GBAS-SBAS Procedure Design Courses at APAC FPP

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ICAO Asia-Pacific Flight Procedure Programme

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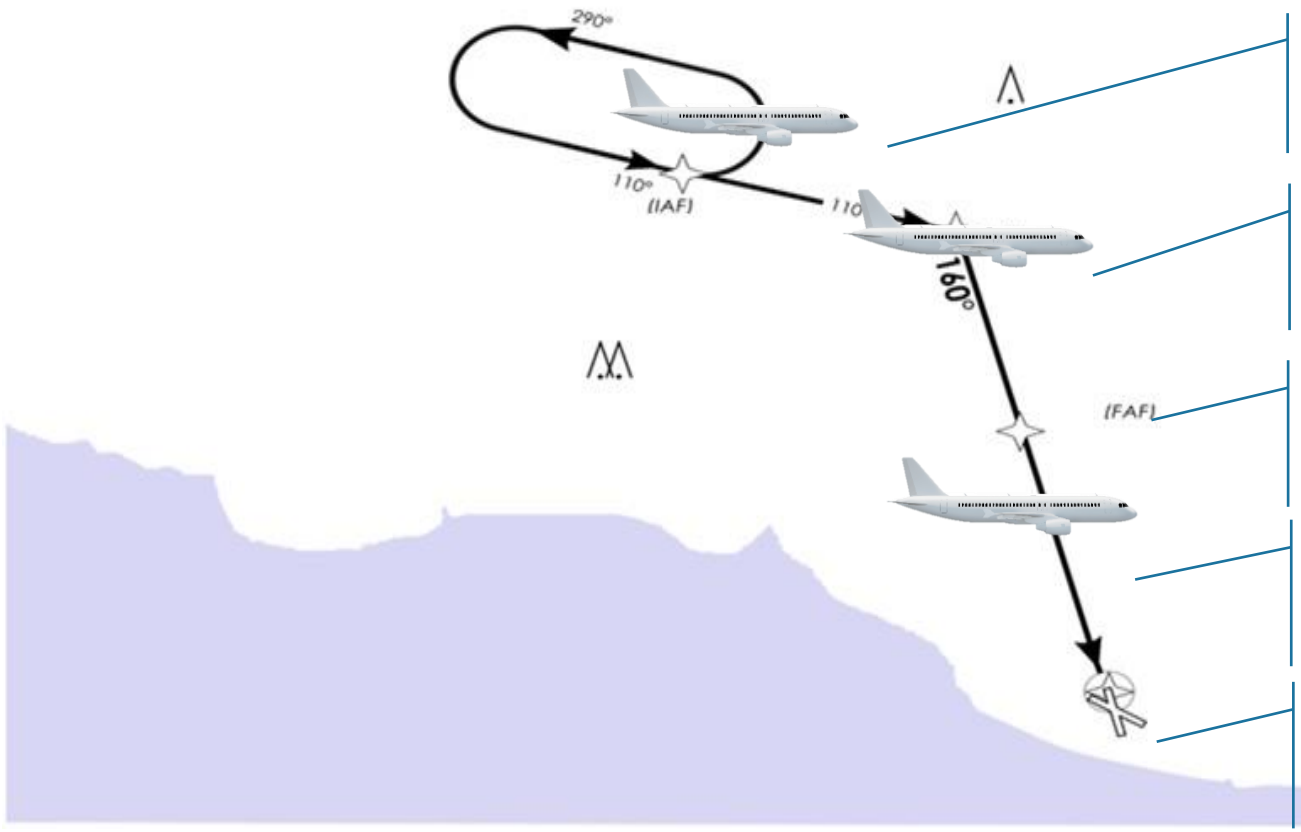
Flight Procedure Programme (FPP) History

- To support ICAO Assembly Resolution A36-23 and then A37-11 on PBN implementation, ICAO Asia-Pacific PBN Task Force recommended ICAO APANPIRG to establish the FPP.
- In September 2009, APANPIRG/20 meeting endorsed the concept.
- With supports from 10 Active Participating members, the FPP office was established in October 2009 and located in Beijing, China hosted by the Civil Aviation Administration of China (CAAC).
- In June 2013, co-located with APAC RSO.

History

FPP Phases



Phase 1
(2010-2012)

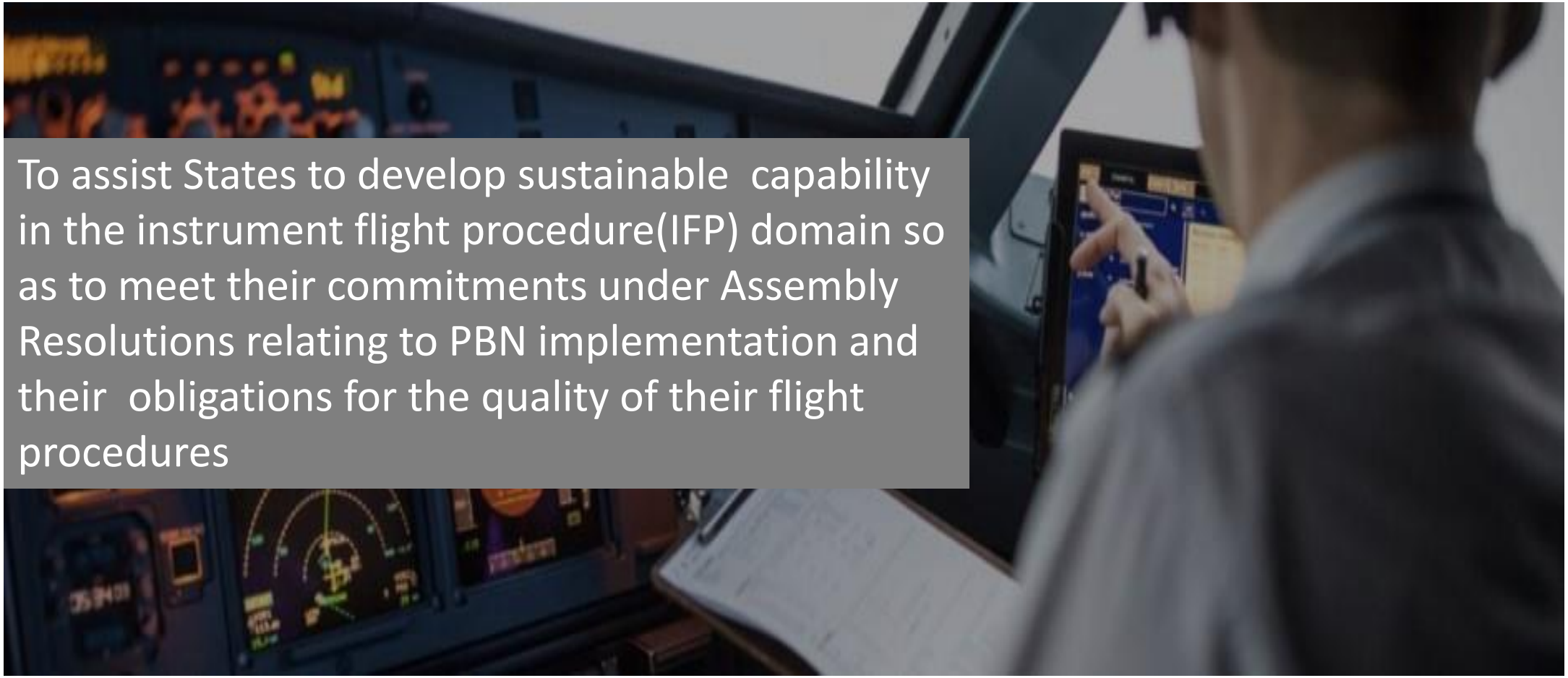
Phase 2
(2013-2017)

Phase 3
(2018-2020)

Phase 4
(2021-2023)

Phase 5
(2024-2026)

FPP Objectives



To assist States to develop sustainable capability in the instrument flight procedure(IFP) domain so as to meet their commitments under Assembly Resolutions relating to PBN implementation and their obligations for the quality of their flight procedures

FPP Members

MEMBER STATES

- **8 Active** Members (**SCM** members)
- **1 Donor** Member
- 12 **User** Members

+ ACTIVE STATES

8 active participanting States/Administrations, including the Host State which participate in the Programme funding by annual contributions and is a Member of the Steering Committee.

Australia,
China,
Hong Kong SAR China,
Macao SAR China,
Philippines,
Republic of Korea,
Singapore,
Thailand

+ USER STATES

12 user States/Administrations which use the Programme and shall bear certain expenses for assistance provided to but does not participate in the Programme funding by annual contributions.

Bangladesh,
Cambodia,
Fiji,
Indonesia,
Lao PDR,
Malaysia,
Maldives,
Mongolia,
Nepal,
Pakistan,
Sri Lanka,
Vietnam

+ DONOR STATES

1 donor State which supports APAC-FPP by financial contribution or contribution in-kind and is a member of the Streering Committee upon approval by the SC.

France

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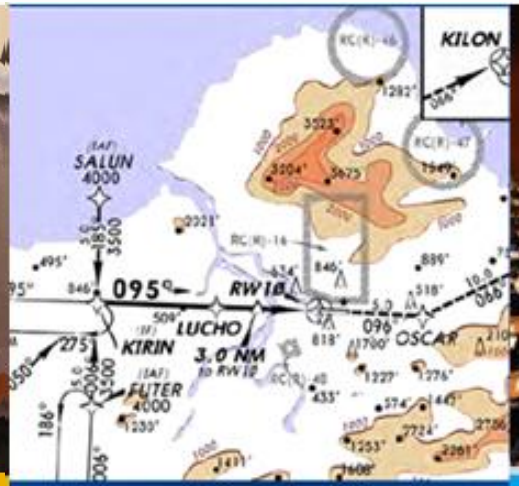
WHAT WE DO

TRAINING



PROCEDURE DESIGN SUPPORT

PARTICIPATIONS IN INT'L FORUM

QUALITY ASSURANCE

"No country left behind" in the instrument flight procedure domain, develop APAC states' capabilities in IFP design through training, project consulting and flight procedure design service.

Making REGIONAL progress in terms of safety, efficiency and environmental improvement.

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Challenges

- Significant Safety Concerns (SSCs) have been raised during the USOAP audit in one Region which are related to publications and the associated oversight/regulatory inadequacies of IFPs.
- The statistics show that regional States and/or Air Navigation Service Providers are still facing some of the following main procedure design-related issues and problems:

a) Need for enhancement of procedure design training: initial, on-the-job (OJT), and/or recurrent;

b) High turnover among procedure designers;

c) Insufficient procedure design work in some States to attain or maintain proficiency;

Challenges

d) Lack of depth in procedure design organization to perform quality assurance (QA);

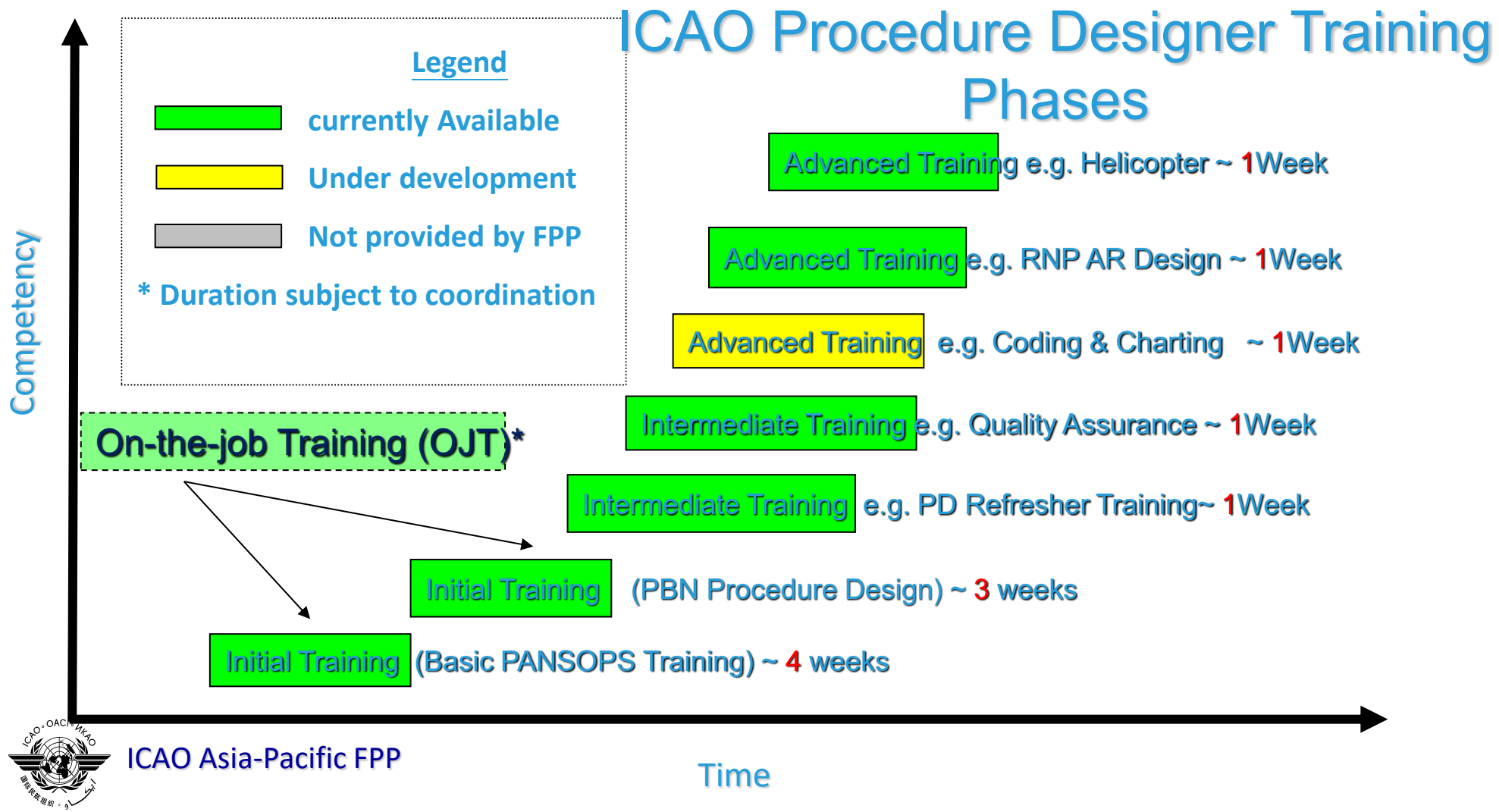
e) Insufficient expertise in procedure design organization to provide adequate QA of procedures;

f) Lack of experience in both charting and navigation database coding;

g) Lack of regulatory oversight framework; and

h) Insufficient regulatory expertise to oversee the procedure design service provider

WHAT WE DO


ICAO Procedure Designer Training Phases
Legend
currently Available
Under development
Not provided by FPP
* Duration subject to coordination
Competency
On-the-job Training (OJT)*
Advanced Training e.g. Helicopter ~ 1Week
Advanced Training e.g. RNP AR Design ~ 1Week
Advanced Training e.g. Coding & Charting ~ 1Week
Intermediate Training e.g. Quality Assurance ~ 1Week
Intermediate Training e.g. PD Refresher Training~ 1Week
Initial Training (PBN Procedure Design) ~ 3 weeks
Initial Training (Basic PANSOPS Training) ~ 4 weeks
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Time

Procedure Design Course Schedule

“APV Baro-VNAV”	**APV Baro-VNAV : approach segment**	**APV Baro-VNAV : approach segment (offset approach)**	***APV Baro-VNAV : approach segment**
“APV Baro-VNAV”	**APV Baro-VNAV : Missed approach segment**		***APV Baro-VNAV : Missed approach segment**
“APV SBAS/GBAS and LPV/GLS concept”	**APV SBAS/GBAS concept**	**LPV/GLS concept**	**Coding for 3D approach**
“PBN in combination with ILS (PBN + ILS)& RF turn ”	PBN in combination with ILS (TF leg)	PBN in combination with ILS (RF leg)	*Coding
“Charting”	Sum up	*Progress test & Self-assessment	

Procedure Design Course Schedule

Registration & Introduction	Doc 8168 Amendment & Doc 9613	Quality Assurance (DOC 8168/9906)	RF Turn
Baro-VNAV	Baro-VNAV	Exercise 1 : Baro-VNAV	Exercise 1 : Baro-VNAV
RNAV + ILS	RNAV + ILS	Exercise 2 : RNAV + ILS	Exercise 2 : RNAV + ILS
SBAS/GBAS Concept	SBAS/GBAS Concept	Charting	Sum up

Procedure Design Course Schedule

09:00-10:30	10:45-12:00	13:20-14:50	15:10-16:40
Departure	Departure Exercise	Departure Exercise	Departure Exercise
Arrival (TAA include)	Holding	RNAV ILS	RF
Coding	Coding Exercise	Charting	CDO
GBAS/SBAS & FAS data block	GBAS/SBAS & FAS data block	Progress Test 2	Group Exercise RNP 1 SID, STAR, RNP APCH
Group Exercise RNP 1 SID, STAR, RNP APCH	Group Exercise RNP 1 SID, STAR, RNP APCH	Group Exercise RNP 1 SID, STAR, RNP APCH	Group Exercise RNP 1 SID, STAR, RNP APCH

GBAS-SBAS Procedure Design

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PART III. PERFORMANCE-BASED NAVIGATION PROCEDURES

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GBAS-SBAS Procedure Design

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Design Comparison

ILS Procedure

- Glide path angle (GPA) and Landing threshold point (LTP) are fixed, determined by terrain and equipment installed
- Use Obstacle Assessment Surface (OAS) software

GBAS-SBAS Procedure

- GPA and LTP can be adjusted as needed. They shall be considered in the overall situation by procedure designers and modified in the FAS data block.
- Use OAS software, design of protection area is different, but the steps are the same.

Design Comparison

ILS Procedure

- Turn at altitude/height can be used in designing missed approach procedure
- Main ILS landing direction is generally the best direction of the terrain

GBAS-SBAS Procedure

- Turn at altitude/height can’t be used in designing missed approach procedure which causes some constraints
- Relatively challenging and large workload, GBAS SBAS procedure shall work for all runways

Thank You!

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