*International Civil Aviation Organization*
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
**First Meeting of the Communications, Navigation and Surveillance / Air Traffic Management Subgroup (CNS/ATM/SG/1)**
(Lima, Peru, 14 to 18 December 2009)

**Agenda Item 2: Review of Global and CAR/SAM CNS/ATM developments**

# NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation

(Presented by the Secretariat)

**SUMMARY**

This working paper contains the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation, as approved by the Directors of Civil Aviation of the NAM/CAR Regions, and its update by the C/CAR and E/CAR working groups.

**References**:

- Report of the ALLPIRG/5 meeting (Montreal, Canada, 23–24 March 2006);
- Report of the NACC/DCA/3 meeting (Punta Cana, Dominican Republic, 8-12 September 2008);
- Report of the GREPECAS/15 meeting (Rio de Janeiro, Brazil, 13 to 17 October 2008);
- Report of the C/CAR DCA/10 meeting (Grand Cayman, 18 to 21 August 2009);
- Report of the E/CAR/WG/31 meeting (St. John's, Antigua, 5 to 8 October 2009); and
- ICAO Assembly Resolution 36-23

| | |
|---|---|
| ***Strategic Objectives*** | *A - Safety*<br>*D - Efficiency* |

## 1. Background

1.1 The Fifth Meeting of All Regional Planning and Implementation Groups/Advisory Group (ALLPIRG/5) agreed to adopt a performance-based approach to its work and take the necessary steps to ensure the harmonisation of the work at regional and national level, in keeping with the global ATM operational concept, in support of ICAO planning and implementation processes and ICAO Council guidance.

1.2 The third meeting of Directors General of Civil Aviation of North America, Central America, and the Caribbean (NACC/DCA/3) adopted Decision NACC/DCA/3/3 - *Approval of the NAM/CAR implementation plan*, which approved the NAM/CAR Implementation Plan developed by the con NACC/WG; and urged NAM/CAR States, Territories and International Organisations to prepare their national implementation plan on the basis of this plan in order to have a harmonised inter-regional implementation; and ICAO to take the appropriate measures to monitor the execution of the NAM/CAR Implementation Plan and report to NACC/DCA meetings on the progress made by the NACC/WG.

1.3 This plan was updated to become the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation and will serve as a link between air navigation implementation activities of the CAR Region and those defined in the United States NEXTGEN for the short and medium term.

1.4 The GREPECAS/15 meeting adopted Conclusion 15/1 - *Development of performance-based regional and national plans*, urging States, Territories and International Organisations to develop performance-based national plans, taking into account user needs, in keeping with the regional performance objectives contained in the Regional Air Navigation Plan.

## 2. Update of, and progress made in, the activities of the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation

### *Central Caribbean Working Group (C/CAR/WG)*

2.1 The C/CAR/WG/7 meeting recognised that there was an amalgamation of the work being carried out in all air navigation spheres and that such work should be approached in a holistic and strategic manner. Therefore, based on Doc 9854 - *Global Air Traffic Management Operational Concept*, ATM implementation would have to be approached as a system requiring the support of all spheres traditionally considered within the air navigation system.

2.2 Accordingly, the C/CAR/WG/7 meeting, following the recommendations of the ALLPIRG/5 meeting and the conclusions of the NACC/DCA, C/CAR/DCA and GREPECAS meetings, reviewed its work programme using a performance-based approach, and updated the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation, incorporating new performance objectives applicable to the Central Caribbean, to ensure coordination amongst all air navigation service spheres, such as ATM, CNS, AGA, AIM and MET, with a view to a seamless ATM system, in keeping with the operational initiatives of Doc 9750 - *Global air navigation plan*.

2.3 The meeting updated the implementation plan in relation to the following performance objectives:

a) Optimisation of the ATS route structure in the en-route airspace
b) Optimisation of the ATS route structure in the terminal airspace
c) Implementation of RNP approaches
d) Improvements in civil/military coordination and cooperation
e) Alignment of the upper airspace classification
f) Improved demand-capacity balancing
g) Improved ATM awareness

2.4 Likewise, implementation tasks needed for new performance objectives were included as follows:

a) Elimination of identified AOP deficiencies
b) Implementation of aerodrome certification
c) Protection and optimum use of the radio frequency spectrum
d) Optimisation and modernisation of the communication infrastructure
e) Implementation of WGS-84 and e-TOD
f) Improved availability of meteorological information
g) Improvement of the SAR system

2.5 The NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation also includes guidelines for the transition to the new flight plan format and action plans for PBN implementation and the implementation of communication, navigation and surveillance systems.

***East Caribbean Working Group (E/CAR/WG)***

2.6 The E/CAR/WG also updated its terms of reference using a performance-based approach, and updated the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation by including new performance objectives for the East Caribbean.

2.7 The meeting updated the implementation plan with respect to the following performance objectives:

a) Optimisation of the ATS route structure in the en-route airspace
b) Optimisation of the ATS route structure in the terminal airspace
c) Implementation of RNP approaches
d) Improvements in civil/military coordination and cooperation
e) Alignment of the upper airspace classification
f) Improved demand-capacity balancing
g) Improved ATM awareness

2.8 Likewise, implementation tasks needed for new performance objectives were added as follows:

h) Implementation of the new flight plan format
i) Improvement of the SAR system
j) Elimination of identified AOP deficiencies
k) Implementation of aerodrome certification
l) Protection and optimum use of the radio frequency spectrum
m) Optimisation and modernisation of the communication infrastructure
n) Improved availability of meteorological information

2.9 **Appendix A** to this working paper contains the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation, including the aforementioned performance objectives and the action plans for the implementation of communication, navigation and surveillance systems. Performance objectives for the ATM and CNS areas are those listed from a) through i) and from l) through m) of paragraphs 2.7 and 2.8, respectively.

2.10 The working groups will periodically review the plan, which also includes AGA, AIS and MET performance objectives, in order to report progress made to the Directors of Civil Aviation. Appendix A contains the plan in MS Project format with a view to identifying task priorities.

3. **Analysis**

3.1 Based on the experience of the C/CAR and E/CAR working groups, it was recognised that:

a) sub-regional programmes had to be aligned with the regional implementation plan, taking into account the performance objectives and action plans associated with specific tasks, deadlines, and ICAO periodic monitoring activities.
b) the model action plans included in the implementation plan could serve as guidance for some tasks related to performance objectives, allowing States/Territories/International Organisations to develop their own implementation plans based on their own needs.
c) several of the new performance objectives could be applied to other regions, and thus at regional level, trying to implement them within the time frame agreed at regional level.
d) this harmonised approach to a common implementation programme for the whole CAR Region would enable working groups to continue their own implementation tasks based on the needs of the States and Territories involved.
e) the establishment of new performance objectives based on ICAO guidance would also provide for the dynamic identification of implementation requirements and periodic follow up of the results attained, as well as the optimum allocation of resources by States/Territories/International Organisations.
f) these performance-based work strategies would have an impact on the dynamic updating of implementation programmes and terms of reference of the working groups, as well as the dynamic definition of other future tasks aimed at a seamless harmonised ATM system in the CAR Region, such as:
    - selecting ANS implementation tasks and/or improvements based on the specific requirements of States, Territories and International Organisations;
    - improving coordination of implementation activities associated to the required technical cooperation projects;
    - optimising human and financial resources;
    - harmonising national implementation programmes with regional strategies approved by GREPECAS, according to the vision outlined in ICAO Doc 9750 - *Global air navigation plan*; and
    - improving ICAO work programmes in order to monitor and meet regional assistance requirements.

3.2 It should also be noted that, after reviewing the guidelines for the transition to the new flight plan format, taking into account the information that would need to be collected, and aware of the automation infrastructure existing in the region, the meeting developed a plan of activities in the performance framework form (PFF) called “Implementation of the new Flight Plan” for purposes of this transition.

4. **Suggested action**

4.1 The Meeting is invited to:

a) review and analyse the development and evolution of the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation, and the work method of the C/CAR and E/CAR working groups described in this working paper;

b) use the NAM/CAR Regional Plan for the Implementation of Performance-Based Air Navigation described in paragraphs 2.7, 2.8, 2.9 and 2.10 as a reference for the development of a performance-based regional plan in the corresponding ATM and CNS areas, taking into account GREPECAS Conclusion 15/1 and based on the lessons learned described in paragraph 3.1; and

c) adopt any other action it may deem advisable.

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**APPENDIX**

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN REGIONAL OFFICE**

# NAM/CAR REGIONAL PERFORMANCE-BASED AIR NAVIGATION IMPLEMENTATION PLAN

## NAM/CAR RPBANIP

Version: 1.0
(February, 2010)

## 1. INTRODUCTION

1.1 The Global Plan describes a strategy aimed at achieving near and medium term ATM benefits on the basis of available and foreseen aircraft capabilities and ATM infrastructure. It contains guidance on ATM improvements necessary to support a uniform transition to the ATM system envisioned in the global ATM operational concept (Doc 9854). The operational concept presents the ICAO vision of an integrated, harmonized and globally interoperable ATM system.

1.2 The Strategic Vision is *"To foster implementation of a seamless, global air traffic management system that will enable aircraft operators to meet their planned times of departure and arrival and adhere to their preferred flight profiles with minimum constraints and without compromising agreed levels of safety."*

1.3 This vision is refined in the Mission of Implementation as follows:

*To develop a seamless, globally coordinated system of air navigation services that will cope with worldwide growth in air traffic demand while:*

- *improving upon the present levels of safety;*
- *improving upon the present levels of regularity;*
- *improving upon the overall efficiency and capacity of airspace and airports;*
- *improving operations allowing for capacity increase while minimizing fuel consumption and aircraft engine emissions;*
- *increasing the availability of user-preferred flight schedules and profiles; and*
- *minimizing differing equipment carriage requirements between regions.*

1.4 Having a strategic geographical location at the confluence of ATS routes connecting the major destinations, the airspace has become a vital link to the smooth flow of traffic between major airspace in NAM and CAR Regions.

1.5 The complexities of Caribbean airspace are unique in nature. Based on the topography, various types of aircraft from Helicopter to bigger type of jet aircraft are being operated in various sectors. Restricted airspace for Military flying and the mixed type of aircraft with unmatching capabilities occupy the airspace and their conflicting demands need to be accommodated.

1.6 Civil commercial, Military, general Aviation, Space research, hobby and adventure flying, flying training, helicopter flying have been constantly increasing and thereby the airspace has been getting congested day by day. Technological innovations provide more simple and flexible solutions not only for transportation needs but also for national security and economic development.

1.7 Entry of Low Cost carriers with attractive flying schemes has boosted traffic in the recent past and the air transport industry is in the upswing with more and more air operations. These carriers have not only become a potential competitors to the currently established airlines but also potential challengers to the ATM system as the airspace/ airports are getting more and more congested and leading to delay and holding resulting in burning of extra fuel.

1.8 Military flying activities with frequent airspace and airport closures implies additional civil flight operations and workload on the capacity and air traffic management point of view.

1.9 Recently the rate of traffic growth is at an average of 3.3% with the advent of new routes and airlines commencing operations as Caribbean destinations have become more popular for international tourist and commercial interest. The total operations at the main airports of the CAR Region in the period 2002 to 2005 reflected a positive trend of 1.92%, the global trend is 6%. The main rates of traffic growing were:

| | |
|---|---|
| Cuba | 6.41% |
| Dominican Republic | 5.74% |
| Belize | 4.77% |
| El Salvador | 3.06% |
| México | 2.57% |
| U. S. (P. R) (V. I) | 2.51% |
| Guatemala | 2.51% |
| Costa Rica | 2.42% |

1.10 What is reflected in the following tables is continuing growth for the next several years:

**Total (international and domestic) services of airlines of ICAO contracting States (NAM/CAR States - Percentage of world traffic 2008)**

| Aircraft Kilometers (millions) | Aircraft Departures (thousands) | Passengers Carried (thousands) | Passenger-Kilometers Performed (millions) | Passenger load factor (%) | Tonne-kilometres Performed | | Tonne Kilometers available (millions) | Weight Load Factor (%) |
|---|---|---|---|---|---|---|---|---|
| | | | | | Freight (millions) | Total (millions) | | |
| 13,523 | 10,652 | 782,200 | 1,434,423 | 80 | 41,279 | 17,3977 | 28,3610 | 61 |

**International services of airlines of ICAO contracting States – NAM/CAR States - Percentage of world traffic 2008**

| Aircraft Kilometers (millions) | Aircraft Departures (thousands) | Passengers Carried (thousands) | Passenger-Kilometers Performed (millions) | Passenger load factor (%) | Tonne-kilometres performed | | Tonne Kilometers available (millions) | Weight Load Factor (%) |
|---|---|---|---|---|---|---|---|---|
| | | | | | Freight (millions) | Total (millions) | | |
| 3,489 | 1,244 | 118,805 | 488,219 | 79 | 24,028 | 69,577 | 115,130 | 60 |

1.11 The regional distribution of scheduled traffic 2008 by aircraft departures and by passengers carried is depicted in the following Tables 1 and 2.

# Regional Distribution of Scheduled Traffic – 2008

**NAM/CAR Aircraft Departures 10.7 Million**

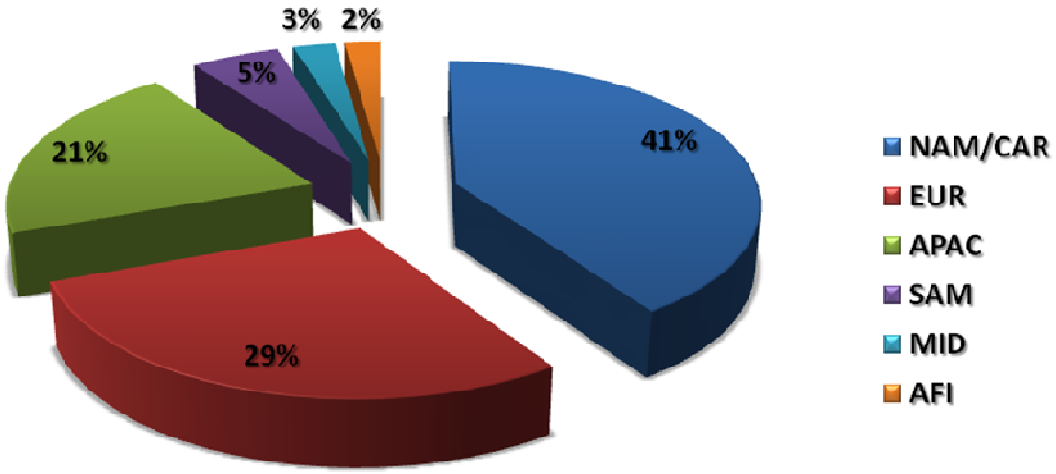



Table 1

# Regional Distribution of Scheduled Traffic – 2008

**NAM/CAR Passengers carried 782.2 Million**

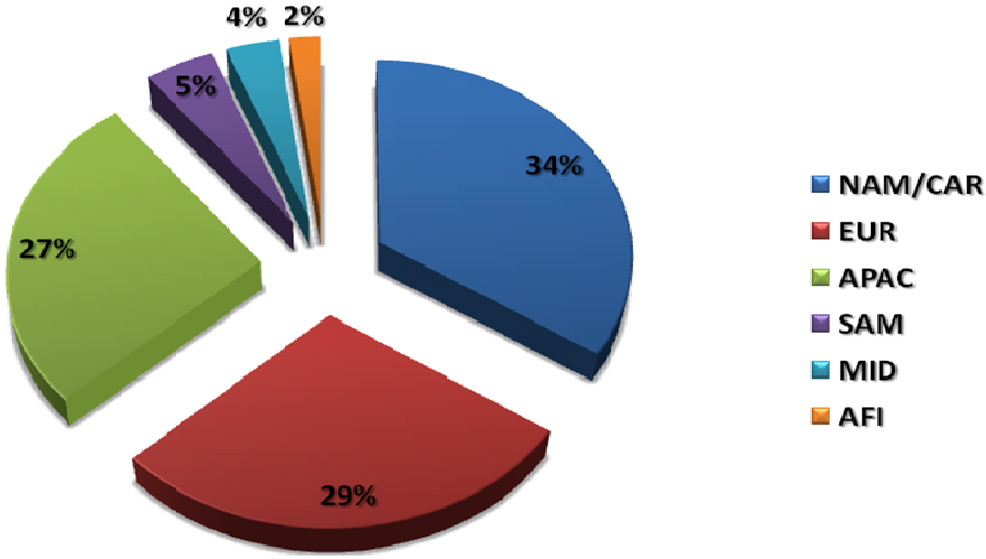



Table 2

1.12 More challenges are in the horizon for ATM seamless system in CAR and NAM Regions. The expectation is more and more air operations among CAR and NAM Regions which will require gradual operational developments of ATM system to ensure an optimum air traffic flow towards among certain areas or through them, during periods in which the demand exceeds or is foreseen to exceed the available capacity.

1.13 New aircraft are capable of extremely accurate navigation during all phases of flight and many are equipped with satellite-based communication. Aircraft operations growth also has resulted in a relatively young airline fleet, most equipped with some or all of enhanced capabilities.

1.14 Implementation programmes are required to be addressed with a performance-based approach, in order to achieve improvements to the air navigation system and environmental benefits, thus preventing costly implementation processes.

## 2. REGIONAL PLANNING PROCESS

2.1 The regional planning process should be conducted in accordance with the global plan initiatives (GPIs) of the *Global Air Navigation Plan* (Doc 9750) and the ICAO vision for an integrated, harmonized and globally interoperable ATM system, as established in the Global ATM Operational Concept (Doc 9854).

2.2 The objective is to achieve the maximum level of inter-operability and harmonization among sub-systems for a seamless and interoperable regional ATM system for all users during all phases of flight, complying with agreed levels of safety, providing optimum economic operations, to be environmentally sustainable and to fulfil national aviation security requirements.

2.3 Planning should be developed through performance objectives with clearly defined implementation requirements. The planning horizon should be focused on the strategies of development, activities or main tasks for two periods – that of less than 5 years (short-term) and 6 to 10 years (medium-term). Some already identified tasks to be analyzed beyond this period may be included if they conform to ICAO ATM requirements**.**

## 3. PERFORMANCE OBJECTIVES

3.1 The performance objectives should be developed using a performance approach to reflect the necessary activities needed to support regional ATM system implementation.

3.2 During its life cycle, the performance objectives may change in a dynamic manner depending on the ATM system's evolution; therefore, these should be coordinated with and available to all interested parties within the ATM Community in order to achieve timely communication throughout the implementation process. The establishment of collaborative decision-making processes (CDM) ensures that all stakeholders are involved in and concur with the requirements, tasks and timelines.

3.3 The following sections describe aspects pertaining to the performance objectives and required changes, and how these changes foster harmonized improvements throughout the regional ATM system.

***Benefits***

3.4 Each performance objective should establish a group of common benefits for all stakeholders and be achieved through the strategies, the operational and technical activities planned. These benefits should be in accordance with the ICAO strategic objectives, and the ATM community expectations.

***Strategy***

3.5 The air navigation system evolution requires a progressive strategy with tasks and actions that best represent the national and regional implementation in accordance with the global planning framework. The final goal is to achieve harmonized regional implementation on a continuous evolution towards a global seamless ATM system.

3.6 This means the need to develop short and medium term implementation programmes, focusing on the necessary changes to the system in which a clear work commitment will be carried out by the parties involved.

3.7 The implementation should define additional tasks and activities, maintaining a direct relation with ATM system components such as airspace organization, civil-military coordination, human factors, aeronautical regulations, operational safety management systems and environmental protection, among others.

3.8 The framework for regional activities should also include the coordination of activities with military authorities who play an important role in helping to ensure that the best use is made of the available airspace resources by all airspace users while still safeguarding national security.

3.9 The following principles should be considered when developing implementation programmes:

- The work should be organized using project management techniques and performance-based objectives in alignment with the Global Plan and the strategic objectives of ICAO. The implementation programmes should be in accordance with the progress, characteristics and regional implementation needs.

- All activities involved in accomplishing the performance objectives should be designed following strategies, concepts, action plans and roadmaps to align the regional work with the fundamental objective of achieving interoperability and seamlessness to the highest level.

- The implementation tasks should encourage human resources optimization, as well as promote the use of electronic communications means such as internet, videoconference, teleconference, phone and fax. It should be ensured that all the resources will be used efficiently, avoiding any duplication or unnecessary work.

- It should be ensured that performance objectives can be measured against timelines and performance targets, and that the regional progress achieved can be easily reported to the Air Navigation Commission and to the ICAO Council.

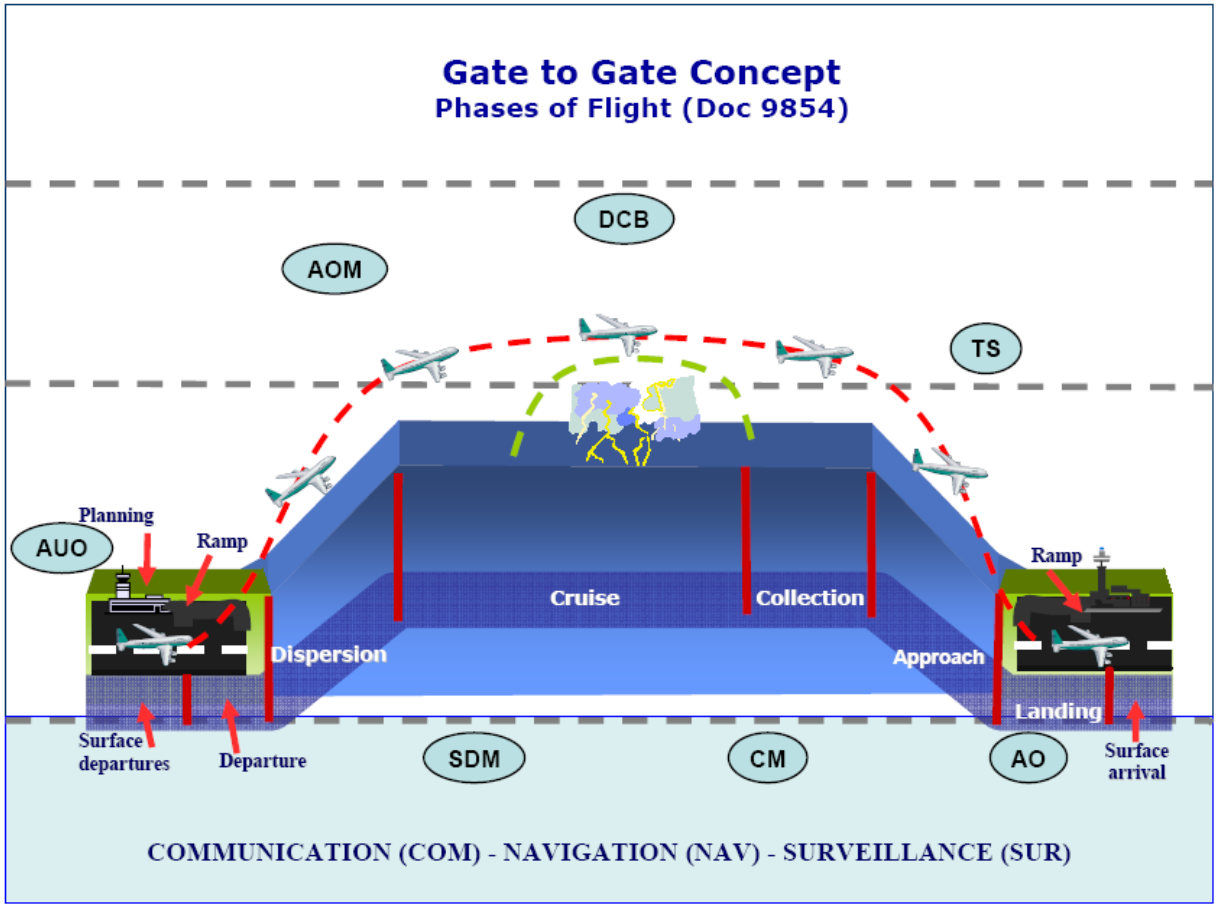
***Identification of tasks***

3.10 Each task should be identified firstly by the activity associated with components of the ATM system when describing the tasks. According to the Doc 9854, the designators for ATM components are as follows:

- **AOM** — Airspace organization and management
- **DCB** — Demand and capacity balancing
- **AO** — Aerodrome operations
- **TS** — Traffic synchronization
- **CM** — Conflict management
- **AUO** — Airspace user operations
- **ATM SDM** — ATM service delivery management

3.11 Each designator looks to link ATM system component pertains to tasks and activities related to phases of air operations, ATC en-route, terminal and airport, capacity management, airspace management including its flexible use and aeronautical information management.

3.12 The infrastructure includes the ground technical systems and capacity required to support operations such as communications, navigation and surveillance, data processing, inter-operability of systems, information management system and spectrum management, including both civil and military systems. The following diagram shows the ATM components in relation to the phases of flight:



3.13 The status is mainly focused on monitoring the progress of the implementation activity as it progresses toward a specific completion date. The status of the activity is defined as follows:

| | |
|---|---|
| ■**Valid** | the feasibility and benefits of an activity has been confirmed, work has been initiated but the activity itself has not been finalized. |
| ■**Completed** | implementation of the activity has been finalized by the involved parties. |
| ■**Tentative** | the feasibility and benefits of an activity investigated or to be developed. |

3.14 A tentative status indicates a potential activity; normally this activity will not be included in the regional planning documents unless it is an ICAO defined requirement.

***Relationship between Performance Objectives and Global Plan Initiatives***

3.15 The 23 GPIs provide a global strategic framework and are designed to contribute to achieving the regional performance objectives and to support the logical progression of regional implementation programmes.

3.16 Each performance objective should be referenced to the pertinent GPIs. The goal is to ensure that the work process will be integrated into the global planning framework

## 4 NATIONAL ACTION PLAN

4.1 States should develop their own national action plans reflecting the specific activities or tasks along with the expected benefits to be obtained and the date by which each should be completed according to the national needs and based on the regionally agreed performance objectives.

4.2 The strategic activities should include the necessary detailed actions to successfully achieve the national performance objectives, relating these activities with the short and medium term regionally agreed performance objectives.

4.3 National plans should identify the individuals or teamwork responsible for achieving the objectives as well as a means for monitoring and eventually reporting progress on the actions to ICAO. The responsibilities and time-tables should be clearly defined so that the involved parties are aware of their commitments throughout the implementation process.

4.4 Additionally, national action plans should include adequate means to provide information on implementation progress achieved such as through a periodic reporting process. This facilitates senior management levels' efforts to prioritize the actions and resources required. The same information provided to ICAO will allow feedback and assistance to be provided specific for each Region as they work to achieve a Global ATM system.

4.5 For the development of a national action plan, the following subjects, as a minimum, should be analysed and properly documented:

**a) Characteristics of the industry**

Enumerate the current and projected growth of Air Traffic in your state and also identify, if any, the efficiency challenges in your State.

**. b) The air navigation service provider**

Describe briefly the organization providing the air navigation services in your State including its institutional format, capital structure, principal shareholders and the management.

**c) Major stakeholders/partners**

Identify the major stakeholders/partners such as the air navigation service providers, the airspace users (the commercial airlines using the airspace, business aviation, general aviation, military, etc.) and the potential funding sources.

**d) Risks and Limitations**

Enumerate the limitations of the current conventional air navigation systems that may arise and which solution would depend on the State/Territory/International Organization.

**e) Risk Management**

What are the identified risks and briefly describe the risk mitigation plans/techniques.

**f. National Performance-based Air Navigation Plan**

i) Define the geographical scope of the National Air Navigation Plan and determine the major traffic flows.
ii) Explain briefly the vision of your State/Territory/International Organization for achieving a seamless Global ATM system in accordance with ICAO Doc 9854.
iii) Determine the current air navigation infrastructure and services.
iv) Through gap analysis define near and medium term operational improvements.
v) Using a standard Performance framework form (PFF), develop different national performance objectives by determining relevant tasks and ensure the linkage to ATM components and Global Plan Initiatives (GPIs).

**CAR/NAM REGIONS PERFORMANCE OBJECTIVES**

| 1. OPTIMIZE THE ATS ROUTE STRUCTURE EN-ROUTE AIRSPACE | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Environment**<br>**Efficiency** | • reductions in fuel consumption;<br>• ability of aircraft to conduct flight more closely to preferred trajectories;<br>• increase in airspace capacity;<br>• facilitate the utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency. | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| **AOM** | a) Develop regional action plan | 2007 | GREPECAS | Completed |
| | b) Develop Airspace Concept based in CAR /SAM PBN Roadmap, in order to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN and, in particular, RNAV/5, taking into account interregional harmonization | 2010 | States, Territories, Int. Org | Valid |
| | c) Develop performance measurement plan | 2010 | States, Territories, Int. Org | Valid |
| | d) Formulate safety plan | 2010 | States, Territories, Int. Org | Valid |
| | e) Establish collaborative decision making (CDM) process | 2010 | States, Territories, Int. Org | Valid |
| | f) Publish national regulations for aircraft and operators approval using PBN manual as guidance material | 2010 | States, Territories, Int. Org | Valid |
| | g) Identify training needs and develop corresponding guidelines | 2010 | States, Territories, Int. Org | Valid |
| | h) Implementation of ATS routes enroute | 2010 | States, Territories, Int. Org | Valid |
| | i) Monitor implementation progress in accordance with CAR/SAM PBN implementation roadmap and State implementation plan | On going | GREPECAS | Valid |
| **GPIs** | GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures | | | |

| 2. OPTIMIZE THE ATS ROUTE STRUCTURE IN TERMINAL AREA AIRSPACE | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Environment**<br>**Efficiency** | • reductions in fuel consumption;<br>• ability of aircraft to conduct flight more closely to preferred trajectories;<br>• increase in airspace capacity;<br>• facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency. | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| **AOM** | a) Develop regional PBN implementation plan | 2007 | GREPECAS | Completed |
| | b) Develop State PBN implementation plan | 2010 | States, Territories | Valid |
| | c) Develop Airspace Concept based in CAR /SAM PBN Roadmap, in order to design and implement optimized standard instrument departures (SIDs), standard instrument arrivals (STARs), instrument flight procedures, holding, approach and associated procedures, on the basis of PBN and, in particular RNAV-1 and Basic-RNP1 | 2011 | States, Territories | Valid |
| | d) Develop performance measurement plan | 2010 | States, Territories | Valid |
| | e) Formulate safety plan | 2010 | States, Territories | Valid |
| | f) Establish collaborative decision making (CDM) process | 2010 | States, Territories | Valid |
| | g) Publish national regulations for aircraft and operators approval using PBN manual as guidance material | 2010 | States, Territories | Valid |
| | h) Identify training needs and develop corresponding guidelines | 2010 | States, Territories | Valid |
| | i) Develop system performance monitoring plan | 2010 | States, Territories | Valid |
| | j) Develop a regional strategy and work programme for implementation of SIDs and STARs | 2011 | States, Territories | Valid |
| | k) Monitor implementation progress in accordance with CAR/SAM PBN implementation roadmap and State implementation plan | On going | GREPECAS | Valid |
| **GPIs** | GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures. | | | |

| 3. IMPLEMENT RNP APPROACHES | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency**<br>**Safety** | • Improvements in capacity and efficiency at aerodromes.<br>• Improvements in safety at aerodromes. | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| **AOM** | a) Develop State PBN implementation plan. | 2009 | States, Territories | Valid |
| | b) Develop Airspace Concept based in CAR /SAM PBN Roadmap, in order to design and implement RNP APCH with Baro-VNAV in accordance with assembly resolution A36-23, and RNP AR APCH where beneficial | 2010 | States, Territories | Valid |
| | c) Develop performance measurement plan | 2010 | States, Territories | Valid |
| | d) Formulate safety plan | 2010 | States, Territories | Valid |
| | e) Establish collaborative decision making (CDM) process | 2010 | States, Territories | Valid |
| | f) Publish national regulations for aircraft and operators approval using PBN manual as guidance material. | 2010 | States, Territories | Valid |
| | g) Identify training needs and develop corresponding guidelines | 2010 | States, Territories | Valid |
| | h) Implementation of APV procedures | 2016 | States, Territories | Valid |
| | i) Formulate system performance monitoring plan | 2011 | States, Territories | Valid |
| | j) Monitor implementation progress in accordance with CAR/SAM PBN implementation roadmap and State implementation plan | On going | GREPECAS | Valid |
| **GPIs** | GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures. | | | |

| 4. ENHANCE CIVIL/MILITARY COORDINATION AND CO-OPERATION | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency**<br><br><br>**Continuity** | • increase airspace capacity;<br>• allow a more efficient ATS route structure<br>• ensure safe and efficient action in the event of unlawful interference;<br>• make available military restricted airspace more hours of the day so that aircraft can fly on their preferred trajectories; and<br>• improve search and rescue services. | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| **AOM** | a) Develop guidance material on civil/military coordination and co-operation to be used by States/Territories to develop national policies, procedures and rules. | 2007 | ICAO | Completed |
| | b) Establish civil/military coordination bodies. | 2008 – 2012 | States, Territories | Valid |
| | c) Arrange for permanent liaison and close cooperation between civil ATS units and appropriate air defence units. | 2008 – 2012 | States, Territories | Valid |
| | d) Conduct a regional review of special use airspace. | 2008 – 2012 | GREPECAS | Valid |
| | e) Develop a regional strategy and work programme for implementation of flexible use of airspace in a phased approach for dynamic sharing of restricted airspace | 2008 – 2010 | States, Territories | Valid |
| | f) full integration of civil and military aviation activities by 2012. | 2008 – 2012 | States, Territories | Valid |
| | g) Monitor implementation progress. | On going | GREPECAS | Valid |
| **GPIs** | GPI/1: flexible use of airspace. | | | |

## 5. ALIGN UPPER AIRSPACE CLASSIFICATION

**Benefits**

| | |
|---|---|
| **Efficiency** | • better utilization of data link communication;<br>• optimize use of flight plan data processing systems;<br>• enhance airspace management coordination, message exchange capabilities and utilization of flexible and dynamic airspace management techniques;<br>• harmonization of interregional coordination processes; |
| **Continuity** | • improvement of airspace interoperability and seamlessness; and<br>• ensure the provision of positive air traffic control services to all aircraft operations. |

**Strategy**

| ATM Component | TASK DESCRIPTION | START-END | RESPON-SIBLE | STATUS |
|---|---|---|---|---|
| | a) Develop a regional implementation strategy and work programme for the implementation of ICAO Annex 11 airspace Class A above FL 195. | 2007 | GREPECAS | Completed |
| | b) Identify key stakeholders, ATCOs, pilots, and relevant international organisations for coordination and cooperation on changes for new airspace organization, using a CDM process. | 2008 – 2010 | States, Territories, Int. Org | Valid |
| | c) Develop new national airspace organization in accordance with ICAO provisions, as needed. | 2008 – 2010 | States, Territories, Int. Org | Valid |
| **AOM** | d) Coordinate changes for regional and national documents;<br>• Doc 8733, CAR/SAM ANP;<br>• AIP; and,<br>• ATS letters of agreement. | 2008 – 2012 | ICAO, States, Territories, Int. Org | Valid |
| | e) Carry out improvements in ground systems to support new airspace organization configurations, as necessary. | 2008 – 2012 | States, Territories, Int. Org | Valid |
| | f) Publish national regulatory material for implementation of new rules and procedures to reflect airspace organizational changes. | 2008 – 2010 | States, Territories, Int. Org | Valid |
| | g) Train ATCOs and pilots in new procedures, including all civil and military airspace users, as required; | 2008 – 2012 | States, Territories, Int. Org | Valid |
| | h) Monitor implementation progress. | On going | GREPECAS | Valid |
| **GPIs** | GPI/4: align upper airspace classification. | | | |

## 6. IMPROVE DEMAND AND CAPACITY BALANCING

**Benefits**

| | |
|---|---|
| **Environment** | • reduction in weather- and traffic-induced holding, leading to reduced fuel consumption and emissions; |
| **Efficiency** | • improved and smoother traffic flows;<br>• improved predictability;<br>• improved management of excess demand for service in ATC sectors and aerodromes;<br>• improved operational efficiency;<br>• enhanced airport capacity;<br>• enhanced airspace capacity; and |
| **Safety** | • improved safety management. |

**Strategy**

| ATM Component | TASK DESCRIPTION | START-END | RESPON-SIBLE | STATUS |
|---|---|---|---|---|
| **DCB** | a) Identify key stakeholders (ATC service providers and users, military authorities, airport authorities, aircraft operators and relevant international organisations) for purposes of coordination and cooperation, using a CDM process. | 2008 | GREPECAS | Valid |
| | b) Identify and analyse traffic flow problems and develop methods for improving efficiencies on a gradual basis, as needed, through enhancements in current:<br>i. airspace organization and management (AOM) and ATS routes structure (unidirectional routes) and SID and STARS;<br>ii. communication, navigation and surveillance systems;<br>iii. aerodrome capacity;<br>iv. ATS capacity;<br>v. training for pilots and Controllers; and<br>vi. ATS letters of agreement. | 2008 – 2012 | GREPECAS | Valid |
| | c) Define common elements of situational awareness between FMUs;<br>i. common traffic displays,<br>ii. common weather displays (Internet),<br>iii. communications (teleconferences, web), and,<br>iv. daily teleconference/ messages methodology advisories. | 2010 – 2012 | GREPECAS | Valid |
| | d) Develop methods to establish demand/capacity forecasting; | 2007 – 2012 | GREPECAS | Valid |
| | e) Develop a regional strategy and work programme for harmonized implementation of ATFM service. | 2007 | GREPECAS | Completed |

| Medium term | | | | |
|---|---|---|---|---|
| **DCB** | f) Develop a regional strategy for the implementation of flexible use of airspace (FUA);<br>i. assess use of airspace management processes;<br>ii. improve current national airspace management to adjust dynamic changes in tactical stage to traffic flows;<br>iii. introduce improvements in ground support systems and associated procedures for the extension of FUA with dynamic airspace management processes; and<br>iv. implement dynamic ATC sectorization in order to provide the best balance between demand and capacity to respond in real-time to changing situations in traffic flows, and to accommodate in short-term the preferred routes of users. | 2008 – 2012 | GREPECAS States, Territories, Int. Org | Valid |
| | g) Define common electronic information and minimum databases required for decision support and alerting systems for interoperable situational awareness between Centralized ATFM units. | 2008 – 2014 | GREPECAS States, Territories, Int. Org | Valid |
| | h) Develop regional procedures for efficient and optimum use of aerodrome and runway capacity. | 2008 – 2012 | GREPECAS | Valid |
| | i) Develop a regional ATFM procedural manual to manage demand/capacity balancing. | 2008 – 2010 | GREPECAS | Valid |
| | j) Develop a regional strategy and framework for the implementation of a Centralized ATFM unit. | 2008 – 2012 | GREPECAS | Valid |
| | k) Develop operational agreements between Centralized ATFM units for interregional demand/capacity balancing. | 2008 – 2015 | GREPECAS | Valid |
| | l) Monitor implementation progress. | On going | GREPECAS | Valid |
| **GPIs** | GPI/1: flexible use of airspace; GPI/6: air traffic flow management; GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/13: aerodrome design and management; GPI/14: runway operations; and GPI/16: decision support and alerting systems. | | | |

## 7. IMPROVE ATM SITUATIONAL AWARENESS

**Benefits**

| | |
|---|---|
| **Efficiency** | • enhanced traffic surveillance;<br>• enhanced collaboration between flight crew and the ATM system;<br>• improved collaborative decision-making through sharing electronic aeronautical data information;<br>• reduced of workload for both pilots and controllers;<br>• improved operational efficiency;<br>• enhanced airspace capacity;<br>• improved implementation on a cost-effective basis; |
| **Safety** | • improved available electronic terrain and obstacle data in the cockpit;<br>• reduced of the number of controlled flight into terrain related accidents; and<br>• improved safety management. |

**Strategy**

| ATM Component | TASK DESCRIPTION | START-END | RESPON-SIBLE | STATUS |
|---|---|---|---|---|
| **SDM** | a) Identify parties concerned. | 2009 | GREPECAS | Completed |
| | b) Identify the automation level required according to the ATM service provided in airspace and international aerodromes, assessing<br>i. operational architecture design,<br>ii. characteristics and attributes for interoperability,<br>iii. data bases and software, and<br>iv. technical requirements. | 2008 – 2010 | States, Territories, Int. Org | Valid |
| | c) Improve ATS interfacility communication. | 2008 – 2015 | States, Territories, Int. Org | Valid |
| | d) Implement flight plan data processing system and electronic transmission tools. | 2008 – 2012 | States, Territories, Int. Org | Valid |
| | e) Implement radar data sharing programs where benefits can be obtained. | 2008 – 2012 | States, Territories, Int. Org | Valid |
| | f) Develop situational awareness training programmes for pilots and controllers. | 2008 – 2012 | States, Territories, Int. Org | Valid |
| | g) Implement ATM surveillance systems for situational traffic information and associated procedures. | 2010 – 2015 | States, Territories, Int. Org | Valid |
| | h) Implement ATS automated message exchanges, as required;<br>a. FPL, CPL, CNL, DLA, etc. | 2008 – 2012 | GREPECAS States | Valid |
| | i) Implement automated radar handovers, where able. | 2008 – 2014 | States, Territories, Int. Org | Valid |
| | j) Implement ground and air electronic warnings, as needed<br>i. Conflict prediction<br>ii. Terrain proximity<br>iii. MSAW<br>iv. DAIW<br>v. Surveillance system for surface movement. | 2008 – 2012 | States, Territories, Int. Org | Valid |

| | | | | |
|---|---|---|---|---|
| | k) Implement data link surveillance technologies and applications: ADS, CPDLC, AIDC, as required. | 2008 – 2012 | States, Territories, Int. Org | Valid |
| ***Medium term*** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| | l) Implement additional/advanced automation support tools to increase sharing of aeronautical information<br>i. ETMS or similar<br>ii. MET information<br>iii. AIS/NOTAM dissemination<br>iv. Surveillance tools to identify airspace sector constraints<br>v. A-SMGC in specific aerodromes, as required. | 2010 – 2012 | States, Territories, Int. Org | Valid |
| | m) Implement teleconferences with ATM stakeholders. | 2008 - 2014 | States, Territories, Int. Org | Valid |
| | n) Monitor implementation progress | On going | GREPECAS | Valid |
| **GPIs** | GPI/1: flexible use of airspace; GPI/6: air traffic flow management; and GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/13: aerodrome design and management; GPI/14: runway operations; and GPI/16: decision support and alerting systems; GPI/17: implementation of data link applications; GPI/18: aeronautical Information; GPI/19: meteorological systems. | | | |

| 8. IMPLEMENTATION OF NEW FLIGHT PLAN FORMAT | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency**<br><br><br>**Safety** | • improved operational efficiency;<br>• enhanced airspace capacity;<br>• improved implementation on a cost-effective basis;<br>• improved safety management | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| **SDM** | a) Guidelines on transition to new Flight Plan Format | 2009 | ICAO | Completed |
| | b) Develop regional strategy for transition to new Flight Plan Format | March 2010 | GREPECAS | Valid |
| | c) Identification of stakeholders involved and possible impact by implementation of New Flight Plan Format (FPL/RPL/CPL) | 10/2009-06/2010 | States, Territories, Int. Org | Valid |
| | d) Evaluation of current/future flight plan processing capabilities regarding the New Flight Plan Format. | 10/2009-06/2010 | States, Territories, Int. Org | Valid |
| | e) Conduct trials between systems with NEW flight Plan processing capacity. | 01/2010-12/2010 | States, Territories, Int. Org | Valid |
| | f) Develop of contingency procedures and determination of operational/ technical considerations for the transition | 01/2011-06/2011 | States, Territories, Int. Org | Valid |
| | g) Identification of major parties considering FP data flow and definition of transition steps based on:<br>• systems with capability to process both formats: current and NEW.<br>• Systems to be upgraded/implemented before 2012 and that will be capable to process New Flight Plan Format. | 01/2011-06/2011 | States, Territories, Int. Org | Valid |
| | h) Publication on Transition Actions, Trials and other publication for the users and stakeholders | 10/2011-05/2012 | States, Territories, Int. Org | Valid |
| | i) Assessment of Transition Actions and make adjustments | 06/2012-09/2012 | States, Territories, Int. Org | Valid |
| | j) Conduct Transition plan | 11/2012 | States, Territories, Int. Org | Valid |
| | k) Monitor the transition activities | 10/2009-12/2012 | ICAO | Valid |
| **GPIs** | GPI/1: flexible use of airspace; GPI/6: air traffic flow management; and GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/13: aerodrome design and management; GPI/14: runway operations; and GPI/16: decision support and alerting systems; GPI/17: implementation of data link applications; GPI/18: aeronautical Information; GPI/19: meteorological systems; GPI-21: Navigation Systems; GPI-22: Communications Infrastructure and GPI-23: Aeronautical radio spectrum. | | | |

| 9. IMPROVE SAR SYSTEM | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency**<br><br><br><br>**Safety** | • enhanced traffic surveillance;<br>• enhanced collaboration between stakeholders;<br>• improved operational efficiency;<br>• improved implementation on a cost-effective basis;<br>• improved safety management. | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| **SDM** | a) Develop regional strategy to improve SAR System | End 2009 | ICAO | Completed |
| | b) Identify parties concerned | End 2009 | ICAO | Completed |
| | c) Conduct comprehensive analysis of SAR requirements based on risk assessment and quality assurance principles | 2009 - 2010 | States, Territories, Int. Org, ICAO | Valid |
| | d) Foster the harmonization of policies, regulations, practices and procedures of the aeronautical/maritime SAR services, in accordance with ICAO Standards and Recommended Methods. | 2009 - 2012 | States, Territories, Int. Org, ICAO | Valid |
| | e) Develop, update and ratify SAR agreements with RCCs of adjacent States. | 2009 - 2012 | States, Territories, Int. Org | Valid |
| | f) Develop, update and ratify SAR agreements with SAR service International agencies. | 2009 - 2012 | States, Territories, Int. Org | Valid |
| | g) Foster the establishment of joint aeronautical/maritime SAR Committees, including the integration of voluntary SAR organizations, as well as the development of agreements between all the stakeholders of the national SAR service | 2009 - 2012 | States, Territories, Int. Org, ICAO | Valid |
| | h) Develop human resources and training planning strategy in line with ICAO SAR guidelines and the regional agreements reached. | 2009 - 2012 | States, Territories, Int. Org, ICAO | Valid |
| | i) Monitor implementation progress | 2009 - 2012 | ICAO | Valid |
| **GPIs** | GPI/6: air traffic flow management; and GPI/9: Situational awareness | | | |

| 10.- ENHANCE CAPACITY AND EFFICIENCY OF AERODROME OPERATIONS | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| Safety<br>Efficiency<br><br><br><br><br><br><br><br><br><br>Environment | • Improve situational awareness and conflict detection tools.<br>• Enhance safety, access, efficiency and capacity of aerodrome operations in the States.<br>• Efficient use of aerodrome resources,<br>• Reduced wildlife / bird strikes,<br>• Reduction in delays,<br>• Maximize aerodrome capacity in all weather conditions,<br>• Safely maneuver in all weather conditions,<br>• Precise surface guidance to and from a runway,<br>• Reduced noise impact,<br>• Reduced incident/accident factors,<br>• Reduced number of deficiencies,<br>• Increased runway usability factor.<br>• Reduction in fuel consumption. | | | |
| Strategy | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **Start-End** | **RESPON-SIBLE** | **Status** |
| AO | a) Implementation of Aerodrome Certification | 12/2009–12/2014 | States, Territories | Valid |
| AO | b) Analyze new requirements of rapid exit taxiways | 12/2009–12/2014 | States, Territories | Valid |
| AO | c) Implementation of action plans for runway incursion prevention. | 12/2009–12/2014 | States, Territories | Valid |
| **DCB** | d) Implement the Airport Capacity analysis, Enhancement and planning (ACE) procedure. | 12/2009–12/2013 | States, Territories | Valid |
| **AO** | e) Minimizing the effects of adverse meteorological conditions on aerodrome operational capacity. | 12/2009–12/2013 | States, Territories | Valid |
| **DCB** | f) Implement Airport Collaborative Decision Making (CDM), prioritizing the following aspects:<br>• Collaborative management of the capacity of a CDM Airport during periods of a predicted or unpredicted reduction of capacity.<br>• Determination of Turn-Round and Variable Taxi Times<br>• Apron Congestion | 12/2010–12/2014 | States, Territories | Valid |
| **AO** | g) Implement Advanced Surface Movement Guidance and Control System (A-SMGCS) | 12/2013–12/2014 | States, Territories | Valid |
| | h) Monitor implementation progress. | 12/2009–12/2014 | ICAO | Valid |
| **GPIs** | GPI/6 Air traffic flow management; GPI/9 Situational awareness; GPI/13 Aerodrome design and management; GPI/14 Runway operations; GPI/15 Match IMC and VMC operating capacity; GPI/18 Aeronautical information. | | | |

| 11. PROTECTION AND OPTIMUM USE OF RADIOFREQUENCY SPECTRUM | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency** | • Efficient use of aviation radio spectrum<br>• Ensure availability of frequencies for services and aeronautical systems | | | |
| **Safety** | • Assurance of aviation spectrum | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| AOM, DCB, AO, TS, CM, AUO, SDM | a) Ensure Regional coordination for the protection of the aviation spectrum at WRC-12, and beyond | 2009-2011 | States, Territories, Int. Org, ICAO | Valid |
| | b) Ensure Participation of Civil Aviation Experts in State's delegation to ITU WRC Meetings | 2009-2010 | States, Territories, Int. Org, | Valid |
| | c) Disseminate ICAO policy statements of requirements for aeronautical radio frequency spectrum | 2009-2010 | ICAO | Valid |
| | d) Implement frequency spectrum management | 2009-2011 | States, Territories, Int. Org, | Valid |
| | e) Support ICAO Position during WRC-12 | 2012 | States, Territories, Int. Org, | Valid |
| | f) Monitor the understanding of radio spectrum management and support on WRC-2012 | 2009-2012 | ICAO | Valid |
| **GPIs** | GPI/1: flexible use of airspace; GPI/6: air traffic flow management; GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/14: runway operations; GPI-21: Navigation Systems, GPI-22: Communications Infrastructure and GPI-23: Aeronautical radio spectrum. | | | |

| 12. OPTIMIZATION AND MODERNIZATION OF COMMUNICATION INFRASTRUCTURE | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency**<br>**Continuity**<br>**Safety** | • Improvements in coordination<br>• Increase availability of communications<br>• Avoid misunderstandings in communications<br>• Facilitate the utilization of advanced technologies<br>• improvement of airspace interoperability and seamlessness; and<br>• ensure the provision of positive air traffic control services to all aircraft operations.<br>• Improvement in safety in airspaces and aerodromes | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| AO, TS, CM, AUO AOM, SDM | a) Review the status of performance of current AFS Services and identify deficiencies or improvements (AFTN, oral ATS services, A/G communications) | 2009-2010 | States, Territories, Int. Org, | Valid |
| | b) Analysis and formulation of plans for implementing improvement or solving deficiencies | 2009-2010 | States, Territories, Int. Org, | Valid |
| | c) Develop Regional ATN Planning documents | 2009-2012 | GREPECAS | Valid |
| | d) Coordination and testing of ATN G-G Application implementation aspects | 2009-2012 | States, Territories, Int. Org, | Valid |
| | e) Planning and trial activities for A-G Application implementation | 2010-2011 | States, Territories, Int. Org, | Valid |
| | f) Technical review of Regional Telecommunication networks for ATN implementation | 2009-2010 | States, Territories, Int. Org, | Valid |
| | g) Implement available technologies in to facilitate ground and airborne applications (CPDLC, ADS-C, ADS-B) | 2009-2015 | States, Territories, Int. Org, | Valid |
| | h) Monitor the implementation and improvement of the telecommunications and ATN applications issues. | 2009-2012 | States, Territories, Int. Org, OACI | Valid |
| **GPIs** | GPI/1: flexible use of airspace; GPI/6: air traffic flow management; GPI/7: dynamic and flexible ATS route management; GPI/9: Situational awareness; GPI/14: runway operations; GP1-17: Data Link Application, GPI-21: Navigation Systems and GPI-22: Communications Infrastructure | | | |

| 13. IMPLEMENTATION OF WGS-84 AND e-TOD | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency** | • implementation of WGS-84 in support PBN<br>• in support to approach and departure procedures design<br>• improve aircraft operating limitations analysis<br>• support aeronautical chart production and on-board databases(FMS) | | | |
| **Safety** | • improve situational awareness<br>• improve electronic terrain and obstacle data in display cockpit<br>• CFIT reduction<br>• support technologies such as ground proximity and minimum safe altitude warning systems (GPWS)<br>• Review the benefits mentioned in performance objectives for PBN | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START-END** | **RESPON-SIBLE** | **STATUS** |
| AO, SDM | ***Electronic terrain and obstacle data (eTOD)*** | | | |
| | a) share experience and resources in the implementation of e-TOD through the establishment of an e-TOD Regional working group. | 2011 – 2015 | GREPECAS States | Valid |
| | b) Technical requirements. | 2010 | GREPECAS States, Territories, Int. Org. | Valid |
| | c) report requirements and monitor implementation status of e-TOD using electronic media to ICAO NACC Regional Office | 2010-2011 | States, Territories, Int. Org. | Valid |
| | d) develop a high level agreement for the management of a national eTOD programme. | On going | States, Territories, | |
| **AUO** | ***WGS-84*** | | | |
| | e) establish WGS-84 implementation goals in coordination with the national PBN implementation | 2010-2012 | GREPECAS States, Territories | Valid |
| | f) Technical requirements. | 2010 | GREPECAS States, Territories | Valid |
| | g) monitor implementation status of WGS-84 using the AIS-5 Table of the FASID and take remedial action as required. | On going | GREPECAS States, Territories | |
| **GPIs** | GPI-5: Performance-based navigation; GPI-9: Situational awareness; GPI-11: RNP and RNAV SIDs and STARs; GPI-18: Aeronautical Information; GPI-20: WGS-84; GPI-21: Navigation systems | | | |

## 14. IMPLEMENTATION OF THE AIM TRANSITION

**Benefits**

| | |
|---|---|
| **Efficiency** | • facilitate the generation and distribution of aeronautical information which serves to improve the safe and cost-effective accessibility of air traffic services in the CAR Region, the benefits mentioned in performance objectives for PBN<br>• improve electronic aeronautical charts in display cockpit<br>• improve aeronautical chart production and on-board databases(FMS) |
| **Safety** | • improve situational awareness<br>• ensure, to the greatest extent possible, that aeronautical information safety solutions are Regionally harmonized and integrated related to multiple equipment carriage requirements for aircraft or multiple systems on the ground<br>• requirements for aircraft or multiple systems on the ground Review the benefits mentioned in performance objectives for PBN |

***Strategy***

| ATM Component | TASK DESCRIPTION | START-END | RESPON-SIBLE | STATUS |
|---|---|---|---|---|
| CM / **AUO** | ***Transition from AIS to AIM concept***<br><br>To be developed | | | |
| **GPIs** | GPI-5: Performance-based navigation; GPI-9: Situational awareness; GPI-11: RNP and RNAV SIDs and STARs; GPI-18: Aeronautical Information; GPI-20: WGS-84; GPI-21: Navigation systems | | | |

| 15. IMPROVE AVAILABILITY OF METEOROLOGICAL INFORMATION | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency**<br>• Assist ATM in tactical decision making for aircraft surveillance, air traffic flow management and flexible and dynamic routing of aircraft<br>• improve aerodrome and air space capacity<br>• improve situational awareness of pilots<br>• reduce unnecessary consumption of fuel and prevent unnecessary delays due to minimal meteorological conditions at the airports<br>• improve planning of flight itineraries<br>**Safety**<br>• Increase the number of flights in areas of fair weather conditions and prevent or reduce flights in areas of adverse meteorological conditions and volcanic ash clouds<br>• prevent landing operations at aerodromes under minimal meteorological conditions | | | | |
| **Strategy** | | | | |
| **ATM Component** | **TASK DESCRIPTION** | **START - END** | **RESPON-SIBLE** | **STATUS** |
| AOM, DCB, AO, TS, AUO | a) Increase facilities to disseminate and exchange aeronautical meteorological information<br>i) Increase AFTN, WAFS and internet facilities to disseminate OPMET data at meteorological offices and stations.<br>ii) Increase AFTN communications facilities to relay aircraft special reports from the air traffic control units to the meteorological offices<br>iii) Maintain and expand the number of workstations used to receive meteorological products of the World Area Forecast System | 2009-2015 | States, Territories | Valid |
| AOM,DCB, AO, TS, AUO | b) Increase availability, timeliness and quality of OPMET data<br>i) Improve the use of the METAR and TAF codes/templates used to disseminate meteorological reports and aerodrome forecasts<br>ii) Enhance preparation and availability of SIGMET information on hazardous meteorological conditions and volcanic ash clouds<br>iii) Enhance the availability of landing forecasts, TREND, considering user requirements | 2009-2015 | States, Territories | Valid |
| AOM, DCB, AO, TS, AUO | c) Establish contingency procedures to disseminate OPMET data, via Internet, in case of failure of the AFTN or WAFS facilities. | 2009 - 2015 | States, Territories ICAO NACC | Valid |
| AO | d) Improve the quality of data, provided by meteorological sensors, used in meteorological reports<br>• Establish verification and calibration programmes of data provided by meteorological instruments and automated weather systems at the aerodromes | 2009 - 2015 | States, Territories | Valid |
| AUO | e) Monitor availability and quality of OPMET data issued by CAR States and Territories and Territories and provide assistance if required | 2009 - 2015 | States, Territories | Valid |

| | | | | |
|---|---|---|---|---|
| AUO | f) Monitor participation of States and Territories in the International Airways Volcano Watch and provide assistance if necessary | 2009 - 2015 | ICAO NACC Washington VAAC | Valid |
| AUO | g) Monitor participation of States and Territories in the International Tropical Cyclone Watch and provide assistance if necessary | 2009 - 2015 | ICAO NACC Miami TCAC | Valid |
| AOM, DCB,AO, TS, AUO | h) Establish Quality Assurance Systems provided to the aeronautical meteorological service provided to users | 2010- 2015 | States, Territories | Valid |
| AUO | i) Conduct, every year, update seminars and courses on relevant operational aeronautical meteorological matters | 2009- 2015 | States, Territories ICAO NACC, WMO AR IV | Valid |
| AO, TS | j) Increase the number of automated weather systems at the aerodromes | 2011 - 2015 | States, Territories | Valid |
| AO, TS | k) Implement meteorological data downlinks at the MET and ATS units | 2012-- 2015 | States, Territories | Valid |
| AUO | l) Prepare monthly-hourly aerodrome climatological tables for flight planning | 2010 - 2015 | States, Territories | Valid |
| AUO | m) Prepare monthly-hourly climatological satellite images for route planning | 2010 - 2015 | States, Territories | Valid |
| **GPIs** | GPI/6 air traffic flow management, GPI/7 flexible/dynamic ATS route management, GPI/9 situational awareness, GPI/14 runway operations, GPI/17 implementation of datalink applications, GPI/18. aeronautical information, GPI 19. Meteorological systems. | | | |

| PBN en-route Action Plan<br>GPI 1, 4, 5, 7, 8, 10, 11, 12, 16, 21,23 | | | |
|---|---|---|---|
| **1 Airspace Concept** | **Start** | **End** | **Remarks** |
| 1.1 Establish and prioritize Strategic Objectives (Safety, Capacity, Environment, etc) | | | |
| 1.2 Collect air traffic data to understand airspace traffic flows in a particular airspace. | | | |
| 1.3 Analyse navigation capability of the fleet | | | |
| 1.4 Analyse communication, ground navigation (VOR, DME) and surveillance for navigation specification and reversionary mode compliance. | | | |
| 1.5 Optimise the airspace structure, by reorganising the network or implementing new routes based on the strategic objective of the airspace concept. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc. | | | |
| **2 Develop Performance Measurement Plan** | | | |
| 2.1 Prepare Performance Measurement Plan, including gas emission, safety, efficiency, etc. | | | |
| 2.2 Conduct Performance Measurement Plan | | | |
| **3 Airspace safety assessment** | | | |
| 3.1 Determine which methodology shall be used to evaluate airspace safety and ATS routes spacing, depending on the navigation specification. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc. | | | |
| 3.2 Prepare a data collection programme for airspace safety assessment | | | |
| 3.3 Prepare preliminary airspace safety assessment | | | |
| 3.4 Prepare final airspace safety assessment | | | |
| **4 Establish collaboration decision making (CDM) process** | | | |
| 4.1 Coordinate planning and implementation needs with Air Navigation Service Providers, Regulators, Users, aircraft operators and military authorities | | | |
| 4.2 Establish implementation date | | | |
| 4.3 Establish the documentation format of CAR/SAM RNAV/RNP Website | | | |

| | | | |
|---|---|---|---|
| 4.4 Report planning and implementation progress to the corresponding Regional Office | | | |
| **5 ATC Automated Systems** | | | |
| 5.1 Evaluate the PBN implementation in the ATC Automated Systems, considering the Amendment 1 to the PANS/ATM (FPLSG). | | | |
| 5.2 Implement the necessary changes in the ATC Automated Systems | | | |
| **6 Aircraft and operators approval** | | | |
| 6.1 Be aware of the national implementation programme and of the required navigation specifications | | | |
| 6.2 Analyse aircraft approval requirements, aircrew and operator approval requirements for the navigation specifications to be implemented, as contained in the ICAO PBN Manual | | | |
| 6.3 Publish the national regulations to implement the required ICAO navigation specifications | | | |
| 6.4 Approval of aircraft and operators for each type of procedure and navigation specification | | | |
| 6.5 Establish and keep updated a record of approved aircraft and operators | | | |
| 6.6 Verify operations with a continuing monitoring programme | | | |
| **7 Standards and Procedures** | | | |
| 7.1 Evaluate regulations for GNSS use, and if such were the case, proceed to its publication. | | | |
| 7.2 Finalize implementation of WGS-84 | | | |
| 7.3 Develop and publish AIC notifying PBN implementation planning | | | |
| 7.4 Publish AIP Supplement including applicable standards and procedures | | | |
| 7.5 Review Procedural Manuals of the ATS units involved | | | |
| 7.6 Update Letters of Agreement between ATS units | | | |
| 7.7 Develop amendment to the regional documentation, if necessary | | | |

| | | | | |
|---|---|---|---|---|
| 7.8 | Provide procedures to accommodate non-approved RNAV/RNP aircraft, when applicable | | | |
| 7.9 | Identify transition areas and procedures, if necessary | | | |
| 7.10 | Conduct ATC simulations to identify the workload/operational factors, if necessary, and report the simulations activities to the ATM Committee | | | |
| **8** | **Training** | | | |
| 8.1 | Develop a training programme and documentation for operators (pilots, dispatchers and maintenance) | | | |
| 8.2 | Develop training programme and documentation for Air Traffic Controllers and AIS Operators | | | |
| 8.3 | Develop training programme to regulators (aviation safety inspectors) | | | |
| 8.4 | Conduct training programmes | | | |
| 8.5 | Hold seminars oriented to operators, indicating the plans and the operational and financial benefits expected | | | |
| **9** | **Decision for implementation** | | | |
| 9.1 | Evaluate operational documentation availability (ATS, OPS/AIR) | | | |
| 9.2 | Evaluate the percentage of approved aircraft and operations (mixed equipage concerns) | | | |
| 9.3 | Review safety assessment results | | | |
| **10** | **System Performance Monitoring** | | | |
| 10.1 | Develop post-implementation en-route operations monitoring programme | | | |
| 10.2 | Execute post-implementation en-route operations monitoring programme | | | |
| **Pre operational implementation date** | | | | |
| **Definitive implementation date** | | | | |

| PBN TMA and Approach Action Plan<br>GPI 5, 7, 8, 10, 11, 12 | | | |
|---|---|---|---|
| **1 Airspace Concept** | **Start** | **End** | **Remarks** |
| 1.1 Establish and prioritize Strategic Objectives (Safety, Capacity, Environment, etc) | | | |
| 1.2 Collect air traffic data to understand airspace traffic flows in the TMA. | | | |
| 1.3 Analyse aircraft fleet navigation capacity operating in the TMA | | | |
| 1.4 Analyse communication, ground navigation (VOR, DME) and surveillance for navigation specification and reversionary mode compliance | | | |
| 1.5 Optimise the airspace structure, by implementing new SID and STARS, based on the strategic objective of the airspace concept. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc. | | | |
| **2. Develop Performance Measurement Plan** | | | |
| 2.1 Prepare Performance Measurement Plan, including gas emission, safety, efficiency, etc. | | | |
| 2.2 Conduct Performance Measurement Plan | | | |
| **3 Airspace safety assessment** | | | |
| 3.1 Determine which methodology shall be used to evaluate airspace safety and routes spacing, depending on the navigation specification. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc. | | | |
| 3.2 Prepare a data collection programme for airspace safety assessment | | | |
| 3.3 Prepare preliminary airspace safety assessment | | | |
| 3.4 Prepare final airspace safety assessment | | | |
| **4 Establish collaboration decision making (CDM) process** | | | |
| 4.1 Coordinate planning and implementation needs with Air Navigation Service Providers, Regulators, Users, aircraft operators and military authorities | | | |
| 4.2 Establish implementation date | | | |
| 4.3 Establish the documentation format of CAR/SAM RNAV/RNP Website | | | |
| 4.4 Report planning and implementation progress to the corresponding Regional Office | | | |

| PBN TMA and Approach Action Plan<br>GPI 5, 7, 8, 10, 11, 12 | | | |
|---|---|---|---|
| **5 ATC Automated Systems** | | | |
| 5.1 Evaluate the PBN implementation in the ATC Automated Systems, considering the Amendment 1 to the PANS/ATM (FPLSG). | | | |
| 5.2 Implement the necessary changes in the ATC Automated Systems | | | |
| **6 Aircraft and operator approval** | | | |
| 6.1 Be aware of the national implementation programme and of the required navigation specifications | | | |
| 6.2 Analyse aircraft approval requirements, aircrew and operator approval requirements for the navigation specifications to be implemented, as contained in the ICAO PBN Manual | | | |
| 6.3 Publish the national regulations to implement the required ICAO navigation specifications | | | |
| 6.4 Approval of aircraft and operators for each type of procedure and navigation specification | | | |
| 6.5 Establish and keep updated a record of approved aircraft and operators | | | |
| 6.6 Verify operations with a continuing monitoring programme | | | |
| **7 Standards and Procedures** | | | |
| 7.1 Evaluate regulations for GNSS use, and if such were the case, proceed to its publication. | | | |
| 7.2 Develop and publish AIC notifying PBN implementation planning | | | |
| 7.3 Publish AIP Supplement including applicable standards and procedures | | | |
| 7.4 Review Procedural Manuals of the ATS units involved | | | |
| 7.5 SID and/or STAR Ground Validation and Flight Inspection/Flight Validation | | | |
| 7.6 Data Base Validation Requirements/Procedures | | | |
| 7.5 Update Letters of Agreement between ATS units | | | |
| 7.6 Provide procedures to accommodate non-approved RNAV/RNP aircraft, when applicable | | | |
| 7.7 Conduct ATC simulations to identify the workload/operational factors, if necessary. | | | |
| **8 Training** | | | |

| PBN TMA and Approach Action Plan<br>GPI 5, 7, 8, 10, 11, 12 | | | |
|---|---|---|---|
| 8.1 Develop a training programme and documentation for operators (pilots, dispatchers and maintenance) | | | |
| 8.2 Develop training programme and documentation for Air Traffic Controllers and AIS Operators | | | |
| 8.3 Develop training programme to regulators (aviation safety inspectors) | | | |
| 8.4 Conduct training programmes | | | |
| 8.5 Hold seminars oriented to operators, indicating the plans and the operational and financial benefits expected | | | |
| **9 Decision for implementation** | | | |
| 9.1 Evaluate operational documentation availability (ATS, OPS/AIR) | | | |
| 9.2 Evaluate the percentage of approved aircraft and operations (mixed equipage concerns) | | | |
| 9.3 Review safety assessment results | | | |
| **10 System Performance Monitoring** | | | |
| 10.1 Develop post-implementation TMA operations monitoring programme | | | |
| 10.2 Execute post-implementation TMA operations monitoring programme | | | |
| **Pre operational implementation date** | | | |
| **Definitive implementation date** | | | |

| PBN Approach Procedures Action Plan<br>GPI 1, 12, 16, 21, 23 | | | |
|---|---|---|---|
| **1 Airspace Concept** | **Start** | **End** | **Remarks** |
| 1.1 Establish and prioritize Strategic Objectives (Safety, Capacity, Environment, etc) | | | |
| 1.2 Analyse aircraft fleet navigation capacity operating in the Airport | | | |
| 1.3 Analyse communication, ground navigation (VOR, DME) and surveillance for navigation specification and reversionary mode compliance | | | |
| 1.4 Design Instrument Approach Procedure (RNP APCH/APV Baro-VNAV or RNP AR), based on the strategic objective of the airspace concept. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc. | | | |
| **2 Develop Performance Measurement Plan** | | | |
| 2.1 Prepare Performance Measurement Plan, including gas emission, safety, efficiency, etc. | | | |
| 2.2 Conduct Performance Measurement Plan | | | |
| **3 Procedure safety assessment** | | | |
| 3.1 Determine which methodology shall be used to evaluate procedure safety, depending on the navigation specification. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc. | | | |
| 3.2 Prepare a data collection programme for airspace safety assessment | | | |
| 3.3 Prepare preliminary procedure (s) safety assessment | | | |
| 3.4 Prepare final procedure (s) safety assessment | | | |
| **4 Establish collaboration decision making (CDM) process** | | | |
| 4.1 Coordinate planning and implementation needs with Air Navigation Service Providers, Regulators, Users, aircraft operators and military authorities | | | |
| 4.2 Establish implementation date | | | |
| 4.3 Establish the documentation format of CAR/SAM RNAV/RNP Website | | | |
| 4.4 Report planning and implementation progress to the corresponding Regional Office | | | |

| PBN Approach Procedures Action Plan<br>GPI 1, 12, 16, 21, 23 | | | |
|---|---|---|---|
| **5 ATC Automated Systems** | | | |
| 5.1 Evaluate the PBN implementation in the ATC Automated Systems, considering the Amendment 1 to the PANS/ATM (FPLSG). | | | |
| 5.2 Implement the necessary changes in the ATC Automated Systems | | | |
| **6 Aircraft and operator approval** | | | |
| 6.1 Be aware of the national implementation programme and of the required navigation specifications | | | |
| 6.2 Analyse aircraft approval requirements, aircrew and operator approval requirements for the navigation specifications to be implemented, as contained in the ICAO PBN Manual | | | |
| 6.3 Publish the national regulations to implement the required ICAO navigation specifications | | | |
| 6.4 Approval of aircraft and operators for each type of procedure and navigation specification | | | |
| 6.5 Establish and keep updated a record of approved aircraft and operators | | | |
| 6.6 Verify operations with a continuing monitoring programme | | | |
| **7 Standards and procedures** | | | |
| 7.1 Evaluate regulations for GNSS use, and if such were the case, proceed to its publication. | | | |
| 7.2 Develop and publish AIC notifying PBN implementation planning | | | |
| 7.3 Publish AIP Supplement including applicable standards and procedures | | | |
| 7.4 Review Procedural Manuals of the ATS units involved | | | |
| 7.5 Update Letters of Agreement between ATS units, if necessary | | | |
| 7.6 Provide procedures to accommodate non-approved RNAV/RNP aircraft, when applicable | | | |
| 7.7 Conduct ATC simulations to identify the workload/operational factors, if necessary. | | | |
| **8 Training** | | | |

| PBN Approach Procedures Action Plan<br>GPI 1, 12, 16, 21, 23 | | | |
|---|---|---|---|
| 8.1 Develop a training programme and documentation for operators (pilots, dispatchers and maintenance) | | | |
| 8.2 Develop training programme and documentation for Air Traffic Controllers and AIS Operators | | | |
| 8.3 Develop training programme to regulators (aviation safety inspectors) | | | |
| 8.4 Conduct training programmes | | | |
| 8.5 Hold seminars oriented to operators, indicating the plans and the operational and financial benefits expected | | | |
| **9 Decision for implementation** | | | |
| 9.1 Evaluate operational documentation availability (ATS, OPS/AIR) | | | |
| 9.2 Evaluate the percentage of approved aircraft and operations (mixed equipage concerns) | | | |
| 9.3 Review safety assessment results | | | |
| **10 System Performance Monitoring** | | | |
| 10.1 Develop post-implementation APP operations monitoring programme | | | |
| 10.2 Execute post-implementation APP operations monitoring programme | | | |
| **Pre operational implementation date** | | | |
| **Definitive implementation date** | | | |

**2009-2014**
**FOLLOW-UP AND IMPLEMENTATION ACTION PLAN**
**AIR-GROUND AND GROUND-GROUND COMMUNICATIONS**

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 12 a), 12 b) | Improve VHF and HF/AMS (R) coverages and mitigate deficiencies | States/ Territories coordinated by WG | Oct 2009 | April 2010 | • Deficiencies Identification and<br>• Corresponding corrective action plan | References to CNS tables 2A and 2B |
| 2 | 12 a), 12 b) | Improve AFTN communications and ATS direct communications and mitigate deficiencies | States/ Territories coordinated by WG | Oct 2009 | November 2010 | • Deficiencies Identification and<br>• Corresponding corrective action plan | References to CNS tables 1A and 1C |
| 3a | 12 a), 12 b) | Replace E/CAR Telecommunication network by ECAR VSAT network | E/CAR NTG | Oct 2009 | Mid 2011 | E/CAR VSAT Telecommunication Network | |
| 3b | 12a), 12 b) | MEVA II REDDIG Interconnection | Jamaica, Netherland Antilles, COCESNA | Jul 2009 | May 2010 | MEVA II REDDIG Network Interconnection | |
| 3c | 12a), 12 b) | MEVA II REDDIG Integration | MEVA TMG | Jul 2009 | 2014 | MEVA II REDDIG Network Integration | |
| 4 | 1 b) | Evaluation of required communication infrastructure to satisfy the navigation requirements based on PBN. | States/ Territories coordinated by WG | July 2009 | Dec 2010 | Analysis of communication infrastructure | |
| 5 | 7 l) | Adoption of an "equipment modernization/DATIS Service implementation plan for international airports" in compliance to the ATM requirements. | States/ Territories coordinated by WG | July 2009 | Dec 2012 | DATIS Modernization and Implementation Plan | |
| 6 | 12 c) | Elaborate Air-ground datalink progressive execution Plan based on CAR/SAM Activities Plan and Datalink implementation programme (Appendix AW and AX of Agenda 3 of GREPECAS/13). | GREPECAS CNS/ATM/SG (ATN TF) | June 2009. | Dec 2010 | Initial Transition Plan for ATN Air-ground applications | References to CNS table 1Bc |

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 7 | 12 c) | Elaborate ATN AIDC Implementation Plan | GREPECAS CNS/ATM/SG (ATN TF) | June2009. | Dec 2010 | Initial Transition Plan for ATN ground-ground Applications (AIDC) | |
| 8 | 12 c) | Update the ATN Routers Regional Plan | GREPECAS CNS/ATM/SG (ATN TF) | June2009. | June 2010 | CNS Table 1Ba Updated proposal | References to CNS table 1Ba |
| 9 | 12 d) | Preliminary review of ATN Routers Regional Plan | States/ Territories coordinated by WG | Oct 2009 | April 2010 | Comments to current version of CNS Table 1Ba | References to CNS table 1Ba |
| 10 | 12 d) | Evaluation of AMHS CAAS addresses proposal | States/ Territories coordinated by WG | Oct 2009 | March 2010 | Comments to AMHS CAAS addresses proposal | CAR AMHS CAAS Addresses Proposal |
| 11 | 12 d) | Technical evaluation of communications and interfaces for AIDC implementation over the AFTN. | States/ Territories coordinated by WG | Oct 2009 | June 2010 | Technical recommendations for AIDC implementation over the AFTN | |
| | | Perform activities for the implementation of the ATN and its applications according to the CAR/SAM Regional strategy for the implementation of the ATN and its applications. (Appendix BA of Agenda 3 of GREPECAS/13 Report).: | | | | | |
| 12 | 12 d) | i. Perform AMHS operation trials | Dom Rep., Jamaica, USA, Trinidad & Tobago, COCESNA | Oct 2009 | Jul 2010 | Trial results | |
| 13 | 12 e), 7c) | ii. Evaluation of regional networks to support ATN Applications | States/ Territories coordinated by WG | Oct 2009 | May 2010 | Trial results | |
| 14 | 12 d) | iii. Update of Regional Plan for ATN ground-ground applications | States/ Territories coordinated by WG | Oct 2009 | June 2010 | Updates to Regional Plan for ATN ground-ground applications | References to CNS table 1Bb |

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 15 | 12 e) | iv. Review of CAR/SAM Regional Program for the implementation of the air – ground data links | States/ Territories coordinated by WG | Oct 2009 | March 2010 | Comments to this Regional Program | Reference: CAR/SAM Regional Program for the implementation of the air – ground data links |
| 16 | 12 e), 12 g) | v. A-G Applications trial Plans | States/ Territories coordinated by WG | Oct 2009 | Nov 2010 | Trial Plans for A-G Applications | |
| 17 | 12 d), 12 e) | vi. Participate on training seminars and events | States/ Territories | Oct 2009 | Nov 2011 | Participation on events | |
| 18 | 12 c) | Procure the application of management and coordination of frequency assignments and the implementation of tools for this goal. | ICAO | Jul 2009 | Dec 2010 | Frequency Management and coordination tools | |
| 19 | 12 c) | Implement management and coordination of frequencies with ICAO | States/ Territories | Oct 2009 | Dec 2010 | Comments to ICAO reviewed frequency assignment lists | |
| 20 | 12 c) | Comments to management frequency tools provided by ICAO | Participant States (Barbados, Dominican Rep., French Antilles, Jamaica, Trinidad and Tobago, COCESNA, ECCAA | Nov 2009 | Apr 2010 | Comments and evaluation of tools | |
| 21 | 11 a) | Promote and coordinate diffusion of ICAO position for WRC-2012 | ICAO | Oct 2009 | Dec 2011 | Promote ICAO position | |
| 22 | 11 b), 11 e) | Participate and coordinate with their national spectrum regulation entities the support to ICAO position for the WRC-2012 | States/ Territories | Oct 2009 | Dec 2011 | Support ICAO position in WRC-2012 related meetings | |

2009-2014

**FOLLOW-UP AND IMPLEMENTATION ACTION PLAN**
**NAVIGATION SYSTEMS**

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 1 b) | Evaluation of required navigation infrastructure to satisfy the PBN based navigation requirements, identifying improvements and deficiencies | States/ Territories coordinated by WG | Oct 2009 | Dec 2010 | 1. Analysis of required navigation infrastructure for example: DME-DME coverage for selected ATS routes for RNAV 5<br>2. Identification of deficiencies<br>3. Corresponding corrective Action plan | Reference to CNS table 3 |
| 2 | 1 b), 2c), 3 b) | Development of a regional strategy for the implementation of navigation systems | GREPECAS CNS/ATM/SG | Sep 2009 | Dec 2009 | Regional Strategy for Navigation Systems | Navigation Infrastructure alternatives for PBN |
| 3 | 1 b), 2c), 3 b) | Develop recommendations for training in GNSS elements | GREPECAS CNS/ATM/SG | Sep 2009 | Dec 2009 | recommendations for training in GNSS elements | Navigation Infrastructure alternatives for PBN |
| 4 | 1 b), 2c), 3 b) | Plans on GNSS systems (SBAS y GBAS) and trial conduction. | States/ Territories coordinated by WG | Oct 2009 | Dec 2014 | GNSS trial plan | Navigation Infrastructure alternatives for PBN |
| | | | | | | | |

**2009-2011**
**FOLLOW-UP AND IMPLEMENTATION ACTION PLAN**
**SURVEILLANCE SYSTEMS**

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 7 e) | Evaluation of radar coverage and identification of improvements to satisfy operative requirements. | States/ Territories coordinated by WG | Oct 2009 | April 2010 | • Identification of improvements and<br>• Respective Action Plan | Reference to CNS table 4A |
| 2 | 7 e) | Radar Data Sharing implementation | Barbados, Cayman Islands, Cuba, French Antilles, Jamaica, Haiti, Netherland Antilles, Saint Lucia, Trinidad & Tobago, , USA, COCESNA, | Oct 2009 | Dec 2010 | Agreements and implementation of radar data sharing | |
| 3 | 1 b) | Evaluation of surveillance infrastructure to satisfy navigation requirements for PBN | States/ Territories coordinated by WG | Oct 2009 | Dec 2010 | Analysis of surveillance infrastructure | |
| 4 | 7 k) | Implementation of 24 bits Address registry | States/ Territories coordinated by WG | Oct 2009 | Dec 2010 | 24 bits Address registry | |
| 5 | 12 g), 7 k) | ADS-B, ADS-C and MLAT trials | States/ Territories coordinated by WG | Oct 2009 | Dec 2015 | Trials on ADS-B, MLAT and ADS-C | |
| 6 | 12 g), 7 k) | ADS-B cost – benefit analysis | States/ Territories coordinated by WG | Oct 2009 | Dec 2015 | ADS-B cost-benefit analysis | |
| 7 | 7e), 7 k) | *Development of a regional strategy for surveillance systems* | GREPECAS CNS/ATM/SG | July 2009 | Apr 2010 | Regional Strategy for Surveillance Systems | |
| 8 | 7 k) | Mode S radar implementation and update to Regional Plan on Surveillance Systems | States/ Territories coordinated by WG | Oct 2009 | Dec 2011 | Information on Mode S Radar implementation and updates to Regional Plan | Reference to CNS table 4A |
| | | | | | | | |

**2009-2011**
**FOLLOW-UP AND IMPLEMENTATION ACTION PLAN**
**AERODROMES AND GROUND AIDS (AGA)**

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 10 c) | Implement an action plan for the prevention of runway incursions. | States / Territories | Dec 2009 | Dec 2010 | • Establish a specific set of recommendations to implement for aerodrome community involved in runway operations. | |
| 2 | 10 c), g) | Implement Advanced Surface Movement Guidance and Control System (A-SMGCS) | States / Territories | Dec 2009 | Dec 2014 | • The implementation of A-SMGCS Level 1 gives accurate surveillance picture of the traffic on and adjacent to the runway, including the position and identify all known traffic and unknown traffic (or intruders).<br>• Detect when a landed aircraft has vacated the runway.<br>• Know when a departure starts rolling on the runway<br>• By observing the speed of a landed aircraft, decide if another departure is possible or not before the next landing<br>• Detects when a vehicle is on the runway. | |
| | 10 e) | | | | | • The implementation of A-SMGCS will provide controllers with an accurate picture of the traffic situation under all weather conditions. This will enable the controller to maintain situational awareness under all conditions. In poor weather it will help to reduce workload and improve planning through knowledge of the actual and pending traffic situation. | |
| | 10 c), e) | | | | | • Will ensure complete situational awareness under all conditions and enable controllers to detect aircraft and vehicles diverting from given clearances. | |
| 3 | 10 d) | Implement the Airport airside Capacity analysis, Enhancement and planning (ACE) procedure. | States / Territories | Dec 2009 | Dec 2014 | • Accurate assessment of capacity in reduced weather conditions.<br>• Implementation of best in class practices based upon existing ICAO criteria. | |

| No. | Performance Objective Task | Action Description | Responsible | Begin date | End date | Deliverables | Observations |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4 | 10 e) | Implement Airport Collaborative Decision Making (CDM) recovery of adverse meteorological conditions procedure. | States / Territories | Dec 2009 | Dec 2014 | • The Collaborative Decision Making (CDM) in Adverse Conditions consists of a collaborative management of the capacity of a CDM Airport during periods of a predicted or unpredicted reduction of capacity. | |
| 5 | 10 f) | Implement the Airport Collaborative Decision Making Turn-Round process. | States / Territories | DEC 2009 | Dec 2014 | • The Collaborative Decision Making turn-round process identifies significant steps from which it is possible to accurately monitor the progress of an aircraft. This permits common and accurate situational awareness of all involved in the process, plus the availability of accurate departure times which can be provided to air traffic control. | |
| 6 | 10 f) | Implement the Airport Collaborative Decision Making Variable Taxi Time procedure. | States / Territories | Dec 2009 | Dec 2014 | • Variable taxi time calculation consists of calculating and distributing the actual times it will take an aircraft to taxi from each parking stand to the runway, a time which can vary significantly depending on the taxiway used. The goal is to improve the traffic predictability. | |

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