

Regional Aviation Safety Group-Middle East RASG-MID



MID Region Safety Strategy

Revision 2, April 2015

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MID Region Safety Strategy

1. Strategic Safety Objective

1.1 Continuous improvement of aviation safety through a progressive reduction of the number of accidents and related fatalities in the MID Region to be in line with the global average, based on reactive, proactive and predictive safety management practices.

2. Safety Objectives

2.1 States and regions must focus on their safety priorities as they continue to foster expansion of their air transport sectors.

2.2 The ICAO Global Aviation Safety Plan (GASP) establishes targeted safety objectives and initiatives while ensuring the efficient and effective coordination of complementary safety activities between all stakeholders.

2.3 The GASP includes a framework comprised of measurable objectives, supported by Safety Performance Areas and associated safety initiatives.

2.4 One of the strengths of the GASP is that while setting global objectives and priorities, it allows States and Regions to plan and establish their own specific approaches towards meeting these objectives and priorities according to each Member State's safety oversight capabilities, SSPs and safety processes necessary to support the air navigation systems of the future.

2.5 The MID Region safety objectives are in line with the GASP objectives and address specific safety risks identified within the framework of the Regional Aviation Safety Group-Middle East (RASG-MID), based on the analysis of available safety data.



GASP Objectives

2.6 The enhancement of communication and information exchange between aviation Stakeholders and their active collaboration under the framework of RASG-MID would help achieving the MID Region safety objectives in an expeditious manner.

3. Measuring and monitoring Safety Performance:

3.1 The first version of the MID Region Safety Strategy was developed by the First MID Region Safety Summit (Bahrain, 28-29 April 2013) and endorsed by the DGCA-MID/2 meeting (Jeddah, Saudi Arabia, 20 -22 May 2013).

3.2 The monitoring of safety performance and its enhancement is achieved through identification of relevant Safety Themes and Indicators as well as the adoption and attainment of Safety Targets.

3.3 The following are the MID Region Safety Themes endorsed for the monitoring of safety performance:

- 1) Accidents;
- 2) Runway Safety (RS);
- 3) Loss of Control In-Flight (LOC-I);
- 4) Controlled Flight Into Terrain (CFIT);
- 5) Safety oversight capabilities (USOAP-CMA, IOSA and ISAGO);
- 6) Aerodrome Certification; and
- 7) SSP/SMS Implementation.

3.4 The MID Region Safety Indicators and Targets are detailed in the Table below:

| | Theme | Safety Indicator | Safety Target |
|---|---------------------------------------|--|---|
| 1 | Accidents | Number of accidents per million departures | Reduce/Maintain the regional average rate of accidents to be in line with the global average rate by 2016. |
| | | Number of fatal accidents per million departures | Reduce/Maintain the regional average rate of fatal accidents to be in line with the global average rate by 2016. |
| 2 | Runway Safety (RS) | Number of Runway Safety related accidents per million departures | Reduce/Maintain the regional average rate of Runway Safety related accidents to be below the global average rate by 2016. |
| | | | Reduce/Maintain the Runway Safety related accidents to be less than 1 accident per million departures by 2016. |
| | | Number of established Runway Safety Team (RST) at MID International Aerodromes | 50% of the international aerodromes by 2020. |
| 3 | Loss of Control In-Flight (LOC-I) | Number of LOC-I related accidents per million departures | Reduce/Maintain the regional average rate of LOC-I related accidents to be below the global rate by 2016. |
| 4 | Controlled Flight Into Terrain (CFIT) | Number of CFIT related accidents per million departures | Reduce/Maintain the regional average rate of CFIT related accidents to be below the global rate by 2016. |

| | Theme | Safety Indicator | Safety Target |
|---|---|---|---|
| 5 | Safety oversight capabilities (USOAP-CMA, IOSA and ISAGO) | USOAP-CMA Effective Implementation (EI) results: <ol style="list-style-type: none"> a. Regional average EI. b. Number of MIDStates with an overall EI over 60%. c. Number of MIDStates with an EI score less than 60% for more than 2 areas (LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA). | Progressively increase the USOAP-CMA EI scores/results: <ol style="list-style-type: none"> a. Increase the regional average EI to be above 70% by 2020. b. 11 MID States to have at least 60% EI by 2020. c. Max 3 MIDStates with an EI score less than 60% for more than 2 areas by 2017. |
| | | Number of Significant Safety Concerns | <ol style="list-style-type: none"> a. MID States resolve identified Significant Safety Concerns as a matter of urgency and in any case within 12 months from their identification. b. No significant Safety Concern by 2016. |
| | | Use of the IATA Operational Safety Audit (IOSA), to complement safety oversight activities | <ol style="list-style-type: none"> a. Maintain at least 60% of eligible MID airlines to be certified IATA-IOSA by 2015 at all times. b. All MID States with an EI of at least 60% accept the IATA Operational Safety Audit (IOSA) as an acceptable Means of Compliance (AMC) by 2015 to complement their safety oversight activities. |
| | | Number of Ground Handling service providers in the MID Region having the IATA Safety Audit for Ground Operations (ISAGO) certification, as a percentage of all Ground Handling service providers | <ol style="list-style-type: none"> a. 75% of the Ground Handling service providers to be certified IATA-ISAGO by the 2017. b. The IATA Ground Handling Manual (IGOM) endorsed as a reference for ground handling safety standards by all MID States with an EI above 60% by 2017. |

| | Theme | Safety Indicator | Safety Target |
|---|-------------------------|---|---|
| 6 | Aerodrome Certification | Number of certified international aerodrome as a percentage of all international aerodromes in the MID Region | a. 50% of the international aerodromes certified by 2015. b. 75% of the international aerodromes certified by 2017. |
| 7 | SSP/SMS Implementation | Number of MID States, having completed the SSP gap analysis on iSTARS | 10 MID States by 2015. |
| | | Number of MID States, that have developed an SSP implementation plan | 10 MID States by 2015. |
| | | Number of MID States with EI>60%, having completed implementation of SSP Phase 1. | All MID States with EI>60% to complete phase 1 by 2016. |
| | | Number of MID States with EI>60%, having completed implementation of SSP Phase 2. | All MID States with EI>60% to complete phase 2 by 2017. |
| | | Number of MID States with EI>60%, having completed implementation of SSP Phase 3. | All MID States with EI>60% to complete phase 3 by 2018. |
| | | Number of MID States with EI>60%, having completed implementation of SSP | All MID States with EI>60% to complete SSP implementation by 2020 |
| | | Number of MID States with EI>60% that have established a process for acceptance of individual service providers' SMS. | a. 30% of MID Stateswith EI>60% by 2015. b. 70% of MID Stateswith EI>60% by 2016. c. 100% of MID Stateswith EI>60% by 2017. |

4. Governance

4.1

4.2 The MID Region Safety Strategy will guide the work of RASG-MID and all its member States and partners.

4.3 The RASG-MID will be the governing body responsible for the review and update of the Strategy, as deemed necessary.

4.4 Progress on the implementation of the MID Region Safety Strategy and the achievement of the agreed Safety Targets will be reported to the ICAO Air Navigation Commission (ANC), through the review of the RASG-MID reports; and to the stakeholders in the Region during the MID Region Safety Summits.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

**MID REGION
AIR NAVIGATION STRATEGY**

EDITION JUNE, 2015

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MID REGION AIR NAVIGATION STRATEGY

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.

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

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

3.4 Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2018, 2023 and 2028, respectively. Associated timescales are intended to depict the initial deployment targets along with the readiness of all components needed for deployment.

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

3.5 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.

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

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

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

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

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.

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

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 should be developed by the Air Navigation System Implementation Group (ANSIG) and presented to the MIDANPIRG Steering Group (MSG) and/or MIDANPIRG on regular basis.

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 subsidiary 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; 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 | Indicator: % of States that provided updated PBN implementation Plan Supporting metric: Number of States that provided updated PBN implementation Plan | 80 % by Dec. 2014 100% by Dec. 2015 |
| LNAV | All RWYs Ends at International Aerodromes | 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.

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

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

Description and purpose

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

Main performance impact:

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

Applicability consideration:

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

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

B0 – DATM: Service Improvement through Digital Aeronautical Information Management

Description and purpose

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

Main performance impact:

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

Applicability consideration:

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

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

| | | | |
|------------------|-------------------|---|--|
| 6-eTOD | <i>All States</i> | <p>Indicator: % of States that have implemented required Terrain datasets</p> <p>Supporting Metric: Number of States that have implemented required Terrain datasets</p> <p>Indicator: % of States that have implemented required Obstacle datasets</p> <p>Supporting Metric: Number of States that have implemented required Obstacle datasets</p> | <p>Area 1 : Terrain: 50% by Dec. 2015, 70% by Dec. 2018</p> <p>Obstacles: 40% by Dec. 2015, 60% by Dec. 2018</p> <p>Area 4: Terrain: 50% by Dec. 2015, 100% by Dec. 2018</p> <p>Obstacles: 50% by Dec. 2015, 100% by Dec. 2018</p> |
| 7-Digital NOTAM* | <i>All States</i> | <p>Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM</p> <p>Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM</p> | <p>80% by Dec. 2016</p> <p>90% by Dec. 2018</p> |

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

Description and purpose

Global, regional and local meteorological information:

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

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

Main performance impact:

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

Applicability consideration:

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

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

| <i>Elements</i> | <i>Applicability</i> | <i>Performance Indicators/Supporting Metrics</i> | <i>Targets</i> |
|-------------------------------|----------------------|---|---|
| SADIS 2G and Secure SADIS FTP | <i>All States</i> | Indicator: % of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service Supporting metric: number of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service | 90% by Dec. 2015 100% by Dec. 2017 |
| QMS | <i>All States</i> | Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET | 60% by Dec. 2015 80% by Dec. 2017 |

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 | | | |
|--|----------------------|---|------------------|
| <i>Elements</i> | <i>Applicability</i> | <i>Performance Indicators/Supporting Metrics</i> | <i>Targets</i> |
| Flexible use of airspace (FUA) | <i>All States</i> | Indicator: % of States that have implemented FUA Supporting metric*: number of States that have implemented FUA | 40% by Dec. 2017 |
| Flexible routing | <i>All States</i> | Indicator: % of required Routes that are not implemented due military restrictions (segregated areas) Supporting metric 1: total number of ATS Routes in the Mid Region Supporting metric 2*: number of required Routes that are not implemented due military restrictions (segregated areas) | 60% by Dec. 2017 |

* 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.

| <i>B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view</i> | | | |
|--|-----------------------------|---|-----------------------|
| <i>Elements</i> | <i>Applicability</i> | <i>Performance Indicators/Supporting Metrics</i> | <i>Targets</i> |
| ATFM Measures implemented in collaborative manner | <i>All States</i> | 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 |

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

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

Description and purpose

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

Main performance impact:

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

Applicability consideration:

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

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

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

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

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

Description and purpose

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

Main performance impact:

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

Applicability consideration:

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

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

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

| <i>Elements</i> | <i>Applicability</i> | <i>Performance Indicators/Supporting Metrics</i> | <i>Targets</i> |
|--|---|---|---|
| PBN SIDs | in accordance with States’ implementation Plans | Indicator: % of International Aerodromes/TMA with PBN SID implemented as required. Supporting Metric: Number of International Aerodromes/ TMAs with PBN SID implemented as required. | 100% by Dec. 2016 for the identified Aerodromes/TMAs 100% by Dec. 2018 for all the International Aerodromes/TMAs |
| International aerodromes/TMAs with CCO | in accordance with States’ implementation Plans | Indicator: % of International Aerodromes/TMA with CCO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented as required. | 100% by Dec. 2018 for the identified Aerodromes/TMAs |

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