SLCAP 2450



Civil Aviation Authority of Sri Lanka

Guidance Manual for IFP Design Service in Sri Lanka

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SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



List of Effective Pages

Page	Eff. Date	Page	Eff. Date	Page	Eff. Date	Page	Eff. Date
1	23-June-23	21	23-June-23				
2	23-June-23	22	23-June-23				
3	23-June-23	23	23-June-23				
4	23-June-23	24	23-June-23				
5	23-June-23	25	23-June-23				
6	23-June-23	26	23-June-23				
7	23-June-23	27	23-June-23				
8	23-June-23	28	23-June-23				
9	23-June-23	29	23-June-23				
10	23-June-23	30	23-June-23				
11	23-June-23	31	23-June-23				
12	23-June-23	32	23-June-23				
13	23-June-23	33	23-June-23				
14	23-June-23	34	23-June-23				
15	23-June-23	35	23-June-23				
16	23-June-23	36	23-June-23				
17	23-June-23						
17	23-June-23						
19	23-June-23						
20	23-June-23						

Section: List of Effective Pages	Page: iii	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



History of Revisions

Revision Number	Source	Areas subjected to change	Effective date

Section: History of Revisions	Page: iv	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Table of Content

Record of Revisions	 ii
List of effective pages	 iii
History of Revisions	 iv
Table of contents	 v
Forward	 vii

PART A - GENERAL

1.0	Authority	 02
2.0	Purpose	 02
3.0	Applicability	 02
4.0	Definitions	 02
5.0	Abbreviations	 04

PART B – REGULATORY POLICIES & FUNCTIONS

1.0	Regulatory Policy	06
2.0	Regulatory framework	07
3.0	Regulatory Process	07
4.0	Regulatory Safety oversight	07

PART C - APPROVAL REQUIREMENTS FOR IFP DESIGN

Chapter 1	Introduction	
1.1	Background	10
1.2	IFP Roles and Responsibility	10
Chapter 2	IFP Designer Approval	
2.1	Overview	12
2.2	Criteria for the Authorization	12
2.3	Approval Process	13
2.4	Criteria for the Approval	14
2.5	Issue of Approval	15
2.6	Transferability	15
Chapter 3	Instrument Flight Procedure Design Approval	
3.1	Design Process	15
3.2	Design Criteria	16
3.3	Design Submission – Format and content	16
3.4	External Data and information	17
3.5	Drawings	17

Section: Table of Contents	Page: v	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



3.6	Calculations	17
3.7	Submissions	18
3.8	Design evaluation & approval	18
3.9	Establishing IFP Design	18
3.10	Maintenance of IFP Design	18
3.11	Rejected Submissions	18
3.12	Cancellation/ Withdrawal	18
Chapter 4	Maintenance, Review and Safeguarding	
4.1	Maintenance	19
4.2	Safeguarding	19
Appendix A	Template for Simulator Evaluation Checklist (Fixed win	ng)
Appendix B	Template for Flight Evaluation Checklist (Fixed wing)	
Appendix C	Template for Validation Report Checklist (Fixed wing)	
Appendix D	IFP designs evaluation checklist	
Appendix E	Diagram on Overview of the necessary steps in the IFF publication	P design approval and
Appendix F	Template to make a "request to obtain regulatory appr process for the establishment of a new IFP design / Design"	-

Section: Table of Contents	Page: vi	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00

Foreword

As International Civil Aviation Organization stands with that the Instrument Flight Procedure is an essential component of the aviation system, Sri Lanka as a Contracting State to the Convention on International Civil Aviation has an obligation to ensure that the IFP design services are provided as per the Standards and Recommended Practices (SARPs) contained in the relevant Annexes to the Convention on International Civil Aviation and the requirements contained in the associated ICAO Documents. As such, this guidance manual has been developed in such a way specifying the national standards and requirements to be met by the Service provider responsible for instrument flight procedure design service and instrument flight procedure designers for the design and maintenance of instrument flight procedures within the Colombo Flight Information Region.

Further, this manual stipulates regulatory safety oversight functions on service provider responsible for Instrument Flight Procedure design service in Sri Lanka and inspectorate responsibilities in this regard as well as approval procedures for service provider responsible for Instrument Flight Procedure design service in Sri Lanka, Instrument Flight Procedure designers and Instrument Flight Procedures designs for effective services.

The requirements and recommended clauses in this Manual are based mainly on ICAO Document 8168, volume II (Procedures for Air Navigation Services – Aircraft Operations [PANS-OPS]), ICAO Doc. 9906, volume I to volume VI, ICAO DOC 10068 (development of Regulatory frame work of IFP Design Service) and other relevant ICAO documents, and with such modifications as may be determined by CAASL to be applicable in Sri Lanka.

This document is continually subject to revisions and amendments without any prior notice, if required or changes on source documents. Amendments to this Guidance Manual are the responsibility of the Director of Air Navigation Services section.

It is necessary that the Flight procedure Inspectorate attached to ANS-CAASL shall be guided by the provisions contained in this manual to the greatest extent possible, when attending to their duties and functions in the subject of IFP design.

P. A. Jayakantha Director General of Civil Aviation Civil Aviation Authority of Sri Lanka No.152/1, Minuwangoda Road, Katunayake.

23.06.2023

Section: Foreword	Page: vii	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Part A

GENERAL

Section: General	Page: 1	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



<u> Part A – GENERAL</u>

1.0 Authority

1.1 This Guidance Manual is published to provide guidance for the compliance of standards and design criteria established for the Instrument Flight procedure design in Annex 11 and PANS OPS DOC 8168, volume II that have been given effect through implementing standards 025, 087 and 099 under the powers vested to Director General of Civil Aviation through Sec. 120 of Civil Aviation Act No. 14 of 2010.

2.0 Purpose

- 2.1 The purpose of this manual is to provide guidance for all personnel and entities involved in the design, review, validation and publication process of Instrument Flight Procedures in Sri Lanka.
- 2.2 This elaborate the functions and responsibilities of individuals and entities and provide guidance to meet Standards/criteria to ensure constructions of Instrument Flight Procedure (IFP) are produced under the standardized processes that ensure safety and quality.
- 2.3 Further, it describes the procedures to obtain regulatory approval for IFP designs, IFPdesign service providers and IFP designers and overall safety oversight activities on the procedure design function.

3.0 Applicability

- 3.1 This guidance manual is applicable to IFP Design service provider who is responsible for IFP design service in Sri Lanka.
- 3.2 The guidance contained in this manual is applicable to all aspects of constructions of Instrument Flight Procedures.
- 3.3 The guidance contained herein are applicable to Instrument Flight Procedure Designers and other personnel involved in review, validation, promulgation and maintenance of Visual or Instrument Flight Procedures in Sri Lanka.
- 3.4 It is also applicable for Flight Procedure Inspectorate of CAASL who are tasked with safety oversight of all Visual and/or Instrument Flight Procedures in Sri Lanka.

4 & 5 Definitions & Abbreviations

When the following terms/abbreviations are used in this document, they have the following meanings. The meanings of the terms/abbreviations given here are limited to this document only.

4.0 Definitions

When the following terms are used in this manual, they have the following meanings:

Section: General	Page: 2	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Competency. A dimension of human performance that is used to reliably predict successful performance on the job.

Flight inspection. The operation of a suitably equipped aircraft for the purpose of calibrating ground-based NAVAIDS or monitoring/evaluating the performance of the global navigation satellite system (GNSS).

Flight procedure designer. A person responsible for flight procedure design who meets the competency requirements as laid down by the State.

Flight procedure design process. The process which is specific to the design of instrument flight procedures leading to the creation or modification of an instrument flight procedure.

Flight procedure inspectorate (FPI). A State entity designated to carry out the safety oversight activities in the area of development and maintenance of visual and instrument flight procedures.

Flight procedure inspectorate staff. A person or persons responsible for the oversight of the process of development and maintenance of visual and instrument flight procedures.

Flight validation pilot. A person performing flight validation who meets the competency requirements as laid down by the State.

Flyability. The ability to keep an aircraft within the predefined tolerances of the designed lateral and vertical flight track

Instrument flight procedure. A description of a series of predetermined flight manoeuvres by reference to flight instruments, published by electronic and/or printed means.

Instrument flight procedure process. The overarching process from data origination to the publication of an instrument flight procedure.

Instrument flight procedure design service (IFPDS). A service established for the design, documentation, validation, continuous maintenance and periodic review of instrument flight procedures necessary for the safety, regularity and efficiency of air navigation.

Instrument flight procedure design service provider. A service provider responsible for the development and maintenance of PANS OPS Visual and Instrument Flight Procedures.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or
- b) extend above a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

Section: General	Page: 3	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Validation. Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (ISO 9000: Quality Management Systems — Fundamentals and Vocabulary)

Verification. Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

5.0 Abbreviations

ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ASN	Aviation Safety Notice
ATS	Air Traffic Service
CAASL	Civil Aviation Authority of Sri Lanka
DGCA	Director General of Civil Aviation
FPD	Flight Procedure Designer
FVP	Flight Validation Pilot
ICAO	International Civil Aviation Organization
IFP	Instrument Flight Procedure
IFPDS	Instrument Flight Procedure-Design Service
IFPDSP	Instrument Flight Procedure Design Service Provider
PBN	Performance Based Navigation
IS	Implementing Standards
PPM	Policy & Procedure Manual for IFP Service
QM	Quality Manual
QMS	Quality Management System
RNAV	Area Navigation
SLCAP	Sri Lanka Civil Aviation Publication
SMS	Safety Management System
SSP	State Safety Programme

Section: General	Page: 4	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Part B

REGULATORY POLICIES & FUNCTIONS

Section: Part B – Regulatory Policies & Functions	Page: 5	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Part B - REGULATORY POLICIES & FUNCTIONS

1.0 Regulatory Policies

- 1.1 The Instrument Flight Procedure (IFP) is an essential component of the aviation system. CAASL endeavors to ensure that the ATM operations in Sri Lankan airspace are supported with quality assured Instrument Flight Procedures developed and maintained according to standards and criteria stipulated by ICAO which CAASL has given effect through Implementing Standards 087 and 099, ensuring safe, efficient and environmentally responsible aircraft operations.
- 1.2 CAASL endeavors to meet the changing criterion of IFP Design and update the Instrument Flight procedures established accordingly.
- 1.3 CAASL that approves IFP designs remains responsible for all instrument flight procedures for aerodromes and airspace under the authority of the State.
- 1.4 CAASL remains responsible for the continuous maintenance and conduct of periodic review of instrument flight procedures for aerodromes and airspace under the responsibility of the State.
- 1.5 Deviations from PANS-OPS, DOC 8168, Volume II criteria will be published in the State Aeronautical Information Publication (AIP)
- 1.6 CAASL engages in safety oversight work on Instrument flight procedures.
- 1.7 A safety risk assessment of an IFP is considered completed when the IFP Design is in compliance with regulatory framework promulgated by CAASL.
- 1.8 Any deviation from the regulatory framework warrants conducting a safety risk assessment.
- 1.9 Mandatory implementation of quality management system at each stage of the Instrument Flight Procedure design process.

Section: Part B – Regulatory Policies & Functions	Page: 6	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



2.0 Regulatory Framework

- 2.1 The Civil Aviation Act No.14 of 2010 enables the Minister in charge of the subject of Civil Aviation to promulgate regulations for the implementation of the provisions of the same Act and for the fulfillment of international obligations of Sri Lanka in respect of the SARPS and safety oversight of civil aviation and matters connected therewith. The Minister may delegate the power to the Civil Aviation Authority or to the Director General, who shall exercise, perform or discharge such powers, duties or functions.
- 2.2 Civil Aviation Act further enables the Director-General with power to issue whenever he considers it necessary or appropriate to do so, such implementing standards for the purpose of giving effect to any of the provisions of this Act.
- 2.3 As such, The IS 099 on Instrument Flight Procedure Design service in Sri Lanka and IS087 on requirements to be satisfied for the certification of Air Navigation Service Providers issued by DGCA details the regulatory framework for the safety oversight of Instrument Flight Procedure design function of the state.

3.0 Regulatory process

- 3.1 The Regulatory Process on approval of IFP Designs, IFP Designers, ANSP responsible for IFP Design Service and safety oversight are executed through:
 - CAASL approval of procedure designers through evaluation of their training, experience, procedure designs and working practices.
 - CAASL regular safety oversight inspections on a pre-determined surveillance plan, periodic auditing of instrument procedure design-service provider,
 - CAASL evaluation and approval of completed IFP designs.
- 3.2 The CAASL accepts IFP design submissions from Instrument Flight Procedure Designers from ANSP responsible for IFP Design Service who would conform and meet the standards and criterion of procedure design in Sri Lanka and acceptable to CAASL.
- 3.3 A list of approved IFP designs as charts for particular aerodrome shall be published in Sri Lanka AIP.

4.0 Regulatory Safety Oversight

4.1 The DGCA is responsible to ensure the implementation and compliance of the IFP design requirements prescribed by the service provider responsible for IFP-Design Service.

Section: Part B – Regulatory Policies & Functions	Page: 7	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- 4.2 The DGCA is responsible to ensure that the ANSP responsible for IFP Design Service who design IFP designs for Sri Lankan airspace, shall meet the requirements established in the Implementing Standards 099, 087 and this Guidance manual for IFP design service in Sri Lanka.
- 4.3 As an integral component of the safety oversight, FPI should devise periodic surveillance plans to conduct surveillance activities using standardized procedures and checklists as specified in the SLCAP 2300–ANS Inspector Handbook.

<u>Note:</u> - The detail procedure and its checklist for safety oversight activities of IFP-Design Service technical unit, are given in the ANS Inspector Handbook, chapter 3 and chapter 4, section 4.8 respectively.

4.4 Flight Procedure Inspectorate/ FPI Staff (Inspectors)

4.4.1 Procedure design inspectorate should be established with FPI staff authorized by Director General of Civil Aviation meeting requirements contained in ANS Inspector Handbook.

5.0 Functions and responsibilities of FPI staff

- 5.5.1 As and when required, draft Primary Aviation Legislation to regulate Instrument Flight procedures development in Sri Lanka.
- 5.5.2 Develop Operating Regulations for the Basic Aviation Legislation and amend as necessary to maintain required safety and quality in the provision of Instrument Flight Procedures in Sri Lanka.
- 5.5.3 Develop Guidance Materials related to Instrument Flight procedure design services and update them as necessary.
- 5.5.4 In order to ensure the safety and quality of Instrument Flight Procedures, shall evaluate all procedures submitted for the approval of the Director General in accordance with the prescribed criteria in the ICAO Doc. 9906, Vol. I Quality assurance manual for flight procedure design.
- 5.5.5 Procedure design inspectorate shall inspect ANSP responsible for IFP Design Service on a pre-determined periodicity to ensure that the service provider/personnel engaged in the process of instrument flight procedure design are complying with the applicable provisions.
- 5.5.6 Assist authorizing ANSP responsible for IFP Design Service and IFP Designers in Sri Lanka in accordance with applicable regulations, Standards, written procedures and other relevant directives issued by the DGCA.

Section: Part B – Regulatory Policies & Functions	Page: 8	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



PART C

APPROVAL REQUIREMENTS FOR IFP DESIGN SERVICE

Section: Part C – Approval Requirements	Page: 9	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



PART C – APPROVAL REQUIREMENTS FOR IFP DESIGN

Chapter 1 – Introduction

1.1 Background

- 1.1.1 This chapter elaborates the processes and procedures established and adopted at CAASL facilitating the granting of DGCA approval for IFP designs, IFP designers and to ANSP responsible for IFP Design Service in Sri Lanka.
- 1.1.2 The requirements stipulated in the Implementing Standards 099, 087 and those prescribed in this guidance manual, shall be fulfilled by relevant personnel seeking DGCA approval for IFP designs, authorization for IFP Designers.
- 1.1.2 The purposes of this chapter:
 - a) To provide guidance on the procedure to be followed to obtain approval for the instrument flight procedure designs produced by the IFP designers
 - b) To provide guidance to IFP designers and to the ANSP responsible for IFP design service on the procedure for the issuance, with any applicable conditions, and continuation of an approval for an instrument flight procedure designs to be used in Sri Lanka airspace
 - c) To indicate the criteria used for assessing an application for an approval
 - d) To describe how the responsibilities and accountabilities are borne through the design process to the approval process among the procedure designers, the ANSP responsible for IFP design service and the DGCA.

1.2. IFP Roles and Responsibilities

- 1.2.1 Regulator (CAASL)
 - A. The DGCA/CEO of CAASL is responsible for overall regulatory oversight of IFP-design service within Sri Lanka airspace. IFP designs are published on behalf of the state under the authority of DGCA.
- 1.2.2 The Air Navigation Services section CAASL
 - A. The ANS section of CAASL is responsible for:
 - a) ensuring the provision of IFP as appropriate;
 - b) assisting DGCA for granting approval to IFP Designers, IFP Design Service Provider and IFP designs;
 - c) providing guidance to IFP Design Service Provider and IFP Designers as appropriate in developing IFP Designs;

Section: Part C – Approval Requirements	Page: 10	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- d) ensuring regular inspections/ audits of IFP design service provider are conducted; and
- e) to provide sectional expertise to the CAASL or DGCA on all regulatory aspects of IFP design
- 1.2.3 ANSP Responsible for IFP design service
 - A. The ANSP responsible for IFP design service is responsible for:
 - a) Maintenance of an IFP designs
 - b) initiating any new design or change to an IFP designs
 - c) ensuring that any new design or change to an IFP is undertaken by an IFP Designer
 - d) ensuring the validation as required of any new/changed IFP designs
 - e) ensuring that IFP designs are undertaken with relevant safety assessment and in additionally, submission of PBN safety assessment checklist in the case of RNAV design procedures
- 1.2.4 Instrument Flight Procedure Designer
 - A. The IFP Designer is responsible for:
 - a) ensuring that the design meets the requirements of the regulator implemented through applicable regulation and other guidelines prior to submission for regulatory approval
 - b) documenting the rationale for any non-compliance
 - c) ensuring that the design is documented against declared quality system
 - d) providing advice to the IFP Design Service provider on all aspects of IFP design
- 1.2.5 Head of ANSP responsible for IFP design service
 - A. ANSP responsible for IFP Design service, head is responsible for:
 - a) acting as the focal point of contact for the IFP design service
 - b) compiling all elements of the regulatory assessment
 - c) ensuring guidance is provided to IFP Designers regarding any IFP matters.

Section: Part C – Approval Requirements	Page: 11	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Chapter 2 – Instrument Flight Procedure Designer Approval

2.1 Overview

- 2.1.1 A person shall not act as a procedure designer in an IFP design process unless specifically authorised by the Director General of Civil Aviation. The terms and conditions for the grant of such authorization shall be determined by the Director General.
- 2.1.2 The basic minimum qualification required for approval of IFP designers are prescribed in IS 087, Chap. 4, Sec. 4.1 (J) (vi) and IS 099, chapter 04.
- 2.1.3 Further, the DGCA will consider that a combination of specialist knowledge and experience provides the basis for an effective and safe IFP designer.

2.2 Criteria for the Authorization of Instrument Flight Procedure Designer

- 2.2.1 Procedure Designers seeking approval to design IFP Designs for use in Sri Lanka airspace shall meet qualifications and required to provide evidence of the following. The requirements for approval shall be defined according to design types to which approval is seeking.
 - **A.** The minimum requirements for a Procedure Designer to be approved to design conventional procedures is:
 - I. Satisfactory completion of an approved PANS-OPS DOC 8168 basic procedures design course conducted by ICAO or at any institute determined by DGCA.
 - II. Satisfactory completion of On the Job Training (OJT) in procedure design under the supervision of an approved IFP designer as determined by DGCA.
 - III. Aviation experience acceptable to DGCA
 - IV. Training/ course completed on Quality Management System and Safety Management System acceptable to DGCA
 - V. The minimum experience required for a Designer to be approved for design of conventional procedures is at least one satisfactory design or review under the supervision of authorized designer or as determined by DGCA.
 - **B.** The minimum requirements for a Procedure Designer to be approved to design PBN procedures is:
 - I. satisfactory completion of an approved PANS-OPS DOC 8168, volume II basic procedures design course conducted by ICAO or at any institute determined by DGCA
 - Satisfactory completion of an approved PBN (advance FPP PBN procedure design course) procedures design course conducted by ICAO or at any institute determined by DGCA.

Section: Part C – Approval Requirements	Page: 12	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- III. Aviation experience acceptable to DGCA
- IV. Training/ course completed on Quality Management System and Safety Management System acceptable to DGCA
- V. Satisfactory completion of On the Job Training (OJT) in procedure design under the supervision of an authorized designer as determined by DGCA.
- VI. The minimum experience required for a Designer to be approved for PBN procedures is at least one satisfactory design or review under the supervision of an authorized designer or as or determined by DGCA.

2.2.2 Competency

- A. The service provider responsible for IFP Design service shall develop and implement a procedure for maintaining the competence of its IFP Designers (OJT programme, proficiency and refresher)
- B. The service provider responsible for IFP Design service shall establish a programme for conducting proficiency checks and schedule for conducting proficiency checks shall be developed. A designated person to administer proficiency checks, shall be available as well as the records on proficiency checks properly shall be kept and readily available.
- C. The CAASL oversight inspectors will assess that the competency of IFP designers are evaluated in appropriate interval as determined.
- D. The designer approved under above criteria, shall has designed, checked or been directly involved in the detailed review of an appropriate procedure design.

Note:- This requirement shall be subject to changes as determined by DGCA.

2.2.3 Procedure Design supervisor

A. In order to act as a supervisor, the IFP designer shall has at least two years experience in the relevant field, conventional and PBN.

2.3 Approval process

- 2.3.1 Procedure designer seeking approval to perform as an IFP Designer shall provide evidence of the following
 - a) Instrument Flight Procedure design training course completion certificate/s as applicable

Proof of attendance and successful completion of an Instrument Flight Procedure design training course based upon ICAO PANS OPS Doc 8168, Vol. II.

Section: Part C – Approval Requirements	Page: 13	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



2.3.2 Practical Application of Theoretical Knowledge: The ability of an applicant to demonstrate practical application of theoretical knowledge is required.

Applicants are expected to provide:

- a) Proof of recent IFP design work:
- b) Aviation Experience: acceptable to DGCA
- c) Demonstration with references: Applicants should be prepared to demonstrate knowledge level as required by DGCA.

2.4 Criteria for the Approval of ANSP responsible for IFP Design service

2.4.1. Implementing Standards 087, 099

The service provider responsible for IFP design service shall be approved in accordance with provision given in the above Implementing Standards.

- 2.4.2 The requirements given in the IS 087, Chap. 4, Sec. 4.1 (H) (J) and IS 099, Chap. 3 shall be met by IFP Design Service Provider for approval process.
- 2.4.3 Human resources

For an IFP Design Service provider to be approved, the service provider shall have in it employment at least two (2) IFP Designers who meets criteria given in sec. 2.2 and authorized by DGCA.

2.4.4. Operational Manual

The IFP procedure design service provider shall satisfy that it has developed and implemented IFP Design Service provider Operational Manual approved by DGCA, in accordance with Implementing Standards 099.

2.4.5 Quality system

The IFP service provider shall demonstrate that they have established and are able to maintain a documented quality system. The quality system shall be described in a quality manual that includes control procedures for:

- a) management responsibility
- b) a quality system including:
 - i. controlled documentation of the design process;
 - ii. record control system of design drawings and worksheets;

Section: Part C – Approval Requirements	Page: 14	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- iii. record control system of input data including items such as: survey data and charting;
- iv. record control system of regulatory documents and reference material;
- v. control procedures for validation of software tools if applicable;
- vi. control of non-conforming design;
- vii. records of personnel competence and qualifications;
- viii. training of personnel;
- ix. internal quality audits and corrective actions;
- x. Co-ordination throughout the process from design to publication.

2.5 Issue of Approval

- 2.5.1 An IFP designer shall be entitled to have an authorization issued by DGCA when it has demonstrated compliance with the applicable requirements.
- 2.5.2 Application for approval of an individual as an Instrument Flight Procedure designer should be made to DGCA through written letter.

2.6 Transferability

2.6.1 An Approval granted in accordance with the requirements, as set out in the Implementing Standards 099 and this manual is not transferable.

Chapter 3 - IFP Design Approvals

3.1 Design Process

- 3.1.1 The ANSP responsible for IFP design service shall notify the DGCA in writing of his intention to establish or amend an IFP. The letter shall contain the reasons to carry-out the task acceptable to DGCA.
- 3.1.2 Formal notification to the DGCA shall include detail description on new establishment or amendments to be taken place.
- 3.1.3 Following receipt of the letter, the DGCA shall notify service provider with any comments to be considered during design within the period required, depends on volume of changes for design and acknowledgement will be sent.
- 3.1.4 The procedure designer applying for new procedures shall consider the processes involved (See Figure I-2-4-1 IFP process, Doc 8168, Vol. II). These considerations shall also include the following:

Section: Part C – Approval Requirements	Page: 15	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- a) design period (negotiated between regulator and service provider)
- b) associated regulatory activity by DGCA office
- c) production of a chart suitable to allow AIS to produce a chart for the AIP
- d) Ground & Flight Validation as applicable
- e) flight calibration of navigation aids if required
- f) Promulgation of IFP according to the AIRAC cycle.

3.2 Design Criteria

- 3.2.1 The criterion for IFP design in Sri Lanka Airspace is based on the following document:
 - a) ICAO Doc 8168 Procedures for Air Navigation Services Aircraft Operations Volume II, Construction of Visual and Instrument Flight Procedures (PANS-OPS Vol. II); and/or
 - b) ICAO Doc 9905 Required Navigation Performance Authorization Required (RNP-AR) Procedure Design Manual.

3.3 Design Submission - Format and Content

- 3.3.1 IFP designs submitted for evaluation and approval by DGCA are to provide with:
 - a) a complete record of the design process including copies of all source data, information, calculations and drawings used in the project;
 - b) a record of Quality Assurance and Quality Control;
 - c) safety assessment report with checklist
 - d) a report demonstrating how the original requirement has been satisfied;
 - e) report describes the procedure in textual format and table showing all tracks and any additional database procedure coding;
 - f) a graphical representation which accurately reflects the content of the narrative provided;
 - g) relevant signed validation reports; and
 - h) a comprehensive design rationale in text format, including references to PANS-OPS
 Volume II and CAASL Guidance Manual for IFP design service in Sri Lanka where a deviation from the standard criteria has been employed.
 - <u>Note:</u> A one report including all above expected elements, shall be submitted for approval.

Section: Part C – Approval Requirements	Page: 16	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- The sample templates for Simulator evaluation, Flight validation checklist and Validation report checklist for fixed wing, can be found in the Appendix A, B and C to this Guidance manual respectively.

3.4 External Data and Information

3.4.1 External data used in the design process should be submitted in source format by the designer. The data handling process used by the designer should be documented, including all quality management processes and procedures to provide demonstrable proof of data quality and integrity. A full reference to any maps or charts is required.

Copies of paper maps used shall be required unless electronic versions are available.

- 3.4.2 Where any maps or charts have been scanned or digitized, such scans or digitized drawings should be included in the submission, subject to approval.
- 3.4.3 Instrument Flight Procedure designs as a charts shall only be included in the AIP Sri Lanka where the runway served by the procedure has been assigned an instrument runway certified by DGCA.
- 3.4.4 Current survey data and information are crucial to the design of safe IFPs. All data shall comply with quality requirements. Aerodrome surveys used for IFP design purposes shall be acquired from Survey Department of Sri Lanka. If required, any change to the survey with DGCA approval, shall require an assessment as to the impact upon current IFP Designs.
- 3.4.5 Service Provider responsible for IFP Design service is responsible for ensuring that the survey and subsequent IFP activities are controlled and monitored to an appropriate quality standard.

3.5 Drawings

3.5.1 CAD or other useable software acceptable to DGCA, is recommended for design drawings and drawings shall be submitted to the DGCA in a generic format.

<u>Note:</u> - The requirements to be satisfied for procedure design automation are referred in the IS 099, chapter 11.

3.6 Calculations

- 3.6.1 The results and calculations shall be presented in a manner that enables the DGCA office to follow and trace the logic and resultant output including:
 - a) a record of all relevant calculations kept in order to prove compliance with or variation from the criteria;

Section: Part C – Approval Requirements	Page: 17	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- b) formulae used during calculation should be the standard formulae as declared in ICAO Doc. 8168 and other related ICAO publications; and
- c) units of measurement and conversion factors shall be in accordance with IS 003 issued by DGCA.

3.7 Submissions

- 3.7.1 All completed submissions with all required reports & documentations as requested by this manual, shall be sent to DGCA, Civil Aviation Authority of Sri Lanka
- 3.7.2 Submissions shall be acknowledged within appropriate working days of receipt.

3.8 Design evaluation & approval

3.8.1 The IFP designs submitted for approval, shall be assessed by FPIs using specific checklist in the appendix D to this manual, in order to ensure that the designs meet the regulatory requirements specified in the IS 099, IS 087, this guidance manual and other operating regulations of CAASL.

Note: - An overview of the necessary steps in the IFP design approval and publication shall be found in Appendix E to this manual.

3.9 Establishing IFP Design

3.9.1 The IFP designs as a chart publication for flight under IFR, shall be established through Sri Lanka AIP after required approval by DGCA.

3.10 Maintenance of Instrument Flight Procedure designs

The Director General shall ensure that, the ongoing integrity of an instrument flight procedure designs established, is maintained in accordance with the procedures contained in the Part C.

3.11 Rejected Submissions

Where the DGCA is unable to approve an IFP design, consultation between the DGCA, service provider and Designer shall be encouraged to explore all possible solutions.

3.12 Cancellation or withdrawal of IFP design procedures

3.12.1 When an instrument flight procedure for flight under IFR established by the DGCA is no longer required, or it cannot be maintained in accordance with Sri Lanka regulatory framework, or a request for cancellation is received by the service provide with applicable reason, the DGCA shall—

Section: Part C – Approval Requirements	Page: 18	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



- (1) make an recommendation to cancel that instrument flight procedure from AIP Sri Lanka; and
- (2) Notify the cancellation by way of notice
 - i. in applicable official means
 - ii. in an AIP supplement or by NOTAM
- 3.12.2 If the Director detects an error or is advised by service provider or other appropriate personal of an error in a visual and instrument flight procedure for flight under IFR established by the DGCA, the Director General shall—
 - (1) immediately withdraw the use of that procedure until that error is corrected; and
 - (2) if that error cannot be corrected, cancel the procedure in accordance with above sec.3.11.

Chapter 4 – Maintenance, Review and Safeguarding

4.1 Maintenance

- 4.1.1 The design service provider responsible for IFP design service shall ensure that Maintenance of the procedures includes updates due to:
 - a) Magnetic variation changes;
 - b) New survey information; and
 - c) Changes to airspace structure.
- 4.1.2 A full review of the procedures is required on a 5 yearly basis.
- 4.1.3 Records supporting the design of the IFP(s) shall be kept throughout the lifetime of the IFP Designs.

4.2 Safeguarding of IFPs

- 4.2.1 The assessment of the impact a proposed development or construction, or planned temporary obstacle, might have on an aerodrome's operation is known as safeguarding.
- 4.2.2 The assessment should include the impact on an aerodrome's IFP Designs. The airport operator is responsible for having the safeguarding assessment carried out.

Section: Part C – Approval Requirements	Page: 19	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Appendix A - Simulator Evaluation Checklist (Fixed wing)

SIMULATOR EVALUATION CHECKLIST — FIXED WING						
	REPORT HEADER					
Date: Validation type (new/amended procedure):						
Organization:						
Procedure title:						
Location:						
Airport:			Runway:			
Evaluator's name/telepho	one no.:					
PBN navigation specificat	tion:					
					SATISF	ACTORY
					YES	NO
Comparison of FMS navig	gation database and sourc	ce documents, i	ncluding proper ARINC 424 c	oding		
Provide simulator docume	entation, including FMS so	oftware				
Assessed faster and/or sl	ower than charted					
Assessed at allowed tem	perature limits					
Assessed with adverse w						
Flight track matches proc	edure design					
Flyability						
Human Factors assessme	ent					
	ADDITIONAL RE		FOR SIMULATOR ACTIVIT	IES		1
					COMP	LETED
Document the following heading/track, distance, Tand temperature condition	AWS alerts, flight path and	y or not for ea gle (for final seg	ch procedure segment as a ment only) and note the wind o	ppropriate: component		
Note the maximum bank	angle achieved during any	/ RF segments				
Record simulation data (if	f applicable)					
		REM	ARKS			
PROCEDURE	PASS		FAIL	_		
EVALUATOR'S SIGNATI	JRE:		I			
Date:						

Section: Appendixes	Page: 20	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Appendix B - Flight Evaluation Checklist (Fixed wing)

FLIGHT EVALUATI	ION CHECKLIST — FIXED WING		
RE	EPORT HEADER		
Date:	Validation type (new/amended procedure):		
Organization:			
Procedure title:			
Location:			
Airport:	Runway:		
Evaluator's name/telephone no.:			
PBN navigation specification:			
	PLANNING		
		COMPI	ETED
Check that all the necessary items from the IFP package submission form	are available, including: graphics, text, maps,		
Check that the necessary flight validation forms are availabl	le		
Check that the aircraft and avionics are appropriate for the I	IFP being evaluated		
Does the procedure require use of autopilot or flight director	r?		
	PREFLIGHT		
		COMPL	ETED
Review preflight validation assessment			
Review simulator evaluation assessment (if applicable)			
Obstacle assessment planning: areas of concern; ability assessment area (if required)	to identify and fly lateral limits of obstacle		
Verify source of IFP data for aircraft FMS (electronic or man	nual creation)		
Evaluate navigation system status at time of flight (NOTAM,	, RAIM, outages)		
Weather requirements			
Night evaluation requirement (if applicable)			
Required navigation (NAVAID) support (if applicable)			
Combination of multiple IFP evaluations			
Estimated flight time			
Coordination (as required) with ATS, procedure designer, ai	irport authority		
Necessary equipment and media for electronic record of val	lidation flight		
	GENERAL		
		SATISFA	CTORY
		YES	NO
IFP graphic (chart) is complete and correct			
Check for interference: document all details related to detec	ted RFI		
Satisfactory radio communication			
Required radar coverage is satisfactory			
Verify proper runway markings, lighting and VASIS			
Altimeter sources			
Extra consideration given to non-surveyed areas			
For approach procedures with circling minima, verify control	lling obstacle for each circling category		

Section: Appendixes	Page: 21	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



		FLYABILITY		
	SATISFACT		CTORY	
			YES	NO
Comparison of FMS nav	igation database and so	urce documents, including proper ARINC 424 coding.		
remarks section to alert	t the approving authority	I is marked "N/A", and a note must be inserted in the of the procedure that a table top review of the coded company pilot, should be completed prior to operational		
Human Factors and gen	eral workload are satisfa	ctory		
Was there any loss of R	AIM?			
Was there any loss of re	quired RNP (where appli	icable)?		
Missed approach proced	lure			
Descent/climb gradients				
Procedure flown auto-co	upled			
Segment length, turns ar	nd bank angles, speed re	estrictions and deceleration allowance		
TAWS				
	INS	TRUMENT APPROACH PROCEDURE		
			SATISF	CTORY
			YES	NO
Segment lengths, headir	ngs/tracks and waypoint	locations match procedure design		
Final segment vertical glide path angle (if applicable)		ble)		
Threshold crossing height (LTP or FTP), if applicable.				
Course alignment				
Along-track alignment				
FAS data block				
		REMARKS		
PROCEDURE	PASS	FAIL		
EVALUATOR'S SIGNAT	URE:	·		

Section: Appendixes	Page: 22	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Appendix C - Validation Report Checklist (Fixed wing)

VALIDATION REPORT CHECKLIST — FIXED WING				
REPORT HEADER				
Date:	te: Validation type (new/amended procedure):			edure):
Organization:				
Procedure title:				
Location:				
Airport:		Runway:		
Evaluator's name/telephor	ne no.:			
PBN navigation specificat	ion:			
		POST FLIGHT		
				COMPLETED
Evaluate collected data				
Submit flight validation rep	port with recorded electronic	c flight data for archives		
Request NOTAM action (i	f appropriate)			
Sign and submit the IFP s	ubmission documentation			
	REMARKS			
PROCEDURE	PASS		FAIL	
EVALUATOR'S SIGNATURE:				
Date:				

Section: Appendixes	Page: 23	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Appendix D – IFP designs evaluation checklist

Chi Astern Autority	CIVIL AVIATION AUTHORITY INSTRUMENT FLIGHT PROCEDURE DESIGN (IFPD) EVALUATION CHECKLIST PBN (RNP) Approach Procedures		CAA/AS/034/01	
Name of Airport:				
Type(s) of Instrument Flight Procedure (IFP) Designed / Reviewed			d	
Name of IFP Desig	gner		_	
IFP Ground Valida	ited by:			
Date of Report submitted				
Coding utilized:	s=Satisfactory; U=Unsatisfactory	Coding utilized: S=Satisfactory; U=Unsatisfactory; N/A= Not applicable Y=Yes, N=No		

			- ·
S No.	Evaluation of IFP Data	Observation	Comments)
1.	Verify Approval of IFPD requested contains		
	following Documents		
	i. Design Report(s)		
	ii. Instrument Approach Chart(s)		
	iii. Coding table chart(s)		
	iv. Ground Validation endorsement		
	v. Flight Validation Report		
	vi. Safety assessments reports		
2.	IFP Flight Validated by approved personnel		
3.	Warning Areas (prohibited, Restricted and		
	Danger Areas) identified		
4.	Magnetic Variation catered		
5.	Minimum Sector Altitude (MSA)		
	i. New MSA Established or reviewed?		
	ii. Appropriate MOC applied		
	iii. MSA Calculation is correct		
6.	Initial approach Segment		
	i Initial Approach Fix (IAF) defined		
	 Initial Approach Fix (IAF) defined Segment length Standard 		
	iii. ATT/XTT/TRD/MSD/1/2 Area width		
	calculated accurately		
	iv. Descend Gradient as per criterion		

Section: Appendixes	Page: 24	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



	y MOC is applied accurately	
	v. MOC is applied accurately	
	vi. Procedure Altitude (s) / OCA/H calculated	
_	accurately	
7.	Intermediate Approach Segments	
	the state of the second state of the second	
	i. Intermediate Fix defined	
	ii. Segment length standard	
	iii. Level Segment	
	iv. ATT/XTT/TRD/MSD/1/2 Area width	
	calculated accurately	
	v. Descend Gradient as per criterion	
	vi. MOC is applied accurately	
	i. (Procedure Altitude / OCA /H	
8.	Final Approach Segment	
	ii. Final Approach Fix (FAF) defined	
	iii. Segment length appropriate	
	iv. ATT/XTT/TRD/MSD/1/2 Area width	
	calculated accurately	
	v. Descend Gradient standard	
	vi. MOC is applied accurately	
	vii. OCA /H (LNAV /VNAV) correct	
	viii. Step Descend Fix (SDF)	
9.	Missed Approach Segment	
5.	Missed Approach Segment	
	Initial Missed Approach Segments	
	i. MAPT defined	
	ii. Missed Approach concept defined	
	iii. MOC (30m/50m) applied	
	iv. Missed Approach narrated accurately	
	v. Design report include calculations for	
	Missed Approach segment	
10.	Circling Approach OCA/H	
10.		
	i. OCA /H calculations are correct	
	ii. Design report include calculation	
11.	Holding Segment	
	i. Holding pattern standard / Non Standard	
	ii. Minimum Holding Altitude (MHA) is	
	correctly calculated / defined	
12.	Visual Segment Surface (VSS)	
	i. VSS Obstacle assessment conducted	
	accurately	
	ii. VSS Obstacle assessment found any	
	penetration if yes then what alternate	
	action taken	
13.	Charting	

Section: Appendixes	Page: 25	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



	i. Plan / profile View data
	ii. Scale
	iii. Missed Approach depiction / Narration
	iv. OCA/H depiction
14.	Safety Assessment
	i. Safety Assessment conducted
	ii. Mitigation measure defined
	iii. Risk Index in Tolerable /acceptable
	region

Recommended / Not Recommended for DGCAA Approval

Instrument Flight Procedures Design Evaluated By (Name) #_____

Dated: _____

Signature #_____

Section: Appendixes	Page: 26	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



CIVIL AVIATION AUTHORITY INSTRUMENT FLIGHT PROCEDURE DESIGN (IFPD) EVALUATION CHECKLIST Precision Approach Procedures (ILS)		<u>CAA/AS/034/02</u>	
Name of Airport:		-	
Type(s) of Instrum	ent Flight Procedure (IFP)	Designed / Reviewe	d
Name of IFP Desig	ner		_
IFP Ground Valida	ted by:		_

Date of Report submitted _____

		•	
S No.	Evaluation of IFP Data	Observation	Comments)
1	Marife Annual of IEDD no superior departments		
1.	Verify Approval of IFPD requested contains		
	following Documents		
	i. Design Report(s)		
	ii. Instrument Approach Chart(s)		
	iii. Ground Validation endorsement		
	iv. Flight Validation Report		
	v. Safety assessments reports		
2.	IFP Flight Validated by approved personnel		
3.	Warning Areas (prohibited, Restricted and		
	Danger Areas) identified		
4.	Magnetic Variation catered		
5.	Minimum Sector Altitude (MSA)		
	i. New MSA Established or reviewed?		
	ii. Appropriate MOC applied		
	iii. MSA Calculation is correct and verified		
6.	Initial approach Segment		
	i. Initial Approach Fix (IAF) defined		
	ii. Segment length Standard		
	iii. Descend Gradient as per criterion		
	iv. MOC is applied accurately		
	v. Procedure Altitude (s) / OCA/H accurate		

Section: Appendixes	Page: 27	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



-		
7.	Intermediate Approach Segments	
	i. Intermediate Fix defined	
	ii. Segment length standard	
	iii. Level Segment	
	vi. Descend Gradient as per criterion	
	iv. MOC is applied accurately	
	v. (Procedure Altitude / OCA /H calculated	
8.	Final Approach Segment ILS (PA)	
	i. ILS Category defined	
	ii. Glide Path Angle	
	iii. Localizer-THR Distance available	
	iv. Computation of obstacle assessment	
	surfaces:	
	v. Penetration of obstacle found	
	vi. Equivalent height formula used to resolved penetration found satisfactory	
	ix. OCA/H Calculated x. Step Descend Fix (SDF) utilized	
	xi. OCA/ H calculated correctly	
9.	Missed Approach Segment	
5.		
	Initial Missed Approach Segments	
	i. MAPT defined	
	ii. Missed Approach concept defined	
	iii. MOC (30m/50m) applied	
	iv. Missed Approach narrated accurately	
	v. Design report include calculations for	
10.	Missed Approach segment Circling Approach OCA/H	
10.		
	i. OCA /H calculations are correct	
	ii. Design report include calculation	
11.	Holding Segment	
	i. Holding pattern standard / Non Standard	
	ii. Minimum Holding Altitude (MHA) is	
	correctly calculated / defined	
12.	Visual Segment Surface (VSS)	
	i. VSS Obstacle assessment conducted	
	accurately	
	ii. VSS Obstacle assessment found any	
	penetration if yes then what alternate	
	action taken	
13.	Charting	
	i. Plan / profile View data	
	ii. Scale	

Section: Appendixes	Page: 28	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



	iii. Missed Approach depiction / Narration iv. OCA/H depiction	
14.	Safety Assessment	
	 i. Safety Assessment conducted ii. Mitigation measure defined iii. Risk Index in Tolerable /acceptable region 	

Recommended / Not Recommended for DGCAA Approval

Instrument Flight Procedures Design Evaluated By (Name)#_____

Dated: _____

Signature #_____

Section: Appendixes	Page: 29	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



CIVIL AVIATION AUTHORITY INSTRUMENT FLIGHT PROCEDURE DESIGN (IFPD) EVALUATION CHECKLIST Conventional NDB/ VOR/DME Approach Procedures		CAA/AS/034/03		
Name of Airport:		-		
Type(s) of Instrument Flight Procedure (IFP) Designed / Reviewed				
Name of IFP Designer				
IFP Ground Validated by:				

Date of Report submitted _____

S No.	Evaluation of IFP Data	Observation	Comments)
1.	Verify Approval of IFPD requested contains		
	following Documents		
	i. Design Report(s)		
	ii. Instrument Approach Chart(s)		
	iii. Ground Validation endorsement		
	iv. Flight Validation Report		
	v. Safety assessments reports		
2.	IFP Flight Validated by approved personnel		
3.	Warning Areas (prohibited, Restricted and		
	Danger Areas) identified		
4.	The location of NAV Aid meets the straight in		
	approach criteria? (within 150 meter)		
5.	Magnetic Variation Catered		
6.	Minimum Sector Altitude (MSA)		
	i. New MSA Established or reviewed?		
	ii. Appropriate MOC applied		
_	iii. MSA Calculation is correct and verified		
7.	Initial approach Segment		
	i. Initial Approach Fix (IAF) defined		
	ii. Segment length Standard		
	iii. Descend Gradient as per criterion		
	iv. MOC is applied accurately		
	v. Procedure Altitude (s) / OCA/H accurate		

Section: Appendixes	Page: 30	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



8.	Intermediate Approach Segments	
	i. Intermediate Fix defined	
	ii. Segment length standard	
	iii. Level Segment	
	iv. Descend Gradient as per criterion	
	v. MOC is applied accurately	
	vi. (Procedure Altitude (s) / OCA /H	
9.	accurate Final Approach Segment	
9.	<u>Final Approach Segment</u>	
	i. Final Approach Fix (FAF) defined	
	ii. Segment length appropriate	
	iii. Descend Gradient standard	
	iv. MOC is applied accurately	
	v. OCA /H calculations are correct	
	vi. Step Descend Fix (SDF)	
10.	Missed Approach Segment	
	Initial Missed Approach Segments	
	i. MAPT defined	
	ii. Missed Approach concept defined	
	iii. MOC (30m/50m) applied	
	iv. Missed Approach narrated accurately	
	v. Design report include calculations	
	vi. Protection areas (Software or Manual)	
	evidence provided	
11.	Circling Approach OCA/H	
	i. OCA /H calculations are correct	
12	ii. Design report include calculation	
12.	Holding Segment	
	i. Holding pattern standard / Non Standard	
	ii. Minimum Holding Altitude (MHA) is	
	correctly calculated / defined	
13.	Visual Segment Surface (VSS)	
	i. VSS Obstacle assessment conducted	
	accurately	
	ii. VSS Obstacle assessment found any	
	penetration if yes then what alternate	
	action taken	
14.	<u>Charting</u>	
	i. Plan / profile View data	
	ii. Scale	
	iii. Missed Approach depiction / Narration	
	iv. OCA/H depiction	
15.	Safety Assessment	

Section: Appendixes	Page: 31	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



i.	Safety Assessment conducted	
ii.	Mitigation measure defined	
iii.	Risk Index in Tolerable /acceptable	
	region	

Recommended / Not Recommended for DGCAA Approval

Instrument Flight Procedures Design Evaluated By (Name) #_____

Dated: _____

Signature #_____

Section: Appendixes	Page: 32	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Child Avision Authority	CIVIL AVIATION AUTHORITY INSTRUMENT FLIGHT PROCEDURE DESIGN (IFPD) EVALUATION CHECKLIST SIDs/ STARs (Conventional / PBN) Procedures		CAA/AS/034/04
Name of Airport:		_	
Type(s) of Instrum	ent Flight Procedure (IFP)	Designed / Reviewed	
Name of IFP Desig	ner		_
IFP Ground Valida	ted by:		

Date of Report submitted _____

S No.	Evaluation of IFP Data	Observation	Comments)
1.	Verify Approval of IFPD requested contains following Documents i. Design Report(s) ii. Instrument Approach Chart(s) iii. Coding table chart(s) (PBN SID) iv. Ground Validation endorsement v. Flight Validation Report vi. Safety assessments reports		
2.	IFP Flight Validated by approved personnel		
3.	Warning Areas (prohibited, Restricted and Danger Areas) identified		
4.	Magnetic Variation catered		
5.	Scale Defined		
6.	Obstacles depicted clearly		
7.	 Minimum Sector Altitude (MSA) i. New MSA Established or reviewed? ii. Appropriate MOC applied iii. MSA Calculation is correct 		

Section: Appendixes	Page: 33	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



0	STARs Evaluation	
8.	STARs Evaluation	
	i. Initial Approach Fixes (IAFs)	
	defined	
	ii. Segment length Standard	
	iii. ATT/XTT/TRD/MSD/1/2 Area	
	width calculated accurately	
	iv. Descend Gradient as per	
	criterion	
	v. MOC is applied accurately	
	vi. Procedure Altitude (s) adequate	
	to carryout Instrument	
	Approach Procedures.	
9.	SIDs Evaluations	
	i. Straight or turning Departure	
	ii. Straight Departure with Track	
	guidance / With No Track	
	Guidance/ PBN	
	iii. SID Based on TNA or TP	
	iv. Origin DER 5m catered	
	v. OIS (2.5%) catered	
	vi. MOC (0.8%) applied	
	vii. PDG (3.3%) catered	
	viii. MOC 75m applied for Turning	
	D Departure	
	ix. PDG (%) other than Standard	
	applied	
	x. Protection Areas verified	
	xi. Departure .TNA/H protection	
	Area from 600m catered	
	xii. Obstacle assessment	
10	conducted correctly	
10	Safety Assessment	
•	i. Safety Assessment conducted	
	ii. Mitigation measure defined	
	Risk Index in Tolerable /acceptable	
	region	

Recommended / Not Recommended for DGCAA Approval

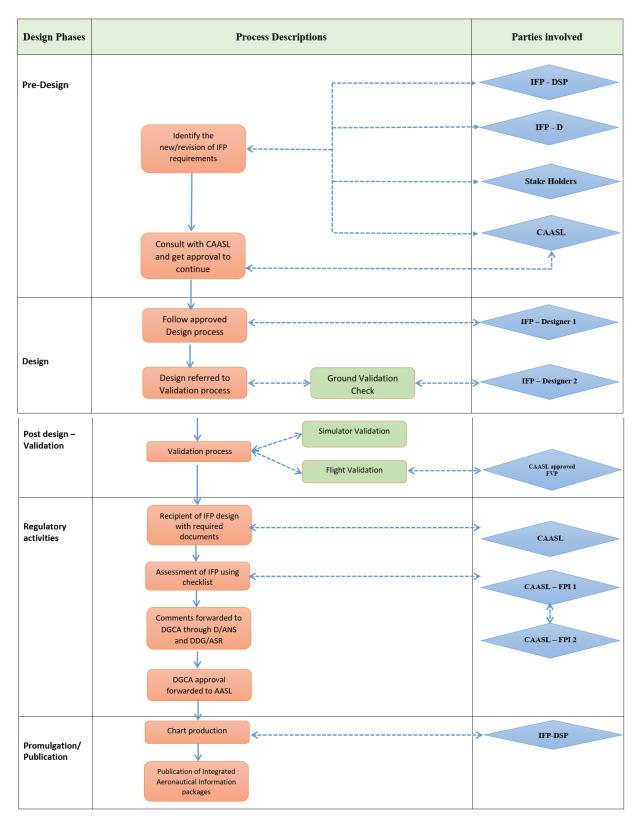
Instrument Flight Procedures Design Evaluated By (Name) #_____

Dated: _____

Signature #_____

Section: Appendixes	Page: 34	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00





Appendix E – An overview of the necessary steps in the IFP design approval and publication

Section: Appendixes	Page: 35	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00



Appendix F: Template to make a "request to obtain regulatory approval to initiate the IFP design process for the establishment of a new IFP design / amendment of existing IFP Design"

Civil Aviation Authority of Sri Lanka Request to obtain regulatory approval to initiate the IFP design process for the establishment of a new IFP design / amendment of existing IFP Design Requirement has been raised to design a (new/ amend the existing] IFP design for the (Airport/Runway)		
Director General of Civil Aviation & Chief Executive Officer Civil Aviation Authority of Sri Lanka Request to obtain regulatory approval to initiate the IFP design process for the establishment of a new IFP design / amendment of existing IFP Design Requirement has been raised to design a (new/ amend the existing] IFP design for the (Airport/Runway)		
Director General of Civil Aviation & Chief Executive Officer Civil Aviation Authority of Sri Lanka Request to obtain regulatory approval to initiate the IFP design process for the establishment of a new IFP design / amendment of existing IFP Design Requirement has been raised to design a (new/ amend the existing] IFP design for the (Airport/Runway)	(Your) Ref.	
Civil Aviation Authority of Sri Lanka Request to obtain regulatory approval to initiate the IFP design process for the establishment of a new IFP design / amendment of existing IFP Design Requirement has been raised to design a (new/ amend the existing] IFP design for the (Airport/Runway)		
Request to obtain regulatory approval to initiate the IFP design process for the establishment of a new IFP design / amendment of existing IFP Design Requirement has been raised to design a (new/ amend the existing] IFP design for the (Airport/Runway)	Director General of Civil Aviation & Chief Executive Officer	
of a new IFP design / amendment of existing IFP Design Requirement has been raised to design a (new/ amend the existing] IFP design for the (Airport/Runway)due to the	Civil Aviation Authority of Sri Lanka	
(Airport/Runway)	<u>Request to obtain regulatory approval to initiate the IFP design process for the establishm</u> of a new IFP design / amendment of existing IFP Design	<u>ent</u>
details provided below and agree to comply the Regulatory requirements detailed in IS099. Name of Airport:-		the
 Runway Type of task to be undertaken:- (New Design/ Amendment) Type(s) of Instrument Flight Procedure (IFP)		vith
 Type of task to be undertaken:- (New Design/ Amendment) Type(s) of Instrument Flight Procedure (IFP)	Name of Airport:-	
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Section: Appendixes	Page: 36	Date: 23-June-23
SLCAP 2450 : Guidance Manual for IFP Design Service in SL	1 st Edition	Rev. No : 00