



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Fourth Meeting (MSG/4)
(Cairo, Egypt, 24 – 26 November 2014)

Agenda Item 4: MID Region Air Navigation Planning

MID REGION AIR NAVIGATION STRATEGY

(Presented by the Secretariat)

SUMMARY

This paper presents a revised version of the MID Air Navigation Strategy consolidated by the Secretariat based on the outcome of the different MIDANPIRG Subsidiary bodies, for endorsement by the MSG/4 meeting on behalf of MIDANPIRG.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/14
- MIDANPIRG subsidiary bodies reports

1. INTRODUCTION

1.1 States and planning and implementation regional groups (PIRGs) are transitioning to a performance-based approach to support their air navigation infrastructure planning.

1.2 MIDANPIRG/14 under conclusion 14/5 and 14/6, endorsed the ASBU Block 0 Modules prioritization Table and Draft MID Air Navigation Strategy.

2. DISCUSSION

2.1 The meeting may wish to recall that MIDANPIRG/14 through the following Conclusions endorsed the ASBU Block 0 Modules prioritization Table and Draft MID Air Navigation Strategy:

CONCLUSION 14/5: MID REGION AIR NAVIGATION PRIORITIES

That,

- a) *the ASBU Block 0 Modules prioritization Table at **Appendices 4.1E** to the Report on Agenda Item 4.1 be endorsed as the initial version of the MID ASBU Implementation Plan; and*

- b) *the ASBU Block 0 Modules prioritization Table be reviewed on regular basis and be extended to cover Block 1 Modules, as appropriate.*

CONCLUSION 14/6: DRAFT MID REGION AIR NAVIGATION STRATEGY

That,

- a) *the Draft MID Region Air Navigation Strategy at **Appendix 4.1F** to the Report on Agenda Item 4.1 be:*
- i. endorsed as the initial version of the MID Region Air Navigation Strategy; and*
 - ii. further reviewed and completed by the different MIDANPIRG subsidiary bodies*
- b) *MID States be urged to:*
- i. develop their National Air Navigation Performance Framework, ensuring the alignment with and support to the MID Region Air Navigation Strategy;*
 - ii. incorporate the agreed MID Region Performance Metrics into their National reporting and monitoring mechanisms; and*
 - iii. provide the ICAO MID Regional Office, on annual basis, with relevant data necessary for regional air navigation planning and monitoring.*

2.2 The ASBU Block 0 Modules prioritization table, the applicability areas for priority 1 modules, the Performance Indicators/Supporting Metrics and Targets were reviewed and updated by the concerned MIDANPIRG Subsidiary bodies.

2.3 Based on the outcome of the different MIDANPIRG subsidiary bodies and other inputs from States and concerned international organizations, the draft MID air navigation strategy was updated. It's to be highlighted that the MIDANPIRG subsidiary body(ies) responsible for monitoring and supporting the implementation of the different priority 1 Block 0 modules were not specified in the draft MID Air Navigation Strategy. Accordingly, the table 1 in the Strategy has been renamed as MID REGION ASBU BLOCK 0 MODULES PRIORITIZATION AND MONITORING.

2.4 The governance for the review and update of the MID Region Air Navigation Strategy was also updated to assign the responsibility for monitoring the implementation and achievement of targets to the Air Navigation Systems Implementation Group (ANSIG) and the governance of the Strategy to MIDANPIRG and its Steering group (MSG).

2.5 Based on all of the above, the MID Region Air Navigation Strategy has been updated as at **Appendix A**.

2.6 The meeting may wish to note that detailed information on the monitoring of certain ASBU modules will be included in Volume III of the MID e-ANP, including necessary supporting enablers (i.e: tables, databases, etc.), in order to be used as planning tools for the measurement of the air navigation systems performance.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review, update as deemed necessary and endorse the MID Region Air Navigation Strategy at **Appendix A**; and
- b) agree to the following Draft Conclusion:

Why	Need agree on the regional air navigation priorities, performance indicators and targets
What	Endorsement of the MID Region Air Navigation Strategy
Who	MSG/4 on behalf of MIDANPIRG
When	November 2014

DRAFT CONCLUSION 4/XX: MID REGION AIR NAVIGATION STRATEGY

That,

- a) *the MID Air Navigation Strategy at **Appendix 4X** be endorsed as the framework for the identification of the regional air navigation priorities, performance indicators and targets; and*
- b) *MID States be urged to:*
 - i. *develop their National Air Navigation Performance Framework, ensuring the alignment with and support to the MID Region Air Navigation Strategy; and*
 - ii. *provide the ICAO MID Regional Office, on annual basis, with relevant data necessary for regional air navigation planning and monitoring.*



INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

**MID REGION
AIR NAVIGATION STRATEGY**



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DRAFT

MID REGION AIR NAVIGATION STRATEGY

Introduction

As traffic volume increases throughout the world, the demands on air navigation service providers in a given airspace increase, and air traffic management becomes more complex.

It is foreseen that the implementation of the components of the ATM operational concept will provide sufficient capacity to meet the growing demand, generating additional benefits in terms of more efficient flights and higher levels of safety. Nevertheless, the potential of new technologies to significantly reduce the cost of services will require the establishment of clear operational requirements.

Taking into account the benefits of the ATM operational concept, it is necessary to make many timely decisions for its implementation. An unprecedented cooperation and harmonization will be required at both global and regional level.

ICAO introduced the Aviation System Block Upgrades (ASBU) methodology as a systemic manner to achieve a harmonized implementation of the air navigation services. An ASBU designates a set of improvements that can be implemented globally from a defined point in time to enhance the performance of the ATM system.

Through Recommendation 6/1 - *Regional performance framework – planning methodologies and tools*, AN-Conf/12 urged States and PIRGs to harmonize the regional and national air navigation plans with the ASBU methodology in response to this, the MID region is developing MID Region Air Navigation Strategy that is aligned with the ASBU methodology.

Stakeholders including service providers, regulators, airspace users and manufacturers are facing increased levels of interaction as new, modernized ATM operations are implemented. The highly integrated nature of capabilities covered by the block upgrades requires a significant level of coordination and cooperation among all stakeholders. Working together is essential for achieving global harmonization and interoperability.

Strategic Air Navigation Capacity and Efficiency Objective:

To realize sound and economically-viable civil aviation system in the MID Region that continuously increases in capacity and improves in efficiency with enhanced safety while minimizing the adverse environmental effects of civil aviation activities.

MID Air Navigation Objectives:

The MID Region air navigation objectives are set in line with the global air navigation objectives and address specific air navigation operational improvements identified within the framework of the Middle East Regional Planning and Implementation Group (MIDANPIRG).

Near-term Objective (2013 - 2018): ASBU Block 0

Block '0' features Modules characterized by operational improvements which have already been developed and implemented in many parts of the world today. It therefore has a near-term implementation period of 2013–2018. The MID Region near-term priorities are based on the implementation of an agreed set of Block 0 Modules as reflected in **Table 1** below.

The MID Region Air Navigation Strategy is aimed to maintain regional harmonisation. The States should develop their national performance framework, including action plans for the implementation of relevant priority 1 ASBU Modules and other modules according to the State operational requirements.

Mid-term Objective (2018 - 2023): ASBU Block 1

Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2018, 2023 and 2028, respectively.

Associated timescales are intended to depict the initial deployment targets along with the readiness of all components needed for deployment.

Long-term Objective (2023 - 2028): ASBU Block 2

The Block Upgrades incorporate a long-term perspective matching that of the three companion ICAO Air Navigation planning documents. They coordinate clear aircraft- and ground-based operational objectives together with the avionics, data link and ATM system requirements needed to achieve them. The overall strategy serves to provide industry wide transparency and essential investment certainty for operators, equipment manufacturers and ANSPs.

MID Region ASBU Block 0 Modules Prioritization and Monitoring

On the basis of operational requirements and taking into consideration the associated benefits, **Table 1** below shows the priority for implementation of the 18 Block “0” Modules, as well as the MIDANPIRG subsidiary bodies that will be monitoring and supporting the implementation of the Modules:

Table 1. MID REGION ASBU BLOCK 0 MODULES PRIORITIZATION AND MONITORING

Module Code	Module Title	Priority	Monitoring		Remarks
			Main	Supporting	
Performance Improvement Areas (PIA) 1: Airport Operations					
B0-APTA	Optimization of Approach Procedures including vertical guidance	1	PBN SG	ATM SG, AIM SG, CNS SG	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	2			
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	2			
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	1	ANSIG	CNS SG	Coordination with RGS WG
B0-ACDM	Improved Airport Operations through Airport-CDM	1	ANSIG	CNS SG, AIM SG, ATM SG	Coordination with RGS WG
Performance Improvement Areas (PIA) 2 Globally Interoperable Systems and Data Through Globally Interoperable System Wide Information Management					
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	1	CNS SG	ATM SG	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	1	AIM SG	-	

B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	1	MET SG	-	
Performance Improvement Areas (PIA) 3 Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	1	ATM SG		
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	2			
B0-ASUR	Initial capability for ground surveillance	2			
B0-ASEP	Air Traffic Situational Awareness (ATSA)	2			
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	2			
B0-ACAS	ACAS Improvements	1	CNS SG		
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	2			
Performance Improvement Areas (PIA) 4 Efficient Flight Path – Through Trajectory-based Operations					
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	1	PBN SG		
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	1	ATM SG	CNS SG	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	1	PBN SG		

Priority 1: Modules that have the highest contribution to the improvement of air navigation safety and/or efficiency in the MID Region. These modules should be implemented where applicable and will be used for the purpose of regional air navigation monitoring and reporting for the period 2013-2014.

Priority 2: Modules recommended for implementation based on identified operational needs and benefits.

Measuring and monitoring air navigation performance:

The monitoring of air navigation performance and its enhancement is achieved through identification of relevant air navigation Metrics and Indicators as well as the adoption and attainment of air navigation system Targets.

MIDANPIRG through its activities under the various subsidiary bodies will continue to update and monitor the implementation of the ASBU Modules to achieve the air navigation targets.

The priority 1 Modules along with the associated elements, applicability, performance Indicators, supporting Metrics, and performance Targets are shown in the **Table 2** below.

Note: The different elements supporting the implementation are explained in detail in the ASBU Document which is attached to the Global Plan (Doc 9750).

Governance:

Progress report on the status of implementation of the different priority 1 Modules should be developed by the Air Navigation System Implementation Group (ANSIG) and presented to the MIDANPIRG Steering Group (MSG) and/or MIDANPIRG on regular basis.

The MIDANPIRG and its Steering Group (MSG) will be the governing body responsible for the review and update of the MID Region Air Navigation Strategy.

The MID Region Air Navigation Strategy will guide the work of MIDANPIRG and its subsidiary bodies and all its member States and partners.

Progress on the implementation of the MID Region Air Navigation Strategy and the achievement of the agreed air navigation targets will be reported to the ICAO Air Navigation Commission (ANC), through the review of the MIDANPIRG reports; and to the stakeholders in the Region within the framework of MIDANPIRG.

**Table 2. MONITORING THE IMPLEMENTATION OF THE ASBU BLOCK 0 MODULES
IN THE MID REGION**

B0 – APTA: Optimization of Approach Procedures including vertical guidance

Description and purpose

The use of performance-based navigation (PBN) and ground-based augmentation system (GBAS) landing system (GLS) procedures will enhance the reliability and predictability of approaches to runways, thus increasing safety, accessibility and efficiency. This is possible through the application of Basic global navigation satellite system (GNSS), Baro vertical navigation (VNAV), satellite-based augmentation system (SBAS) and GLS. The flexibility inherent in PBN approach design can be exploited to increase runway capacity.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	Y

Applicability consideration:

This module is applicable to all instrument, and precision instrument runway ends, and to a limited extent, non-instrument runway ends.

B0 – APTA: Optimization of Approach Procedures including vertical guidance

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
States' PBN Implementation Plans	All	Indicator: % of States that provided updated PBN implementation Plan Supporting metric: Number of States that provided updated PBN implementation Plan	80 % by Dec. 2014. 100% by Dec. 2015	
LNAV	All RWYs Ends at International Aerodromes (180)	Indicator: % of runway ends at international aerodromes with RNAV(GNSS) Approach Procedures (LNAV) Supporting metric: Number of runway ends at international aerodromes with RNAV (GNSS) Approach Procedures (LNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2016	The status of implementation was 41% in Jan. 2014
LNAV/VNAV	All RWYs ENDS at International Aerodromes (180)	Indicator: % of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2017	The status of implementation was 13% in Jan. 2014

Module N° B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)

Description and purpose

Basic A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety. ADS-B information is used when available (ADS-B APT).

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	Y

Applicability consideration:

A-SMGCS is applicable to any aerodrome and all classes of aircraft/vehicles. Implementation is to be based on requirements stemming from individual aerodrome operational and cost-benefit assessments. ADS-B APT, when applied is an element of A-SMGCS, is designed to be applied at aerodromes with medium traffic complexity, having up to two active runways at a time and the runway width of minimum 45 m.

B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
A-SMGCS Level 1	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 1 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 1	70 % by December 2017	
A-SMGCS Level 2	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 2 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 2	50 % by December 2017	

B0 – ACDM: Improved Airport Operations through Airport-CDM

Description and purpose

To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	N

Applicability consideration:

Local for equipped/capable fleets and already established airport surface infrastructure.

B0 – ACDM: Improved Airport Operations through Airport-CDM				
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK,OMDB, OMAA,OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	40 % by Dec. 2017	

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration

Description and purpose

To improve coordination between air traffic service units (ATSUs) by using ATS Interfacility Data Communication (AIDC) defined by the ICAO *Manual of Air Traffic Services Data Link Applications* (Doc 9694). The transfer of communication in a data link environment improves the efficiency of this process particularly for oceanic ATSUs.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	N	Y

Applicability consideration:

Applicable to at least two area control centres (ACCs) dealing with enroute and/or terminal control area (TMA) airspace. A greater number of consecutive participating ACCs will increase the benefits.

<i>B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration</i>				
<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Remarks</i>
AMHS capability	<i>All States</i>	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS capability	70 % of States with AMHS capability by Dec. 2017	The status of implementation was in Sep. 2014: 10 States have the capability
AMHS implementation /interconnection	<i>All States</i>	Indicator: % of States with AMHS implemented (interconnected with other States AMHS) Supporting metric: Number of States with AMHS implemented (interconnections with other States AMHS)	4 States with AMHS interconnected by Dec. 2017	
Implementation of AIDC/OLDI between adjacent ACCs	<i>All ACCs</i>	Indicator: % of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI with neighboring ACCs Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70% by Dec. 2017	

B0 – DATM: Service Improvement through Digital Aeronautical Information Management

Description and purpose

The initial introduction of digital processing and management of information, through aeronautical information service (AIS)/aeronautical information management (AIM) implementation, use of aeronautical information exchange model (AIXM), migration to electronic aeronautical information publication (AIP) and better quality and availability of data

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	N	Y	Y	Y

Applicability consideration:

Applicable at State level, with increased benefits as more States participate

B0 – DATM: Service Improvement through Digital Aeronautical Information Management				
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
1- National AIM Implementation Plan/Roadmap	<i>All States</i>	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	80% by 2016 90% by 2018	Current Status: 47% (7 States)
2-AIXM	<i>All States</i>	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	60% by 2015 80% by 2017 100% by 2019	Current Status: 47% (7 States)
3-eAIP	<i>All States</i>	Indicator: % of States that have implemented an IAID driven AIP Production (eAIP) Supporting Metric: Number of States that have implemented an IAID driven AIP Production (eAIP)	60% by 2016 80% by 2018 100% by 2020	Current Status: 27% (4 States)
4-QMS	<i>All States</i>	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	70% by 2016 90% by 2018	Current Status: 53% (8 States)
5-WGS-84	<i>All States</i>	Indicator: % of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Supporting Metric: Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD)	Horizontal: 100% by 2017 Vertical: 90% by 2018	Current Status: ENR: 93% (14 States) Terminal: 87% (13 States) Aerodromes: 87% (13 States)

		<p>Indicator: % of States that have implemented WGS-84 Geoid Undulation</p> <p>Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation</p>		Geoid Undulation: 80% (12 States)
6-eTOD	<i>All States</i>	<p>Indicator: % of States that have implemented required Terrain datasets</p> <p>Supporting Metric: Number of States that have implemented required Terrain datasets</p> <p>Indicator: % of States that have implemented required Obstacle datasets</p> <p>Supporting Metric: Number of States that have implemented required Obstacle datasets</p>	<p>Area 1 : Terrain: 50% by 2015, 70% by 2018 Obstacles: 40% by 2015, 60% by 2018</p> <p>Area 4: Terrain: 50% by 2015, 100% by 2018 Obstacles: 50% by 2015, 100% by 2018</p>	<p>Current Status: Area 1: Terrain: 33% (5 States) Obstacles: 27% (4 States)</p> <p>Area 4: Terrain: 33% (5 States) Obstacles: 27% (4 States)</p>
7-Digital NOTAM*	<i>All States</i>	<p>Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM</p> <p>Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM</p>	<p>80% by 2016</p> <p>90% by 2018</p>	<p>Current Status: 60% (9 States)</p>

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety

Description and purpose

Global, regional and local meteorological information:

- a) forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC);
- b) aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including wind shear; and
- c) SIGMETs to provide information on occurrence or expected occurrence of specific en-route weather phenomena which may affect the safety of aircraft operations and other operational meteorological (OPMET) information, including METAR/SPECI and TAF, to provide routine and special observations and forecasts of meteorological conditions occurring or expected to occur at the aerodrome.

This module includes elements which should be viewed as a subset of all available meteorological information that can be used to support enhanced operational efficiency and safety.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	Y

Applicability consideration:

Applicable to traffic flow planning, and to all aircraft operations in all domains and flight phases, regardless of level of aircraft equipage.

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety				
<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Remarks</i>
SADIS 2G and Secure SADIS FTP	<i>All States</i>	Indicator: % of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service Supporting metric: : number of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service	93% by Dec. 2015 100 by Dec. 2017	Current status 14 out of 15 States
QMS	<i>All States</i>	Indicator: % % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	66% by Dec. 2015 80% by Dec. 2017	Current status 7 out of 15 States

B0 – FRT0: Improved Operations through Enhanced En-Route Trajectories

Description and purpose

To allow the use of airspace which would otherwise be segregated (i.e. special use airspace) along with flexible routing adjusted for specific traffic patterns. This will allow greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight length and fuel burn.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	N/A

Applicability consideration:

Applicable to en-route and terminal airspace. Benefits can start locally. The larger the size of the concerned airspace the greater the benefits, in particular for flex track aspects. Benefits accrue to individual flights and flows. Application will naturally span over a long period as traffic develops. Its features can be introduced starting with the simplest ones.

B0 – FRT0: Improved Operations through Enhanced En-Route Trajectories				
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
Flexible use of airspace (FUA)	<i>All States</i>	Indicator: % of States implementing FUA Supporting metric: number of States implementing FUA	40% by Dec. 2017	Implementation should be based on the published aeronautical information
Flexible routing	<i>All States</i>	Indicator: % of required Routes that are not implemented due military restrictions (segregated areas) Supporting metric 1: total number of ATS Routes in the Mid Region Supporting metric 2: number of required Routes that are not implemented due military restrictions (segregated areas)	60% by Dec. 2017	Based on published aeronautical information

B0 – ACAS: ACAS Improvements

Description and purpose

To provide short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N/A	N/A	Y	N/A	Y

Applicability consideration:

Safety and operational benefits increase with the proportion of equipped aircraft.

B0 – ACAS: ACAS Improvements

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
Avionics	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	80% by Dec. 2015 100% by Dec. 2016	

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)

Description and purpose

To use performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles and increase capacity in terminal areas.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	Y

Applicability consideration:

Regions, States or individual locations most in need of these improvements. For simplicity and implementation success, complexity can be divided into three tiers:

- a) least complex – regional/States/locations with some foundational PBN operational experience that could capitalize on near term enhancements, which include integrating procedures and optimizing performance;
- b) more complex – regional/States/locations that may or may not possess PBN experience, but would benefit from introducing new or enhanced procedures. However, many of these locations may have environmental and operational challenges that will add to the complexities of procedure development and implementation; and
- c) most complex – regional/States/locations in this tier will be the most challenging and complex to introduce integrated and optimized PBN operations. Traffic volume and airspace constraints are added complexities that must be confronted. Operational changes to these areas can have a profound effect on the entire State, region or location.

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)

<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Remarks</i>
PBN STARS	In accordance with States' implementation Plans	Indicator: % of International Aerodromes/TMA with PBN STAR implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented as required.	100% by Dec. 2016 for the identified Aerodromes/TMAs 100% by Dec. 2018 for all the International Aerodromes/TMAs	
International aerodromes/TMAs with CDO	In accordance with States' implementation Plans	Indicator: % of International Aerodromes/TMA with CDO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs	

B0 –TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route

Description and purpose

To implement an initial set of data link applications for surveillance and communications in ATC, supporting flexible routing, reduced separation and improved safety.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N/A	Y	N/A	N/A	Y

Applicability consideration:

Requires good synchronization of airborne and ground deployment to generate significant benefits, in particular to those equipped. Benefits increase with the proportion of equipped aircraft.

B0 –TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Remarks
ADS-C and CPDLC	Muscat and Sanaa FIRs	Indicator: % of FIRs having implemented data link en-route, as and where required Supporting Metric: Number of FIRs having implemented data link en-route, as and where required	50% by Dec. 2017	Oceanic parts of Muscat and Sana'a FIRs

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

Description and purpose

To implement continuous climb operations in conjunction with performance-based navigation (PBN) to provide opportunities to optimize throughput, improve flexibility, enable fuel-efficient climb profiles and increase capacity at congested terminal areas.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N/A	N/A	Y	Y	Y

Applicability consideration:

Regions, States or individual locations most in need of these improvements. For simplicity and implementation success, complexity can be divided into three tiers:

- a) least complex: regional/States/locations with some foundational PBN operational experience that could capitalize on near-term enhancements, which include integrating procedures and optimizing performance;
- b) more complex: regional/States/locations that may or may not possess PBN experience, but would benefit from introducing new or enhanced procedures. However, many of these locations may have environmental and operational challenges that will add to the complexities of procedure development and implementation; and
- c) most complex: regional/States/locations in this tier will be the most challenging and complex to introduce integrated and optimized PBN operations. Traffic volume and airspace constraints are added complexities that must be confronted. Operational changes to these areas can have a profound effect on the entire State, region or location.

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)				
<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Remarks</i>
PBN SIDs	in accordance with States' implementation Plans	Indicator: % of International Aerodromes/TMA with PBN SID implemented as required. Supporting Metric: Number of International Aerodromes/ TMAs with PBN SID implemented as required.	100% by Dec. 2016 for the identified Aerodromes/TMAs 100% by Dec. 2018 for all the International Aerodromes/TMAs	
International aerodromes/TMAs with CCO	in accordance with States' implementation Plans	Indicator: % of International Aerodromes/TMA with CCO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs	

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