being published from the threshold.
A.48	SRA	AIP GEN 1-7 ICAO PANS-OPS Doc 8168 UK Addition 6.6 refers.
A.49	SRA - RTR to MAPt	The Final Approach Segment splays at 15° from the earliest fix tolerance of the RTR as this is the point where course guidance stops.
A.50	HOLDs	All IAPs should terminate at a hold located either overhead the aerodrome or at the IAF. Exceptions may be considered on a case-by-case basis where rationale and supporting evidence will be required as part of the IFP design report.

A.51	Vertical profile	Where a new IAP is being introduced to an aerodrome with existing IAPs, APDs shall ensure that the vertical profiles of the proposed IAPs are aligned with the existing IAPs and the visual reference aids at the aerodrome.

Table 7 - Design guidance for IAPs

REQUIRED NAVIGATION PERFORMANCE IAP

A.52	FAS DB	When the FPAP is a surveyed location (e.g. LOC or ASDA_END) then the elevation from the survey in meters is rounded to the nearest 0.1m. When the FPAP is calculated then the closet survey ground point elevation should be used.
A.53	SBAS	For runways where the THR to LOC/GARP distance is less than 2000m, the position of the FPAP should be such that the LTP/GARP distance is at least 2000m. This also applies when there is an existing LOC located within 2000m of the THR. On short runways the FPAP needs to be situated beyond the end of the runway to maintain the relationship of 105, course width at LTP with the max angle of full-scale deflection of 3°.
A.54	RNP APCH Missed approach	At present, there are some RNP IAPs published in the AIP where the missed approach is based on conventional ground-based navigation aids. In accordance with the “Policy for Application of Performance-Based Navigation in the UK/Irish Airspace” published on 13 October 2011, aerodromes are required to ensure that the IAPs are wholly based on RNP (GNSS) navigation specifications. The conversion of the missed approach procedure from Conventional ground-based navigation aids to GNSS may be carried out via the periodic review process. Please note an additional ATS safety case may be required.

A.55	RNP APCH Missed Approach	There is a known issue with PBN coding whereby if a direct fix path terminator is used to define a free turn back through 180° some aircraft systems can provide guidance for a turn in the shortest way irrespective of which direction is required in the procedure. e.g. in cross wind situations, the shortest way may be the incorrect direction. To mitigate the above, APDs have two options when designing RNP Missed approaches: Missed approach design utilising at least two waypoints thereby ensuring the turn is executed in the desired direction Use of a DF with a large angle turn to a hold or IAF. In this case, both turn directions will need to be assessed for obstacle clearance purposes and a safety case provided by the ATSU to mitigate the risks and required ATC intervention in the event of an incorrect MAP turn direction being executed.
A.56	LPV MAP obstacle analysis	The 'range method' classification from ICAO PANS-OPS Doc 8168 Vol II Part III-3-5.4.5.9.2 is the only option currently approved by the UK CAA.
A.57	HOLDs	Where a hold is published as part of an IAP, a separate hold coding table is not required to be published. The last line of the IAP coding table (which leads the aircraft to the hold) shall have “HOLD” included in the remarks.
A.58	FAS DB VAL	Where a standard LPV the VAL shall be 50m. Where an LPV 200 is being implemented to a precision instrument runway and an OCH less than 250ft can be achieved for all CATs at the aerodrome, the VAL shall be 35m. To maximise the availability of the procedure at the aerodrome; if an OCH of less than 250ft cannot be achieved for all CATs in an LPV 200 design, the VAL shall be 50m and subsequently, the minimum OCH for that procedure shall also be at least 250ft for all CATs.
A.59	Baro-VNAV	Designers are required to calculate the average minimum temperature based on aerodrome meteorological data in the last 5 years. Typically, this would be -15°C for northern parts of the UK and -10° for southern parts of the UK.

A.60	Intermediate Segment Length	A minimum segment length of 2NM for the intermediate segment only for RNP IAPs for aircraft that is vectored to the IF waypoint (no T / Y-Bars for initial segments) with an intercept angle of 45° maximum.
A.61	Procedure Altitude at IAF and IAF/IF FIX/WP	The procedure altitude applied to an IAP IAF or IAF/IF Fix/WP must be at or above the procedure MSA or TAA. A reduced distance (no less than 10NM) and/or subsector can be used to achieve a desired procedure altitude where necessary.
A.62	RNP IAP Straight in Approach Procedure Altitude	When a straight in RNP approach does not have a separate initial approach segment, the IF WP will be published as an IAF/IF WP and the associate procedure altitude must be at or above the procedure MSA/TAA. A reduced distance and/or subsector MSA/TSS can be used to achieve a desired procedure altitude. On any combination of a RNP IAP (e.g. L type RNP) where the IF WP is used as the commencement WP, the WP will also be published as an IAF/IF WP and the procedure altitude must be at or above the procedure MSA/TAA. A reduced distance and/or subsector MSA/TAA can be used to achieve a desired procedure altitude.

Table 8 - Design guidance for RNP IAPs

CONVENTIONAL IAP

A.63	Offset IAP	Where applicable APDs should ensure that FAT alignment criteria for straight in approaches as detailed in ICAO PANS-OPS Doc 8168 Vol II Part I, Section 4, Chapter 5 are applied. Additionally, APD's shall ensure the following: Where the FAT intersects the runway centreline; the final approach track shall intersect the runway centreline at a point 1400m or greater before the runway threshold within a maximum of 150m "gate" laterally (at 1400m before the threshold).
A.64	Intermediate	ICAO PANS-OPS Doc 8168 Vol II Part I Section 4, Chapter 4

	Segment Length	“Intermediate Segment” requires a minimum of 5NM for the intermediate segment. A reduced length of 3NM (as applied to ILS procedures) may be applied to all conventional IAPs.
A.65	True Track	The Conventional True IAP final approach track is to be based on the runway true track. For example, if the true track of the runway is 269.15°T, then the true track from IF to MAP will be 269.15°T until there is a track change in the MAP. This differs from a PBN procedure where the true track is calculated from waypoint to waypoint.

Appendix B
Charting and Publication of IFP

INTRODUCTION

B.1 The design of IFPs and charting of IFPs are two distinctly different functions, each with its own processes and competency requirements.

B.2 NATS is the UK Aeronautical Information Service (AIS) provider and is regulated by the UK CAA. This includes the charting and production of all AIP Charts (including IFPs).

B.3 Due to the differences in the competency requirements between IFP design and cartography, the submitted IFP data may be open to interpretation resulting in errors or ambiguity in the proposed aeronautical charts. To mitigate the risk of errors and inconsistencies in promulgated procedures, this policy sets out the required process which shall be followed to promulgate an IFP in the AIP.

B.4 This Appendix details the process steps required in the creation or amendment of a chart from the Approval of an IFP by the CAA to promulgation within the AIP.

B.5 Where an Airspace Change has been initiated in accordance with CAP1616, this process is applied within Stage 5 “Decide” where the CAA have concluded the assessment of the IFP but before a formal decision is made on the Airspace Change Proposal.

B.6 Aeronautical data relevant to the designed/reviewed IFP and the associated charts/ conventional true tracks /coding tables/FAS Data Block (FAS DB) to be promulgated in the AIP fall within the scope Aeronautical Data Quality requirements as found in UK CAA CAP 1054.

B.7 This appendix sets out the required process from the approval to promulgation of an IFP in the UK AIP.

B.8 The process and technical requirements for the design of IFPs and cartography are outside of the scope of this document.

B.9 This appendix is applicable to the introduction of new IFPs as well as any proposed amendments as a result of periodic reviews and/or safeguarding of IFPs.

PROCESS FOR APPROVED PROCEDURE DESIGN ORGANISATION

B.10 At the end of the IFP design process, a draft graphical depiction (draft chart), conventional true track data, draft coding tables (for PBN procedures) and draft FAS

DB (as applicable) shall be created to facilitate the necessary review, verification, validation and approval activities. These draft charts, coding tables and FAS DB will form part of the submission to the UK CAA for approval in accordance with this document and Step 4b of the CAP 1616 process.

B.11 Once the CAA assessment of the IFP submission has been completed, the Airspace Regulator (IFP) will make a recommendation for the draft chart, conventional true tracks, coding tables and FAS DB to be submitted to AIS via the Aurora Data Originators Portal (Aurora) for the creation of *AIP ready proofs*.

Note: At this stage, the recommendation from the CAA for the AIP ready proofs to be generated should not be confused with an ACP decision being made.

B.12 The draft chart, conventional true tracks, coding tables and FAS DBs shall be submitted to Aurora by a change request (CR) raised with a prefix of “APDO DRAFT” in the title of the request and approved files attached.

B.13 To allow for the planning of projects in AIS, the submission of draft charts, conventional true tracks, coding tables and FAS DB to AIS is encouraged to be as early as possible ahead of the desired AIRAC effective date. AIRAC dates and AIP change request submission deadlines are available on the AIS website.

B.14 AIS will create *AIP ready proof* files which will include draft charts, coding tables and FAS DB as applicable by applying the relevant charting processes and procedures.

B.15 The *AIP ready proof* files will be returned to the nominated Approved Procedure Designer (APD) for verification. The remit of this verification is to cross-check the promulgated publication for completeness and consistency as intended by the APD. At this stage, it is also the APD’s responsibility to liaise with the ACP Change Sponsor to ensure they agree with the *AIP ready proof* as proposed.

Note: The nominated APD checking the AIP ready proofs shall be the original APD for the IFP design. The formal arrangement between the APDO and the Authorised Source (e.g. the Aerodrome Operator) as required under CAP 1054 shall include the verification of “AIP ready proofs” by the APD.

B.16 This verification of *AIP ready proof* files is an iterative process which may be carried out via email (or as agreed) between AIS and the nominated APD.

B.17 It is the responsibility of the cartographers to ensure that any comments and subsequent changes are documented within the proofs as required by their QMS.

B.18 It is the nominated APD’s responsibility to ensure that *AIP ready proof* files correctly reflects the IFP as designed and intended.

B.19 When the verification of the *AIP ready proof* files is complete, an approval task will be raised for the nominated approved procedure designer (APD) and the CAA Airspace Regulator (IFP) within Aurora.

B.20 Once the *AIP ready proof* files are approved by both the nominated approved procedure designer (APD) and CAA Airspace Regulator (IFP), the chart creation process is complete. The APD will provide the ACP Change Sponsor the Change Request reference number which will be used to implement the AIP change when the ACP is approved by the CAA via the CAP 1616 process.

B.21 To allow sufficient time for the creation of the *AIP ready proofs,* the above process shall be completed as early as possible (before the AIRAC deadline). Where sufficient time was not allowed for the creation of the AIP ready proofs, the change will not be implemented until the next available AIRAC.

PROCESS FOR AIP AUTHORISED SOURCE

B.22 Once an approval for airspace change (ACP) has been granted by the CAA in accordance with the process as detailed in CAP 1616, the AIP Authorised Source may submit an AIP Change Request (CR) to implement the change in the AIP.

B.23 This is actioned via Aurora where the sponsor will insert “IMPLEMENT CR-XXXXX” in the “title” field along with the ACP reference number entered[6] into the “Evidence Number” field and the CR-XXXXX in the “Related Change Request” field.

Note: XXXXX denotes the Aurora Change reference number from the creation of the chart.

B.24 It is the Authorised Source’s responsibility to ensure that the sponsor approval is provided within the timeframe as advised by AIS. Failure to do so may result in the ACR being rejected.

[6] The final approval task in Aurora will be sent to the Primary AIP Sponsor appointed by the Authorised Source (e.g. Aerodrome Operator). If there is more than one Primary Sponsor appointed by the Authorised Source, the AIP Sponsors List provided and maintained by the Authorised Source should clearly indicate which Primary Sponsor should be contracted for IFP-related matters. If this information is not provided, AIS will seek further advice from the Authorised Source.

Appendix C
Use and Allocation of RNAV Waypoints

INTRODUCTION

C.1 All RNAV waypoints must be named in a manner appropriate for use in the navigation database. The UK naming convention used for alphanumeric RNAV waypoints is based upon guidance in this appendix.

C.2 Waypoints will be either Strategic or Tactical depending on their position and function.

C.3 Strategic Waypoints:

a. Where the waypoint is used strategically (i.e. part of the route structure itself) and is likely to be used routinely in RTF exchanges, a standard ICAO five-letter name code (5LNC) is allocated.

b. Where a waypoint is placed at the same location (same co-ordinates to 100th of a second) as an existing ground-based navigation aid, the waypoint will adopt the same three-letter name code (3LNC).

C.4 Tactical Waypoints:

a. A waypoint that is intended for use on a tactical basis, but still needing to be contained in the navigation database for procedure definition purposes other than as an ATS significant point, is allocated an alphanumeric designator.

C.5 Where alpha numeric RNAV waypoints are used, the sponsor/APDO shall ensure that the waypoint names are not duplicated.

NAMING CONVENTION

C.6 SID/STAR/Approach Transition waypoint naming convention:

a. AAXNN where:

- AA The last two letters of the aerodrome ICAP location indicator.
- X A quadrant designator N, E, S or W.
- NN a numeric code from 00 to 99 (the allocation of numbers shall be in sequence at that aerodrome).

C.7 IAP waypoint naming Convention:

b. All initial approach fixes (IAF) will be allocated a 5LNC.

c. The intermediate fix (IF) and final approach fix (FAF) waypoints shall be defined as follows, except at airports where aircraft are normally vectored to the final approach course, in which case the IF will also be assigned a 5LNC.

d. AAXXZ where:

- AA the last two letters of the aerodrome ICAO location indicator.
- XX the runway designator.
- Z the indicator for the segment of the procedure I or F.

E.g. CN21I – intermediate fix runway 21 Doncaster

E.g. CN21F – final approach fix runway 21 Doncaster

C.8 For 2 or more parallel runways the following convention is adopted:

b. AXXYZ where:

- A the last letter of the 4-letter ICAP location indicator.
- XX the runway.
- Y runway descriptor: 'C' centre of 3 parallel runways
  - 'L' for a left-hand runway
  - 'R' for a right-hand runway
- Z the indicator for the segment of the procedure, I or F
- L27LI (intermediate fix Runway 27L at Heathrow).
- L27LF (final approach fix runway 27L at Heathrow).
- L27CF (final approach fix runway 27C if built at Heathrow).

C.9 The runway threshold which is normally the MAPt as described in the PBN design criteria shall be defined as follows:

a. CCXX/D (where required):

- CC "RW".
- XX the runway designator.
- D a descriptor for the runway "C" – centre of 3 parallel runways.
- "L" – for a left-hand runway.
- "R" – for a right-hand runway.

- Left blank when there is only one runway.
- e.g. RW21 (runway 21 Doncaster).
- RW 27L (runway 27L at Heathrow).
- RW 27C (Heathrow's 3rd runway if built).

C.10 Where the MAPt is not at the threshold the waypoint shall be designated:

a. MAXX/D

- MA signifies the MAPt (before the threshold).
- XX is the runway designator.
- D is the runway descriptor L, R or C (if and as required).

C.11 The missed approach holding or turning fix as appropriate or any other waypoint that is required in the missed approach segment shall be defined as follows:

a. AAFNN

- AA the last two letters of the aerodrome ICAO location indicator.
- F 'M'.
- NN a number commencing at "1" and allocated in sequence (e.g. LLM01, LLM02, LLM03 etc…).

C.12 Where two IFPs intersect at the same waypoint it shall be designated as a 5LNC for ATC RT purposes

Appendix D
RNAV conversion of conventional holds

INTRODUCTIONS

D.1 This appendix is for converting an existing conventional hold to RNAV for use in RNAV IFPs.

DESIGN PROCESS

D.2 To convert an existing conventional hold into an RNAV Hold APDs shall ensure the following:

a. The hold to be confirmed with the sponsor to ensure as a minimum that the hold levels (minimum and maximum) and speed restrictions are valid.

b. The same holding location is defined as an RNAV waypoint.

c. Maintain the same hold turn direction.

d. Maintain current inbound and outbound true tracks.

e. Magnetic Variation to be applied is that of the destination aerodrome.

f. Maintain hold levels if applicable.

g. Maintain existing conventional hold outbound timing/distance.

h. Hold protection areas to be constructed by APDO and submitted to the CAA in accordance with this document.

D.3 RNAV holdings are defined by the following and will be shown on the chart:

a. Waypoint name (5LNC/3LNC).

b. Waypoint co-ordinates (lat/long to 1/100th of a second).

c. The magnetic track of the inbound to the waypoint (to the nearest degree).

d. Turn direction.

e. Outbound timing/distance.

f. Max speed (knots).

g. Minimum and maximum altitude/flight levels.

D.4 RNAV holdings are defined by the following and will be shown on the coding table:

a. Hold Designator.

b. Waypoint name (5LNC/3LNC).

c. Waypoint co-ordinates (lat/long to 1/100th of a second).

d. Flyover (Y).

e. Course/Track M° (T°).

f. Magnetic variation (destination aerodrome).

g. Time/distance.

h. Turn direction.

i. Level constraint (min – max).

j. Max Speed.

k. Navigation Performance (same as associated STAR).

Appendix E
The Designation of Standard Instrument Departures (SIDs) and Standard instrument Arrival (STARs)

SID DESIGNATORS

E.1 SIDs are promulgated in the respective aerodrome entries in UK AIP Aerodrome AD 2 section.

E.2 SIDs end at a Significant Point on a designated ATS Route at which the en-route ATS system is joined. The name of the ATS significant point at the end of the SID procedure (navigation aid identifier 3LNC or ICAO 5LNC) will normally determine the designation of the SID procedure.

E.3 Designator assignment is undertaken by the CAA in accordance with ICAO Annex 11. In assigning designators, care will be taken to ensure that no confusion will arise in their practical use in voice communications through close similarities with other designators.

STAR DESIGNATORS

E.4 STARs are promulgated in the respective aerodrome entries in UK AIP Aerodrome AD 2 section.

E.5 Historically the basic indicator for UK STARs is the name or the name code for the holding facility or fix where the arrival route terminates. See UK AIP GEN 1.7.

E.6 ICAO Annex 11 requires the basic indicator for STARs to be the name of, or the name code for the point at which the arrival route commences. Designation of all new STARs established with effect from 1 August 2018 (including PBN replications of conventional STARs or STAR re-designations arising from navigation aid removal or replacement) is in accordance with ICAO Annex 11.

E.7 Re-designation of all other STARs to comply with ICAO Annex 11 is to be carried out as part of a periodic review, completed by no later than 1 April 2024.

BASIC INDICATOR CHANGES

E.8 The Basic indicator shall be the name or name-code of the significant point where a standard departure route (SID) terminates, or a standard instrument arrival (STAR) begins.

E.9 The withdrawal or replacement of navigation aids at the commencement point of a STAR will require a change in the Basic Indicator. The new basic indicator will be the 3LNC of the new ground-based navigation aid or the new waypoint positioned overhead the navigation aid adopting the same 3LNC.

E.10 Where the commencement of the STAR changes to a new waypoint or fix (e.g. a truncation or re-designation of a STAR), the new basic indicator of the STAR will be the 5LNC of the new waypoint or fix.

VALIDITY INDICATOR CHANGES

E.11 The validity indicator shall be a number from 1 to 9.

E.12 Changes to SIDs and STARs will invariably require a change in procedure validity indicator. In the absence of guidance at Annex 11, Annex 4 and CAP 1616, SID designator changes will be required in the following circumstances:

e. Changes to vertical profile, i.e.: procedure design gradient and altitude/FL constraints.

f. Changes to lateral profile, i.e.: ground track.

g. Speed limitation changes.

h. The withdrawal or replacement of navigation aids within a SID (that is not the SID termination waypoint).

E.13 STAR validity indicator changes will be required in the following circumstances:

i. Changes to vertical profile, i.e.: altitude/FL constraints.

j. Changes to lateral profile, i.e.: ground track.

k. Speed limitation changes, including changes to Speed Limitation Points.

l. The withdrawal or replacement of navigation aids within a STAR (that is not the commencement point).

E.14 Designator changes are not required in the following circumstances:

m. Changes to magnetic variation.

n. Changes to departure aerodrome runway designators arising from changes to magnetic variation.

o. Changes to ATS information, e.g. frequencies.

p. Changes to Area Minimum Altitudes or their presentation on charts.

q. Transition Altitude changes.

r. Navigation aid frequency changes.

s. Waypoint or navigation aid co-ordinate refinements and/or corrections.

t. Track mileage refinements and/or corrections.

u. Changes to background airspace or topographical information on procedure charts.

E.15 Changes to ‘General Information’ or ‘Warnings’ will generally not generate designator changes, however the significance of any such changes may warrant a designator change at the discretion of the appropriate Airspace Regulator (IFP).

ROUTE INDICATOR

E.16 The route indicator shall be a letter of the alphabet. The letter “I” and “O” shall not be used.

E.17 Requests for new SID and STAR route indicators are to be submitted to the Airspace Regulator (IFP) in advance of submitting proposed new or trial designs for regulatory approval.

Appendix F
Ground (SIMULATOR) Validation Report

GROUND (SIMULATOR) VALIDATION REPORT [one required per simulator session]				
Airport Name				
List of IFPs [please provide the name of each IFP – found on charts assessed in this ground validation (simulator) session]				
Validating Pilot (PF)	Name	Licence Type and No		
Validating Pilot (PM)	Name	Licence Type and No		
Simulator Used	Aircraft Type	Simulator Registration		
FMS/C Manufacturer				
Navigation Database Provider	BOEING (JEPPESEN)	NAVBLUE	LUFTHANSA SYSTEMS	OTHER
Draft Chart and Coding Tables provided by IFP DSP?	YES / NO			
Date of assessment				

Test Navigation Database Check for PBN IFPs [one required per procedure]			
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
	Are procedures loaded and activated from an official navigation database?	YES / NO	
	Do waypoint coordinates agree with charted information?	YES / NO	
	Do tracks between waypoints agree with charted information?	YES / NO	
	Do distances between waypoints agree with charted information?	YES / NO	
If the THR co-ordinates cannot be confirmed the validation should be discontinued.	Are runway threshold coordinates confirmed?	YES / NO	

SIDs [one required for each SID validated]			
SID DESIGNATOR	E.G. DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Consider whether the climb can be achieved without generating TCAS alerts and altitude attainment	Are the vertical profile/climb gradients achievable?	YES / NO	
	Are altitude restrictions correctly coded?	YES / NO	
Conventional only	Lead radials give adequate warning of turns?	YES / NO	
	Are turn anticipation for all waypoints satisfactory?	YES / NO	
Consider speed, turn radii and altitude requirements Applicable to procedures with CF path terminators.	Are all turns flyable/achievable?	YES / NO	
	Are minimum distances between waypoints satisfactory?	YES / NO	
	Are course interceptions achievable?	YES / NO	
	Are the speed restrictions achievable?	YES / NO	
Please report any disconnects within the procedure Please indicate in the remarks if the workload is considered “HIGH”	Are speed Limits correctly coded?	YES / NO	
	Sequencing of waypoints correct?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
	Are Human Factors / Cockpit Workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	

STAR [one required for each STAR validated]			
STAR DESIGNATOR	E.G. DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Consider whether the climb can be achieved without generating TCAS alerts and altitude attainment	Are descent rates acceptable?	YES / NO	
	Are altitude restrictions correctly coded?	YES / NO	
Conventional only	Lead radials give adequate warning of turns?	YES / NO	
	Are turn anticipation for all waypoints satisfactory?	YES / NO	
	Are all turns flyable/achievable?	YES / NO	
Consider speed, turn radii and altitude requirements Applicable to procedures with CF path terminators.	Are minimum distances between waypoints satisfactory?	YES / NO	
	Are course interceptions achievable?	YES / NO	
	Are the speed restrictions achievable?	YES / NO	
	Are speed Limits correctly coded?	YES / NO	
Please report any disconnects within the procedure	Sequencing of waypoints correct?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”	Are Human Factors / Cockpit Workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	

STAR [one required for each STAR validated]			
STAR DESIGNATOR	E.G. DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Applicable to intermediate holds where it is not a direct entry and holds located at clearance limit point.	The Entry and exit to the HOLD is acceptable.	YES / NO	
This includes entry and exit of the STAR hold as part of transition to the next procedure.	Are transitions to the following initial approach or RNAV approach transitions acceptable?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Are Human Factors / Cockpit workload satisfactory?	YES / NO	

INITIAL APPROACH PROCEDURE / RNAV APPROACH TRANSITION [one required for each IAP validated]			
PROCEDURE DESIGNATOR	E.G. INITIAL APPROACH PROCEDURES ILS RWY 09 OR DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Consider whether the climb can be achieved without generating TCAS alerts and altitude attainment	Are descent rates acceptable?	YES / NO	
	Are altitude restrictions correctly coded?	YES / NO	
Conventional only	Lead radials give adequate warning of turns?	YES / NO	
	Are turn anticipation for all waypoints satisfactory?	YES / NO	
Normally this procedure will terminate at the IF of the IAP.	Is the transition to the IAP acceptable?	YES / NO	
	Are all turns flyable/achievable?	YES / NO	
Consider speed, turn radii and altitude requirements Applicable to procedures with CF path terminators.	Are minimum distances between waypoints satisfactory?	YES / NO	
	Are course interceptions achievable?	YES / NO	
	Are the speed restrictions achievable?	YES / NO	
Please report any disconnects within the procedure	Are speed Limits correctly coded?	YES / NO	
	Sequencing of waypoints correct?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
	Where applicable, are there any loss of RNP.	YES / NO	

INITIAL APPROACH PROCEDURE / RNAV APPROACH TRANSITION. [one required for each IAP validated]			
PROCEDURE DESIGNATOR	E.G. INITIAL APPROACH PROCEDURES ILS RWY 09 OR DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Please indicate in the remarks if the workload is considered “HIGH”	Are Human Factors / Cockpit Workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	

INSTRUMENT APPROACH PROCEDURE (GENERAL) [one required for each IAP validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
If not please specific which segment	Are all segment lengths acceptable?	YES / NO	
	Are the descent rates for all segments acceptable?	YES / NO	
	Are there any discontinuities in the procedure?	YES / NO	
Conventional only	After turns, roll out close to the next intended track?	YES / NO	
	Speed Limits correctly coded?	YES / NO	
	Altitude restrictions correctly coded?	YES / NO	
	Sequencing of waypoints correct?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Turn anticipation for all waypoints satisfactory?	YES / NO	
	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
	Where applicable, are there any loss of RNP.	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	

FINAL APPROACH (NON-PRECISION) [one required for each IAP validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
	Descent profiles provide a CDA to 50 ft above THR?	YES / NO	
	Are all SDF Altitude restrictions on or below recommended profile?	YES / NO	
	Visual indicators coincide with the constant decent profile?	YES / NO	
Only applicable to manual entry into navigation database of LNAV ONLY procedure Only applicable to manual entry into navigation database of LNAV ONLY procedure Please indicate in the remarks if the workload is considered “HIGH”.	CDI scale changes activated at appropriate phase of procedure? (*See note 3 below*)	YES / NO	
	Terminal mode activated at appropriate range? (*See note 3 below*)	YES / NO	
	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	
	Were any TAWS alerts encountered during the validation activities?	YES / NO	

FINAL APPROACH (PRECISION/APV) [one required for each IAP validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
ILS only	Smooth interception onto the final approach track/localiser?	YES / NO	
	Is there a smooth transition from the Intermediate segment at the FAP (Glide slope interception)?	YES / NO	
	Glide path angle and localizer stable?	YES / NO	
	Do the Visual indicators co-inside with the constant decent profile?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	
	Were any TAWS alerts encountered during the validation activities?	YES / NO	

MISSED APPROACH (MAP) [one required for each IAP validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Applicable when MAPt is not located at the THR	Is the location of the MAPt acceptable?	YES / NO	
	Is the turn at MAPt (if any) acceptable?	YES / NO	
	Is the track interception (if any) after turn achievable?	YES / NO	
	Is the correct turn direction provided?	YES / NO	
	Minima reached at or before MAPt?	YES / NO	
	Are the published missed approach gradients achievable?	YES / NO	
	Missed approach turns (if any) acceptable?	YES / NO	
	CDI scale changes activated at appropriate phase of procedure? (*See note 3 below*)	YES / NO	
	Terminal mode activated at appropriate range? (*See note 3 below*)	YES / NO	
	Missed approach termination suitable for either further approach or diversion?	YES / NO	
	Does the chart/coding table provided correctly reflect with the procedure flown?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Were any TAWS alerts encountered during the validation activities?	YES / NO	

General Comments (please use this space for any comments relating to the IFPs validated):	
Simulator Validation Result	Simulator Validation Pilot
Acceptable	Name
Not Acceptable	Signature and Date

Note.

1. Where a report item is not applicable for the procedure being validated, delete as required.
2. Where a procedure has been manually entered into the RNAV system in use, this process will not occur automatically. In this case the validating pilot will need to activate the CDI scaling changes during the different phases of the flight.

Appendix G
Flight Validation Report

FLIGHT VALIDATION REPORT [one required per flight validation session]						
Airport Name						
List of IFPs [please provide the name of each IFP – found on charts assessed in this flight validation session]						
Validating Pilot (PF)	**Name**		**Licence Type and No**			
Validating Pilot (PM)	**Name**		**Licence Type and No**			
Aircraft Used	**Aircraft Type**		**Aircraft Registration**			
FMS/C Manufacturer						
Navigation Database Provider	**BOEING (JEPPESEN)**	**NAVBLUE**	**LUFTHANSA SYSTEMS**	**MANUAL (LNAV ONLY)**	**OTHER**	
Draft Chart and Coding Tables provided by IFP DSP?	YES / NO					
Date of assessment						

Test Navigation Database Check for PBN IFPs [one required per procedure]			
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
	Are procedures loaded and activated from an official navigation database?	YES / NO	
	Do waypoint coordinates agree with charted information?	YES / NO	
	Do tracks between waypoints agree with charted information?	YES / NO	
	Do distances between waypoints agree with charted information?	YES / NO	
If the THR co-ordinates cannot be confirmed the validation should be discontinued.	Are runway threshold coordinates confirmed?	YES / NO	
	RAIM check complete?	YES / NO	

SIDs [one required for each SID validated]			
SID DESIGNATOR	E.G. DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Consider whether the climb can be achieved without generating TCAS alerts and altitude attainment	Are the vertical profile/climb gradients achievable?	YES / NO	
	Are altitude restrictions correctly coded?	YES / NO	
Conventional only	Lead radials give adequate warning of turns?	YES / NO	
	Are turn anticipation for all waypoints satisfactory?	YES / NO	
	Are all turns flyable/achievable?	YES / NO	
Consider speed, turn radii and altitude requirements Applicable to procedures with CF path terminators.	Are minimum distances between waypoints satisfactory?	YES / NO	
	Are course interceptions achievable?	YES / NO	
	Are the speed restrictions achievable?	YES / NO	
	Are speed Limits correctly coded?	YES / NO	
Please report any disconnects within the procedure	Sequencing of waypoints correct?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”	Are Human Factors / Cockpit Workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	
	Were any TCAS alerts encountered during the validation activities?	YES / NO	

STAR [one required for each STAR validated]			
STAR DESIGNATOR	E.G. DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Consider whether the climb can be achieved without generating TCAS alerts and altitude attainment	Are descent rates acceptable?	YES / NO	
	Are altitude restrictions correctly coded?	YES / NO	
Conventional only	Lead radials give adequate warning of turns?	YES / NO	
	Are turn anticipation for all waypoints satisfactory?	YES / NO	
	Are all turns flyable/achievable?	YES / NO	
Consider speed, turn radii and altitude requirements Applicable to procedures with CF path terminators.	Are minimum distances between waypoints satisfactory?	YES / NO	
	Are course interceptions achievable?	YES / NO	
	Are the speed restrictions achievable?	YES / NO	
	Are speed Limits correctly coded?	YES / NO	
Please report any disconnects within the procedure	Sequencing of waypoints correct?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”	Are Human Factors / Cockpit Workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	

STAR [one required for each STAR validated]			
STAR DESIGNATOR	E.G. DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Applicable to intermediate holds where it is not a direct entry and holds located at clearance limit point.	The Entry and exit to the HOLD is acceptable.	YES / NO	
This includes entry and exit of the STAR hold as part of transition to the next procedure.	Are transitions to the following initial approach or RNAV approach transitions acceptable?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Were any TCAS alerts encountered during the validation activities?	YES / NO	

INITIAL APPROACH PROCEDURE / RNAV APPROACH TRANSITION. [one required for each IAP validated]			
PROCEDURE DESIGNATOR	E.G. INITIAL APPROACH PROCEDURES ILS RWY 09 OR DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Consider whether the climb can be achieved without generating TCAS alerts and altitude attainment	Are descent rates acceptable?	YES / NO	
	Are altitude restrictions correctly coded?	YES / NO	
Conventional only	Lead radials give adequate warning of turns?	YES / NO	
	Are turn anticipation for all waypoints satisfactory?	YES / NO	
Normally this procedure will terminate at the IF of the IAP.	Is the transition to the IAP acceptable?	YES / NO	
	Are all turns flyable/achievable?	YES / NO	
Consider speed, turn radii and altitude requirements Applicable to procedures with CF path terminators.	Are minimum distances between waypoints satisfactory?	YES / NO	
	Are course interceptions achievable?	YES / NO	
	Are the speed restrictions achievable?	YES / NO	
	Are speed Limits correctly coded?	YES / NO	
Please report any disconnects within the procedure	Sequencing of waypoints correct?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
	Where applicable, are there any loss of RNP.	YES / NO	

INITIAL APPROACH PROCEDURE / RNAV APPROACH TRANSITION. [one required for each IAP validated]			
PROCEDURE DESIGNATOR	E.G. INITIAL APPROACH PROCEDURES ILS RWY 09 OR DESIG 1L		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Please indicate in the remarks if the workload is considered “HIGH”	Are Human Factors / Cockpit Workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	
	Were any TCAS alerts encountered during the validation activities?	YES / NO	

INSTRUMENT APPROACH PROCEDURE (GENERAL) [one required for each IAP validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
If not please specific which segment	Are all segment lengths acceptable?	YES / NO	
	Are the descent rates for all segments acceptable?	YES / NO	
Conventional only	Are there any discontinuities in the procedure?	YES / NO	
	After turns, roll out close to the next intended track?	YES / NO	
	Speed Limits correctly coded?	YES / NO	
	Altitude restrictions correctly coded?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Sequencing of waypoints correct?	YES / NO	
	Turn anticipation for all waypoints satisfactory?	YES / NO	
	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Along track and cross track alignment is satisfactory?	YES / NO	
	Where applicable, are there any loss of RNP.	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	
	Were any TCAS alerts encountered during the validation activities?	YES / NO	

FINAL APPROACH (NON-PRECISION) [one required for each IAP line or minima validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
	Descent profiles provide a CDA to 50 ft above THR?	YES / NO	
Only applicable to manual entry into navigation database of LNAV ONLY procedure[2] Only applicable to manual entry into navigation database of LNAV ONLY procedure[2] Please indicate in the remarks if the workload is considered “HIGH”.	Are all SDF Altitude restrictions on or below recommended profile?	YES / NO	
	Visual indicators coincide with the constant decent profile?	YES / NO	
	CDI scale changes activated at appropriate phase of procedure?	YES / NO	
	Terminal mode activated at appropriate range?	YES / NO	
	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	
	Were any TAWS alerts encountered during the validation activities?	YES / NO	

FINAL APPROACH (PRECISION/APV) [one required for each IAP line or minima validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
	Smooth interception onto the final approach track/localiser?	YES / NO	
	Is there a smooth transition from the Intermediate segment at the FAP (Glide slope interception)?	YES / NO	
ILS only	Glide path angle and localizer stable?	YES / NO	
	Do the Visual indicators co-inside with the constant decent profile?	YES / NO	
Only applicable to manual entry into navigation database of LNAV ONLY procedure[2]	CDI scale changes activated at appropriate phase of procedure?	YES / NO	
Only applicable to manual entry into navigation database of LNAV ONLY procedure[2]	Terminal mode activated at appropriate range?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	
	Were any TAWS alerts encountered during the validation activities?	YES / NO	

MISSED APPROACH (MAP) [one required for each IAP line or minima validated]			
AERODROME (ICAO) AND IAP DESIGNATOR	E.G. EGXX R09R		
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
Applicable when MAPt is <u>not</u> located at the THR	Is the location of the MAPt acceptable?	YES / NO	
	Is the turn at MAPt (if any) acceptable?	YES / NO	
	Is the track interception (if any) after turn achievable?	YES / NO	
	Is the correct turn direction provided?	YES / NO	
	Minima reached at or before MAPt?	YES / NO	
	Are the published missed approach gradients achievable?	YES / NO	
	Missed approach turns (if any) acceptable?	YES / NO	
Only applicable to manual entry into navigation database of LNAV ONLY procedure[2]	CDI scale changes activated at appropriate phase of procedure?	YES / NO	
Only applicable to manual entry into navigation database of LNAV ONLY procedure[2]	Terminal mode activated at appropriate range?	YES / NO	
	Missed approach termination suitable for either further approach or diversion?	YES / NO	
	Does the chart/coding table provided correctly reflect the procedure flown?	YES / NO	
Please indicate in the remarks if the workload is considered “HIGH”.	Are Human Factors / Cockpit workload satisfactory?	YES / NO	
	Were any TAWS alerts encountered during the validation activities?	YES / NO	
	Are there any obstructions observed that caused concern?	YES/ NO	

VM(C) [one required per aerodrome – see 2.16b for applicability]			
GUIDANCE	**REQUIREMENT**	**RESULT**	**REMARKS**
	VM(C) areas safe for specified aircraft categories?	YES / NO	

General Comments (please use this space for any comments relating to the IFPs validated):	
Simulator/Flight Validation Result	Simulator/ Flight Validation Pilot
Acceptable	Name
Not Acceptable	Signature and Date

Note.

1. Where a report item is not applicable for the procedure being validated, delete as required.
2. Where a procedure has been manually entered into the RNAV system in use, this process will not occur automatically. In this case the validating pilot will need to activate the CDI scaling changes during the different phases of the flight.

Appendix H
Navigation Database Validation Report

NAVIGATION DATABASE VALIDATION REPORT [one required per validation session]				
Airport Name				
List of IFPs [please provide the name of each IFP – found on AIP charts assessed in this validation session]				
Validator [pilot or personnel who understands the validation	**Name**	**Title**	**Licence No (as applicable)**	**Signature**
Validation Tool [please provide type used]	**AIRCRAFT**	**SIMULATOR**	**DESKTOP TRAINER**	**OTHER**
FMS/C Manufacturer				
Navigation Database Provider	**BOEING (JEPPESEN)**	**NAVBLUE**	**LUFTHANSA SYSTEMS**	**OTHER**
UK AIP Chart/Coding Table/FAS DB used? [if "no", discontinue validation activities]	YES / NO			
AIRAC Date of Data				
Date				

DRAFT

GUIDANCE	REQUIREMENT	RESULT	REMARKS
	Procedure loaded and activated from an official database?	YES / NO	
Please advice if navigation database uses decimal minutes in the remarks.	Waypoint coordinates agree with charted information?	YES / NO	
Please document any differences.	Tracks between waypoints agree with charted information?	YES / NO	
Please document any differences.	Distances between waypoints agree with charted information?	YES / NO	
	Speed Limits correctly coded?	YES / NO	
	Altitude restrictions correctly coded?	YES / NO	

General Comments (please use this space for any comments relating to the IFPs validated)			
Database Validation Result			Validator
Acceptable			Name
Not Acceptable			Signature and Date
NOTAM Action required?	YES	NO	**PLEASE CONTACT CAA (IFP) PRIOR TO ISSUING A NOTAM.**