International Civil Aviation Organization

MIDANPIRG STEERING GROUP

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

Agenda Item 5.2: MID Region Air Navigation Priorities and Targets

MID AIR NAVIGATION STRATEGY

(Presented by the Secretariat)

SUMMARY

This paper presents an updated version of the MID Air Navigation Strategy (MID Doc 002) based on the ANSIG/3 meeting proposals, for endorsement by the MSG on behalf of MIDANPIRG.

Action by the meeting is at paragraph 3.

REFERENCES

- MID Region Air Navigation Strategy (MID Doc 002)
- MIDANPIRG/16 Report
- ANSIG/3 Report

1. INTRODUCTION

1.1 The MIDANPIRG/16 meeting (Kuwait, 13-16 February 2017), through Conclusion 16/3, updated and endorsed the MID Region Air Navigation Strategy (MID Doc 002).

2. DISCUSSION

2.1 The MID Region Air Navigation Strategy (MID Doc 002), endorsed by MIDANPIRG/16, was further reviewed by the MIDANPIRG subsidiary bodies and the following amendments have been proposed:

AIM SG/4 (Cairo, Egypt, 13-15 February 2018)

2.2 The ANSIG/3 agreed with the AIM SG/3 meeting proposal to delete the element "National AIM implementation plan/roadmap" from the list of Elements of B0-DATM in the MID Air Navigation Strategy.

2.3 The meeting reviewed B0-DATM elements and agreed that, for a simplified performance monitoring of the AIM implementation (B0-DATM), eTOD and Digital NOTAM should also be deleted from the list of Elements of B0-DATM. It was noted that eTOD will still be monitored through the MID eANP Volume III (Tables B0-DATM 3-4-1, 3-4-2 and 3-4-3).

2.4 The meeting agreed that the agreements with data originators is an important Step of the ICAO Roadmap for the transition from AIS to AIM. Accordingly, the meeting agreed to include this element in the MID Air Navigation Strategy (B0-DATM).

ATM SG/4 (Amman, Jordan, 29 April - 2 May 2018)

2.5 Based on the ATM SG/4 meeting outcome, the ANSIG/3 meeting reviewed and updated the MID Region Air Navigation Strategy, parts related to ATM: B0-FRTO, B0-NOPS, B0-FICE and B0-SNET.

CNS SG/8 (Cairo, Egypt, 26 - 28 February 2018)

2.6 Considering the progress related to ADS-B and MLAT implementation in the MID Region, the CNS SG/8 meeting proposed to change the B0-ASUR from priority 2 to priority 1. However, the ANSIG/3 meeting agreed that, prior to changing the priority of B0-ASUR from 2 to 1, it was necessary for the CNS SG to agree on the elements, applicability area, performance indicators/supporting metrics and their associated targets.

MET SG/7 (Cairo, Egypt, 14 - 16 November 2017)

2.7 The meeting reviewed the MID Air Navigation Strategy parts related to B0-AMET and agreed to the proposal to add a new element related to OPMET.

2.8 The meeting also noted that providing wind shear information was part of B0-AMET. The ANSIG/3 meeting agreed that the MET SG/8 meeting should consider the inclusion of the wind shear as an element of the B0-AMET in the MID Air Navigation Strategy with well identified applicability area (list of International Airports requiring implementation of wind shear systems).

PBN SG/3 (Cairo, Egypt, 11 – 13 February 2018)

2.9 Taking into consideration the expected significant changes to the GANP 2019 edition and the current MID Region status of implementation of the ASBU B0-APTA, B0-CCO and B0-CDO, the meeting agreed to maintain the current elements of the above ABSU Modules unchanged, with the exception of the "PBN Plans", which would be removed.

2.10 Based on the inputs from AIM SG/4, ATM SG/4, CNS SG/8, MET SG/7 and PBN SG/3 meetings, the ANSIG/3 meeting reviewed and updated the MID Region Air Navigation Strategy (MID Doc 002), as at **Appendix A**.

2.11 Based on the above, the following Draft MSG Conclusion is proposed:

DRAFT MSG CONCLUSION 6/X: MID REGION AIR NAVIGATION STRATEGY

That, the revised MID Region Air Navigation Strategy (MID Doc 002, Edition December 2018) at ***Appendix A*** *is endorsed.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and update, as deemed necessary, the revised MID Region Air Navigation Strategy (MID Doc 2), at **Appendix A**; and

b) endorse the proposed Draft MSG Conclusion.

MID DOC 002

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

MID REGION

AIR NAVIGATION STRATEGY

EDITION DECEMBER, 2018

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1. Introduction

1.1 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.

1.2 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.

1.3 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.

1.4 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.

1.5 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.

1.6 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.

2. Strategic Air Navigation Capacity and Efficiency Objective

2.1 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.

3. MID Air Navigation Objectives

3.1 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***~~

3.2 ~~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.~~ Block '0' features Modules are characterized by operational improvements, which have already been developed and implemented in many parts of the world. The MID Region priority 1 Block 0 Modules are reflected in **Table 1** below.

3.3 ~~The MID Region Air Navigation Strategy aims 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.~~ The MID Region Air Navigation Strategy aims to maintain regional harmonisation. The States should develop their National ASBU Implementation Plan, including action plans for the implementation of relevant priority 1 ASBU Modules and other Modules according to the States' operational requirements.

Mid-term Objective (2019 - 2024): ASBU Block 1

3.4 The implementation of the ASBU Block 0 Modules in the MID Region started in 2013 and is continuing.

3.5 Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2019, 2025 and 2031, respectively. Associated timescales are intended to depict the initial deployment targets along with the readiness of all components needed for deployment. Blocks 1 features Modules are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2019.

Long-term Objective (2025 - 2030): ASBU Block 2

3.6 The Block Upgrades incorporate a long-term perspective matching that of the Regional Air Navigation Plan (eANP). 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.

3.7 The implementation of Block 2 and Block 3 Modules is planned for 2025 and beyond.

4. MID Region ASBU Block 0 Modules Prioritization and Monitoring

4.1 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	Start Date	Monitoring		Remarks
				Main	Supporting	
***Performance Improvement Areas (PIA) 1*: Airport Operations**						
B0-APTA	Optimization of Approach Procedures including vertical guidance	1	2014	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	2014	ANSIG	CNS SG	Coordination with RGS WG
B0-ACDM	Improved Airport Operations through Airport-CDM	1	2014	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	1	2014	CNS SG	AIM SG, ATM SG	

	through Ground-Ground Integration					
B0-DATM	Service Improvement through Digital Aeronautical Information Management	1	2014	AIM SG		
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	1	2014	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	2014	ATM SG		
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	1	2015			
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	2014	CNS SG		
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	1	2017	ATM SG		
Performance Improvement Areas (PIA) 4 Efficient Flight Path – Through Trajectory-based Operations						
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	1	2014	PBN SG		
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	2		ATM SG	CNS SG	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	1	2014	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 2015-2018.

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

5. Measuring and monitoring air navigation performance

5.1 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. The monitoring of the priority 1 ASBU modules is carried out through the MID eANP Volume III.

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

5.3 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).*

6. Governance

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

6.2 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.

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

6.4 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, MID Air navigation Report, etc.; 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**
~~States' PBN Implementation Plans~~	~~All States~~	~~Indicator: % of States that provided updated PBN implementation Plan~~ ~~Supporting metric: Number of States that provided updated PBN implementation Plan~~	~~100% by Dec. 2018~~
LNAV	All RWYs Ends at International Aerodromes	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
LNAV/VNAV	All RWYs ENDs at International Aerodromes	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

Module 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**
A-SMGCS Level 1*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, 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 Dec. 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 Dec. 2017

**Reference: Eurocontrol Document – "Definition of A-SMGCS Implementation Levels, Edition 1.2, 2010".*

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**
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	50% by Dec. 2018

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 Inter-facility 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.

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
AMHS capability	All States	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS capability	70% of States with AMHS capability by Dec. 2017
AMHS implementation /interconnection	All States	Indicator: % of States with AMHS implemented (interconnected with other States AMHS) Supporting metric: Number of States with AMHS implemented (interconnections with other States AMHS)	60% of States with AMHS interconnected by Dec. 2017
Implementation of AIDC/OLDI between adjacent ACCs	~~All ACCs~~As per the AIDC/OLDI Applicability Table*	Indicator: % of priority 1 ~~FIRs within which all applicable ACCs have implemented at least one interface to use~~ AIDC/OLDI Interconnection have been implemented~~with neighboring ACCs~~ Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70% by Dec. ~~2017~~2020

** Note – the required AIDC/OLDI connection is detailed in the MID eANP Volume II Part III-CNS under Specific Regional Requirements*

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**
~~National AIM Implementation Plan/Roadmap~~	~~All States~~	~~Indicator: % of States that have National AIM Implementation Plan/Roadmap~~ ~~Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap~~	~~90% by Dec. 2018~~
AIXM	All States	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	80% by Dec. 2018
eAIP	All States	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)	80% by Dec. 2020
QMS	All States	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	90% by Dec. 2018
WGS-84	All States	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) Indicator: % of States that have implemented WGS-84 Geoid Undulation Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation	Horizontal: 100% by Dec. 2018 Vertical: 90% by Dec. 2018
Agreement with data originators	All States	Indicator: % of States that have signed Service Level Agreements (SLA) with at least 50% of their AIS data originators Supporting Metric: Number of States that have signed Service Level Agreements (SLA) with at least 50% of	~~60~~80% by Dec. 2020

		their AIS data originators	
eTOD	All States	Indicator: % of States that have implemented required Terrain datasets Supporting Metric: Number of States that have implemented required Terrain datasets —— Indicator: % of States that have implemented required Obstacle datasets Supporting Metric: Number of States that have implemented required Obstacle datasets	Area 1 : Terrain: 70% by Dec. 2018 Obstacles: 60% by Dec. 2018 Area 4: Terrain: 100% by Dec. 2018 Obstacles: 100% by Dec. 2018
Digital NOTAM*	All States	Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM	90% by Dec. 2020

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			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
SADIS FTP	All States	Indicator: % of States ~~that have~~ having implemented SADIS FTP service Supporting Metric: Number of States ~~that have~~ having implemented SADIS FTP service	100% by Dec. 2018
QMS	All States	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	80% by Dec. 2018
SIGMET	All States with MWOs in MID Region	Indicator: % of States having implemented ~~FIRs in which~~ SIGMET ~~is implemented~~ Supporting metric: number of ~~FIRs~~ States having implemented SIGMET ~~is implemented~~	100% by Dec. 2018
WIND SHEAR	TBD	Indicator: TBD Supporting metric: TBD	TBD
OPMET	All States	Indicator: % of States having implemented METAR and TAF Supporting metric: number of States having implemented METAR and TAF	95% by Dec. 2018

B0 – FRTO: 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 – FRTO: Improved Operations through Enhanced En-Route Trajectories			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
~~Flexible use of airspace (FUA)~~	~~All States~~	~~Indicator: % of States that have implemented FUA~~ ~~Supporting metric*: number of States that have implemented FUA~~	~~40% by Dec. 2017~~
~~Flexible routing~~	~~All States~~	~~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~~
Flexible Use of Airspace (FUA) Level 1 Strategic	All States	Indicator: % of States that have implemented FUA Level 1 Supporting metric*: number of States that have implemented FUA Level 1	50% by Dec. 2019
FUA Level 2 Pre-tactical	All States	Indicator: % of States that have implemented FUA Level 2 Supporting metric*: number of States that have implemented FUA Level 2	60% by Dec. 2020
FUA Level 3 Tactical	All States	Indicator: % of States that have implemented FUA Level 3 Supporting metric*: number of States that have implemented FUA Level 3	60% by Dec. 2022

~~** Implementation should be based on the published aeronautical information*~~

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view

Description and purpose:

Air Traffic Flow Management (ATFM) is used to manage the flow of traffic in a way that minimizes delay and maximizes the use of the entire airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or Flight Information Region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including crisis caused by human or natural phenomena.

Experience clearly shows the benefits related to managing flows consistently and collaboratively over an area of a sufficient geographical size to take into account sufficiently well the network effects. The concept for ATFM and demand and capacity balancing (DCB) should be further exploited wherever possible. System improvements are also about better procedures in these domains, and creating instruments to allow collaboration among the different actors**.**

Guidance on the implementation of ATFM service are provided in the ICAO Doc 9971– Manual on Collaborative Air Traffic Flow Management

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. Application will naturally span over a long period as traffic develops.

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
ATFM Measures implemented in collaborative manner	All States	Indicator: % of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision Supporting metric: number of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision	100% by Dec. ~~2017~~2018
ATFM Structure	All States	Indicator: % of States that have established an ATFM Structure Supporting metric: number of States that have established an ATFM Structure	100 % by 2019

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**
Avionics (TCAS V7.1)	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	100% by Dec. 2017

B0 – SNET: Increased Effectiveness of Ground-based Safety Nets

Description and purpose:

To enable monitoring of flights while airborne to provide timely alerts to air traffic controllers of potential risks to flight safety. Alerts from short-term conflict alert (STCA), area proximity warnings (APW) and minimum safe altitude warnings (MSAW) are proposed. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centered.

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:

Benefits increase as traffic density and complexity increase. Not all ground-based safety nets are relevant for each environment. Deployment of this Module should be accelerated.

B0 – SNET: Increased Effectiveness of Ground-based Safety Nets			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
Short-Term Conflict Alert (STCA)	All States	Indicator: % of States that have implemented Short-term conflict alert (STCA) Supporting metric*: number of States that have implemented Short-term conflict alert (STCA)	80 % by 2018
Minimum Safe Altitude Warning (MSAW)	All States	Indicator: % of States that have implemented Minimum safe altitude warning (MSAW) Supporting metric*: number of States that have implemented Minimum safe altitude warning (MSAW)	80 % by 2018

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)			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
PBN STARs	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	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. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CDO	OBBI, HESH, HEMA, HEGN, OIIE, OIKB, OIFM, OJAI, OJAQ, OKBK, OLBA, OOMS, OTHH, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	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 – 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)			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
PBN SIDs	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	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. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CCO	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OIKB, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	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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