International Civil Aviation Organization

MIDANPIRG ATM/AIM/SAR Sub-Group

Thirteenth Meeting (ATM/AIM/SAR SG/13)
(Cairo, Egypt, 30 September – 3 October 2013)

Agenda Item 8: Performance Framework for Regional Air Navigation Planning and Implementation

MID REGION AIR NAVIGATION STRATEGY

(Presented by the Secretariat)

SUMMARY

This paper presents the MID Region Air Navigation Strategy which includes the mechanism for monitoring of the Aviation System Block Upgrades (ASBU) implementation.

Action by the meeting is at paragraph 3.

REFERENCES

- MSG/3 Report

1. INTRODUCTION

1.1 The third meeting of the MIDANPIRG Steering Group (MSG/3) was held in Cairo, Egypt, from 17 to 19 June 2013. The meeting was attended by a total of twenty two (22) participants from seven (7) MID Region States (Bahrain, Egypt, Iran, Jordan, Lebanon, Saudi Arabia and United Arab Emirates), two (2) Organisations and one (1) Agency (MIDRMA).

2. DISCUSSION

2.1 The MSG/3 meeting recalled that the Global Air Navigation Plan (GANP) establishes a framework for incremental implementations based on the specific operational profiles and traffic densities of each region and State, which is accomplished through the evaluation of the Aviation System Block upgrades (ASBU) modules to identify which of those modules best provide the needed operational improvements. In this respect, it was highlighted that Recommendation 6/1 of the AN-Conf/12 calls upon States and PIRGs to finalize the alignment of regional air navigation plans with the Fourth Edition of the GANP by May 2014.

2.2 The MSG/3 meeting was apprised of the outcome of the Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs) Global Coordination Meeting (GCM) that was held in Montreal on 19 March 2013 under the Chairmanship of the President of the ICAO Council. It was highlighted that the outcome of the meeting includes:

a) agreement on establishing regional priorities and targets for air navigation by May 2014 consistent with the GANP/ASBU framework;

b) agreement on the need to measure performance improvements to help demonstrate their positive impact on the environment; and

c) endorsement of the envisioned regional performance dashboard prototype and envisioned determination of an initial set of indicators and metrics for air navigation.

2.3 The meeting noted that ICAO is presently introducing regional " Performance Dashboard" homepages for every public website of the ICAO Regional Offices. These dashboards will illustrate the regional implementation status relating to the strategic objectives on Safety, Air Navigation Capacity and Efficiency, and Environmental Protection. They will show targeted performance at the regional level and will, initially, contain graphics and maps with a planned expansion to include the Aviation System Block upgrades (ASBU) Block 0 Modules. This new interactive online system will be in place in January 2014 and will be updated at regular intervals.

2.4 In the same vein, the meeting noted that the first edition of the Global Air Navigation Report is planned for release in March 2014. The initial Report will cover the following subjects:

- global air navigation challenges;
- measuring against those challenges;
- status of operational measures for performance improvement;
- implementation progress of selected priority ASBU Block 0 Modules. The metrics or initial dataset that includes key global air navigation priorities are Performance Based Navigation (PBN), Continuous Decent Operation (CDO), Continuous Climb Operations (CCO), Aeronautical Information Management (AIM), Air Traffic Flow Management (ATFM) and estimated environmental benefits accrued from operational improvements based on ICAO Fuel Savings Estimation Tool (IFSET) or any other more rigorous tool recognized by Committee on Aviation Environmental Protection (CAEP). This initial dataset for both *Regional Performance Dashboard* and the *Global Air Navigation Report* was recently agreed by the PIRG Chairs; and
- sharing of successful initiatives and key demonstrations.

2.5 The meeting recalled that MIDANPIRG/12 through Conclusion 12/47 endorsed 8 Metrics for performance monitoring of the air navigation systems in the MID Region and MIDANPIRG/13 endorsed an initial set of operational improvements for further review/consideration taking into account the outcome of the AN-Conf/12.

2.6 The meeting noted that, in accordance with Recommendation 6/1of the AN-Conf/12 and the outcome of the Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs) Global Coordination Meeting (GCM) held in Montreal on 19 March2013, the DGCA-MID/2 meeting reiterated the need for the establishment of regional priorities and targets for air navigation by May 2014 consistent with the GANP and ASBU framework. Accordingly, the DGCA-MID/2 meeting:

a) urged States to:

i. establish a performance measurement strategy for their air navigation system;
ii. share successful initiatives among each other; and
iii. support the ICAO MID Regional Office by providing the requisite information to demonstrate operational improvements; and

b) tasked MIDANPIRG and its Steering Group (MSG) with:

i. the establishment of priorities and targets for air navigation by May 2014, in accordance with Recommendation 6/1 of the Twelfth Air Navigation Conference (AN Conf/12);

ii. the monitoring and measurement of the agreed air navigation Metrics and indicators, at regional level; and

iii. the identification of necessary measures/action plans to reach the agreed air navigation targets.

2.7 Based on all of the above and taking into consideration the outcome of the First meeting of the ANP Ad-hoc Working Group (ANP WG/1) held in Cairo, 27-29 May 2013, the MSG/3 meeting agreed that the following ASBU Block 0 Modules be included in the MID Region Air Navigation Strategy, pending final endorsement by MIDANPIRG/14:

1) B0 – APTA: Optimization of Approach Procedures including vertical guidance
2) B0 – SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)
3) B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
4) B0 – DATM: Service Improvement through Digital Aeronautical Information Management
5) B0 – MET: Meteorological information supporting enhanced operational efficiency and safety
6) B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories
7) B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)
8) B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

2.8 Based on all the foregoing, the MSG/3 meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 3/1: MID REGION AIR NAVIGATION STRATEGY

That, States and all stakeholders review the draft MID Air Navigation Strategy, and provide comments/inputs to the ICAO MID Regional Office before 15 August 2013 for further review by the CNS/ATM/IC SG/7 meeting before presentation of the final version of the strategy for endorsement by MIDANPIRG/14.

2.9 Accordingly, the ICAO MID Regional Office issued State Letter Ref.: AN 1/7– 13/169 dated 30 June 2013, requesting States and Users to review the draft MID Air Navigation Strategy, and provide comments/inputs to the ICAO MID Regional Office before 15 August 2013. Few replies were received but with no inputs regarding the Metrics, Key Performance Indicators (KPIs) and Action Plans.

2.10 The ICAO MID Regional Office updated the MID Region Air Navigation Strategy as at **Appendix A** to this Working Paper, taking into consideration the Global and Regional developments.

3. ACTION BY THE MEETING

3.1 The meeting is invited:

a) review the revised draft version of the MID Air Navigation Strategy as at **Appendix A** to this working paper; and

b) provide comments/inputs on the Metrics, Key Performance Indicators (KPI) and Action Plans concerning the ASBU Modules related to ATM and AIM.

APPENDIX A

MID Region Air Navigation Strategy

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MID Region Air Navigation Strategy

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, security and facilitation while minimizing the adverse environmental effects of civil aviation activities.

Background

The Global ATM Operational Concept was approved by the Eleventh Air Navigation Conference (Montreal, September-October 2003) and published as Doc. 9854-AN/458.

In order to align global planning to the ATM Operational Concept, the Eleventh Air Navigation Conference (AN-Conf/11), recommended States and Regional Planning and Implementation Groups (PIRG), through Recommendation 1/1, to consider the Concept as a common global framework to guide in the planning for the implementation of the systems in support of the air navigation services.

The 37 Session of the International Civil Aviation Organization (ICAO) General Assembly (2010) directed the Organization to double its efforts to meet the global needs for airspace interoperability while maintaining its focus on safety. The Aviation System Block Upgrades (ASBU) methodology was formalized at the Twelfth Air Navigation Conference (AN-Conf/12) (Montreal, November 2012) and it is part of the new GANP, 4th Edition (Doc 9750).

The block upgrades describe a way to apply the concepts defined in the GANP with the goal of implementing regional performance improvements. They include the development of technology roadmaps, to ensure that standards are mature and to facilitate synchronized implementation between air and ground systems and between regions. The ultimate goal is to achieve global interoperability. Safety demands this level of interoperability and harmonization but it must be achieved at a reasonable cost with commensurate benefits.

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.

Stakeholder roles and responsibilities

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.

With the ASBU methodology States, operators and industry will benefit from the availability of Standards and Recommended Practices (SARPs) with realistic lead times. This will enable regional regulations to be identified, allowing for the development of adequate action plans and, if needed, investment in new facilities and/or infrastructure.

For the industry, this constitutes a basis for planning future development and delivering products on the market at the proper target time. For service providers or operators, ASBU should serve as a planning tool for resource management, capital investment, training as well as potential reorganization.

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. Increased traffic density brings about an increase in the number of flights that cannot fly their optimum path.

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.

With the introduction of the ASBU the Performance Framework Forms (PFF) are restructured and aligned with the ASBU modules, and renamed as Air Navigation Report Forms (ANRF) and presents a standard format for high level monitoring of the ASBU module implementation, where as detailed monitoring of the implementation will be developed in Volume III of the revised new Regional Air Navigation Plans.

Aviation System Block Upgrades (ASBU) framework

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. There are four components of a block upgrade.

Module – is a deployable package (performance) or capability. A module will offer an understandable performance benefit, related to a change in operations, supported by procedures, technology, regulations/standards as necessary, and a business case. A module will be also characterized by the operating environment within which it may be applied. The date allocated to a module in a block is that of the initial operating capability (IOC).

Of some importance is the need for each of the modules to be both flexible and scalable to the point where their application could be managed through any set of regional plans and still realize the intended benefits. The preferential basis for the development of the modules relied on the applications being adjustable to fit many regional needs as an alternative to being made mandated as a one-size-fits-all application. Even so, it is clear that many of the modules developed in the block upgrades will not be necessary to manage the complexity of air traffic management in many parts of the world.

Thread – describes the evolution of a given capability through the successive block upgrades, from basic to more advanced capability and associated performance, while representing key aspects of the global ATM concept

Block – is made up of modules that when combined enable significant improvements and provide access to benefits.

The notion of blocks introduces a form of date segmentation in five year intervals. However, detailed considerations will call for more accurate implementation dates, often not at the exact assigned block date. The purpose is not to indicate when a module implementation must be completed unless dependencies among modules logically suggest such a completion date.

Performance improvement area (PIA) – sets of modules in each block are grouped to provide operational and performance objectives in relation to the environment to which they apply, thus forming an executive view of the intended evolution. The PIAs facilitate comparison of on-going programmes.

The four PIAs are as follows:

a) airport operations;
b) globally interoperable systems and data – through globally interoperable system-wide information management;
c) optimum capacity and flexible flights – through global collaborative ATM; and
d) efficient flight paths – through trajectory-based operations.

Figure 1 illustrates the relationships between the modules, threads, blocks, and PIAs.

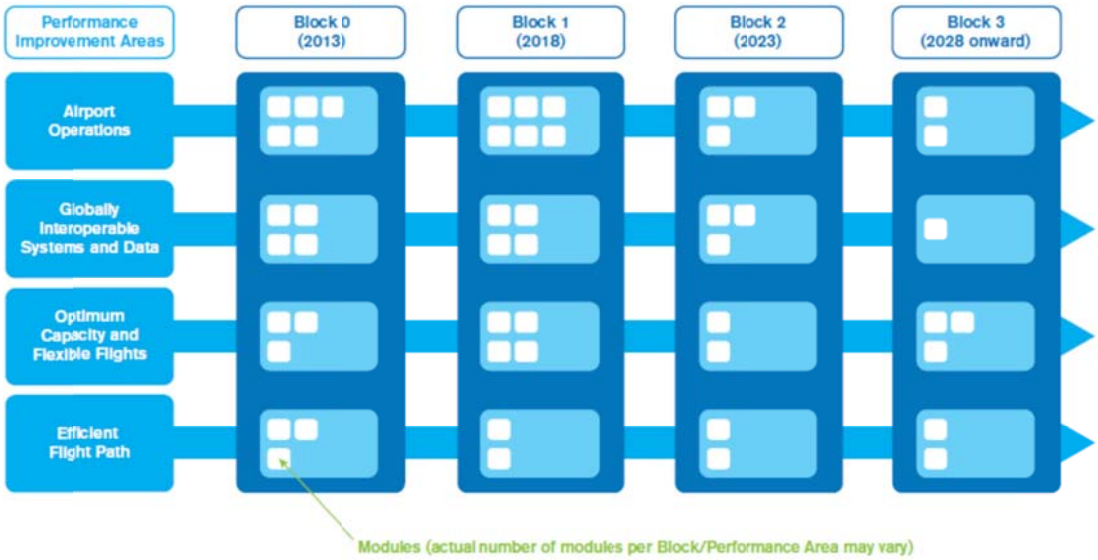

Figure 1.

MID Air Navigation Objectives:

States must focus on their Air Navigation Capacity and Efficiency priorities as they continue to foster expansion of the air transport sectors.

The ICAO Global Air Navigation Plan (GANP) represents a rolling strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives. The Block Upgrades are organized in five-year time increments starting in 2013 and continuing through 2028 and beyond. This structured approach provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers.

The Global Plan offers a long-term vision that will assist ICAO, States and industry to ensure continuity and harmonization among their modernization programmes. It also explores the need for more integrated aviation planning at both the regional and State level and addresses required solutions by introducing Aviation System Block Upgrade (ASBU) methodology.

The MID Region air navigation objectives are 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).

The enhancement of communication and information exchange between aviation Stakeholders and their active collaboration under the framework of MIDANPIRG would help achieving the MID Region Air Navigation objectives in an expeditious manner.

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

The Fourth Edition of the *Global Air Navigation Plan* introduces ICAO's ASBU methodology and supporting technology roadmaps based on a rolling fifteen-year planning horizon. Although the GANP has a global perspective, it is not intended that all ASBU modules are to be applied around the globe. Some of the ASBU modules contained in the GANP are specialized packages that should be applied where specific operational requirements or corresponding benefits exist.

Although some modules are suitable for entirely stand-alone deployment, an overall integrated deployment of a number of modules could generate additional benefits. The benefits from an integrated implementation of a number of modules may be greater than the benefits from a series of isolated implementations. Similarly, the benefits from the coordinated deployment of one module simultaneously across a wide area (e.g. a number of proximate airports or a number of contiguous airspaces/flight information regions) may exceed the benefits of the implementations conducted on an ad hoc or isolated basis.

An example of a need for global applicability would be performance-based navigation (PBN). Assembly Resolution A37-11 urges all States to implement approach procedures with vertical guidance in accordance with the PBN concept. Therefore, the ASBU modules on PBN approaches should be seen as required for implementation at all airports. In the same way, some modules are well suited for regional or sub-regional deployment and should take this into account when considering which modules to implement regionally and in what circumstances and agreed timeframes.

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, whereby 2013 refers to the availability of its particular performance Modules and 2018 the target implementation deadline. It is not the case that all States will need to implement every Module, and ICAO will be working with its Members to help each determine exactly which capabilities they should have in place based on their unique operational requirements.

It is important to clarify how each ASBU module fits into the framework of the MID Regional Air Navigation system. On the basis of operational requirements and taking into consideration benefits associated, MID Region has chosen 8 out of 18 Block "0" Module for implementation as they respond to air navigation capacity and efficiency requirements for the Region for the period from 2013 to 2018.

Table 1

Performance Improvement Areas (PIA)	Performance Improvement Area Name	Module	Module Name
PIA 1	Airport Operations	B0-65 APTA	Optimization of Approach Procedures including vertical guidance
		B0-75 SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)
PIA 2	Globally Interoperable Systems and Data - Through Globally Interoperable System Wide Information Management	B0-25 FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
		B0-30 DATM	Service Improvement through Digital Aeronautical Information Management
		B0-105 AMET	Meteorological information supporting enhanced operational efficiency and safety
PIA 3	Optimum Capacity and Flexible Flights – Through Global Collaborative ATM	B0-10 FRTO	Improved Operations through Enhanced En-Route Trajectories
PIA 4	Efficient Flight Path – Through Trajectory-based Operations	B0-05 CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)
		B0-20 CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

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

Block 0 features Modules characterized by technologies and capabilities which have already been developed and implemented in many parts of the world today. It therefore features a near-term availability milestone, or Initial Operating Capability (IOC), of 2013 based on regional and State operational need. 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. It must be stressed that a Block's availability milestone is not the same as a deadline.

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.

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.

The modules shown in **Table 1** are ASBU Block 0 Modules that the MID Region air navigation Metrics endorsed for the monitoring of air navigation system performance.

The MID Region air navigation Key Performance Indicators, Targets and Action Plans are detailed in the **Table 2** below.

Attachment A presents the Air Navigation Report Forms for each of the ASBU Block 0 endorsed taken as priority for implementation in the MID Region.

***Note**: The different elements supporting the implementation are explained in the ASBU Document, and Global Plan (Doc 9750)*

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 1) 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.

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

Implementation Roadblocks/Issues/Challenges

Insufficient number of equipped aircraft
Lack of cost benefit analysis adverse ionosphere
Lack of appropriate training
Evaluation of a real operational requirement

B0 – APTA: Optimization of Approach Procedures including vertical guidance				
Applicability: *Aerodromes (TBD)*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***
LNAV approaches	*Percentage of runway ends with LNAV approach*	All instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016	*Develop procedures*	
LNAV/VNAV approaches	*Percentage of runway ends with LNAV/VNAV approach*	All instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2018	*Develop procedures*	
APV with GBAS	*Percentage of runway ends with APV GBAS*	*As agreed*		*Applicable only to specific Aerodrome*

Module N° B*0-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.

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.

Implementation Roadblocks/Issues/Challenges
Lack of procedures and training, Lack of inspector for approvals operations and Lack of surveillance system on board (ADS B capacity).

Applicability: *Aerodromes (TBD) Abu Dhabi , Cairo , Dubai , Doha,*				
Metric	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan*** ***Responsible***	***Remarks***
Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)	***KPIs*** Percentage of international aerodromes with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement	50 % of the aerodromes Implemented *June 2016* *100 % June 2018*	*-1 Study requirement and cost benefits* assessments A*erodrome operator+ CNS/ATM directorate* *2-establish Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)* *3- Develop procedures and conduct training*	
Surveillance system on board (SSR transponder, ADS B capacity)			*Study requirement and cost benefits* assessments	

			Prepare Surveillance system on board (SSR transponder ,ADS B capacity) *Develop procedures and conduct training*	
Surveillance system for vehicle			*Study requirement and cost benefits* assessments *Prepare Surveillance system for vehicle* *Develop procedures and conduct training*	
Visual aids for navigation	***KPIs*** Percentage of international aerodromes complying with visual aid requirements as per Annex 14 Number of international aerodromes complying with visual aid requirements as per Annex 14	*100% December 2015*		

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.

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.

Implementation Roadblocks/Issues/Challenges

TPDI negotiations between MTAs and Compatibility between AIDC or OLDI systems from various manufacturers.

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration				
Applicability: *States/ACCs (TBD)*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***
AMHS implementation at States still not counting with this system	*Indicator: Percentage of States with AMHS implemented* *Supporting metric: Number of AMHS installed*		*1- Complete AMHS implementation at States still not counting with this system*	
AMHS interconnection	*Indicator: Percentage of States with AMHS interconnected with other AMHS* *Supporting metric: Number of AMHS interconnections implemented*		*Complete AMHS interconnection*	
Implement AIDC /OLDI	*Indicator: Percentage of ATS units with AIDC or OLDI* *Supporting metric: Number of AIDC or OLDI systems installed*		Implement AIDC /OLDI at MID States automated centres	

Implement operational AIDC/OLDI between adjacent ACC´s	*Indicator: Percentage of ACCs with AIDC or OLDI systems interconnection implemented* *Supporting metric: Number of AIDC interconnections implemented, as per Plan*		Implement operational AIDC/OLDI between adjacent ACC´s and complete the LOA	

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.

Applicability consideration:

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

Implementation Roadblocks/Issues/Challenges

Lack of electronic Database.
Lack of electronic access based on Internet protocol services.
Lack of procedures to allow airlines provide digital AIS data to on-board devices, in particular electronic flight bags (EFBs).
Lack of training for AIS/AIM personnel

B0 – DATM: Service Improvement through Digital Aeronautical Information Management				
Applicability: *States*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***
1- AIXM based AIS database				
2- eAIP				
3- WGS-84				

4-eTOD				
5- Aeronautical data quality				

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

Main performance impact:
KPA- 01 – Access and Equity, KPA-02 – Capacity, KPA-04 – Efficiency, KPA-05 – Environment, KPA-10 – Safety.

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

Implementation Roadblocks/Issues/Challenges

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety				
Applicability: *States*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***

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.

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.

Implementation Roadblocks/Issues/Challenges

Lack of organize and manage airspace prior to the time of flight
Lack of AIDC
Poor percentage of fleet approvals
Lack of procedures
Lack of implementation FUA Guidance
Lack of LOAs

B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories				
Applicability: *States*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***
Airspace under full control of Civil Authority				
Airspace under full control of Military Authority	*Indicator: % of time segregated airspaces are available for civil operations in the State* *Supporting Metric: Reduction of delays in time of civil flights.*			

Jointly used Airspace (Civil/Military)				

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.

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

Implementation Roadblocks/Issues/Challenges

Airspace Design

LOAs and Training

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)				
Applicability: *Aerodromes*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***
International aerodromes/TMAs with CDO	*Indicator: % of International Aerodromes/TMA with CDO implemented* *Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented*		*Upgrade the ground trajectory calculation function* *Airspace Design*	

PBN STARs	*Indicator: % of International Aerodromes/TMA with PBN STAR implemented* *Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented*		*LOAs and Training* *Define application requirements*	

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.

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.

Implementation Roadblocks/Issues/Challenges

Airspace Design,
LOAs; and
Training

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)				
Applicability: *Aerodromes*				
Metrics	***Key Performance Indicators (KPIs)***	***Targets***	***Action Plan***	***Remarks***
International aerodromes/TMAs with CCO	*Indicator: % of International Aerodromes/TMA with CCO implemented* *Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented*		*Airspace Design* *LOAs and Training* *Define application requirements*	

PBN SIDs	*Indicator: % of International Aerodromes/TMA with PBN SID implemented* *Supporting Metric: Number of International Aerodromes/TMAs with PBN SID implemented*			

Action Plans:

MIDANPIRG through its activities under the various subsidary bodies will continue to develop, update and monitor the implementation of Action Plans to achieve the air navigation targets.

A progress report on the implementation of the Action Plans and achieved targets will be developed by the Air Navigation System Implemenation Group (ANSIG) and presented to MIDANPIRG.

Governance:

The MID Region Air Navigation Strategy is to be endorsed by MIDANPIRG.

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

The MIDANPIRG will be the governing body responsible for the review and update of the Strategy, as deemed necessary.

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.

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – B0-05: Improved Flexibility and Efficiency in Descent Profiles (CDO) Performance Improvement Area 4: Efficient Flight Path – Through Trajectory-based Operations					
ASBU B0-05: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	Y	N	Y

ASBU B0-05: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. CDO implementation	Dec.2017
2. PBN STARs	Dec.2017

ASBU B0-05: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. CDO implementaion	The ground trajectory calculation function will need to be upgraded.	CDO Function	LOAs and Training	In accordance with application requirements
2. PBN STARs	Airspace Design		LOAs and Training	

ASBU B0-05: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. CDO implementation	Indicator: % of International Aerodromes/TMA with CDO implemented Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented
2. PBN STARs	Indicator: % of International Aerodromes/TMA with PBN STAR implemented Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented

ASBU B0-05: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	NA
Capacity	NA
Efficiency	Cost savings through reduced fuel burn. Reduction in the number of required radio transmissions
Environment	Reduced emissions as a result of reduced fuel burn
Safety	More consistent flight paths and stabilized approach paths. Reduction in the incidence of controlled flight into terrain (CFIT

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – Module N° B0-(105)AMET: Meteorological information supporting enhanced operational efficiency and safety **Performance Improvement Area 2:** **Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management**					
ASBU B0-(105)AMET: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	Y	Y

ASBU B0-(105)AMET: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. WAFS	In process of improvement
2. IAVW	In process of improvement
3. Tropical cyclone watch	In process of improvement
4. Aerodrome warnings	In process of improvement
5. Wind shear warnings and alerts	MET provider services / 2015
6. SIGMET	MET provider services / 2015
7. QMS/MET	MET provider services / 2018

ASBU B0-105: Meteorological information supporting enhanced operational efficiency and safety				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. WAFS	Connection to the AFS satellite and public Internet distribution systems	Nil	Prepare a contingency plan in case of public Internet failure	N/A
2. IAVW	Connection to the AFS satellite and public Internet distribution systems	Nil	Prepare a contingency plan in case of public Internet failure	N/A
3. Tropical cyclone watch	Connection to the AFS satellite and public Internet distribution systems	Nil	Prepare a contingency plan in case of public Internet failure	N/A

ASBU B0-105: Meteorological information supporting enhanced operational efficiency and safety				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
4. Aerodrome warnings	Connection to the AFTN	Nil	Local arrangements for reception of aerodrome warnings	N/A
5. Wind shear warnings and alerts	Connection to the AFTN	Nil	Local arrangements for reception of wind shear warning and alerts	N/A
6. SIGMET	Connection to the AFTN	Nil	N/A	N/A
7. QMS/MET	Nil	Commitment of top management	N/A	N/A

ASBU B0-105: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. WAFS	Indicator: States implementation of WAFS Internet File Service (WIFS) Supporting metric: Number of States implementation of WAFS Internet File Service (WIFS)
2. IAVW	Indicator: Percentage of international aerodromes/MWOs with IAVW procedures implemented Supporting metric: Number of international aerodromes/MWOs with IAVW procedures implemented
3. Tropical cyclone watch	Indicator: Percentage of international aerodromes/MWOs with tropical cyclone watch procedures implemented Supporting metric: Number of international aerodromes/MWOs with tropical cyclone watch
4. Aerodrome warnings	Indicator: Percentage of international aerodromes/AMOs with Aerodrome warnings implemented Supporting metric: Number of international aerodromes/AMOs with Aerodrome warnings implemented
5. Wind shear warnings and alerts	Indicator: Percentage of international aerodromes/AMOs with wind shear warnings procedures implemented Supporting metric: Number of international aerodromes/AMOs with wind shear warnings and alerts implemented
6. SIGMET	Indicator: Percentage of international aerodromes/MWOs with SIGMET procedures implemented Supporting metric: Number of international aerodromes/MWOs with SIGMET procedures implemented
7. QMS/MET	Indicator: Percentage of MET Provider Sates with QMS/MET implemented Supporting metric: Number of MET Provider Sates with QMS/MET certificated

ASBU B0-105: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	Not applicable
Capacity	Optimized usage of airspace and aerodrome capacity due to MET support
Efficiency	Reduced arrival/departure holding time, thus reduced fuel burn due to MET support
Environment	Reduced emissions due to reduced fuel burn due to MET support
Safety	Reduced incidents/accidents in flight and at international aerodromes due to MET support.

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-10: Improved Operations through Enhanced En-Route Trajectories Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
ASBU B0-10: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	Y	Y	Y	Y	N

ASBU B0 10: Implementation Progress	
Elements	**Implementation Status Air Ground**
1. Airspace planning	Dec.2018
2. Flexible Use of airspace	Dec. 2016
3. Flexible Routing	Dec. 2018

ASBU B0-10: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground system Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. Airspace planning	Lack of organize and manage airspace prior to the time of flight Lack of AIDC		Lack of procedures	
2. Flexible Use of airspace	NIL		Lack of implementation FUA Guidance	
3. Flexible Routing	ADS-C/CPDLC	Lack of FANS 1/A Lack of ACARS	Lack of LOAs and procedures	Poor percentage of fleet approvals

B0-10: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. Airspace planning	Not assigned Indicator and metrics.
2. Flexible Use of airspace	Indicator: % of time segregated airspaces are available for civil operations in the State Supporting Metric: Reduction of delays in time of civil flights.
3. Flexible Routing	Indicator: % of PBN routes implemented Supporting Metric: KG of Fuel savings Supporting Metric: Tons of CO2 reduction

ASBU B0-10: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	Better access to airspace by a reduction of the permanently segregated volumes of airspace.
Capacity	Flexible routing reduces potential congestion on trunk routes and at busy crossing points. The flexible use of airspace gives greater possibilities to separate flights horizontally. PBN helps to reduce route spacing and aircraft separations.
Efficiency	In particular the module will reduce flight length and related fuel burn and emissions. The module will reduce the number of flight diversions and cancellations. It will also better allow avoiding noise sensitive areas.
Environment	Fuel burn and emissions will be reduced
Safety	NA

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – B0-20: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO) Performance Improvement Area 4: Efficient Flight Path – Through Trajectory-based Operations					
ASBU B0-20: Improved Flexibility and Efficiency in Departure Profiles (CCO)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	Y	N	N

ASBU B0-20: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. CCO implementation	Dec.2017
2. PBN SIDs implementation	Dec.2017

ASBU B0-20: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. CCO implementation			LOAs and Training	In accordance with application requirements
2. PBN SIDs implementation	Airspace Design		LOAs and Training	

ASBU B0-20: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. CCO implementation	Indicator: Percentage of international aerodromes with CCO implemented Supporting metric: Number of international airport with CCO implemented
2. PBN SIDs implementation	Indicator: Percentage of international aerodromes with PBN SIDs implemented Supporting metric: Number of international airport with PBN SIDs implemented

ASBU B0-20: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	
Capacity	
Efficiency	Cost savings through reduced fuel burn and efficient aircraft operating profiles. Reduction in the number of required radio transmissions
Environment	Authorization of operations where noise limitations would otherwise result in operations being curtailed or restricted. Environmental benefits through reduced emissions
Safety	More consistent flight paths. Reduction in the number of required radio transmissions. Lower pilot and air traffic control workload

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – B0-(25): FICE Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration **Performance Improvement Area 2:** **Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management**					
ASBU B0-25: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	N	Y

ASBU B0-(25)FICE : Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. Complete AMHS implementation at States still not counting with this system	December 2015 Services provider
2. AMHS interconnection	December 2015 Services provider
3. Implement AIDC /OLDI at MID States automated centres	June 2015 Services provider
4. Implement operational AIDC/OLDI between adjacent ACC´s	June 2018 Services provider
5. Implement new regional network	June 2018 Services provider

ASBU B0-(25) FICE: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. Complete AMHS implementation at States still not counting with this system	NIL	NIL	NIL	NIL
2. AMHS interconnection	TPDI negotiations between MTAs	NIL	NIL	NIL
3. Implement AIDC /OLDI at MID States automated centres	NIL	NIL	NIL	NIL
4. Implement operational AIDC/OLDI between adjacent ACC´s	Compatibility between AIDC or OLDI systems from various manufacturers	NIL	NIL	NIL

ASBU B0-(25) FICE: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
5. Implement new regional network	NIL	NIL	NIL	NIL

ASBU B0-(25) FICE: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. Complete AMHS implementation at States still not counting with this system	Indicator: Percentage of States with AMHS implemented Supporting metric: Number of AMHS installed
2. AMHS interconnection	Indicator: Percentage of States with AMHS interconnected with other AMHS Supporting metric: Number of AMHS interconnections implemented
3. Implement AIDC /OLDI at MID States automated centres	Indicator: Percentage of ATS units with AIDC or OLDI Supporting metric: Number of AIDC or OLDI systems installed
4. Implement operational AIDC/OLDI between adjacent ACC´s	Indicator: Percentage of ACCs with AIDC or OLDI systems interconnection implemented Supporting metric: Number of AIDC interconnections implemented, as per MID Plan
5. Implement new regional network	Indicator: Percentage of phases completed for the implementation of new digital network Supporting metric: Number of implementation phase

ASBU B0-(25) FICE: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	NIL
Capacity	Reduced controller workload and increased data integrity supporting reduced separations translating directly to cross sector or boundary capacity flow increases
Efficiency	The reduced separation can also be used to more frequently offer aircraft flight levels closer to the optimum; in certain cases, this also translates into reduced en-route holding
Environment	NIL
Safety	Better knowledge of more accurate flight plan information

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – B0-(30) DATM: Service Improvement through Digital Aeronautical Information Management Performance Improvement Area 2: Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management					
ASBU B0-(30)DATM : Impact on Main Key Performance Areas					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	N	Y	Y

ASBU B0-(30) DATM: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. QMS for AIM	Dec.2015
2. e.TOD implementation	Dec.2016
3. WGS-84 implementation	Implemented
4. AIXM implementation	Dec.2018
5. E-AIP implementation	Dec.2015
6. Digital NOTAM	Dec. 2018

ASBU B0-(30) DATM: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. QMS for AIM 2. e-TOD implementation 3. WGS-84 implementation 4. AIXM implementation 5. e-AIP implementation 6. Digital NOTAM	Lack of electronic Database. Lack of electronic access based on Internet protocol services.	NIL	Lack of procedures to allow airlines provide digital AIS data to on-board devices, in particular electronic flight bags (EFBs). Lack of training for AIS/AIM personnel.	NIL

ASBU B0-(30) DATM: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. QMS for AIM	Indicator: % of States QMS Certified Supporting Metric: number of States QMS Certification
2. e-TOD implementation	Indicator: % of States e-TOD Implemented Supporting Metric: number of States with e-TOD Implemented
3. WGS-84 implementation	Indicator: % of States WGS-84 Implemented Supporting Metric: number of States with WGS-84 Implemented
4. AIXM implementation	Indicator: % of States with AIXM implemented Supporting Metric: number of States with AIXM implemented

ASBU B0-(30)DATM: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
5. e-AIP implementation	Indicator: % of States with e-AIP Implemented Supporting Metric: number of States with e-AIP Implemented
6. Digital NOTAM	Indicator: % of States with Digital NOTAM Implemented Supporting Metric: number of States with Digital NOTAM Implemented

ASBU B0-(30) DATM: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	NA
Capacity	NA
Efficiency	NA
Environment	Reduced amount of paper for promulgation of information
Safety	Reduction in the number of possible inconsistencies

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MID Regional Planning for ASBU Modules

REGIONAL PERFORMANCE OBJECTIVE – B0-(65) APTA: Optimization of Approach Procedures Including Vertical Guidance Performance Improvement Area 1: Airport Operations					
ASBU B0-(65) APTA: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	Y	Y	Y	Y	Y

ASBU B0-(65) APTA: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. APV with Baro VNAV	December 2016 – Service Providers and users
2. APV with SBAS	Not applicable
3. APV with GBAS	December 2018 – Initial implementation at some States (services providers)

ASBU B0-65: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground system Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. APV with Baro VNAV	NIL	Insufficient number of equipped aircraft	Insufficient appropriate training	Lack of appropriate training
2. APV with SBAS	Not Applicable	Not applicable	Not applicable	Not applicable
3. APV with GBAS	Lack of cost benefit analysis Adverse ionosphere	Insufficient number of equipped aircraft	Insufficient appropriate training	Lack of appropriate training Evaluation of a real operational requirement

ASBU B0-65: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
1. APV with Baro VNAV	Indicator: Percentage of international aerodromes having instrument runways provided with APV with Baro VNAV procedure implemented Supporting metric: Number of international airport having approved APV with Baro VNAV procedure implemented
2. APV with SBAS	Not Applicable

ASBU B0-(65) APTA: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
3. APV with GBAS	Indicator: Percentage of international aerodromes having instrument runways provided with APV GBAS procedure implemented Supporting metric: Number of international airport having APV GBAS procedure implemented.

ASBU B0-65: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	Increased aerodrome accessibility
Capacity	Increased runway capacity
Efficiency	Reduced fuel burn due to lower minima, fewer diversions, cancellations, delays
Environment	Reduced emissions due to reduced fuel burn
Safety	Increased safety through stabilized approach paths.

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REGIONAL PERFORMANCE OBJECTIVE – B0-(75) SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2) Performance Improvement Area 1: Airport operation					
ASBU B0-(75) SURF: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	Y	Y	Y	Y	Y

B0-75: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)	June 2018 Service provider
2. Surveillance system on board (SSR transponder, ADS B capacity)	June 2018 Service Provider
3. Surveillance system for vehicle	June 2018 Service Provider
4. Visual aids for navigation	December 2015 Service Provider
5. Wild life strike hazard reduction	December 2015 Aerodrome operator/wildlife committee
6. Display and processing information	June 2018 Service Provider

ASBU B0-75: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)	NIL	NIL	Lack of procedures and training	Lack of inspector for approvals operations
2. Surveillance system on board (SSR transponder ,ADS B capacity)	NIL	Lack of surveillance system on board (ADS B capacity) On general aviation and some commercial aircraft	Lack of procedures and training	NIL
3. Surveillance system for vehicle	NIL	NIL	Lack of procedures and training	NIL

ASBU B0-75: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
4. Visual aids for navigation	Implementation of new technologies (such as LED) not compliant with Annex 14	NIL	NIL	NIL
5. Wild life strike hazard reduction	NIL	NIL	Lack of Aerodrome Wildlife Committee	NIL

ASBU B0-(75) SURF: Performance Monitoring and Measurement (Implementation)	
Elements	**Performance Indicators/Supporting Metrics**
6. Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)	Indicator: Percentage of international aerodromes with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement Supporting metric: Number of international aerodrome with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement
7. Surveillance system on board (SSR transponder ,ADS B capacity)	Indicator: Percentage of surveillance system on board (SSR transponder, ADS B capacity) Supporting metric: Number of aircraft with surveillance system on board (SSR transponder ,ADS B capacity)
8. Surveillance system for vehicle	Indicator Percentage of international aerodromes with a cooperative transponder systems on vehicles Supporting metric: Number of vehicle with surveillance system installed
9. Visual aids for navigation	Indicator: Percentage of international aerodromes complying with visual aid requirements as per Annex 14 Supporting metric: Number of international aerodromes complying with visual aid requirements as per Annex 14
10. Wild life strike hazard reduction	Indicator: Percentage of reduction of wildlife incursions Supporting metric: Number of runway incursions due to wild life strike

ASBU B0-(75) SURF: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Benefits**
Access & Equity	Improves portions of the manoeuvring area obscured from view of the control tower for vehicles and aircraft. Ensures equity in ATC handling of surface traffic regardless of the traffic's position on the international aerodrome
Capacity	Sustained level of aerodrome capacity during periods of reduced visibility
Efficiency	Reduced taxi times through diminished requirements for intermediate holdings based on reliance on visual surveillance only. Reduced fuel burn
Environment	Reduced emissions due to reduced fuel burn
Safety	Reduced runway incursions. Improved response to unsafe situations. Improved situational awareness leading to reduced ATC workload