



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

PBN MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents some Performance Based Navigation (PBN) matters through the review of the outcome of the PBN SG/3, CNS SG/8, ATM SG/4 and ANSIG/3 meetings for consideration and/or endorsement by the meeting.

Action by the meeting is at paragraph 3.

REFERENCES

- PBN SG/3 Report
- CNS SG/8 Report
- ATM SG/4 Report
- ANSIG/3 Report

1. INTRODUCTION

1.1 The MID Region PBN Implementation Plan was reviewed and endorsed by the MSG/5 meeting (Cairo, Egypt, 16-18 April 2016) based on the outcome of the PBN SG/2 and ATM SG/1 meetings.

1.2 The meeting may wish to recall that MIDANPIRG/14 agreed that the PBN Sub-Group will be responsible for PBN implementation for Terminal and Approach, while the ATM Sub-Group will be responsible for PBN implementation for en-route.

2. DISCUSSION

MID Region PBN Implementation Plan

2.1 The meeting may wish to note that the PBN SG/3 meeting (Cairo, Egypt, 11-13 February 2018) reviewed and updated the MID Region PBN Implementation Plan (MID Doc 007) parts related mainly to terminal airspace. The meeting agreed that Chapter 2 of the plan (CNS Infrastructure) should be reviewed and updated by the CNS SG/8 meeting, as appropriate. The CNS SG/8 meeting (Cairo, Egypt, 26-28 February 2018) reviewed and updated Chapter 2 of the plan.

2.2 The ATM SG/4 meeting (Amman, Jordan, 29 April – 2 May 2018) was apprised of the PBN SG/3 and CNS SG/8 meetings outcomes related to the update of the MID Region PBN Plan (MID Doc 007). The meeting reviewed and updated the Plan parts related to en-route. The meeting agreed through ATM SG/4 Draft Conclusion 4/1 that the revised plan should be circulated to States for their review and inputs before 15 June 2018 in order for the Secretariat to present a consolidated version to the ANSIG/3 meeting.

2.3 Taking into consideration that MSG/6 meeting was planned for December 2018 and to give more time for States to comment on the revised MID Region PBN Implementation Plan, the MID Office circulated the Plan through State Letter Ref: AN 6/28 – 18/245 with deadline for response 30 September 2018. The consolidated version of the revised Plan is at **Appendix A**.

MID Flight Procedure Programme (MID FPP)

2.4 Considering the challenges related to PBN implementation, it was recognized that the MID FPP would be the ultimate solution to support States at national level in meeting their obligations related to PANS-OPS (regulatory and service provision) through an effective resource sharing approach under ICAO umbrella.

2.5 The services that will be provided by the MID FPP free of charge for its Active States are listed in the Project Document including PANS-OPS training courses.

2.6 It is to be highlighted that based on the outcome of the MID FPP Kick-off meeting (Cairo, Egypt, 22 – 24 January 2018), the MID Office circulated the consolidated draft MID FPP Project Document for States review through State Letter AN 6/33 – 18/144 dated 9 May 2018 at **Appendix B**. Only, Jordan and Lebanon provided feedback. The MID Office sent follow-up Letters on 15 November 2018 with a new deadline for comments 15 December 2018. It is to be noted that it was envisaged that the Programme starts operation in January 2019.

2.7 As an example of the MID FPP benefits, a PBN OPS-Approval Course was conducted at the MID FPP premises in Beirut from 26-30 November 2018 free of charge instead of USD 3100 per trainee, as in-kind contribution from IATA to the MID FPP; twenty-two (22) experts from the Region benefited from the course.

2.8 The meeting may wish to recall that in order to start the recruitment of the Manager for the MID FPP by ICAO TCB and formally start operation, it is required that five (5) States sign the MID FPP Project Document with ICAO and that USD300,000 be secured in the Programme's bank account at ICAO. Currently, USD100,000 were provided by Saudi Arabia and UAE and ICAO MID Office is working on some additional options for resource mobilization.

2.9 States were invited to provide advance payments that will be deducted from their annual financial contributions for the coming years to expedite the launching of the project.

2.10 It is to be underlined that the MID FPP funding mechanism including the exact amount of the financial annual contributions will be agreed upon by the MID FPP Steering Committee. It is to be noted that States' advance financial contributions to the MID FPP will not be used without the MID FPP Steering Committee Decision.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) urge States, if not yet done so, to respond to the MID Office State Letter related to the MID FPP, join and support the Programme to benefit from its services;

- b) urge States to provide the ICAO MID Office with their updated National PBN Implementation Plans by end of each year or to notify in case of no changes in accordance with MSG Conclusion 4/11;
- c) agree that the States' National PBN Implementation Plan be published on the MID Office website to facilitate consultation and the planning of the airspace users; and
- d) review and endorse the revised version of the MID Region PBN Implementation Plan through the following Draft Conclusion:

Why	To update the MID Region PBN Implementation Plan
What	Endorsement of the revised MID Region PBN Implementation Plan
Who	MSG/6
When	Dec 2018

DRAFT CONCLUSION 6/X: MID REGION PBN IMPLEMENTATION PLAN

That the MID Region MID Region PBN Implementation Plan (MID Doc 007) at Appendix A is endorsed and to be published on the ICAO MID website.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**MIDDLE EAST AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP
(MIDANPIRG)**

**MID REGION
PERFORMANCE BASED NAVIGATION
IMPLEMENTATION PLAN**

EDITION DECEMBER, 2016

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EXECUTIVE SUMMARY

The MID Region Performance Based Navigation (PBN) Implementation Plan has been developed to harmonize PBN implementation in the MID Region and to address the strategic objectives of PBN based on clearly established operational requirements, avoiding equipage of multiple on-board or ground based equipment, avoidance of multiple airworthiness and operational approvals and explains in detail contents relating to potential navigation applications.

The Plan was prepared in accordance with ICAO provisions related to PBN, the Global Air Navigation Plan, Aviation System Block Upgrades (ASBU) methodology, MID Region Air Navigation Plan and the MID Region Air Navigation Strategy. In addition to the Assembly Resolutions and the twelfth Air Navigation Conference (AN-Conf/12) Recommendations related to PBN.

The plan envisages pre- and post-implementation safety assessments and continued availability of conventional air navigation procedures during transition. The plan discusses issues related to implementation which include traffic forecasts, aircraft fleet readiness, adequacy of ground-based CNS infrastructure etc. Implementation targets for various categories of airspace for the short term (2013 – ~~2017~~2018) and for the medium term (~~2018-2019~~ – ~~2022~~2025) have been projected in tabular forms to facilitate easy reference. For the long term (~~2023-2026~~ and beyond) it has been envisaged that GNSS and its augmentation system would become the primary navigation infrastructure

This Document consolidates, updates and supersedes all previous MID Region PBN and GNSS Strategies/Plans.

The parts related to PBN implementation for En-route will be reviewed and updated by the ATM Sub-Group and those related to terminal and approach will be reviewed and updated by the PBN Sub-Group.

Explanation of Terms

The drafting and explanation of this document is based on the understanding of some particular terms and expressions that are described below:

MID Region PBN Implementation Plan - A document offering appropriate guidance for air navigation service providers, airspace operators and users, regulating agencies, and international organizations, on the evolution of navigation, as one of the key systems supporting air traffic management, and which describes the RNAV and RNP navigation applications that should be implemented in the short, medium and long term in the MID Region.

Performance Based Navigation - Performance based navigation specifies RNAV and RNP system performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in an airspace.

Performance requirements - Performance requirements are defined in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept. Performance requirements are identified in navigation specifications which also identify which navigation sensors and equipment may be used to meet the performance requirement.

REFERENCE DOCUMENTS

The below ICAO Documents provide Guidance related to the PBN implementation:

- PANS-ATM (Doc 4444)
- PANS-Ops (Doc 8168)
- PBN Manual (Doc 9613)
- GNSS Manual (Doc 9849)
- RNP AR Procedure Design Manual (Doc 9905)
- CDO Manual (Doc 9931)
- Manual on Use of PBN in Airspace Design (Doc 9992)
- CCO Manual (Doc 9993)
- Procedure QA Manual (Doc 9906)
- PBN Ops Approval Manual (Doc 9997)

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ACRONYMS

The acronyms used in this document along with their expansions are given in the following List:

AACO	Arab Air Carrier Association
ABAS	Aircraft-Based Augmentation System
ACAC	Arab Civil Aviation Commission
AIS	Aeronautical Information System
APAC	Asia and Pacific Regions
APCH	Approach
APV	Approach Procedures with Vertical Guidance
AOC	Air operator certificate
ATC	Air Traffic Control
ASBU	Aviation System Block Upgrades
Baro VNAV	Barometric Vertical Navigation
CCO	Continuous Climb Operations
CDO	Continuous Decent Operations
CNS/ATM	Communication Navigation Surveillance/Air Traffic Management
CPDLC	Controller Pilot Data Link Communications
DME	Distance Measuring Equipment
FIR	Flight Information Region
FMS	Flight Management System
GBAS	Ground-Based Augmentation System
GNSS	Global Navigation Satellite System
GLS	GBAS Landing System
IATA	International Air Transport Association
IFALPA	International Federation of Air Line Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IFF	Identification Friend or Foe
INS	Inertial Navigation System
IRU	Inertial Reference Unit
MEL	Minimum equipment list
MID eANP	MID Region Air Navigation Plan
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
MIDRMA	Middle East Regional Monitoring Agency
MLAT	Multilateration
PANS	Procedures for Air Navigation Services
PBN	Performance Based Navigation
PIRG	Planning and Implementation Regional Group
RCP	Required Communication Performance
RNAV	Area Navigation
RNP	Required Navigation Performance
SARP	Standards and Recommended Practices
SBAS	Satellite-Based Augmentation System
SID	Standard Instrument Departure
SOP	Standard operating procedure
STAR	Standard Instrument Arrival
TAWS	Terrain awareness warning system
TMA	Terminal Control Area
VOR	VHF Omni-directional Radio-range
WGS	World Geodetic System

CHAPTER 1

PERFORMANCE BASED NAVIGATION

1. INTRODUCTION

1.1 The Performance Based Navigation (PBN) concept specifies aircraft RNAV system performance requirements in terms of accuracy, integrity, availability, continuity and functionality needed for the proposed operations in the context of a particular airspace concept, when supported by the appropriate navigation infrastructure. In this context, the PBN concept represents a shift from sensor-based to performance based navigation.

1.2 The main tool for optimizing the airspace structure is the implementation of PBN, which will foster the necessary conditions for the utilization of RNAV and RNP capabilities by a significant portion of airspace users in the MID Region.

1.3 The MID Regional PBN Implementation Plan will serve as guidance for regional projects for the implementation of air navigation infrastructure, as well as for the development of national implementation plans.

1.4 The PBN Manual (Doc 9613) provides guidance on PBN navigation specifications and encompasses two types of approvals: airworthiness, exclusively relating to the approval of aircraft, and operational, dealing with the operational aspects of the operator. PBN approval will be granted to operators that comply with these two types of approval.

1.5 After the implementation of PBN as part of the airspace concept, the total system needs to be monitored to ensure that safety of the system is maintained. A system safety assessment shall be conducted during and after implementation and evidence collected to ensure that the safety of the system is assured.

2. BENEFITS OF PERFORMANCE BASED NAVIGATION

- a) *Access and Equity*: Increased aerodrome accessibility.
- b) *Capacity*: In contrast with ILS, the GNSS based approaches do not require the definition and management of sensitive and critical areas resulting in potentially increased runway capacity.
- c) *Efficiency*: Cost savings related to the benefits of lower approach minima: fewer diversions, overflights, cancellations and delays. Cost savings related to higher airport capacity in certain circumstances (e.g. closely spaced parallels) by taking advantage of the flexibility to offset approaches and define displaced thresholds.
- d) *Environment*: Environmental benefits through reduced fuel burn.
- e) *Safety*: Stabilized approach paths.
- f) *Cost Benefit Analysis*: Aircraft operators and air navigation service providers (ANSPs) can quantify the benefits of lower minima by using historical aerodrome weather observations and modeling airport accessibility with existing and new minima. Each aircraft operator can then assess benefits against the cost of any required avionics upgrade. Until there are GBAS (CAT II/III) Standards, GLS cannot be considered as a candidate to globally replace ILS. The GLS business case needs to consider the cost of retaining ILS or MLS to allow continued operations during an interference event

3. GOALS AND OBJECTIVES OF PBN IMPLEMENTATION

- 3.1. The MID Region PBN Implementation Plan has the following strategic objectives:
- a) ensure that implementation of the navigation element of the MID CNS/ATM system is based on clearly established operational requirements;
 - b) avoid unnecessarily imposing the mandate for multiple equipment on board or multiple systems on ground;
 - c) avoid the need for multiple airworthiness and operational approvals for intra and inter-regional operations; and
 - d) avoid an eclipsing of ATM operational requirements by commercial interests, generating unnecessary costs to States, organizations, and airspace users.
- 3.2. Furthermore, the Plan will provide a high-level strategy for the evolution of the navigation applications to be implemented in the MID Region in the short term (2013-2018), medium term (2019-2025).
- 3.3. The plan is intended to assist the main stakeholders of the aviation community to plan the future transition and their investment strategies. For example, Operators can use this Regional Plan to plan future equipage and additional navigation capability investment; Air Navigation Service Providers can plan a gradual transition for the evolving ground infrastructure, Regulating Agencies will be able to anticipate and plan for the criteria that will be needed in the future.

4. PLANNING PRINCIPLES

- 4.1. The implementation of PBN in the MID Region shall be based on the following principles:
- a) implementation of PBN specification and granting PBN operational approvals should be in compliance with ICAO provisions;
 - b) States conduct pre- and post-implementation safety assessments to ensure the application and maintenance of the established target level of safety;
 - c) continued application of conventional air navigation procedures during the transition period, to guarantee the operation by users that are not PBN capable;
 - d) Users/operational requirements should be taken into consideration while planning for PBN implementation;
 - e) States should provide the ICAO MID Regional Office with their updated PBN implementation Plan on annual basis (before December);
 - ~~f) the implementation of Advanced RNP should start by January 2015;~~
 - ~~g) implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including LNAV only minima, for all runway ends at international Aerodromes, either as the primary approach or as a back-up for precision approaches by 2017 with intermediate milestones as follows: 50 percent by 2015 and 70 per cent by 2016;~~
 - ~~h) implementation of straight in LNAV only procedures, as an exception to g) above, for instrument runways at aerodromes where there is no local altimeter setting available and where there are no aircraft suitably equipped for APV operations with a maximum certificated take-off mass of 5 700 kg or more; and~~
- ~~f)~~ States should assess the benefit accrued from the implementation of PBN procedures and ATS Routes, and to report the environmental benefits to the ICAO MID

Regional Office.

5. PBN OPERATIONAL REQUIREMENTS AND IMPLEMENTATION STRATEGY

5.1. Introduction of PBN should be consistent with the Global Air Navigation Plan. Moreover, PBN Implementation shall be in full compliance with ICAO SARPs and PANS.

5.2. Continuous Climb and Descent Operations (CCO and CDO) ~~are two of several tools available to aircraft operators and ANSPs, through collaboration between stakeholders,~~ would enhance efficiency, flight predictability, while reducing fuel burn, emissions and controller-pilot communications, thereby enhancing safety.

En-route

5.3. Considering the traffic characteristic and CNS/ATM capability of the Region, the en-route operations can be classified as oceanic, remote continental, continental, and local/domestic. In principle, each classification of the en-route operations should adopt, but not be limited to single PBN navigation specification. This implementation strategy will be applied by the States and international organizations themselves, as coordinated at regional level to ensure harmonization.

5.4. In areas where operational benefits can be achieved and appropriate CNS/ATM capability exists or can be provided for a more accurate navigation specification, States are encouraged to introduce more accurate navigation specification on the basis of coordination with stakeholders and affected neighbouring States.

Terminal

5.5. Terminal operations have their own characteristics, taking into account the applicable separation minima between aircraft and between aircraft and obstacles. It also involves the diversity of aircraft, including low-performance aircraft flying in the lower airspace and conducting arrival and departure procedures on the same path or close to the paths of high-performance aircraft.

5.6. In this context, the States should develop their own national plans for the implementation of PBN in Terminal Control Areas (TMAs), based on the MID Region PBN Implementation Plan, seeking the harmonization of the application of PBN and avoiding the need for multiple operational approvals for intra- and inter-regional operations, and the applicable aircraft separation criteria.

Approach

5.7. ATC workload should be taken into account while developing PBN Approach Procedures. One possible way to accomplish this would be by co-locating the Initial Approach Waypoint (IAW) for PBN with the Initial Approach Fix (IAF) of the conventional approaches. States should phase-out conventional non-precision approach procedures at a certain point when deemed operationally suitable and taking in consideration GNSS integrity requirements.

5.8. MID States are encouraged to include implementation of CCO and CDO, where appropriate, as part of their PBN implementation plans, in compliance with the provisions of ICAO Documents 9931 and 9993, and in accordance with the MID Region Air Navigation Strategy.

5.9. States are encouraged to plan for the implementation of RNP AR procedures, which can provide significant operational and safety advantages over other area navigation (RNAV) procedures by incorporating additional navigational accuracy, integrity and functional capabilities to permit operations using reduced obstacle clearance tolerances that enable approach and departure procedures to be implemented in circumstances where other types of approach and departure procedures are not operationally possible or satisfactory. Procedures implemented in accordance with RNP AR Procedure

Design Manual (Doc 9905) allow the exploitation of high-quality, managed lateral and vertical navigation (VNAV) capabilities that provide improvements in operational safety and reduced un-stabilized approaches and Controlled Flight Into Terrain (CFIT) risks.

CHAPTER 2

CNS INFRASTRUCTURE

1. NAVIGATION INFRASTRUCTURE

Global Navigation Satellite System (GNSS)

1.1. Global Navigation Satellite System (GNSS) is a satellite-based navigation system utilizing satellite signals, such as Global Positioning System (GPS), and GLONASS for providing accurate and reliable position, navigation, and time services to airspace users. In 1996, the International Civil Aviation Organization (ICAO) endorsed the development and use of GNSS as a primary source of future navigation for civil aviation. ICAO noted the increased flight safety, route flexibility and operational efficiencies that could be realized from the move to space-based navigation.

1.2. GNSS supports both RNAV and RNP operations. Through the use of appropriate GNSS augmentations. GNSS navigation provides sufficient accuracy, integrity, availability and continuity to support en-route, terminal area, and approach operations. Approval of RNP operations with appropriate certified avionics provides on-board performance monitoring and alerting capability enhancing the integrity of aircraft navigation.

1.3. GNSS augmentations include Aircraft-Based Augmentation System (ABAS), Satellite-Based Augmentation System (SBAS) and Ground-Based Augmentation System (GBAS). [More information about GNSS can be found in the Guidance on GNSS Implementation in the MID Region \(MID DOC XXXI\).](#)

~~1.4. For GNSS implementation States need to provide effective spectrum management and protection of GNSS frequencies by enforcing strong regulatory framework governing the use of GNSS repeaters, and jammers. States need to assess the likelihood and effects of GNSS vulnerabilities in their airspace and apply, as necessary, recognized and available mitigation methods.~~

~~1.5. During transition to GNSS, sufficient ground infrastructure for current navigation systems must remain available. Before existing ground infrastructure is considered for removal, users should be consulted and given reasonable transition time to allow them to equip accordingly.~~

~~1.6. GNSS implementation should take advantage of the improved robustness and availability made possible by the existence of multiple global navigation satellite system constellations and associated augmentation systems.~~

~~1.7. Operators consider equipage with GNSS receivers able to process more than one constellation in order to gain the benefits associated with the support of more demanding operations. States allow for realization of the full advantages of on-board mitigation techniques.~~

2. OTHER NAVIGATION INFRASTRUCTURE SUPPORTING PBN

2.1. Other navigation infrastructure that supports PBN applications includes INS, VOR/DME, DME/DME, and DME/DME/IRU. These navigation infrastructures may satisfy the requirements of RNAV navigation specifications, but not those of RNP.

2.2. INS may be used to support PBN en-route operations with RNAV-10 and RNAV 5 navigation specifications.

2.3. VOR/DME may be used to support PBN en-route operations based on RNAV 5 navigation specification.

2.4. DME/DME and DME/DME/IRU may support PBN en-route and terminal area operations based on RNAV 5, and RNAV 1 navigation specifications. Validation of DME/DME coverage area and appropriate DME/DME geometry should be conducted to identify possible DME/DME gaps, including identification of critical DMEs, and to ensure proper DME/DME service coverage.

Note.- The conventional Navaid infrastructure should be maintained to support non-equipped aircraft during a transition period.

3. SURVEILLANCE INFRASTRUCTURE

3.1. For RNAV operations, States should ensure that sufficient surveillance coverage is provided to assure the safety of the operations. Because of the on-board performance monitoring and alerting requirements for RNP operations, surveillance coverage may not be required. Details on the surveillance requirements for PBN implementation can be found in the ICAO PBN Manual (Doc 9613) and ICAO PANS-ATM (Doc 4444), and information on the current surveillance infrastructure in the MID can be found in the MID eANP [and in the MID Region Surveillance Plan](#).

~~3.2. Multilateration (MLAT) employs a number of ground stations, which are placed in strategic locations around an airport, its local terminal area or a wider area that covers the larger surrounding airspace. Multilateration requires no additional avionics equipment, as it uses replies from Mode A, C and S transponders, as well as military IFF and ADS-B transponders.~~

4. COMMUNICATION INFRASTRUCTURE

4.1. Implementation of RNAV and RNP routes includes communication requirements. Details on the communication requirements for PBN implementation can be found in ICAO PANS-ATM (Doc 4444), ICAO RCP Manual (Doc 9869), and ICAO Annex 10. Information on the current communication infrastructure in the MID can also be found in MID eANP.-

CHAPTER 3

IMPLEMENTATION OF PBN

1. ATM OPERATIONAL REQUIREMENTS

1.1. The Global ATM Operational Concept (Doc 9854) makes it necessary to adopt an airspace concept able to provide an operational scenario that includes route networks, minimum separation standards, assessment of obstacle clearance, and a CNS infrastructure that satisfies specific strategic objectives, including safety, access, capacity, efficiency, and environment.

1.2. During the planning phase of any implementation of PBN, States should gather inputs from all aviation stakeholders to obtain operational needs and requirements. These needs and requirements should then be used to derive airspace concepts and to select appropriate PBN navigation specification

1.3. In this regard, the following should be taken into consideration:

- a) Traffic and cost benefit analyses
- b) Necessary updates on automation
- c) Operational simulations in different scenarios
- d) ATC personnel training
- e) Flight plan processing
- f) Flight procedure design training to include PBN concepts and ARINC-424 coding standard
- g) Enhanced electronic data and processes to ensure appropriate level of AIS data accuracy, integrity and timeliness
- h) WGS-84 implementation in accordance with ICAO Annex 15 provisions
- i) Uniform classification of adjacent and regional airspaces, where practicable
- j) RNAV/RNP applications for SIDs and STARs
- k) Coordinated RNAV/RNP routes implementation
- l) RNP approach with vertical guidance
- m) Establish PBN approval database

1.4. Table 23-1 shows the navigation specifications published in PBN Manual (Doc 9613), Volume II. It demonstrates, for example, that navigation specifications extend over various phases of flight. It also contains the Nav aids/Sensor associated with each PBN specification.

1.5. The implementation of PBN additional functionalities/path terminator should be considered while planning/designing new procedures such as:

- the Radius to Fix (RF) for approach;
- Fixed Radius Transition (FRT) for En-route; and
- Time of Arrival Control (TOAC).

Table 3-1. Application of navigation specification by flight phase

Navigation Specification	FLIGHT PHASE								NAVAIDS/SENSORS				
	En-route oceanic/remote	En-route continental	Arrival	Approach				DEP	GNSS	IRU	DME/DME	DME/DME/IRU	VOR/DME
				Initial	Intermediate	Final	Missed ¹						
RNAV 10	10	N/A		N/A				N/A	One or combination of GNSS, INS				
RNAV 5 ²	N/A	5	5	N/A				N/A	One or combination of GNSS, VOR/DME, DME/DME, INS, IRS				
RNAV 2		2	2	N/A				2	One or combination of GNSS, DME/DME, DME/DME/IRU				
RNAV 1		1	1	1	1	N/A	1	1	One or combination of GNSS, DME/DME, DME/DME/IRU				
RNP 4	4	N/A		N/A				N/A	GNSS				
RNP 2	2	2	N/A	N/A				N/A					
RNP 1 ³	N/A		1	1	1	N/A	1	1					
Advanced RNP (A-RNP) ⁴	2	2 or 1	1	1	1	0.3	1	1					
RNP APCH ⁶	N/A			1	1	0.3 ⁷	1	N/A					
RNP AR APCH				1-0.1	1-0.1	0.3-0.1	1-0.1	N/A					
RNP 0.3 ⁸	N/A		0.3	0.3	0.3	0.3	0.3	0.3					

O: Optional; M: Mandatory; SR: Subject ANSP Requirements

1. Only applies once 50 m (40 m, Cat H) obstacle clearance has been achieved after the start of climb.
2. RNAV 5 is an en-route navigation specification which may be used for the initial part of a STAR outside 30 NM and above MSA.
3. The RNP 1 specification is limited to use on STARs, SIDs, the initial and intermediate segments of IAPs and the missed approach after the initial climb phase. Beyond 30 NM from the ARP, the accuracy value for alerting becomes 2 NM.
4. A-RNP also permits a range of scalable RNP lateral navigation accuracies
5. PBN manual contains two sections related to the RNP APCH specification: Section A is enabled by GNSS and Baro-VNAV, Section B is enabled by SBAS.
6. RNP 0.3 is applicable to RNP APCH Section A. Different angular performance requirements are applicable to RNP APCH Section B only.
7. The RNP 0.3 specification is primarily intended for helicopter operations.

2. IMPLEMENTATION PHASES:

En-route

Short Term:

- 2.1. The current application of RNAV 10 will continue for Oceanic and Remote continental routes.
- 2.2. For Continental RNAV 5 specifications should be completed by December 2017. Before the PBN concept, the MID Region adopted the Regional implementation of RNP 5. Further to application of the PBN concept, RNP 5 routes have been changed into RNAV 5 routes. Based on operational requirements, States may choose to implement RNAV 1 routes to enhance efficiency of airspace usages and support closer route spacing, noting that appropriate communication and surveillance coverage is provided. Details of these requirements are provided in the PBN manual (Doc 9613) and PANS-ATM (Doc 4444).

Medium Term:

2.3. RNP 4 and/or RNP 2 routes would be considered for implementation for the en-route oceanic/remote operations.

2.4. RNP 2 or RNAV 1 would be considered for implementation for en-route continental/local domestic operations.

Long Term

A-RNP would be considered for implementation beyond 2026 as a regional requirement based on the PBN SG and ATM SG decisions.

Terminal

Short Term:

2.5. In a non-surveillance environment and/or in an environment without adequate ground navigation infrastructure, the SID/STAR application of RNP 1 is expected in selected TMAs with exclusive application of GNSS.

2.6. CCO and CDO should be implemented at the defined TMAs, in accordance with the State PBN implementation Plans, the MID Region Air Navigation Strategy and the MID ANP.

Medium Term:

2.7. RNAV 1, A-RNP 1 will be implemented in all TMAs, ~~expected target will be 70 % by the end of this term.~~

Approach

Short Term:

2.8. Implementation of PBN approaches with vertical guidance (LNAV/VNAV minima) (~~APV~~) for runway ends at the international aerodromes listed in the MID ANP ~~should be completed by December 2017~~, including LNAV only minima.

2.9. The application of RNP AR APCH procedures would be limited to selected airports, where obvious operational benefits can be obtained due to the existence of significant obstacles.

Medium Term:

2.10. The extended application of RNP AR APCH should continue for airports where there are operational benefits.

2.11. To progress further with the universal implementation of PBN approaches. GLS procedures should be implemented for the defined runway ends to enhance the reliability and predictability of approaches to runways increasing safety, accessibility, and efficiency.

2.12. Table 3-2 summarizes the implementation targets of each PBN navigation specification in the MID Region:

Table 3-2. SUMMARY TABLE AND IMPLEMENTATION TARGETS

Airspace	Short term 2013-2018 Up to 2020		Medium term 2019 2021-2025	
	Navigation Specification Preferred	Targets	Navigation Specification Acceptable	Targets
En-route – Oceanic	RNAV 10 RNP 4*	100 % by 2016 <u>50% by 2020</u>	RNP 4* RNP 2* Defined airspace (A-RNP)	TBD <u>100% by 2025</u>
En-route - Remote continental	RNAV 5 RNAV 10	W/A 100% by 2016	RNP 4* RNP 2* Defined airspace (A-RNP)	<u>50% by 2023</u> <u>100% by 2025</u> TBD
En-route – Continental	RNAV 5 RNAV 1	100 % by 2017 W/A ¹	RNP 2* Defined airspace (A-RNP)	TBD
En-route - Local / Domestic	RNAV 5 RNAV 1	100 % by 2017 W/A	RNP 2 Defined airspace (A-RNP)	TBD
TMA – Arrival	RNAV 1 (surveillance environment) or RNP 1 (non-surveillance environment)	50% by December 2016 100% by 2018 <u>2020</u>	RNP 1 and RNP 2 beyond 30 NM from ARP (A-RNP)	TBD
TMA – Departure	RNAV 1 (surveillance environment) or RNP 1 (non-surveillance environment)	50% by 2016 100% by 2018 <u>2020</u>	RNP 1 and RNP 2 beyond 30 NM from ARP (A-RNP)	TBD
Approach	LNAV: for all RWY Ends at International Aerodromes LNAV/VNAV: for all RWY Ends at International Aerodromes	80 % by 2014. 100% by 2016 <u>2020</u> 70% by 2016 100% by 2018 <u>2020</u>	GLS (GBAS) For the defined RWY Ends <u>Based on operational needs and CBA</u>	TBD
CCO and CDO	W/A	100 <u>50</u> % by 2018 <u>2020</u>	W/A	TBD <u>100 % by 2025</u>

- W/A: where applicable/defined Airspace, in accordance with State PBN implementation Plans, the MID Region Air ~~navigation~~Navigation Strategy and the MID ANP.
- * would be considered for implementation at the identified Airspace/TMAs
- When no month is specified (e.g. by 2017) means by the end of the year (December 2017).

Long Term (2025~~6~~ and Beyond)

2.13. In this phase, GNSS augmentation is expected to be a primary navigation infrastructure for PBN implementation. States should work co-operatively on a multinational basis to implement GNSS in order to facilitate seamless and inter-operable systems and undertake coordinated Research and Development (R&D) programs on GNSS implementation and operation.

2.14. Moreover, during this phase, States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance.

2.15. The required PBN navigation specifications and their associated targets to be implemented for the Long term will be defined in due course.

CHAPTER 4

SAFETY ASSESSMENT AND MONITORING

1. NEED FOR SAFETY ASSESSMENT

1.1. To ensure that the introduction of PBN en-route applications within the MID Region is undertaken in a safe manner and in accordance with relevant ICAO provisions, implementation shall only take place following conduct of a safety assessment that has demonstrated that an acceptable level of safety will be met. This assessment may also need to demonstrate levels of risk associated with specific PBN en-route implementation. Additionally, ongoing periodic safety reviews shall be undertaken where required in order to establish that operations continue to meet the target levels of safety

2. ROLES AND RESPONSIBILITIES

2.1. To demonstrate that the system is safe, it will be necessary that the implementing agency – a State or group of States - ensures that a safety assessment and, where required, ongoing monitoring of the PBN en-route implementation are undertaken.

2.2. In undertaking a safety assessment to enable en-route implementation of PBN, a State or the implementing agency shall:

- a) establish and maintain a ~~database~~-registry of PBN approvals;
- b) monitor aircraft horizontal-plane navigation performance and the occurrence of large navigation errors and report results;
- c) conduct safety and readiness assessments;
- d) monitor operator compliance with State approval requirements after PBN implementation; and
- e) initiate necessary remedial actions if PBN requirements are not met.

CHAPTER 5 OPERATIONAL APPROVAL

1. OPERATIONAL APPROVAL REQUIREMENTS

1.2. Operational approval is usually the responsibility of the regulatory authority of the State of the Operator for commercial air transport operations and the State of Registry for general Aviation (GA) operations. For certain operations, GA operators may not be required to follow the same authorization model as commercial operators.

1.3. The operational approval assessment must take account of the following:

- a) aircraft eligibility and airworthiness compliance;
- b) operating procedures for the navigation systems used;
- c) control of operating procedures (documented in the OM);
- d) flight crew initial training and competency requirements and continuing competency requirements;
- e) dispatch training requirements; and
- f) control of navigation database procedures. Where a navigation database is required, operators need to have documented procedures for the management of such databases. These procedures will define the sourcing of navigation data from approved suppliers, data validation procedures for navigation databases and the installation of updates to databases into aircraft so that the databases remain current with the AIRAC cycle. (For RNP AR applications, the control of the terrain database used by TAWS must also be addressed.)

Aircraft eligibility

1.4. An aircraft is eligible for a particular PBN application provided there is clear statement in:

- a) the Type Certificate (TC); or
- b) the Supplement Type Certificate (STC); or
- c) the associated documentation — Aircraft Flight manual (AFM) or equivalent document; or
- d) a compliance statement from the manufacturer that has been approved by the State of Design and accepted by the State of Registry or the State of the Operator, if different.

1.5. The operator must have a configuration list detailing the pertinent hardware and software components and equipment used for the PBN operation.

1.6. The TC is the approved standard for the production of a specified type/series of aircraft. The aircraft specification for that type/series, as part of the TC, will generally include a navigation standard. The aircraft documentation for that type/series will define the system use, operational limitations, equipment fitted and the maintenance practices and procedures. No changes (modifications) are permitted to an aircraft unless the CAA of the State of Registry either approves such changes through a modification approval process, STC or accepts technical data defining a design change that has been approved by another State.

1.7. For recently manufactured aircraft, where the PBN capability is approved under the TC, there may be a statement in the AFM limitations section identifying the operations for which the aircraft

is approved. There is also usually a statement that the stated approval does not itself constitute an approval for an operator to conduct those operations. Alternate methods of achieving the airworthiness approval of the aircraft for PBN operations is for the aircraft to be modified in accordance with approved data. (e.g. STC, minor modification, etc.)

1.8. One means of modifying an aircraft is the approved Service Bulletin (SB) issued by the aircraft manufacturer. The SB is a document approved by the State of Design to enable changes to the specified aircraft type and the modification then becomes part of the type design of the aircraft. Its applicability will normally be restricted by the airframe serial number. The SB describes the intention of the change and the work to be done to the aircraft. Any deviations from the SB require a design change approval; any deviations not approved will invalidate the SB approval. The State of Registry accepts the application of an SB and changes to the maintenance programme, while the State of the Operator accepts changes to the maintenance programme and approves changes to the MEL, training programmes and Operations specifications. An Original Equipment Manufacturer (OEM) SB may be obtained for current production or out of production aircraft.

1.9. In respect of PBN, in many cases for legacy aircraft, while the aircraft is capable of meeting all the airworthiness requirements, there may be no clear statement in the applicable TC or STC or associated documents (AFM or equivalent document). In such cases, the aircraft manufacturer may elect to issue an SB with appropriate AFM update or instead may publish a compliance statement in the form of a letter, for simple changes, or a detailed aircraft type specific document for more complex changes. The State of Registry may determine that an AFM change is not required if it accepts the OEM documentation. **Table 5-1** lists the possible scenarios facing an operator who wishes to obtain approval for a PBN application, together with the appropriate courses of action.

Table 5-1

Scenario	Aircraft certification status	Actions by operator/owner
1	Aircraft designed and type certificated for PBN application. Documented in AFM, TC or the STC	No action required, aircraft eligible for PBN application
2	Aircraft equipped for PBN application but not certified. No statement in AFM. SB available from the aircraft manufacturer	Obtain SB (and associated amendment pages to the AFM) from the aircraft manufacturer
3	Aircraft equipped for PBN application. No statement in AFM. SB not available. Statement of compliance available from the aircraft manufacturer	Establish whether the statement of compliance is acceptable to the regulatory authority of the State of Registry of the aircraft
4	Aircraft equipped for PBN application. No statement in AFM. SB not available. Statement of compliance from the aircraft manufacturer not available	Develop detailed submission to State of Registry showing how the existing aircraft equipment meets the PBN application requirements
5	Aircraft not equipped for PBN application	Modify aircraft in accordance with the aircraft manufacturer’s SB or develop a major modification in conjunction with an approved design organization in order to obtain an approval from the State of Registry (STC).

Operating procedures

1.10. The Standard operating procedure (SOP) must be developed to cover both normal and non-normal (contingency) procedures for the systems used in the PBN operation. The SOP must address:

- a) preflight planning requirements including the MEL and, where appropriate, RNP/RAIM prediction;
- b) actions to be taken prior to commencing the PBN operation;
- c) actions to be taken during the PBN operation; and
- d) actions to be taken in the event of a contingency, including the reporting of significant incidents

GA pilots must ensure that they have suitable procedures/checklists covering all these areas

Control of operating procedures

1.11. The SOP must be adequately documented in the OM and checklists

Flight crew and dispatch training

1.12. A flight crew and dispatch training programme for the PBN operation must cover all the tasks associated with the operation and provide sufficient background to ensure a comprehensive understanding of all aspects of the operation. The operator must have adequate records of course completion for flight crew, flight dispatchers and maintenance personnel.

Control of navigation database procedures

1.13. If a navigation database is required, the procedures for maintaining currency, checking for errors and reporting errors to the navigation database supplier must be documented in the maintenance manual by commercial operators

2. DOCUMENTATION OF OPERATIONAL APPROVAL

2.1. Operational approval may be documented as an endorsement of the Air operator certificate (AOC) through:

- a) Operations specification, associated with the AOC; or
- b) amendment to the OM; or
- c) LOA.

2.2. During the validity of the operational approval, the CAA should consider any anomaly reports received from the operator or other interested party. Repeated navigation error occurrences attributed to a specific piece of navigation equipment may result in restrictions on use or cancellation of the approval for use of that equipment. Information that indicates the potential for repeated errors may require modification of an operator's training programme. Information that attributes multiple errors to a particular pilot or crew may necessitate remedial training and checking or a review of the operational approval.

2.3. The State may determine that a GA aircraft may operate on a PBN route/procedure provided that the operator has ensured that the aircraft has suitably approved equipment (is eligible), the navigation database is valid, the pilot is suitably qualified and current with respect to the equipment, and adequate procedures (checklists) are in place.

3. STATE REGULATORY MATERIAL

3.1. Individual States must develop national regulatory material which addresses the PBN applications relevant to their airspace or relevant to operations conducted in another State by the State's operators or by aircraft registered in that State. The regulations may be categorized by operation, flight phase, area of operation and/or navigation specification. Approvals for commercial operations should require specific authorization.

4. APPROVAL PROCESS

General

4.2. Since each operation may differ significantly in complexity and scope, the project manager and the operational approval team need considerable latitude in taking decisions and making recommendations during the approval process. The ultimate recommendation by the project manager and decision by the DGCA regarding operational approval should be based on the determination of whether or not the applicant:

- a) meets the requirements established by the State in its air navigation regulations;
- b) is adequately equipped; and
- c) is capable of conducting the proposed operation in a safe and efficient manner.

4.3. The complexity of the approval process is based on the inspector's assessment of the applicant's proposed operation. For simple approvals, some steps can be condensed or eliminated. Some applicants may lack a basic understanding of what is required for approval. Other applicants may propose a complex operation, but may be well prepared and knowledgeable. Because of the variety in proposed operations and differences in an applicant's knowledge, the process must be thorough enough and flexible enough to apply to all possibilities.

Phases of the approval process

Step 1 — Pre-application phase

4.4. The operator initiates the approval process by reviewing the requirements; establishing that the aircraft, the operating procedures, the maintenance procedures and the training meet the requirements; and developing a written proposal to the regulator. A number of regulators have published "job aids" to assist the operator in gathering the necessary evidence to support the approval application. At this stage a pre-application meeting with the regulator can also be very beneficial. If the proposed application is complex, the operator may need to obtain advice and assistance from OEMs or other design organizations, training establishments, data providers, etc.

Step 2 — Formal application phase

4.5. The operator submits a formal, written application for approval to the CAA, which appoints a project manager either for the specific approval or generally for PBN approvals.

Step 3 — Document evaluation phase

4.6. The CAA project manager evaluates the formal, written application for approval to determine whether all the requirements are being met. If the proposed application is complex, the project manager may need to obtain advice and assistance from other organizations such as regional agencies or experts in other States.

Step 4 — Demonstration and inspection phase

4.7. During a formal inspection by the project manager (assisted as necessary by a CAA team), the operator demonstrates how the requirements are being met.

Step 5 — Approval phase

4.8. Following a successful formal inspection by the CAA, approval is given through:

- a) Operations specification, associated with the AOC; or
- b) amendment to the OM; or
- c) LOA.

Some PBN applications may not require formal approval for GA operations — this will be determined by the State of Registry.

Note.— The approval procedure described above consists of a simplified process of the certification guidance contained in Part III of the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).

5. FOREIGN OPERATIONS

5.1. A State undertakes, in accordance with Article 12 to the Convention, to ensure that every aircraft flying over or maneuvering within its territory shall comply with the rules and regulations relating to the flight and maneuver of aircraft there in force. Article 33 to the Convention provides that certificates of airworthiness and certificates of competency and licenses issued, or rendered valid, by the State in which an aircraft is registered, shall be recognized by other States, provided that the requirements under which such certificates or licenses were issued or rendered valid are equal to or above the minimum standards which may be established by ICAO. This requirement for recognition is now extended by Annex 6, Part I and Part III, Section II, such that Contracting States shall recognize as valid an AOC issued by another Contracting State, provided that the requirements under which the certificate was issued are at least equal to the applicable Standards specified in Annex 6, Part I and Part III.

5.2. States should establish procedures to facilitate the application by foreign operators for approval to operate into their territory. States should be careful in their requirements for applications, to request only details relevant to the evaluation of the safety of the operations under consideration and their future surveillance. When evaluating an application by an operator from another State to operate within its territory a State will examine both the safety oversight capabilities and record of the State of the Operator and, if different, the State of Registry, as well as the operational procedures and practices of the operator. This is necessary in order for the State, in the terms of Article 33 to the Convention, to have confidence in the validity of the certificates and licenses associated with the operator, its personnel and aircraft, in the operational capabilities of the operator and in the level of certification and oversight applied to the activities of the operator by the State of the Operator.

5.3. The operator will need to make applications to each State into or over which it is intended to operate. The operator will also need to keep its own CAA, as the authority of the State of the Operator, informed of all applications to operate in other States. Applications should be made direct to the CAAs of the States into which it is intended to operate. In some cases it will be possible to download information and instructions for making an application and the necessary forms from a website maintained by the CAA in question.

5.4. States should promote the implementation and operational approval of Advanced RNP (A-RNP) navigation specifications, which serves all the flight phases as follows:

- En-Route Oceanic, Remote: RNP 2;
- En-Route Continental: RNP 2 or RNP 1;
- Arrival and Departures: RNP 1;
- Initial, intermediate and missed approach phases: RNP 1; and
- Final Approach Phase: RNP 0.3.

5.5. Because functional and performance requirements are defined for each navigation specification, an aircraft approved for an RNP specification is not automatically approved for all RNAV specifications. Similarly, an aircraft approved for an RNP or RNAV specification having a stringent accuracy requirement (e.g. RNP 0.3 specification) is not automatically approved for a navigation specification having a less stringent accuracy requirement (e.g. RNP 4).

CHAPTER 6

PBN CHARTING

1. INTRODUCTION

6.1 Charting of PBN Instrument Approach Procedures in the MID Region should follow the criteria included in Annex 4 and the PANS OPS (DOC 8168).

2. TRANSITION PLAN FOR RNAV TO RNP INSTRUMENT APPROACH CHART DEPICTION

6.2 For a harmonized implementation of the Amendment 6 to the PANS OPS related to RNAV to RNP Approach Chart Depiction, the following transition plan should apply in the MID Region:

- MID States, that have not yet done so, should implement RNAV to RNP Chart naming convention for their current PBN Approach Procedures published in their AIPs, starting from 29 March 2019 up to 8 September 2022.
- New PBN Approach Procedures, planned to be published before 29 March 2019, should be published using the new naming convention, if practicable.
- If a PBN Approach Procedure published in the National AIP is amended and re-published before 29 March 2019 (for any reason), the new naming convention should be used, if practicable.

6.3 States are required to provide the ICAO MID Office with their action plan for the implementation of RNAV to RNP Chart naming convention, and keep the MID Office apprised of the status of implementation.



International Civil Aviation Organization	Organisation de l'aviation civile internationale	Organización de Aviación Civil Internacional	Международная организация гражданской авиации	منظمة الطيران المدنى الدولى	国际民用 航空组织
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File Ref: AN 6/33 – 18/144

9 May 2018

Subject: ICAO MID Region Flight Procedure Programme Draft Project Document

Action required: Reply not later than 10 June 2018

Sir,

I have the honor to refer to the outcome of the Fourth Meeting of the Directors General of Civil Aviation-Middle East Region (DGCA-MID/4), Muscat, Oman, from 17 to 19 October 2017 and the Kick-off meeting of the MID Region Flight Procedures Programme (MID FPP), Cairo, Egypt, 22 – 24 January 2018.

The MID FPP objective is to assist States to develop sustainable capability in the Instrument Flight Procedure (IFP) design, PBN Airspace Design and PBN OPS Approval, including regulatory oversight, so as to meet their obligations related to instrument flight procedure and the regional requirements (MID Region Air Navigation Strategy, MID Region PBN Implementation Plan and the Doha Declaration on Aviation Safety and Air Navigation in the MID Region) related to PBN implementation. In this respect, the MID FPP would support States to overcome the challenges identified as the main impediments faced by States in meeting the agreed global and regional PBN Performance Targets.

As a follow-up to the DGCA-MID/2 meeting (Jeddah, Saudi Arabia, 20 - 22 May 2013) Conclusion 2/5, the ICAO MID Office exerted all efforts for the establishment of the MID FPP. Several meetings/workshops addressing the subject were convened with the support of ICAO HQ, African and Asia Pacific Flight Procedure Programmes and other stakeholders. I would like to recall that the Global Ministerial Aviation Summit (Riyadh, Saudi Arabia, 29-31 August 2016) endorsed the MID FPP as the regional air navigation project with the highest priority.

States willing to join the MID FPP are required to sign a Project Document with ICAO, which defines the institutional framework of the MID FPP, organizational structure, scope, operating concept, host/location, expected outcomes and objectives, first year work plan, Job Descriptions, budget, etc.

The attached Draft MID FPP Project Document was consolidated by ICAO based on the outcome of the MID FPP Kick-off Meeting (Cairo, Egypt, 22-24 January 2018).

../.

The MID FPP will be established as an ICAO technical cooperation project and its office will be hosted by Lebanon in Beirut, based on the results of the selection process of the host State, which was communicated to your Administration through my Letter Ref.: AN 6/33 – 16/176 dated 30 June 2016.

In order for the ICAO Technical Cooperation Bureau (TCB) to initiate the recruitment of the Manager of the Programme at least five (5) States should sign the Project Document and an amount of **USD 300,000** should be available in the bank account of the Programme. Accordingly, States have been strongly encouraged to make advance payments, which would be deducted later from their annual financial contributions based on the agreed funding mechanism. It is to be highlighted that ICAO is exploring all resource mobilization opportunities from donors to expedite the establishment/start of operation of the MID FPP.

Currently, Saudi Arabia and UAE gratefully offered to provide **USD 50,000** each to support the establishment of the MID FPP.

I would like to highlight that the funding mechanism of the MID FPP including the annual amount that should be paid by each Active State will be agreed upon by the MID FPP Steering Committee, which should meet tentatively during the last quarter of 2018 (after the signature of the Project Document by at least five States).

I would be grateful, if you could review the attached Draft MID FPP Project Document and provide the ICAO MID Office with your comments/inputs, if any, preferably not later than **10 June 2018**, in order to consolidate the final version of the Document to be signed by the ICAO Secretary General and then sent to States for signature.

I would also appreciate if you could confirm, by **10 June 2018**, your willingness to join the MID FPP as Active State or User State, indicating the amount of the advanced financial contribution or the in-kind contribution your Administration will provide to the MID FPP.

Mr. Elie El Khoury, Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR) (ekhoury@icao.int), the MID FPP focal point, could be contacted if additional information/clarification is needed.

Accept, Sir, the assurances of my highest consideration.



for/ Mohamed Khalifa Rahma
Middle East Regional Director

Attachments

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**MID REGION FLIGHT PROCEDURE PROGRAMME
(MID FPP)**

Prepared by the

International Civil Aviation Organization (ICAO)

for the

**Directorate General of Civil Aviation (DGCA) of Lebanon
and the
Civil Aviation Administrations of other Participating States**

March 2018

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**INTERNATIONAL CIVIL AVIATION ORGANIZATION
PROJECT DOCUMENT**

Project Title: MID Region Flight Procedure Programme (MID FPP)
Project Number: RAB/18801
Duration: 3 years:
Project Cost: US\$
Participating State: [State]
Sector and Subsector: Air Navigation/Air Traffic Management (ATM)/PANS-OPS
Governments Executing Agency: Civil Aviation Authorities of the MID States
Executing Agency: International Civil Aviation Organization (ICAO)
Location : Beirut, Lebanon
Estimated Starting Date: 01 January 2019

- Active State:** A MID Participating State that commits to funding the Programme by means of an annual financial contribution in line with an approved budget
- User State:** A MID Participating State that is not an Active State, but one that intends to use the MID FPP services

Brief Description: The Programme objective is to assist States to develop sustainable capability in the instrument flight procedure (IFP) design, PBN airspace design and PBN OPS approval, including regulatory oversight, so as to meet their commitments under Assembly Resolutions A37-11 for Performance Based Navigation (PBN) implementation and the regional requirements, and comply with ICAO provisions related to flight procedure design and PBN.

Signed by	Signature	Name	Title	Date
State
ICAO

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1. BACKGROUND

1.1 ICAO developed harmonized navigation specifications for all existing area navigation applications, and published these navigation specifications in the Performance Based Navigation (PBN) Manual (Doc. 9613).

1.2 The 37th session of the ICAO Assembly in 2010 in its Resolution A37-11 reaffirmed the global commitment for PBN implementation and called upon the States to complete a PBN implementation plan as a matter of urgency and ICAO to develop a coordinated action plan to assist States in the implementation of PBN and to ensure development and/or maintenance of globally harmonized SARPs, Procedures for Air Navigation Services (PANS) and guidance material including a global harmonized safety assessment methodology to keep pace with operational demands.

1.3 In 2009, ICAO published the Quality Assurance Manual for Flight Procedure Design (Doc. 9906). This document addresses two levels of processes. A high-level process, called the Instrument Flight Procedure (IFP) process, covers all elements from initiation to publication of the procedure and the relevant maintenance, safety, validation and flight inspection activities. The process does not end with publication. Feedback from users must be considered in the improvement process. A second specific process, for the design of the IFP — the Flight Procedure Design (FPD) process — is part of the IFP process.

1.4 The MID Air Navigation Strategy (ICAO MID Doc 002), endorsed by MIDANPIRG, includes the Aviation System Block Upgrades (ASBU) B0-APTA, B0-CCO and B0-CDO Modules, which are considered as priority 1 for implementation in the MID Region. In this respect, the MID FPP would support its Participating States with the implementation of the mentioned Modules.

1.5 The Directors General of Civil Aviation-Middle East (DGCA-MID) Region through the Doha, Declaration, April 2015, agreed to take necessary measures to implement PBN approach procedures with vertical guidance, for all runways ends at international aerodromes, either as the primary approach or as a back-up for the precision approaches by 2017

1.6 The DGCA-MID/2 (Jeddah, Saudi Arabia, 20 - 22 May 2013) recognized the need for cooperation and exchange of experience between MID States in the field of procedure design (PANS-OPS). The meeting through DGCA-MID Conclusion 2/5 agreed that a study related to the establishment of FPP be carried out within the framework of the PBN/GNSS TF taking into consideration similar programs in other ICAO Regions.

1.7 The MIDANPIRG/15 meeting (Bahrain, 8-11 June 2016) emphasized that the establishment of the MID Flight Procedure Programme (MID FPP) would foster the PBN implementation in the Region. The meeting noted that the MID FPP was endorsed as one of the MID Region ATM Enhancement Programme (MAEP) projects.

1.8 The MIDANPIRG/15 meeting noted with appreciation that ICAO is ready to provide necessary support for the establishment of the MID FPP and to share the experience gained from the ASIA-Pacific and AFI FPPs' establishment. Accordingly, the meeting agreed, through Conclusion 15/13, that a Workshop on the establishment of the MID FPP to be held in Cairo, Egypt, 18-19 October 2015, back-to-back with the Second meeting of the MAEP Steering Committee (MAEP SC/2) (20-22 October 2015). The main objective of the Workshop was to develop a framework for establishing an FPP for the MID Region along with the proposed organizational structure, governance procedures, scope of activities and services, work plan and deliverables, resources and financial structure to be presented in a Project Document.

1.9 The MID FPP Workshop developed the draft MID FPP Project Document, which was further reviewed by the PBN SG/2 meeting (Sharm El Sheikh, Egypt, 22-25 February 2016) and circulated to States for their comments and inputs on 16 March 2016.

1.10 The MAEP Board/2 meeting (Cairo, Egypt, 11-13 April 2016) noted that, as a follow-up action to the MAEP SC/2 Draft Conclusion 2/2, the ICAO MID Regional Office circulated a Questionnaire to seek

States' willingness to join the MID FPP and/or provide in-kind contributions, get their views regarding the hosting, identify the States' needs and determine the flight procedures design and PBN capabilities in the MID Region. The meeting reviewed the survey results as presented to the PBN SG/2 meeting and noted with appreciation that the majority of States are supporting the establishment of the MID FPP.

1.11 The MAEP Board/2 meeting received with appreciation three (3) offers for hosting the MID FPP from Egypt, Lebanon and Sudan. The meeting agreed that the evaluation process of the offers should be based on clear criteria and procedure of evaluation.

1.12 The Evaluation Committee met on 26 June 2016 and selected Lebanon as the hosting State for the MID FPP based on the agreed criteria. The selection result was communicated to States through State Letter Ref. AN 6/33 – 16/176 dated 30 June 2016.

1.13 The Global Ministerial Aviation (GMA) Summit (Riyadh, Saudi Arabia, 29-31 August 2016) supported the MID FPP and agreed to the following Recommendation:

MID FPP Recommendation

- a. *States are encouraged to sign the MID FPP Project Document*
- b. *States and Stakeholders are encouraged to support:*
 - i. *the establishment of MID FPP through the provision of cash and/or in-kind contributions; and*
 - ii. *the MID FPP activities through the assignment of experts to be part of the MID FPP pool of resources*

1.14 The DGCA-MID/4 meeting (Muscat, Oman, 17-19 October 2017) emphasized that the establishment of the MID FPP would enhance the States' capabilities related to PANS-OPS and eventually foster PBN implementation in the Region. The DGCA-MID/4 meeting agreed to the following Conclusion:

DGCA-MID/4 CONCLUSION 4/3 – MID FLIGHT PROCEDURE PROGRAMME

That:

- a) *States are urged to sign the MID FPP Project Document with ICAO TCB;*
- b) *till the recruitment of a MID FPP Manager/Coordinator, the ICAO MID Office provide full support to run the Programme, in close coordination with the Host State;*
- c) *a Kickoff meeting of the MID FPP be held in January 2018; and*
- d) *States and Stakeholders are urged to participate in the Kickoff meeting of the MID FPP*

2. INSTITUTIONAL FRAMEWORK

2.1. **Participating States:** The Programme will be executed on the basis of the Project Document signed by the Host (*Lebanon*) and ICAO and to which any State wishing to participate may sign on. Upon signature onto the Project Document, such State becomes a Participating State. Participating States are grouped in two categories:

- **Active States:** All Participating States that commit to funding the Programme by means of an annual financial contribution in line with an approved budget become an Active State. The Host State (*Lebanon*) is considered an Active State, based on the in-kind contribution provided to the Programme.
- **User States:** MID States that are not Active States but intend to use the MID FPP services are User States.

2.2. **Donors:** States, organizations and entities that support the MID FPP by financial and/or in-kind contribution (experts, equipment, services, etc.). A specific agreement with the Donor might be required.

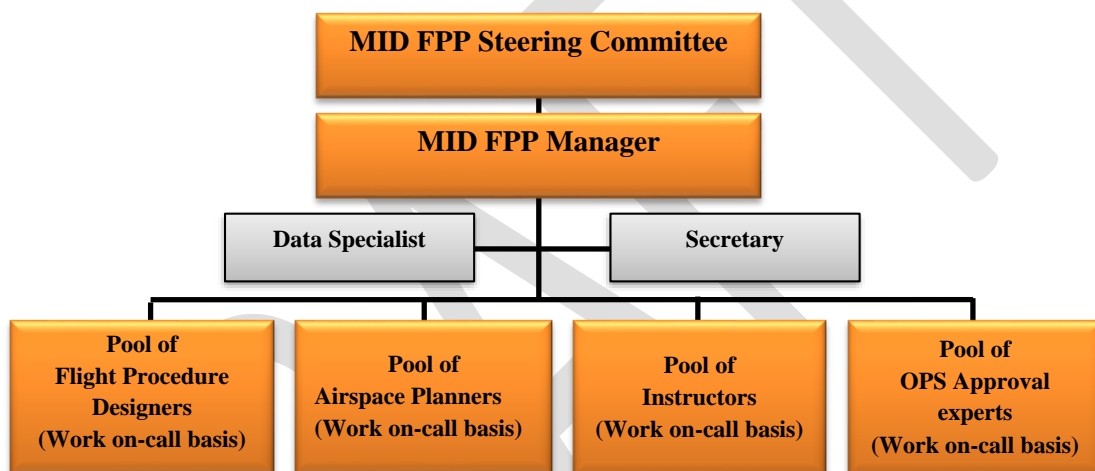
2.3. **Observer States:** States that are not Participating States or Donors and are interested in the Programme.

2.4. The Host State's in kind-contribution related to the hosting of the MID FPP should be taken into account by the MID FPP SC for offsetting its annual financial contribution to the Programme. Contributions in kind from other Participating States may also be taken into account for offsetting their annual financial contribution to the Programme

Host Administration

2.5. During Phase I of the Programme, *Lebanon* is the Host Administration. The MID FPP will be located at the Lebanese Safety Training Centre, Hariri international Airport, Beirut, Lebanon.

MID FPP Organizational Structure



2.6. The Programme will be governed by the MID FPP Steering Committee (MID FPP SC), in accordance with its Terms of Reference at **Appendix A**.

2.7. The MID FPP Manager should present to the ICAO Regional Director, Middle East Office, on a quarterly basis, progress reports related to the Programme developments, recommending necessary measures to improve the effectiveness and efficiency of the Programme. The MID FPP Manager should present progress reports on an annual basis to the MID FPP Steering Committee, including recommendations to improve the performance and efficiency of the Programme.

2.8. The MID FPP Manager will be responsible for the local coordination and the management of the Programme, for maintaining liaison with States and stakeholders as well as ensuring full coordination and cooperation between the MID FPP assigned experts and CAA counterparts. The FPP Manager will also be responsible for the submission of periodic progress reports and for the preparation of the draft Terminal Report prior to the termination of his/her assignment.

Roles and Responsibilities

2.9. In the context of the MID FPP, the roles and responsibilities of the MID FPP Steering Committee, as outlined in **Appendix A**, should include but not be limited to the following:

- review the Programme performance;
- review and approval of the:
 - strategic objectives of the MID FPP;

- annual Work Plan of the MID FPP;
- annual Budget;
- annual financial contribution of the Active States. Contributions in-kind from Participating States may also be taken into account for offsetting their annual financial contribution to the Programme;
- fee schedule for services and trainings in compliance with ICAO existing Policy; and
- MID FPP Project Document as deemed necessary.

2.10. The role of the ICAO MID Regional Office is as follows:

- support the MID FPP Manager who is responsible for the execution of the work plan approved by the MID FPP Steering Committee;
- collaborate with the MID FPP Manager to develop the work plan;
- ensure that the MID FPP work plan is in line with the MID Region priorities and would support States in meeting the regional targets related mainly to PBN implementation;
- monitor PBN implementation and capacity building progress; and
- communicate to the MID FPP the States' needs.

2.11. The role of Technical Cooperation Bureau (TCB) is as follows:

- Assign a Focal Point for the MID FPP;
- Recruit and deploy the MID FPP Manager;
- procure services and goods in accordance with ICAO's Procurement Code, Financial Regulations and Rules, and applicable process and procedures; and
- provide administrative and financial support to the MID FPP.

2.12. The role of Air Navigation Bureau (ANB) at ICAO Headquarters is as follows:

- review the MID FPP Technical work programme/plan to ensure that it is consistent with the ANB PBN regular programme;
- provide the technical/operational input/advice; and
- facilitate the global coordination amongst the FPPs (African, APAC and MID), specifically on educative tools/presentations etc. as necessary.

2.13. The role of the MID FPP Manager includes but is not limited to the following:

- act as the Secretary of the MID FPP Steering Committee;
- develop the Work Plan in collaboration with the MID Regional Office;
- work under the supervision of the ICAO MID Regional Director;
- report to the MID Office technical and operational matters;
- provide progress reports on the Programme to the relevant MIDANPIRG subsidiary bodies; and
- represent the MID FPP in relevant events that would support the achievements of the MID FPP objectives.

3. CHALLENGES AND OPERATING CONCEPT

Challenges

3.1. Instrument flight procedures developed to take advantage of the benefits of PBN are reliant on the data in a database on the aircraft. For this reason, quality assurance in the flight procedure design process, while always important, takes on added importance for PBN-based procedures. A great safety concern in this respect is that many States lack the expertise to establish a sustainable internal procedure design capability, meeting the requirements of PANS-OPS and their responsibility under Annex 15 for the quality of their aeronautical information and data, including instrument flight procedures.

3.2. Following are some of the main procedure design-related challenges and problems faced by States:

- a) Insufficient number of procedure designers;
- b) Insufficient procedure design work in some States to attain or maintain proficiency;
- c) Lack of airspace and procedure design training: initial, On-the-Job Training (OJT), and/or recurrent;
- d) Lack of knowledge to integrate procedure design efficiently into airspace design;
- e) Lack of depth in procedure design organization to perform quality assurance (QA);
- f) Insufficient expertise in procedure design organization to provide adequate QA of procedures;
- g) Lack of procedure design and obstacle data storage automation in the States;
- h) Lack of operational approval expertise to obtain proper operational approval and to oversee operators for PBN operations;
- i) Lack of regulatory expertise to oversee the process leading to procedure publication; and
- j) Lack of service provision for Air Traffic Control/ Air Traffic Management (ATC/ATM) training for PBN implementation.

Operating Concept

3.3. The MID FPP would serve as a means to assist Participating States to address the issues listed in para 3.2. The MID FPP will foster the implementation of instrument flight procedures, developed with the appropriate quality systems, especially focusing on PBN in Terminal Area and vertically guided instrument approach procedures by:

- a) assisting States with sufficient number of procedures to establish a sustainable internal procedure design capability capable of meeting the requirements of PANS-OPS and their responsibility for the quality of their procedures;
- b) providing the appropriate level of technical expertise necessary to enable States that do not have the volume of procedures necessary to sustain an internal procedure design capability; and
- c) providing a vehicle to improve quality in the States' procedure design process through access to procedure design automation solutions and associated data storage; and assisting States with airspace design and operational approval functions.

3.4. At Participating States' request the MID FPP would:

- a) assist State's procedure and airspace designers in developing their Instrument Flight Procedures (IFP) with priority for PBN procedures;
- b) assist State with the development of a Quality Assurance (QA) system for IFP, including flight procedure regulatory approval;

- c) provide refresher, recurrent and PBN initial training courses and OJT to procedure designers, remotely, on-site or at the MID FPP location;
- d) provide training course and OJT on QA for IFP including flight procedure regulatory approval;
- e) provide training course and OJT on operators' approval for PBN operations;
- f) assist State in PBN Plan implementation through operational assessment, business case, and activity planning for PBN Implementation;
- g) assist States in the design of IAPs, SIDs, STARs, Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO);
- h) assist State in developing PBN-related regulations;
- i) develop procedures implementation for States that have no or little procedure design capability;
- j) assist State with data origination and validation;
- k) assist State with ground and flight validation;
- l) assist State in operators' approval for PBN operations;
- m) provide training courses for air traffic controllers about PBN flight procedures operations;
- n) provide State with any other associated assistance, as required;
- o) provide training courses for newly recruited flight procedures designers in accordance with ICAO Doc 9906;
- p) assist States with the estimation of environmental benefit accrued from the implementation of instrument flight procedures/PBN procedures; and
- q) assist States with PBN airspace design.

Note: in order to assist the Participating States in expediting the implementation, both training and services may be extended to air navigation service providers of the Participating States in accordance with applicable ICAO policies.

3.5. As part of the services provided in 3.4 above, the Programme would:

- a) provide States access to procedure design software applications at the MID FPP location; and
- b) provide States access to available databases for training purposes.

3.6. The services listed in 3.4 will be provided free of charge to the Active States. The provision of additional services by MID FPP including the design of new instrument flight procedures, may be against a fee determined based on a cost formula agreed upon by the MID FPP SC.

3.7. User States will be charged for the services provided by the MID FPP in accordance with applicable ICAO policies and as agreed by the MID FPP SC.

3.8. Other States may benefit from the services provided by the MID FPP against fees in accordance with applicable ICAO policies and as agreed by the MID FPP SC.

3.9. For on-site missions/training courses, the travel and accommodation expenses and the daily subsistence allowance for the MID FPP personnel, ICAO Team and course' instructors should be covered by the beneficiary State in accordance with applicable ICAO policies.

4. RELEVANT DOCUMENTS

- a) Global Air Navigation Plan (GANP) (Doc 9750)
- b) Procedures for Air Navigation Services – Aircraft Operations (Doc 8168)
- c) Performance Based Navigation Manual (Doc 9613)
- d) World Geodetic System Manual (Doc 9674)
- e) Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information (Doc 9881)
- f) Required Navigation Performance – Authorization Required Procedure Design Manual (Doc 9905)
- g) Quality Assurance Manual for Flight Procedure Design (Doc 9906)
- h) Continuous Descent Operations Manual (Doc 9931)
- i) Manual on Use of PBN in Airspace Design (Doc 9992)
- j) Continuous Climb Operations Manual (Doc 9993)
- k) PBN Operational Approval Manual (Doc 9997)
- l) PANS-ATM (Doc 4444)
- m) ICAO Annexes 4, 6, 10, 11, 14 and 15
- n) ICAO Assembly Resolutions A37-11
- o) Manual of All-Weather Operations (Doc 9365)
- p) Aeronautical Charting Manual (Doc 8697)

5. PROGRAMME IMPLEMENTATION STRATEGY

5.1 In order to support the goals of the Assembly Resolution A37-11, GANP and the MID regional requirements, Phase I of the Programme will commence on **1 January 2019** and is expected to last at least until **31 December 2021**.

5.2 The following resources are planned to achieve the Programme objectives for Phase I:

- a) The MID FPP is hosted by Lebanon in Beirut. The inputs to be provided by Lebanon are specified in **Appendix B1**; and the MID FPP office minimum requirements are at **Appendix B2**;
- b) The ICAO MID Office will support setting up the office and building the pool of experts for the MID FPP during the first year and may organize some activities as appropriate funded through the Programme budget;
- c) The MID FPP Manager is appointed by ICAO for a period of one-year renewable. The Job descriptions of the MID FPP Manager are presented in **Appendix C1**;
- d) Experts in PANS-OPS, Airspace Planning, OPS Approval, and Instructors, as well as data specialist may be nominated by States, Organizations, and Industry to create a pool of experts who will support the provisions of the MID FPP services. Their Job descriptions are presented in **Appendices C2, C3, C4 and C5**, respectively. Candidates nominated by Participating States and Donors shall meet the job description requirements. The Regional Director of the MID Office and the Chief of the Programmes Coordination and Implementation Section at ICAO Headquarters in coordination with the MID FPP Manager will evaluate the nominated experts. The appointment of the

experts shall be carried out in accordance with the ICAO Policies on Secondment, Consultancy, ICAO Programme for Aviation Volunteers (IPAV), Internship, etc.

5.3 The MID FPP will build its capacity to provide assistance, training, quality assurance, procedure and airspace design, and operational approval to the Participating States. Other specific fields may be identified during implementation. Additional staff may be needed, as deemed necessary, to meet the demand.

5.4 The draft work plan for the first year to be agreed upon by the MID FPP SC is presented at **Appendix D**.

5.5 Implementation strategy detailed in 5.1 through 5.4 herein may be revised by a decision of the MID FPP SC and ICAO.

6. STRATEGIC OBJECTIVES OF THE PROGRAMME

6.1. The strategic objectives of the MID FPP are detailed in **Table 1**.

Note: "T0" in the table refers to the start of operation date of the Programme:

Category		Objective	Target	Remarks
1	Building MID FPP human resources (pool of experts)	a	Assignment of expert by States and stakeholders (PANS-OPS, OPS approval, Airspace Planners, Instructors) to support the MID FPP activities	T0 + 3 Months
		b	Ensuring competency of the MID FPP experts through training courses and workshops	T0 + 12 Months
2	Regulatory oversight framework	a	Develop PANS-OPS Regulation for 80% of Active Participating States	T0 + 15 Months
		b	Assist States as appropriate in meeting the requirements of the USOAP CMA related to PANS-OPS. 100% of Active Participating States receiving USOAP CMA activity to score above 70% EI in PANS-OPS field	T0 + 24 Months
3	Meeting the targets set out in the MID Region Air Navigation Strategy related to PBN	a	Develop/update PBN National Implementation Plans for 100% of Active Participating States	T0 + 12 Months
		b	Implementation of PBN flight procedures at 80% runway ends at international aerodromes of Active Participating States	T0 + 24 Months
		c	Implementation of PBN SIDs and STARs at 70% international aerodromes of Active Participating States, with due regard to incorporate CCO and CDO	T0 + 24 Months

4	Training Programmes	a	100% of Participating States develop Training Programme for PANS OPS inspectorate	T0 + 18 Months	
		b	100% of Participating States develop Training Programme for PANS OPS technical experts (service provider)	T0 + 18 Months	
		c	Qualify at least one OPS Approval expert for each Active participating State	T0 + 24 Months	

Table. 1

6.2. A review by the MID FPP Steering Committee should be conducted at least one (1) year prior to the end of Phase I to determine whether the Programme should be continued into the next Phase, and if so, the strategic direction that the Programme should take.

7. MID FPP FIRST YEAR OUTPUTS AND ACTIVITIES

7.1 The following outputs and activities, related mainly to the setup of the MID FPP capabilities, are targeted for the first year of the Programme.

Objective 1: Convene the First MID FPP Steering Committee meeting

Outputs	Activities
<u>Output 1.1:</u> Convene the kickoff meeting of MID FPP from 22 to 24 January 2018 to officially launch the Programme	<u>Activity 1.1.1:</u> The ICAO MID Regional Office to issue the invitation for the meeting by 20 November 2017 to the 15 MID States and stakeholders.
<u>Output 1.2:</u> Convene the First MID FPP Steering Committee meeting in in second half of 2018	<u>Activity 1.2.1:</u> The ICAO MID Regional Office to issue the invitation for the first MID FPP SC/1 meeting at least 2 months in advance. <u>Activity 1.2.2:</u> The MID FPP SC/1 meeting to agree on the MID FPP work plan for the first year and the funding mechanism.

Objective 2: Establish capability for PBN Workshop Implementation Plan, using external expertise, if required.

Outputs	Activities
<u>Output 2.1:</u> Establish workshop programme for PBN Implementation Plan	<u>Activity 2.1.1</u> Define external expertise origin and source of funding <u>Activity 2.1.2</u> Determine contents and schedule for the workshop

Objective 3: Establish capability for operational approval of air operators by Civil Aviation Authorities (CAA) course, using external expertise if required.

Outputs	Activities
<u>Output 3.1:</u> Establish workshop programme for operational approval of air operators by CAA	<u>Activity 3.1.1:</u> Define external expertise origin and source of funding <u>Activity 3.1.2:</u> Determine contents and schedule for the course

Objective 4: Establish capability for airspace design course, using external expertise if required.

Outputs	Activities
<u>Output 4.1:</u> Establish workshop	<u>Activity 4.1.1:</u> Define external expertise origin and source of funding

programme for Airspace Design Course	<u>Activity 4.1.2</u> : Determine contents and schedule for the course
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Objective 5: Establish operating capability of the MID FPP in the areas of procedure design including initial PANS-OPS, PBN and OJT (On-The-Job) training capability.

Outputs	Activities
<u>Output 5.1</u> : Establish automation system for the input, storage and output of aeronautical data required for the instrument flight procedure process, based on global standards that will interface with flight procedure design automation tools and avionics database packing tools	<u>Activity 5.1.1</u> : Install automated software and middleware supporting on the software on technical computers of the internal network
<u>Output 5.2</u> : Establish initial procedure design and OJT (On-The-Job) training capabilities.	<u>Activity 5.2.1</u> : Train procedure designers as instructors. <u>Activity 5.2.2</u> : Determine contents for procedure design training sessions and OJT sessions

Objective 6: Establish Flight Procedure validation process and regulatory approval process support capability.

Outputs	Activities
<u>Output 6.1</u> : Establishment of Flight Procedure validation process support capability	<u>Activity 6.1.1</u> : Identify a list and pricing or through in-kind contribution of Flight procedure validation suppliers to cover MID Region to establish initial Flight procedure validation capability, <u>Activity 6.1.2</u> : Train MID FPP staff in Flight Procedure design ground validation process. <u>Activity 6.1.3</u> : Establish a support framework to assist States in validating flight procedures.
<u>Output 6.2</u> : Establishment of Flight Procedure regulatory approval process support capability	<u>Activity 6.2.1</u> : Train MID FPP staff in Flight Procedure regulatory validation process based on Doc 9906 (Quality Assurance Manual), examples from competent States (at least three) and consultation with ICAO <u>Activity 6.2.2</u> : Continue updating the training as new ICAO documentation becomes available. <u>Activity 6.2.3</u> : Establish a support framework to assist States in approving flight procedures

Objective 7: Execute -2019 MID FPP annual work plan, as at **Appendix D**.

Outputs	Activities
<u>Output 7.1</u> : Successful execution of MID FPP 2019 annual work plan	<u>Activity 7.1.1</u> : Provide to Member States the schedule list of training and support activities. <u>Activity 7.1.2</u> : Provide trainings and support activities according to annual work plan. <u>Activity 7.1.3</u> : initiate procedure design projects for the top priority runway ends identified in consultation with the airspace users.

Objective 8: Attain the full capability for MID FPP for Phase I.

Outputs	Activities
<p><u>Output 8.1:</u> Establish a pool of specialists in PANS-OPS, OPS Approval and Flight procedures Instructors who will mainly work remotely with the MID FPP Manager (on-call basis).</p>	<p><u>Activity 8.1.1:</u> Establish selection process and identify a pool of suitable candidates, preferably through approaching MID States, Organizations, Airlines, and Donors, according to the job descriptions at Appendices C2-C5. <u>Activity 8.1.2:</u> select the required pool of resources for the execution of the MID FPP work plan.</p>

Objective 9: Obtain approved work plan, budget and agreement on annual States contribution for the second year of operation

Outputs	Activities
<p><u>Output 9.1:</u> Obtain approved work plan, budget and agreement on States contribution for the second year.</p>	<p><u>Activity 9.1.1:</u> provide progress report on the implementation of - 2019 work plan to PBN SG and/or MIDANPIRG meetings <u>Activity 9.1.2:</u> Prepare and propose work plan, budget and annual States contribution level for the second year.</p>

8. INPUTS

8.1. The minimum requirements for the hosting of the MID FPP are specified in **Appendix B2**.

8.2. By 1 January 2019, Lebanon as the Host Administration will provide the facilities and services as outlined in **Appendix B1** (Lebanese offer to host the MID FPP) based on the minimum hosting requirements at **Appendix B2**.

8.3. The host State will facilitate the issuances of visas, accreditations or residence permits for the ICAO experts and recognized dependents ensuring the expeditious relocation of them at the duty station and for the whole duration of their ICAO contracts and subsequent renewals.

Active States

8.4. Active States will provide the following:

- a) annual financial contributions covering the cost of the Programme, as indicated in the annual budget of the Programme; and
- b) participation in the MID FPP SC meetings as Member States with the right to vote.

Participating States

- a) Participating States might provide in-kind contribution to support the MID FPP such as:
 - Computer and Information Technology equipment.
 - Procedure design and charting equipment and software.
 - Suitably equipped classroom(s) for MID FPP training courses held in their States.
- b) support the MID FPP by nominating Procedure Designers, Instructors, Airspace Planners, OPS Approval experts, etc. to support the MID FPP with the implementation of its work plan;
- c) authorize and release to the MID FPP of aeronautical data from third parties, including AIP and electronic terrain and obstacle data, as well as appropriate topographic mapping

data and charts pertaining to their State for the purposes of the Programme, in particular for the design of instrument flight procedures and for quality assurance assistance;

- d) bear the expenses of duty travel (Air Tickets, Transportation, Accommodation and Daily Subsistence Allowances, in accordance to ICAO policies and practices) of MID FPP and ICAO staff as required supporting the MID FPP activities in their States.
- e) release of the assigned experts from their daily duties in order to support the MID FPP activities using their facilities (software, etc.), as required; and
- f) complete all remaining necessary steps to publish instrument flight procedures developed wholly or partly within the MID FPP framework in their State Aeronautical Information Publication.

ICAO (funded by the FPP Programme)

8.5. ICAO will provide the following:

- a) full support from the ICAO MID Office to run the Programme, in close coordination with the Host State, until such a time when the recruitment of a MID FPP Manager is completed;
- b) International Personnel (Programme Manager) for the MID FPP for 3 years;
- c) mission travel of ICAO personnel for monitoring purposes;
- d) administrative and other services for the handling of the Programme;
- e) financial account management and budgetary control of the Programme;
- f) technical support to the Programme experts in the performance of their duties including monitoring missions; and
- g) procurement through TCB: turn-key services for the procurement of goods and services as requested by the MID FPP SC; provided the requisite funds are made available and the project budget is revised, as appropriate. The procurement of equipment or services will be carried out in accordance with ICAO’s Procurement Code, Financial Regulations and Rules, and applicable process and procedures.

9. RISKS, MITIGATION MEASURES AND PREREQUISITES

Risks and Risk Levels

9.1. The following are the main identified risks with their associated level:

Risks	Risk Level
a) Delay in the recruitment of MID FPP Manager	High
b) Delays in transfer of funds to ICAO	High
c) Delays in sourcing OPS Approval Instructor	High
d) Delays in nominating of experts from participating States and Organizations	Medium to High
e) Delays in identification of suitably qualified candidates for positions	Medium to High
f) Delays in sourcing of implementation workshop facilitator	Low
g) Delays in MID FPP expert training as Procedure Design Instructor	Low

Risk Mitigation Measures

9.2. It may be considered that low level in risk is acceptable and does not need any mitigation measure.

9.3. Considering the high and medium to high level for delays in:

- a) Delay in transferring fund to MID FPP account: follow-up by ICAO with the concerned States and Donors would mitigate the risk to an acceptable low level;
- b) Delay in the recruitment of the MID FPP Manager: the MID Office, based on the Steering Committee approval, could set up the Programme in coordination with the host State, establish the pool of expertise, and initiate the implementation of some activity from the first year's work plan, until the recruitment of the Manager. This action could mitigate the risk to an acceptable low level;
- c) Designation and release of experts by States: the MID FPP work plan could be difficult to implement. The MID FPP activity supposed to be provided by the missing expert would be replaced by another activity with capacity to provide. This action could mitigate the risk to an acceptable low level; and
- d) Identification of suitably qualified candidates: MID FPP Manager will support States with the identification of candidates. This mitigation could reduce risk to medium level. The MID FPP activity supposed to be provided by the missing nominated expert would be replaced by another activity that MID FPP is in capacity to provide. This action could mitigate the risk to an acceptable low level.

Pre-requisites

9.4. The Project Document should be signed by the host State and a minimum of four (4) Active States before the start of the Programme to ensure funding for the Annual Budget and to permit the MID FPP to perform its activities effectively and efficiently.

9.5. The establishment of the pool of resources and the readiness of the premises.

10. PROGRAMME WORK PLAN

10.1 The work plan for the first year is provided at **Appendix D**.

11. PROGRAMME BUDGET

11.1 MID FPP budget is composed of resources and expenses.

Resources are composed of:

- Annual contribution paid by the Active States;
- Cash contribution provided by Donors; and
- Fees paid by States in relation to services provided by MID FPP as outlined in Section 3.

Expenses mainly relate to:

- Manager Salary and allowances;
- Allowances paid to MID FPP experts;
- Workshops and courses organization, consultant expertise costs,
- Travel Missions Expenses (travel, transportation and DSA),
- Office costs, and
- Administrative Overhead.

11.2 The activities/events should normally be convened at the MID FPP premises. If a State/Organization offers to host an activity, it shall coordinate with the MID FPP Manager as early as possible, but in any case at least six (06) months in advance and, shall be responsible for providing a venue, services and all costs of travel, accommodation and daily subsistence allowance for MID FPP experts, ICAO personnel, Instructors and Experts performing the activity.

11.3 The Programme budget corresponding to Phase I is provided at **Appendix E**.

12. LEGAL FRAMEWORK

12.1 The funds and activities under this Agreement shall be administered according to applicable ICAO regulations, rules, directives, procedures and practices.

12.2 The obligations assumed by the parties under this Agreement shall continue to exist after termination of this Agreement to the extent necessary to permit the orderly finalization of activities, the withdrawal of personnel, the distribution of funds and assets, the liquidation of accounts existing between the parties, and the settlement of contractual obligations. Additional funds, if necessary, to cover the above-mentioned expenditures shall be provided by the Participating States.

12.3 All cash receipts to, and payments made by, ICAO under this Agreement shall be recorded in a separate account, opened, inter alia, in order to place on record the receipt and administration of payments. All payments made to ICAO shall be made in U.S. dollars and deposited in ICAO's bank account as follows:

Pay to://CC000305101
Royal Bank of Canada
Ste. Catherine and Stanley Branch
1140 Ste. Catherine Street West
Montreal, Quebec
Canada H3B 1H7
For credit to: 05101 404 6 892
Project: RAB/18/801
ICAO Account
Swift code: ROYCCAT2

12.4 ICAO shall not be obliged to begin or continue the provision of the Services until the payments of this Agreement have been received and ICAO shall not be obliged to pay or commit any sums exceeding the funds deposited in the aforementioned account.

12.5 ICAO shall furnish the Participating States with unaudited financial statements concerning the Services covered in this Agreement, showing the status of the funds in U.S. dollars as at the end of March, June, September and December. After ICAO has concluded the provision of the Services, it shall submit a final financial statement. In the event that the Participating State(s) requests that a special audit/evaluation of its account or project under this Agreement be performed by the Internal or External Auditor of ICAO, the Participating State(s) shall bear the cost of such audit.

12.6 If due to unforeseen circumstances the funds received under this Agreement should prove insufficient to cover the total cost of provision of the Services and Administrative Charges, ICAO shall inform the Participating States to that effect and additional funds, if required, shall be made available to ICAO before the continuation of the project

12.7 Any dispute, controversy or claim arising out of or relating to this Agreement, or the breach, termination or invalidity thereof, shall be settled, in the first instance, by direct negotiations between the parties. If unsuccessful, such dispute, controversy or claim shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules, as in force at the time of arbitration. The place of arbitration shall be Montreal, Province of Quebec, Canada, conducted in the English language. Arbitration shall be conducted by one arbitrator. The arbitral award shall contain a statement of reasons on which it is based and shall be accepted by the Parties as the final adjudication of the dispute.

12.8 Nothing in or relating to this Agreement shall be deemed a waiver, express or implied, of any immunity from suit or legal process or any privilege, exemption or other immunity enjoyed or which may be

enjoyed by ICAO, its officers, staff, assets and funds either pursuant to the Convention on the Privileges and Immunities of the Specialized Agencies, 1947 or other applicable conventions, agreements, laws or decrees

12.9 The Participating States shall indemnify, hold harmless and, in consultation with ICAO, defend ICAO, including its personnel from any and all actions, claims or other demands arising out of any act performed by ICAO on behalf of the Participating States pursuant to this Agreement.

DRAFT

MID FPP STEERING COMMITTEE (MID FPP SC)

TERMS OF REFERENCE

A) Purpose of the MID FPP SC:

The MID FPP Steering Committee shall meet at least once a year at a venue and time agreed upon by the SC Members.

In order to meet its Terms of Reference, the MID FPP SC shall:

1. elect a Chairperson for a cycle of three years unless re-elected;
2. review regional objectives, plans and users' requirements;
3. monitor and evaluate the Programme activities since the previous meeting;
4. formulate policies and assign priorities for the activities of the MID FPP taking into account the requirements of this Institutional Framework, the provisions of the MID FPP Project document and the availability of funds;
5. review and approve the annual work plan and budget of the MID FPP; taking into account the Host State's and Participating States' in kind-contributions for offsetting their annual financial contribution to the Programme.
6. review plans submitted by the MID FPP Manager;
7. ensure that the business plans are in line with the MID Air Navigation Strategy;
8. oversee the activities of the MID FPP in line with the plans and approved budgets;
9. monitor the financial performance at project level in line with the approved budget;
10. monitor and follow-up the implementation of the MIDANPIRG Conclusions and Decisions related to the MID FPP;
11. follow up with the implementation of the agreed projects and provide regular progress report to the relevant MIDANPIRG subsidiary bodies;
12. coordinate technical issues with the appropriate MIDANPIRG subsidiary bodies; and
13. review and update its terms of reference as deemed necessary.

B) Composition:

The MID FPP SC is composed of:

- a) MID FPP Active States: Directors General of Civil Aviation of the MID FPP Active States, or their designated representatives;
- b) ICAO: Regional Director, Middle East Office, Director, Technical Cooperation Bureau (TCB), and Chief of Programmes Coordination and Implementation Section (ANB/PCI) or their representatives; and
- c) MID FPP Manager, who will act also as the Secretary of the Steering Committee meetings.

The following may participate in the Steering Committee meetings as observers:

- a) MID FPP Users States: Directors General of Civil Aviation of the MID FPP Member States, or their designated representatives;
- b) Donor States, agencies, organizations and industry having made a financial or in-kind contribution (recognized as "Partners" in the implementation of the Programme);
- c) Representatives from observers States, agencies, organizations and industry with an interest in

aviation safety or air navigation issues in the MID Region; and

d) Representatives from the following Partners:

AACO, ACAC, ACI, AIRBUS, BOEING, CANSO, EUROCONTROL/SESAR JU, IATA, IFALPA IFAIMA, and IFATCA.

Other representatives from States and industry may be invited on ad-hoc basis, as required.

***Note 1:** The composition of the MID FPP SC may be updated over time to include only States and/or Partners that could participate actively and contribute to the work of the SC.*

DRAFT

MID FPP LEBANON HOSTING OFFER

State Name:	Lebanese General Directorate of Civil aviation	date: 18 JUNE 2016
Filled by:	Kamal Nassereddine/Chief of air navigation Department	email:atm@beirutairport.gov.lb

Please complete and send in a closed envelope by courier (DHL, ARAMEX, etc.) to the ICAO Middle East Office, Cairo International Airport, Ministry of Civil Aviation Complex, P.O.Box 85, Postal Code 11776, Cairo, Egypt

During evaluation grades will be set out of 10 marks and then multiplied by the relevant factors.

Item	Requirements	Multiply Factor	Details	Your Offer/Answers
General Living conditions				
1	City Accessibility	2	Indicate which of the MID States have NO direct flight to your State	All states have more than one daily direct flights to Beirut airport Except for Sudan, Libya, and Yemen.
2	Visas	2	Indicate which of the MID States require entry visa to your State	(Egypt , Libya, Sudan, Yemen)
3			Will your Administration facilitate the visa process for the participants?	these states need some documents to get the visas at Beirut airport like hotel reservation ,2way flight tickets, 2000 USD cache, a security check might also be required for some participants, even though the DGCA will provide appropriate support to facilitate visa issuance for them.
4	United Nations privileges	2	Is the necessary procedures in place that facilitate the issuances of visas, accreditations or residence permits for the MID FPP Manager and his family members (UN-ICAO expert) ensuring the expeditious relocation of them at the duty station and for the whole duration of their ICAO contracts and subsequent renewals.	yes Lebanon will facilitate the issuances of their visas also The Programme Coordinator will benefit from the same privileges provided to the United Nations Staff working in Lebanon (residency, Immunities, etc.) in accordance with the Lebanese law and policies.
5	Transportation	1	What are you offering for the MID FPP Manager for his daily transportation?	upon request DGCA can provide the transportation with driver to/from within Beirut city Zone for the FPP coordinator and for purposes of official movements between programme office and supporting facilities as needed or requested.
Premises				
6	Building	2	Building Type (Villa, Apartment, Centre, etc.)	the premises will be in the safety training center located within Beirut Rafic Hariri International Airport-Beirut Area and just away 9 km from Beirut city center.
7	Offices	3	Number of Offices for the Manager and experts.	2-3 OFFICES as requested by ICAO letters :AN 6/33-16/023, and Letter Ref: AN 6/33-16/149 dated 2 June 2016.
8	Facilities	1	List the facilities that will be provided within the premises such as: parking, garden, kitchen, cafeteria, playground, coffee machines, etc.	the center include: large parking for more than 50 cars, backyard garden, kitchen, small self service cafeteria , play ground ,coffee machines and Beverages machines, library with study room . (please see the pictures No 1 &2)
9	Furniture	1	What furniture will be provided?	all requested by ICAO letter:AN 6/33-16/023 AN 6/33-16/023, and Letter Ref: AN 6/33-16/149 dated 2 June 2016 for fully new furnished offices
10	Labs	3	Number of laboratory to be used by procedure designers	Two laboratories are available upon request with pre-reservation : 1- Computer LAB contains 20 workstations. (see the pictures No 3) 2- Another available large ROOM (20 persons) can be used as LAB
11	Meeting Rooms	3	Number and capacity of meeting rooms	3 meeting rooms are available upon request with pre-reservation with the center coordinator and CERSA (security training academy) : 1- examination hall can contain 80 persons.(see the pictures No 4) 2- Amphitheatre capacity 64 people .(see the pictures No 5). 3- one meeting room for 18 persons equipped with smart projector (see the pictures No 6).
12	Classrooms	3	Number and capacity of classrooms	the center has 7 classrooms (Capacity between 10 and 25 trainees) (see the pictures No 7).
13	Air conditioning	2	Indicate if the premises is or will be air-conditioned through the hosting offer	the center is already air-conditioned 24/24hours through the Lebanese DGCA offer.

Running cost of the premises				
14	Security of the premises	1	Are you willing to provide security services?	yes Centre is provided with private parking ,fence and the police is guarding the center 24/24 hours since in the same location there is the CERSA Aviation Security Training Academy and police office (see the pictures No 8).
15	Electricity	1	Is electricity fees covered by your offer?	yes for 24/24hours through the lebanese DGCA offer.
16	Internet	1	Is internet fees covered by your offer?	yes 4 MB HDLSL will be provided through the lebanese DGCA offer.
17	Telephone	1	Is telephone bills covered by your offer (specify if local and/or international calls)?	the local telephone bills will be only covered by lebanon DGCA offer, for the international calls the center is equipped by a pay-phone machine.
18	Cleaning services	1	Are you willing to provide cleaning services of the premises?	yes / a daily cleaning services are already provided through DGCA to all training center premises including MFPP offices.
19	Maintenance	1	Are you willing to cover the maintenance expenses related to the premises?	yes maintenance are already covered through DGCA to all training center premises .
Man power support				
20	PANS-OPS experts	2	Indicate the number of experts that will support the MID FPP and in which area (PANS-OPS, Airspace Planners, OPS-Approval, Instructors)	LEBANON Doesn't have procedures designer experts (we have one person didn't complete all the required courses and without OJT) and we are willing to train 3-4 persons in the mentioned area through the MFPP project training courses.
21	data analyst	1	Are you willing to support the MID FPP with a Data Analyst?	NO
22	secretary	1	Are you willing to support the MID FPP with a Secretary?	NO
Equipment and software				
23	PCs	3	Indicate number of PCs that will be provide (Workstations and Server)	1 server + 4 workstations (PC)
24	Monitors	3	Number of 19 inch monitors for the above PCs	5 Monitors
25	Maps Storage cabinet	1	Cabinet for MAPs and documentation storage	yes (and we will provide more than one cabinet if needed)
26	A0 Printer or Plotter	1	Type of the A0 printer	HP DESIGN-JET
27	Maps A3 printer	1	Type of the A3 printer	HP
28	A0 scanner	1	Type of the A0 scanner	HP DESIGN-JET
29	Computer Data Projector	2	Projector (type and numbers)	ALL classrooms and meeting rooms in the center are equipped with projectors and there is one meeting room is equipped with smart projector and we can provide one extra projector (sony or epson) if needed or requested by MFPP manager.
30	Supplies for training sessions**	1	Are willing to provide supplies for training sessions such as: set squares, protractors, compasses, rulers and nocket calculators?	yes (but we need a list of the items needed+ numbers and types)
31	2 Procedure Design Software Licenses	3	Are willing to provide the procedure design software? Indicate type and how many licenses?	the MFPP STAFF will have access (if requested or needed) to use the lebanese flight procedure design software and tools(GeoTitan) which we are going to upgarde to the new version during 2016/17 and we are planning to get 2 licenses and we will then dedicate one of them to the MFPP project.
32	2 GOOGLE EARTH licenses	1	Are willing to provide 2 GOOGLE EARTH licenses?	yes
33	2 ACROBAT READER licenses	1	Are willing to provide2 ACROBAT READER licenses?	yes
34	2 COREL DRAW licenses	1	Are willing to provide 2 COREL DRAW licenses?	yes
35	Simulator	2	Are you willing to provide or make available the use of a Fast Time Simulator.	A project for a new ATC Simulator (Tower - Approach - Area), including a FTS has been already initiated with ICAO TCB and could be used by the MID FPP .
36	2 virtual machines (such as VMWARE) licenses	1	Are willing to provide 2 virtual machines (such as VMWARE) licenses for the remotely use of the MID FPP software?	YES
Readiness to sign the Agreement				
37	Premises	2	How much time is needed for the readiness of the premises?	the premises is already exist and the training center is opened and operated many years ago.
38	Agreement	3	how much time is needed for the signature of the Hosting Agreement with ICAO Technical Cooperation Bureau (TCB)?	after the signature of the hosting agreement with ICAO (TCB) we need 6 months for purchasing the furniture , tools , and the softwares offered by the Lebanese DGCA.

END

MID FPP MINIMUM OFFICE REQUIREMENTS

MID FPP staff	
	<ul style="list-style-type: none"> • Programme Manager (1) Full Time Recruited by ICAO TCB • 5 to 10 Procedure Designers and Airspace Planners, 2- to 4 OPS Approval experts and 2 to 4 PD Instructors assigned by States and Donors, who will work on-call-basis. • PANS-OPS Specialist, Data Specialist (1), Administrative Assistant (1) and/or IT Specialist (1) should be seconded when needed in compliance with the ICAO policy on secondment.
Office space	
1 office	<ul style="list-style-type: none"> • Programme Manager
1 office	<ul style="list-style-type: none"> • PANS-OPS Expert
1 room	<ul style="list-style-type: none"> • Lab for procedure design
1 room	<ul style="list-style-type: none"> • Classroom/ Meeting room
Furniture equipment	
Manager	<ul style="list-style-type: none"> • Desk and chair • Storage/File cabinet • Book case • Conference table (6 persons) and chairs • Monitor/Webcam for conferences
Offices	<ul style="list-style-type: none"> • Standard furniture for all offices • Desk, chair, storage/file cabinet, book case – per person
Classroom OJT room	<ul style="list-style-type: none"> • Adequate space for 20 students • 4 drawing tables • White boards • Student tables • Projector
Meeting room	<ul style="list-style-type: none"> • Adequate equipment for 20 persons
IT equipment	
	<ul style="list-style-type: none"> • Secure Wi-Fi Internet connection • Desk-top Phone with international services • 1 Mobile phone (Manager) <ul style="list-style-type: none"> – Laptop computer with docking station – monitor 19" • Data Specialist when seconded <ul style="list-style-type: none"> – Office computer equipment (monitor 19") • External storage disks • 1 desktop multi-functional color copier/scanner/printer
Procedure Design equipment	
Offices	<ul style="list-style-type: none"> • Maps Storage cabinet • Maps A3 printer • A0 scanner • A0 printer Semi-professional • GPS • 1 server and 2 workstations (PCs)
Classroom	<ul style="list-style-type: none"> • Computer Data Projector • Supplies for training sessions : set squares, protractors, compasses, rulers and pocket calculators
software	<ul style="list-style-type: none"> • 2 Procedure Design Software Licenses • 2 GOOGLE EARTH licenses • 2 ACROBAT READER licenses • 2 COREL DRAW licenses • 2 virtual machines (such as VMWARE) licenses for the remotely use of the Procedure Design Software

APPENDIX C - JOB DESCRIPTION



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Programme Manager	Position Number (ID):	
Specific Title:	MID FPP Manager	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	TBD	CCOG code:	
Duration:	1 year	Starting Date:	1 January 2019

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional Director and in cooperation with the national counterparts and other MID FPP Programme personnel:

- work with ICAO and the participating States on the establishment of the MID FPP Office and commencement of operations, including establishment of office capability and processes;
- be responsible for all aspects of the operation and management of the Flight Procedure Programme to include Programme coordination functions, personnel resourcing and training, office software and automation implementation, work plans, travel, and budget;
- implement of the work plan agreed upon by the MID FPP Steering Committee;
- perform frequent coordination with ICAO MID Regional Office, other FPP offices, sub-regional groups, international and regional Organizations and States on issues related to FPP operations;
- foster positive relationships and cooperation among assigned staff, international experts, nominated experts, seconded officers and CAA counterparts;
- identify, and develop Programme resources;
- report on a quarterly basis to the MID FPP Steering Committee and the ICAO Middle East Regional Director, on the progress of the FPP to include:
 - a. Programme Status (Interim or Full Operational Capability, status of resources, budget, etc.);
 - b. Accomplishments (since last report);
 - c. Objectives for the next reporting period; and
 - d. Other (new requirements, concerns, issues, etc.)
- develop and amend business plans (deliverables, timeline, budget and concerned entities) for MID FPP and recommends them to the Steering Committee;
- develop Key Performance Indicators (KPIs) to monitor the implementation, assess and measure the effectiveness of the Programme;
- identify and report Programme risk to the MID FPP SC and maintain a risk database;
- assign projects to the MID FPP personnel;
- supervise/monitor the performance of the MID FPP Specialists; and
- perform other related duties as required.

QUALIFICATIONS AND EXPERIENCE

Educational background

A first level university degree in aeronautics, ATM, or in a related field, is required. A technical qualification in aviation such as an Airline Transport Pilot License (ATPL) and Air Traffic Control (ATC) License may be accepted in lieu of a university degree.

Professional experience and knowledge

- At least 10 years' operational experience as PANS-OPS Specialist, Airspace Planner, pilot or Air Traffic Controller, with a good understanding of instrument flight procedure design process. A working knowledge of the Ops Approval and Airspace Design processes is highly desirable.
- Knowledge in aeronautical data quality and trajectories' publication.
- At least 5 years' aviation management experience.
- Knowledge of the ICAO GANP as well as the Performance Based Navigation (PBN) concept, objectives and supporting ICAO provisions and guidance.
- Ability to work and coordinate with civil aviation officials at all levels, as well as industry, regional and sub-regional groups, to accomplish the goals of the Programme.
- Ability to successfully lead major projects under a team structure; Experience in team management with the ability to foster and maintain harmonious, positive working relationships in a multi-national environment.
- Satisfactory completion of PANS-OPS, Airspace planning or PBN course(s).
- Satisfactory completion of the ICAO online course related to PBN.
- Knowledge of the process related to the development of IFPs for conventional and PBN procedures.
- Completion of SMS or Quality assurance course(s) with knowledge about the implementation of Flight Procedure Design Quality Assurance (Doc 9906) requirements.
- Experience using Flight Procedure Design automation systems for flight procedure design is preferable.
- Experience as an Instrument Flight Procedure Design Instructor for ICAO PANS-OPS (Doc 8168) courses is preferable.

Language Skills

Essential

- Fluent reading, writing and speaking abilities in English is essential.

Desirable

- A working knowledge of Arabic is an asset

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTION



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Procedure Designer	Position Number (ID):	
Specific Title:	Procedure Designer	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	Remotely	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- design instrument flight procedures;
- review, verify, maintain and make sure that the flight procedure is ready for the final approval;
- guarantee a quality assurance in the flight procedure design;
- provide OJT training to new procedure designers;
- maintain a well-structured database for obstacles assessment; and
- perform other related duties as assigned.

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Minimum five (5) years' experience at increasing levels of responsibility in flight procedure design
- Experience in aviation operations as a pilot, navigator or air traffic controller is desirable.
- Satisfactory completion of an approved PANS OPS flight procedures design courses and advanced courses on PANS OPS flight procedures design (PBN, RNAV, GBAS, etc.) at a specialized recognized institution.
- Knowledge in the aeronautical information conceptual and exchange model (AIXM), automation, digital terrain model (DTM), geographic information systems and cartography.
- Experience in the use of flight procedure design software.
- Knowledge in participating in the work of International Organization for Standardization (ISO) and quality assurance.
- Thorough knowledge of ICAO Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS).
- Ability to write clearly and concisely detailed technical and specialized reports and to make verbal presentations.
- Ability to develop clear goals that are consistent with agreed strategies.

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTION



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Instructor	Position Number (ID):	
Specific Title:	Instructor	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	Remotely	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- conduct airspace planning, procedure design and OPS Approval courses as tasked by the MID FPP Manager; and
- perform other related duties as assigned by the MID FPP Manager.

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Significant aviation experience as air traffic controller or a pilot or demonstrated equivalencies.
- Significant experience as Instrument Flight Procedure Design specialist with extensive knowledge of ICAO PANS-OPS (Doc 8168) and ICAO PBN (Doc 9613) requirements.
- Significant experience as an Airspace Design specialist with knowledge of ICAO use of PBN in Airspace Design (ICAO Doc 9992).
- Training and Experience as an Instrument Flight Procedure Design Instructor for ICAO PANS-OPS (Doc 8168) courses with thorough understanding of teaching techniques and assessment methods is desirable.
- Thorough understanding of Flight Procedure Design Quality Assurance (Doc 9906) requirements and its implementation.

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTIONS



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	OPS approval Expert	Position Number (ID):	
Specific Title:	OPS approval Expert	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	Remotely	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- assist States with the developments/implementation of flight procedure regulatory approval as tasked by the MID FPP Manager;
- review, verify, maintain and make sure that the flight procedure is ready for the final approval;
- provide on-the-job training to OPS Approval experts; and
- perform other related duties as assigned

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Satisfactory completion of formal PANS-OPS course(s) to cover the conventional and PBN procedure design criteria.
- Experience in the development of IFPs for conventional and PBN procedures.
- Understanding of Flight Procedure Design Quality Assurance (Doc 9906) requirements and its implementation.
- Experience using Flight Procedure Design automation systems for flight procedure design is preferable.
- Experience as an Instrument Flight Procedure Design Instructor for ICAO PANS-OPS (Doc 8168) courses is preferable.
- Experience of working with CAAs (Regulatory authorities).

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTIONS



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Data Specialist	Position Number (ID):	
Specific Title:	Data Specialist	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	TBD	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- establish and update MID FPP data base of aeronautical data to support procedure design;
- acquire and store obstacle data to support procedure design; and
- perform other related duties as assigned

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Significant experience in aeronautical data management.
- Knowledge of ICAO PANS-OPS (Doc 8168) and ICAO PBN (Doc 9613) data requirements.
- Thorough understanding of Flight Procedure Design Quality Assurance (Doc 9906) requirements and its implementation.
- Training and experience using Flight Procedure Design automation systems for flight procedure design.
- Experience of working with CAAs, preferably in the MID Region.

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to

exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.

- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

DRAFT

WORK PLAN 2019

MID FPP Objectives for Year 1 (2019)

The first year will be an important year for the MID Flight Procedures Programme (MID FPP). The purpose of the Programme is to provide opportunity to use the training activities and services proposed by the Programme for Participating States.

In order to propose a variety of training activities and services addressing the needs of Participating States while complying with the ICAO Resolution A37-11, ASBU B0-APTA and the Global and regional requirements, the MID FPP training programme is composed of workshops, training courses and support activities. The training activities centered on PBN Implementation Plan, regulatory approval procedures and PBN OPS Approval for operators have to be considered as essential to improve or start PBN implementation in States.

On the other hand, specific projects and implementation support activities will assist Participating States to consolidate or implement the flight procedures through ground validation and approval process. These activities will allow the Participating States to expedite or to make the first steps for implementing PBN flight procedures in the Region.

The MID FPP Objectives for 2019 are as follows;

- Commence Phase 1 MID FPP operations on **01 January 2019**;
- Conduct 4 Training activities; and
- Conduct 2 Project-orientated implementation support activities

MID FPP Training Activities for-2019

1) PBN Implementation Workshop--5 days – [date]

Description: This PBN Implementation Workshop is intended to assist States/Administrations in enhancing their PBN Implementation Plans and move forward with actual PBN implementations. The Workshop will also provide updated information regarding global PBN activities and how PBN can be an enabler for enhancing ATM operations. During the workshops, the participants with assistance from MID FPP facilitators will develop a list of short-term action items aiming to enhance their existing PBN Implementation Plans and advance their on-going PBN implementations and deployments. The list of action items along with relevant recommendations will then be submitted to appropriate CAAs for their actions.

Participants to these workshops should be representatives from all aviation stakeholders with an interest in PBN implementation.

- Facilitator – TBD
- Coordination/Sponsorship –TBD
- Material – ANB, APAC FPP, AFI FPP, MID FPP
- Facility – TBD
- Funding – TBD

2) PBN Ops Approval Course - 1 week - [date]

Description: The course is based on ICAO Doc 9997 and conducts to support States in developing their operational approval capability for approving PBN operations and air operators in obtaining PBN OPS approvals. The purpose of the course is to provide experienced flight inspectors, flight operations regulators and air operators' personnel with a comprehensive understanding of the requirements for PBN operational approval.

At the end of the course, each participant will be individually assessed and the outcome of the assessment will be reported to each participant and his/her agency. The course is open to qualified and experienced flight inspectors, regulators and air operator personnel involved in PBN flight operations.

- Instructor – TBD
- Coordination/Sponsorship – TBD
- Material – ANB, TBD
- Facility – TBD
- Funding - TBD

3) PANS-OPS Initial Procedure Design Course– 4 Weeks – [dates]

Description: The course is based on ICAO PANS-OPS and aims to support States in developing their conventional flight procedures and basic procedure design capability by providing fundamental knowledge regarding procedure design. The instruction consists of lecturing, exercises, progress tests and examinations. At the end of the course, each participant will be individually assessed and the outcome of the assessment will then be reported to each participant and his/her agency.

- Instructor – TBD
- Material – TBD
- Facility – TBD
- Funding – TBD

4) PBN Procedure Design – 4 Weeks – [dates]

Description: The course aimed to support States/Administrations in developing their PBN procedure design capacity. The course is a follow-up to the ICAO PANS-OPS Initial Procedure Design Course. At the end of the course, each student will be individually assessed and the outcome of the assessment will then be reported to each student and his/her agency. The course is open to qualified procedure designers who have successfully completed PANS-OPS Initial Course either at the MID FPP or other institutions.

- Instructor – TBD
- Material – TBD
- Facility – TBD
- Funding - TBD

MID FPP Project-oriented Implementation Support for 2019

1) OJT on ground validation and approval procedures with specific projects, [States, dates]

Description: The OJT sessions are targeted to assist regulators in validating and approving specific PBN procedures. The purpose of the session is to provide hands-on assistance for regulators in reviewing specific procedure design and validation packages which have been submitted prior to actual approvals and publications into the State AIPs. It is expected that once the validation and approval process is completed, the said procedures will be promptly published and implemented.

- Instructor - Qualified procedure designer from MID FPP
- Funding by States participating on the OJTs or Donors if available
- Facility - TBD
- Conditions – This OJT session is available for
 - Active States with annual contributions to the MID FPP; or
 - States that request this support under a service fee

2) Provision of assistance for the development of IFPs including Quality Assurance. [States, dates]

Description: The MID FPP would assist States for the development of instrument flight procedures with a focus on quality assurance, including the conduct of training courses or workshops for the personnel involved in the development process.

Appendix E

INTERNATIONAL CIVIL AVIATION ORGANIZATION TECHNICAL CO-OPERATION PROGRAMME

PROJECT BUDGET COVERING MSA CONTRIBUTION (IN UNITED STATES DOLLARS)

COUNTRY:	REGIONAL PROJECT									
PROJECT NO:	RAB18801									
PROJECT TITLE:	FLIGHT PROCEDURES PROGRAMME - MID									
WORK ORDER:	RAB18801-01									
VERSION:	3									
			TOTAL		2019		2020		2021	
			w/m	\$	w/m	\$	w/m	\$	w/m	\$
PROJECT PERSONNEL										
INTERNATIONAL PROFESSIONAL POSTS										
B500A	900186 / PROGRAMME MANAGER		36.0	809 200	12.0	286 400	12.0	226 200	12.0	296 600
B554A	CONSULTANTS			85 000		25 000		30 000		30 000
SUB-TOTAL (INTERNATIONAL PROFESSIONAL POSTS)			36.0	894 200	12.0	311 400	12.0	256 200	12.0	326 600
B814A	INTERNATIONAL TRAVEL			45 000		15 000		15 000		15 000
TOTAL (PROJECT PERSONNEL)				939 200		326 400		271 200		341 600
SUB-CONTRACTS										
B803A	SUB-CONTRACT - LOCAL			45 000		15 000		15 000		15 000
TOTAL (SUB-CONTRACTS)				45 000		15 000		15 000		15 000
EQUIPMENT										
B751D	EXPENDABLE EQUIPMENT - LOCAL			15 000		5 000		5 000		5 000
TOTAL (EQUIPMENT)				15 000		5 000		5 000		5 000
MISCELLANEOUS										
B807M	MISCELLANEOUS EXPENSES			25 000		8 700		7 300		9 000
B754A	OVERHEAD CHARGES			102 500		35 500		29 900		37 100
TOTAL (MISCELLANEOUS)				127 500		44 200		37 200		46 100
PROJECT TOTAL				1 126 700		390 600		328 400		407 700

-END-