Organización de Aviación Civil Internacional
Oficina para Norteamérica, Centroamérica y Caribe (NACC)
Primera Reunión del Grupo de Trabajo sobre implementación de Navegación Aérea para las Regiones NAM/CAR (ANI/WG/1)
Ciudad de México, México, 29 de julio al 1 de agosto de 2013

Cuestión 4 del Orden del Día: **Asuntos de Navegación Aérea**

4.2 Seguimiento al Plan de Implementación de Navegación Aérea Basado en la Performance para las Regiones NAM/CAR (RPBANIP NAM/CAR)

REVISIÓN DEL BORRADOR DEL PLAN PROVISIONAL DE IMPLEMENTACIÓN DE NAVEGACIÓN AÉREA BASADO EN LA PERFORMANCE PARA LAS REGIONES NAM/CAR (RPBANIP NAM/CAR) ALINEADO CON LA METODOLOGÍA DE MEJORAS POR BLOQUES DEL SISTEMA DE AVIACIÓN (ASBU)

(Presentada por la Secretaría)

RESUMEN

La revisión del borrador del Plan de Implementación de Navegación Aérea Basado en la Performance para las Regiones NAM/CAR (RPBANIP NAM/CAR) alineado con la metodología de Mejoras por Bloques del Sistema de Aviación (ASBU) de la OACI se presenta en el **Apéndice** a esta nota. Este borrador resultó del *Taller Regional NAM/CAR de la OACI sobre el Marco de Referencia de la Metodología de Mejoras por Bloques del Sistema de Aviación (ASBU): Planificación, Implementación y Monitoreo*, celebrado en las Oficinas Regionales de la OACI, en la Ciudad de México, México, del 22 al 26 de julio de 2013.

Acción: Se invita a la Reunión a revisar el borrador de este documento y formular las acciones necesarias apoyando las actividades de implementación de navegación aérea en las Regiones NAM/CAR.

Referencias:

- Informe final del Taller Regional NAM/CAR de la OACI sobre el Marco de Referencia de la Metodología de Mejoras por Bloques del Sistema de Aviación (ASBU): Planificación, Implementación y Monitoreo, Ciudad de México, México, del 22 al 26 de julio de 2013.
- Plan de Implementación de Navegación Aérea Basado en la Performance para las Regiones NAM/CAR (RPBANIP NAM/CAR http://www.mexico.icao.int/RegionalGroups/NAMCARRPBANIPV02May2011en.pdf

Objetivos Estratégicos	*Esta nota de estudio se relaciona con los Objetivos estratégicos:* *A. Seguridad operacional* *C. Protección al medio ambiente y desarrollo sostenible del transporte aéreo*

(Working Draft) NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)

DRAFT v3.0 — 25 July 2013

International Civil Aviation Organization

This document is available in the ICAO North America, Central America and Caribbean (NACC) Regional Office web site: http://www.mexico.icao.int

(Working Draft) NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)

DRAFT 2013

Working Draft Revision History

Date	Description of changes	Version
May 2011	First version of the performance-based Plan	1.0
May 2011	Incorporates changes with NFPL RPO and PBN concept	2.0
June 2013	Incorporates changes with ASBU methodology and adopted ASBU B0 modules	3.0

AMENDMENTS

The amendments will be submitted to all stakeholders by the ICAO NACC Regional Office, and an uploaded version will be available in web site. The stakeholders should submit any Change Proposal to the ICAO NACC regional office, who will conduct appropriate coordination. The table below provides record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS			
No.	Date applicable	Date entered	Entered by

CORRIGENDA			
No.	Date applicable	Date entered	Entered by

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FOREWORD.

1. Scope and purpose

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 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.

1.6 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.

1.7 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.

1.8 More challenges are in the horizon to achieve an ATM seamless system in the 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 capacit

1.9 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 unmatched capabilities occupy the airspace and their conflicting demands need to be accommodated.

1.10 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.

1.11 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. Status

This document contains guidance material to asssit States in the implementation of operatiponal improvements related to ICAO Standards and Recommended Practices (SARPs) or PANS provisions. It also comprises material related to the regional performance-based air navigation implementation plan for NAM and CAR Regions (NAM/CAR RPBANIP).

3. Implementation

Actions Plans + States may select particular operationa initiatives to develop their national plan based on the regional plan.

4. Promulgation of information

Information relating to the establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations should be notified and take effect in accordance with Annex 15 — Aeronautical Information Services.

5. References

6.1 The following references are cited in this document:

a) ICAO Annex 10 — *Aeronautical Telecommunications – Volume II* — Communication Procedures including those with PANS status

b) ICAO Annex 10 — *Aeronautical Telecommunications – Volume III* — Communication Systems

c) ICAO Annex 11 — *Air Traffic Services*

d) ICAO Annex 15 — *Aeronautical Information Services*

e) *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, ICAO Doc 4444)

f) *Regional Supplementary Procedures* (Regional SUPPs, ICAO Doc 7030)

g) *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, ICAO Doc 8400)

h) *Manual on Airspace Planning Methodology for the Determination of Separation Minima* (ICAO Doc 9689)

i) *Performance-based Navigation Manual* (PBN) (ICAO Doc 9613)

j) *Manual on Required Communication Performance* (RCP) (ICAO Doc 9869)

6. Changes to the document

This document is maintained as a regional document in coordination with all ICAO regional planning and implementation groups within their region. Participats established a mechanism for submitting and administering change proposals.

Change proposals (CPs) can be submitted by any ICAO NACC Regional Office The stakeholder should submit a Change Proposal to their ICAO NACC regional office. The ICAO regional office will coordinate the change proposal with all stakeholders in NAM/CAR regions, other regions, and ICAO HQ, to determine the acceptability of the change proposal. Once the ICAO NACC regional office has completed coordination process with stakeholders the RPB-ANIP will be kept uploaded in its web page.

Chapter 1. Definitions

1.1 Terms and definitions

When the following terms are used in this document they have the following meanings. Where the term has "(ICAO)" annotated, the term has already been defined as such in SARPs and/or PANS.

Term

ADS-C service. A term used to indicate an ATS service that provides surveillance information by means of the ADS-C application.

Note.— ICAO Doc 4444 does not include ADS-C in its definition for ATS surveillance system. Therefore, an ATS surveillance service does not consider those provided by means of the ADS-C application, unless it can be shown by comparative assessment to have a level of safety and performance equal to or better than monopulse SSR.

Aeronautical fixed telecommunication network (AFTN). A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics. (ICAO)

Aeronautical Information Publication (AIP). A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation. (ICAO)

Aeronautical operational control (AOC). Communication required for the exercise of authority over the initiation, continuation, diversion or termination of flight for safety, regularity and efficiency reasons. (ICAO)

Aeronautical telecommunication network (ATN). A global internetwork architecture that allows ground, air-ground and avionic data subnetworks to exchange digital data for the safety of air navigation and for the regular, efficient and economic operation of air traffic services. (ICAO)

Air navigation services provider (ANSP). An organization responsible for the provision of air traffic services.

Air traffic control (ATC) clearance. Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

Note 1.— For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.

Note 2.— The abbreviated term "clearance" may be prefixed by the words "taxi", "take-off", "departure", "en-route", "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates.

(ICAO)

Term

Air traffic control (ATC) service. A service provided for the purpose of:

a) preventing collisions:

1) between aircraft, and

2) on the manoeuvring area between aircraft and obstructions; and

b) expediting and maintaining an orderly flow of air traffic. (ICAO)

Air traffic management (ATM). The dynamic, integrated management of air traffic and airspace including air traffic services, airspace management and air traffic flow management — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions. (ICAO)

Air traffic service (ATS). A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service). (ICAO)

Airborne collision avoidance system (ACAS). An aircraft system based on secondary surveillance radar (SSR) transponder signals which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders. (ICAO)

Area control centre (ACC). A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction. (ICAO)

ATC waypoint. A waypoint contained in Item 15 of the ICAO flight plan, or as amended by ATC.

Note.— A waypoint inserted by the flight crew for purposes of conducting flight operations such as points of no return are not ATC waypoints.

ATS interfacility data communication (AIDC). Automated data exchange between air traffic services units, particularly in regard to co-ordination and transfer of flights. (ICAO)

ATS surveillance service. A term used to indicate a service provided directly by means of an ATS surveillance system. (ICAO)

ATS surveillance system. A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

Note.— A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

Automatic dependent surveillance — broadcast (ADS-B). A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link. (ICAO)

Term

Automatic dependent surveillance — contract (ADS-C). A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports. (ICAO)

Note.— The abbreviated term "ADS contract" is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

C for $RSTP_{CSP}$. The proportion of surveillance messages that can be delivered within the specified $RSTP_{CSP}$ time.

C for TRN. The proportion of intervention messages and responses that can be delivered within the specified TRN time for intervention.

Call sign. The designator used in air-ground communications to identify the aircraft and is equivalent to the encoded aircraft identification.

Closed message. A message that:

a) contains no message elements that require a response; or

b) has received a closure response.

Closure response. A message containing a message element that has the ability to close another message.

Compulsory reporting point. An ATC waypoint for which a position report is required by the aircraft.

Control area (CTA). A controlled airspace extending upwards from a specified limit above the earth. (ICAO)

Controller. A person authorized by the appropriate authority to provide air traffic control services.

Controller-pilot data link communications (CPDLC). A means of communication between controller and pilot, using data link for ATC communications. (ICAO)

CPDLC dialogue. (See ICAO definition for "dialogue.")

a) a single message that is a closed message; or

b) a series of messages beginning with an open message, consisting of any messages related to the original open message and each other through the use of a Message Reference Number (MRN) and ending when all of these messages are closed.

CPDLC message. Information exchanged between an airborne application and its ground counterpart. A CPDLC message consists of a single message element or a combination of message elements conveyed in a single transmission by the initiator.

Note. -- The abbreviated term 'message' is commonly used to refer to a CPDLC message.

Term

CPDLC message element. A component of a message. A message element is defined for specific uses (e.g., vertical clearance, route modification). A"free text message element" provides additional capability.

Note. -- The abbreviated term 'message element' is commonly used to refer to a CPDLC message element.

Current data authority (CDA). The designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place. (ICAO)

Current flight plan. (See flight plan).

Data link initiation capability (DLIC). A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications. (ICAO)

Dialogue. A co-operative relationship between elements which enables communication and joint operation. (ICAO)

Downlink message (DM). A CPDLC message sent from an aircraft.

Dynamic airborne re-route procedure (DARP). The procedure for executing a re-route clearance initiated by a request from AOC.

Filed flight plan. (See flight plan).

Flight crew member. A person authorized by the appropriate authority charged with duties essential to the operations of an aircraft on the flight deck during a flight duty period.

Flight identification. A group of numbers, which is usually associated with an ICAO designator for an aircraft operating agency, to identify the aircraft in Item 7 of the flight plan.

Flight information region (FIR). An airspace of defined dimensions within which flight information service and alerting service are provided. (ICAO)

Flight level (FL). A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals. (ICAO)

Note 1.— A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

a) when set to a QNH altimeter setting, will indicate altitude;

b) when set to QFE altimeter setting, will indicate height above the QFE reference datum;

c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.

Note 2.— The terms "height" and "altitude", used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

Term

Flight plan. Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft. (ICAO)

A flight plan can take several forms, such as:

Current flight plan (CPL). The flight plan, including changes, if any, brought about by subsequent clearances. (ICAO)

Note 1.— When the word "message" is used as a suffix to this term, it denotes the content and format of the current flight plan data sent from one unit to another.

Filed flight plan (FPL). The flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes. (ICAO)

Note 2.— When the word "message" is used as a suffix to this term, it denotes the content and format of the filed flight plan data as transmitted.

Aircraft active flight plan. The flight plan used by the flight crew. The sequence of legs and associated constraints that define the expected 3D or 4D trajectory of the aircraft from takeoff to landing. (RTCA/EUROCAE)

FMC WPR service. A term used to indicate an ATS service that provides surveillance information by means of the FMC WPR application.

Note.— ICAO Doc 4444 does not include FMC WPR in its definition for ATS surveillance system. Therefore, an ATS surveillance service does not consider those provided by means of the FMC WPR application, unless it can be shown by comparative assessment to have a level of safety and performance equal to or better than monopulse SSR.

Figure of merit. An indication of the aircraft navigation system's ability to maintain position accuracy.

Free text message element. A message element used to exchange information not conforming to a defined message element.

Lateral deviation event (LDE). A type of event that triggers an ADS-C report when the absolute value of the lateral distance between the aircraft`s actual position and the aircraft`s expected position on the aircraft active flight plan becomes greater than the lateral deviation threshold.

Level range deviation event (LRDE). A type of event that triggers an ADS-C report when the aircraft`s level is higher than the level ceiling or the aircraft`s level is lower than the level floor.

Note.— Sometimes referred to as altitude range change event or altitude range event.

Maximum accumulated unplanned outage time (min/yr). Measured by accumulating ***only*** the duration times for unplanned outages greater than the unplanned outage duration limit during any 12-month period. The accumulation is performed separately for each relevant operational airspace.

Maximum number of unplanned outages. Measured separately for each relevant operational airspace over any 12-month period.

Term

Message. Basic unit of user information exchanged between an airborne application and its ground counterpart or between two ground applications. Messages are passed in one or more data blocks from one end user to another through different subnetworks. (ICAO Doc 9880)

Note.— Used in this document to mean CPDLC message.

Message element. A component of a message used to define the context of the information exchanged. (ICAO Doc 9880)

Note.— Used in this document to mean CPDLC message element.

Message element identifier. The ASN.1 tag of the ATCUplinkMsgElementId or the ATCDownlinkMsgElementId. (ICAO)

Message identification number (MIN). An integer in the range 0 to 63 (inclusive) that uniquely identifies specific uplink and downlink messages for each CPDLC connection.

Military assumes responsibility for the separation of aircraft (MARSA). Procedures between the controller and the aircraft that delegate the separation responsibility temporarily to the military authority operating the flights, thereby relieving ATC of the separation workload.

Minimum equipment list (MEL). A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type. (ICAO)

Monitored operational performance (TRN). The portion of the transaction time (used for intervention) that does not include the times for message composition or recognition of the operational response.

Multi-element message. A CPDLC message consisting of more than one message element (clearance, instruction or information), handled by the controller of the flight crew as a single message.

Next data authority. The ground system so designated by the current data authority through which an onward transfer of communications and control can take place. (ICAO)

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations. (ICAO)

Open message. A message that contains at least one message element that requires a response. An open message remains open until the required response is received.

Operational communication transaction. The process a human uses to initiate the transmission of an instruction, clearance, flight information, and/or request, and is completed when that human is confident that the transaction is complete.

Preformatted free text message. A free text message element that is stored within the aircraft system or ground system for selection.

Term

Procedural airspace. An airspace where information derived from an ATS surveillance system is not required for the provision of air traffic control service.

Radio operator. A person authorized by the appropriate authority to relay a radiotelephony communication between the ATSU and the flight crew.

RCP availability (A). The required probability that an operational communication transaction can be initiated when needed.

RCP continuity (C). The required probability that an operational communication transaction can be completed within the communication transaction time, either ET or TT 95%, given that the service was available at the start of the transaction.

RCP expiration time (ET). The maximum time for the completion of the operational communication transaction after which the initiator is required to revert to an alternative procedure.

RCP integrity (I). The required probability that an operational communication transaction is completed with no undetected errors.

Note.— Whilst RCP integrity is defined in terms of the "goodness" of the communication capability, it is specified in terms of the likelihood of occurrence of malfunction on a per flight hour basis (e.g. 10^{-5}), consistent with RNAV/RNP specifications.

RCP nominal time (TT 95%). The maximum nominal time within which 95% of operational communication transactions is required to be completed.

RCP specification. A set of ATS provision, including communication services, operator and flight crew requirements (e.g. RCP 240) needed for communications supporting a performance-based operation within a defined airspace.

RCP type. A label (e.g. RCP 240) that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity. (ICAO)

Note.— This document uses the term RCP specification to align RCP with RNP and RNAV specifications provided in the Performance Based Navigation Manual.

$RCTP_{AIR}$. The summed critical transit times for an ATC intervention message and a response message, allocated to the aircraft system.

$RCTP_{ATSU}$. The summed critical transit times for an ATC intervention message and a response message, allocated to the ATSU system.

$RCTP_{CSP}$. The summed critical transit times for an ATC intervention message and a response message, allocated to the CSP system.

Required communication performance (RCP). A statement of the performance requirements for operational communication in support of specific ATM functions. (ICAO)

Term

Required communication technical performance (RCTP). The portion of the (intervention) transaction time that does not include the human times for message composition, operational response, and recognition of the operational response.

Required surveillance technical performance (RSTP). The technical transit time for surveillance data delivery from the time associated with the aircraft's position to when the recipient (e.g. ATSU) receives the report, but does not include the generation or processing of the report.

Required navigation performance (RNP). A statement of the navigation performance necessary for operation within a defined airspace. (ICAO)

Note.— Navigation performance and requirements are defined for a particular RNP type and/or application.

Responder performance criteria. The operational portion of the transaction time to prepare the operational response, and includes the recognition of the instruction, and message composition (e.g. flight crew/HMI) for intervention transactions.

RSP specification. A set of ATS provision, including communication services, aircraft and operator requirements (e.g. RSP 180) needed for surveillance supporting a performance-based operation within a defined airspace.

$RSTP_{AIR}$. The overdue (OD) and nominal (DT) transit times for surveillance data from the aircraft system to the antenna.

$RSTP_{ATSU}$. The overdue (OD) and nominal (DT) transit times for surveillance data from the CSP interface to the ATSU's flight data processing system.

$RSTP_{CSP}$. The overdue (OD) and nominal (DT) transit times for surveillance data allocated to the CSP.

Service availability (A_{CSP}). The required probability that the communication service is available to all users in a specific airspace when desired.

Standardized free text message. A message element that uses a defined free text message format, using specific words in a specific order which has been agreed by stakeholders. Standardized free text message elements may be manually entered by the user or may be a preformatted free text message.

Standard message element. Any message element defined by ICAO Doc 4444 that does not contain the [free text] parameter.

RSP availability (A). The required probability that surveillance data can be provided when needed.

RSP continuity (C). The required probability that surveillance data can be delivered within the surveillance delivery time parameter, either OT or DT 95%, given that the service was available at the start of delivery.

Term

Surveillance data. Data pertaining to the identification of aircraft and/or obstructions for route conformance monitoring and safe and efficient conduct of flight.

Surveillance data delivery. The process for obtaining surveillance data.

RSP data transit time. The required time for surveillance data delivery.

RSP integrity (I). The required probability that the surveillance data is delivered with no undetected error.

Note 1.— Surveillance integrity includes such factors as the accuracy of time, correlating the time at aircraft position, reporting interval, data latency, extrapolation and/or estimation of the data.

Note 2.— Whilst surveillance integrity is defined in terms of the "goodness" of the surveillance capability, it is specified in terms of the likelihood of occurrence of malfunction on a per flight hour basis (e.g. 10^{-5}), consistent with RCP and RNAV/RNP specifications.

RSP nominal delivery time (DT 95%). The maximum nominal time within which 95% of surveillance data is required to be delivered.

RSP overdue delivery time (OT). The maximum time for the successful delivery of surveillance data after which the initiator is required to revert to an alternative procedure.

RSP specification. A set of ATS provision, including communication services, aircraft and operator requirements (e.g. RSP 180) needed for surveillance supporting a performance-based operation within a defined airspace.

Required surveillance performance (RSP). A statement of the performance requirements for operational surveillance in support of specific ATM functions.

Tailored arrival (TA). A 4-dimentional (4-D) arrival procedure, based on an optimized ATC clearance, including, as necessary, vertical and/or speed restrictions, from the aircraft's current position, normally just prior to top of descent, to the designated destination runway. The TA clearance is issued via CPDLC data link message(s) to the aircraft and automatically loaded into the aircraft's 4-D trajectory guidance capability.

Time critical situation. A situation when a prompt controlling action is required in the provision of air traffic services.

Note.— Time-criticality is mainly determined by the following factors: ATC traffic situation, end-to-end performance (systems and flight crew/controller response time), recovery time and controller/flight crew confidence and experience on the means of communication that are available.

Unplanned outage duration limit (minutes). Time after the unplanned outage begins at which there is an operational impact. Measured from when an unplanned outage begins to when the ATSU receives notification that the service has been restored.

Term

Unplanned outage notification delay (min). Notification to the ATSU of an unplanned outage. Measured from when the unplanned outage begins to when the ATSU receives notification.

Uplink message (UM). A CPDLC message sent from a ground system.

Vertical rate change event (VRE). A type of event that triggers an ADS-C report when the aircraft`s rate of climb or descent is greater than the vertical rate threshold.

Waypoint change event (WCE). A type of event that triggers an ADS-C report when there is a change in the next waypoint or the next plus 1 waypoint on the aircraft active flight plan.

1.2 Acronyms

When the following acronyms are used in this document they have the following meanings. Where the term has "(ICAO)" annotated, the acronym has already been defined as such in SARPs and/or PANS.

Acronym	Description
AAR	Air-to-air refueling.
ACARS	Aircraft communications addressing and reporting system.
ACAS	Aircraft collision avoidance system. (ICAO)
ACC	Area control centre. (ICAO)
ADS	Automatic dependent surveillance (retained for reference with non-updated documents. This term would normally be used to refer to ADS-C).
ADS-B	Automatic dependent surveillance – broadcast. (ICAO)
ADS-C	Automatic dependent surveillance – contract. (ICAO)
AFN	ATS facilities notification.
AFTN	aeronautical fixed telecommunication network. (ICAO)
AIC	Aeronautical information circular. (ICAO)
AIDC	ATS interfacility data communications. (ICAO)
AIP	Aeronautical Information Publication. (ICAO)
AIREP	Air-report. (ICAO)

Acronym	Description
ALTRV	Altitude reservation.
AMC	ATS microphone check (data link service).
AMS(R)S	Aeronautical mobile satellite (route) service. (ICAO)
ANSP	Air navigation service provider.
AOC	Aeronautical operational control. (ICAO)
ARCP	Air refueling control point. (ICAO abbreviation?)
AREX	Air refueling exit point. (ICAO abbreviation?)
ARIP	Air refueling initial point. (ICAO abbreviation?)
ARP	Air-report message. (See AIREP)
ATC	Air traffic control. (ICAO)
ATM	Air traffic management. (ICAO)
ATN	Aeronautical telecommunication network. (ICAO)
ATN B1	Aeronautical telecommunication network baseline 1, as defined by RTCA DO-280B/EUROCAE ED-110B. *Note.— ATN B1 generally means that the data link system on an aircraft, the ATSU ground system, and communication service provision comply with the standard as adapted by Eurocontrol Specification on Data Link Services (EUROCONTROL-SPEC-0116). ATN B1 consists of the following data link applications:* *a) Context management (CM) for data link initiation capability (DLIC); and* *b) Limited CPDLC for ATS communications management (ACM), ATS clearance (ACL), and ATC microphone check (AMC).*
ATS	Air traffic service. (ICAO)
ATSU	ATS unit. (ICAO, sort of)
CADS	Centralized ADS-C system.
CDA	Current data authority. (See ICAO definition for current data authority)
CFRS	Centralized FMC waypoint reporting system.
CM	Context management (data link application).

Acronym	Description
CNS	Communications, navigation and surveillance. (ICAO)
CNS/ATM	Communications, navigation and surveillance/air traffic management. (ICAO)
CPDLC	Controller-pilot data link communications. (ICAO)
CRC	Cyclic redundancy check.
CSP	Communication service provider.
CTA	Control area. (ICAO)
DARP	Dynamic airborne re-route procedure.
D-ATIS	Data link – automatic terminal information service (data link service).
DCL	Departure clearance (data link service).
DCPC	Direct controller-pilot communications.
ETD	Estimated time of departure or estimating departure. (ICAO)
FANS	Future air navigation system.
FANS 1/A	Future air navigation system - initial, as defined by RTCA DO-258A/EUROCAE ED-100A, or previous standards that defined the FANS 1/A capability. *Note.— FANS 1/A generally means that the data link system on an aircraft, the ATSU ground system, and communication service provision comply with the standard. In certain cases, specific reference is made to a particular type of FANS 1/A aircraft as follows:* *a). FANS 1/A+ means that the aircraft completely complies with Revision A of the standard, which includes message latency monitor; and* *b) FANS 1/A ADS-C means that the aircraft complies with AFN and ADS-C applications, but does not include the CPDLC application.*
FDPS	Flight data processing system. (ICAO)
FIR	Flight information region. (ICAO)
FL	Flight level.
FMC	Flight management computer.
FMC WPR	Flight management computer waypoint position reporting.
FMS	Flight management system.

Acronym	Description
GPS	Global positioning system (USA).
HF	High frequency (3-30 Mhz). (ICAO)
IATA	International Air Transport Association.
ICAO	International Civil Aviation Organization. (ICAO)
ICD	Interface control document.
MTBF	Mean time between failures.
MTTR	Mean time to repair.
PANS-ATM	Procedures for Air Navigation Services — Air Traffic Management (ICAO Doc 4444). (ICAO)
POS	Position report message.
RCP	Required communication performance.
RCTP	Required communication technical performance.
RNAV	Area navigation.
RNP	Required navigation performance.
	Required surveillance technical performance.
SARPs	Standards and Recommended Practices. (ICAO)
SATCOM	Satellite communication. (ICAO)
SELCAL	Selective calling system. (ICAO)
	Tailored arrival.
VDL M0/A	VHF data link mode 0/A subnetwork.
VDL M2	VHF data link mode 2 subnetwork,
VHF	Very high frequency (30-300 Mhz). (ICAO)

Chapter 2. Crecimiento y distribución del tránsito aéreo en las Regiones NAM/CAR

2.1 The regional rate of traffic growth is at an average of 4.5% 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 some of the main airports of the NAM/CAR Regions in the period 2005 to 2011 reflected a positive trend of 5%, the global trend is 3.5%. The main rates of traffic growing are:

Air Traffic – CAR Region

Air Traffic – NAM Region

Chapter 3. Bloque del Sistema de Aviación / Aviation System Block Upgrade (ASBU) - B0

3.1 Areas de mejoramiento de la eficiencia PIA / Performance Improvement Area (PIA)

Formatos de Informe de navegación aérea / Air Navigation Report Form (ANRF)

Appendix 1. AIR NAVIGATION REPORT FORM (ANRF)

NAM/CAR Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-05/CD0: Improved Flexibility and Efficiency in Descent Profiles (CDO) Performance Improvement Area 4: Efficient Flight Path – Through Trajectory-based Operations					
3. ASBU B0-05/CDO: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	Y	N	Y

4. ASBU B0-05/CDO: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. CDO implementation	Dec.2017
2. PBN STARs	Dec.2017

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

8. ASBU B0-05/CDO: Performance Monitoring and Measurement **8A. ASBU B0-05/CDO: Implementation Monitoring)**	
Elements	**Performance Indicators/Supporting Metrics**
1. CDO implementation	Indicator: % of International Aerodromes/TMA with CDO implemented Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented
2. PBN STARs	Indicator: % of International Aerodromes/TMA with PBN STAR implemented Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented

8. ASBU B0-05/CDO: Performance Monitoring and Measurement 8 B. ASBU B0-05/CDO: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NA
Capacity	NA
Efficiency	Cost savings through reduced fuel burn. Reduction in the number of required radio transmissions
Environment	Reduced emissions as a result of reduced fuel burn (IFSET)
Safety	More consistent flight paths and stabilized approach paths. Reduction in the incidence of controlled flight into terrain (CFIT)

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

4. ASBU B0-10/FRTO: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. Airspace planning	Dec. 2018
2. Flexible Use of airspace	Dec. 2016
3. Flexible Routing	Dec. 2018

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

8. ASBU B0-10/FRTO: Performance Monitoring and Measurement **8A. ASBU B0-10/FRTO: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
1. Airspace planning	Not assigned Indicator and metrics.
2. Flexible Use of airspace	Indicator: % of time segregated airspaces are available for civil operations in the State Supporting Metric: Reduction of delays in time of civil flights.
3. Flexible Routing	Indicator: % of PBN routes implemented Supporting Metric: KG of Fuel savings

8. ASBU B0-10/FRTO: Performance Monitoring and Measurement 8A. ASBU B0-10/FRTO: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
	Supporting Metric: Tons of CO2 reduction

8. ASBU B0-10/FRTO: Performance Monitoring and Measurement 8 B. ASBU B0-10/FRTO: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Better access to airspace by a reduction of the permanently segregated volumes of airspace.
Capacity	Flexible routing reduces potential congestion on trunk routes and at busy crossing points. The flexible use of airspace gives greater possibilities to separate flights horizontally. PBN helps to reduce route spacing and aircraft separations.
Efficiency	The module will reduce flight length and related fuel burn and emissions. The module will reduce the number of flight diversions and cancellations. It will also better allow avoiding noise sensitive areas.
Environment	Fuel burn and emissions will be reduced
Safety	NA

2. REGIONAL PERFORMANCE OBJECTIVE – B0-15/RSEQ: Improve Traffic Flow Through Runway Sequencing (AMAN/DMAN) **Performance Improvement Area 1: Airport Operations**					
3. ASBU B0-15/RSEQ: Impact on Main Key Performance Areas					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	N	N

4. ASBU B0-15/RSEQ: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. AMAN and time based metering	Dec. 2016
2. Departure management	Dec. 2016
3. Movement Area Capacity Optimization	Dec. 2016

7. ASBU B0-15/RSEQ: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. AMAN and time based metering	Lack of automation system to support synchronization	NIL	Lack of appropriate training. Lack of Slots assignment.	
2. Departure management	Lack of automation system to support synchronization	NIL	Lack of slots assignment. Lack of appropriate training	
3. Movement Area Capacity Optimization	NIL	NIL	Lack of capacity calculation procedures for RWY, TWY & platform. Lack of operational procedures for movement area capacity optimization	NIL

8. ASBU B0-15/RSEQ Performance Monitoring and Measurement 8A. ASBU B0-15/RSEQ: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
1. AMAN and time based metering	Indicator: Percentage of international aerodromes with AMAN and time based metering Supporting metric: Number of international airports with AMAN and time based metering
2. Departure management	Indicator: Percentage of international aerodromes with DMAN Supporting metric: Number of international airports DMAN
3. Movement Area Capacity Optimization	Indicator: percentage of international aerodromes with Airport-capacity calculated Supporting metric: Number of international aerodromes with Airport capacity calculated.

8. ASBU B0-15/RESQ. Performance Monitoring and Measurement 8 B. ASBU B0-15/RESQ: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Not applicable.
Capacity	Increase airport capacity through movement area optimization.
Efficiency	Efficiency is positively impacted as reflected by increased runway throughput arrival rates.
Environment	Not applicable.
Safety	Not applicable.

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

4. ASBU B0-20/CCO: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. CCO implementation	Dec.2017
2. PBN SIDs implementation	Dec.2017

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

8. ASBU B0-20/CCO: Performance Monitoring and Measurement **8A. ASBU B0-20/CCO: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
1. CCO implementation	Indicator: Percentage of international aerodromes with CCO implemented Supporting metric: Number of international airport with CCO implemented
2. PBN SIDs implementation	Indicator: Percentage of international aerodromes with PBN SIDs implemented Supporting metric: Number of international airport with PBN SIDs implemented

8. ASBU B0-20/CCO: Performance Monitoring and Measurement 8 B. ASBU B0-20/CCO: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	
Capacity	
Efficiency	Cost savings through reduced fuel burn and efficient aircraft operating profiles. Reduction in the number of required radio transmissions
Environment	Authorization of operations where noise limitations would otherwise result in operations being curtailed or restricted. Environmental benefits through reduced emissions (IFSET)
Safety	More consistent flight paths. Reduction in the number of required radio transmissions. Lower pilot and air traffic control workload

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

4. ASBU B0-25/FICE: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. MEVA III IP Network implementation	100% implementation, August 2015
2. AMHS implementation	6 States by December 2014
3. AIDC implementation	5 AIDC communications by December 2014
4. ATN router structure implementation	70% by June 2016

7. ASBU B0-25/FICE: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. MEVA III implementation	Local site readiness	NIL	NIL	NIL
2. Full AMHS operation and transition from AFTN	Training and funding issues	NIL	Update procedures	NIL
3. AMHS interconnection	Network bandwidth availability and last mile connection	NIL	NIL	NIL
4. Implement AIDC	Training and funding issues	NIL	Update procedures	NIL

8. ASBU B0-25/FICE: Performance Monitoring and Measurement 8A. ASBU B0-25/FICE: Implementation	
Elements	**Performance Indicators/Supporting Metrics**
1. MEVA III IP Network implementation	Indicator: Percentage of MEVA Members implemented in MEVA III Supporting metric: MEVA III Services contracted implemented
2. AMHS implementation	Indicator: Percentage of States with AMHS interconnected with other AMHS Supporting metric: Number of AMHS interconnections implemented
3. AIDC implementation	Indicator: Percentage of ATS units with AIDC Supporting metric: Number of AIDC systems installed
4. ATN router structure implementation	Indicator: Percentage of ATN infrastructure implemented Supporting metric: Number of ATN routers implemented in accordance to CAR/SAM FASID Table CNS 1Ba

8A. ASBU B0-25/FICE: Performance Monitoring and Measurement 8 B. ASBU B0-25/FICE: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NIL
Capacity	• Reduces controller workload • increases data integrity supporting separation reduction and • increases boundary capacity flow
Efficiency	Enables optimum aircraft flight levels Less aircraft in holding
Environment	NIL
Safety	Increases timely and accurate flight plan information for ATC

2. REGIONAL PERFORMANCE OBJECTIVE – B0-30/DAIM: **Service Improvement through Digital Aeronautical Information Management** **Performance Improvement Area 2: Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management**

3. ASBU B0-30/DAIM: Impact on Main Key Performance Areas					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	N	Y	Y

4. ASBU B0-30/DAIM: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
4. QMS for AIM	Dec.2015
5. e.TOD implementation	Dec.2016
6. AIXM implementation	Dec.2018
7. e-AIP implementation	Dec.2018
8. Digital NOTAM	Dec. 2018

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

7. ASBU B0-30/DAIM: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
			personnel.	

8. ASBU B0-30/DAIM: Performance Monitoring and Measurement 8A. ASBU B0-30/DAIM: Implementation	
Elements	**Performance Indicators/Supporting Metrics**
1. QMS for AIM	Indicator: % of States QMS Certified Supporting Metric: number of States QMS Certification
2. e-TOD implementation	Indicator: % of States e-TOD Implemented Supporting Metric: number of States with e-TOD Implemented
3. AIXM implementation	Indicator: % of States with AIXM implemented Supporting Metric: number of States with AIXM implemented
4. e-AIP implementation	Indicator: % of States with e-AIP Implemented Supporting Metric: number of States with e-AIP Implemented
5. Digital NOTAM	Indicator: % of States with Digital NOTAM Implemented Supporting Metric: number of States with Digital NOTAM Implemented

8A. ASBU B0-30/DAIM: Performance Monitoring and Measurement 8 B. ASBU B0-30/DAIM: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NA
Capacity	NA
Efficiency	NA
Environment	Reduced amount of paper for promulgation of information
Safety	Reduction in the number of possible information and data inconsistencies

2 REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – ASBU B0-35/NOPS: Improved Flow Performance through Planning based on a Network-Wide view **Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**					
3. ASBU B0-35/NOPS: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	Y	Y	Y	Y	Y

4. ASBU B0-35/NOPS: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
4. Air Traffic Flow Management	Dec. 2015

7. ASBU B0-35/NOPS: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. Air Traffic Flow Management	Lack of system software for ATFM Lack of ATFM units implemented	NIL	Lack of ATFM and CDM procedures Lack of training	NIL

8. ASBU B0-35/NOPS: Performance Monitoring and Measurement **8A. ASBU B0-35/NOPS: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
1. Air Traffic Flow Management	Indicator: % of implemented FMUs Support Metric: Number of States with ATFM units implemented.

8. ASBU B0-35/NOPS: Performance Monitoring and Measurement **8 B. ASBU B0-35/NOPS: Performance Monitoring**	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Improved Access and equity in the use of airspace or aerodrome by avoiding disruption of air traffic. ATFM processes take care of equitable distribution of delays

8. ASBU B0-35/NOPS: Performance Monitoring and Measurement **8 B. ASBU B0-35/NOPS: Performance Monitoring**	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Capacity	Better utilization of available capacity, ability to anticipate difficult situations and mitigate them in advance
Efficiency	Reduced fuel burn due to better anticipation of flow issues; Reduced block times and times with engines on
Environment	Reduced fuel burn as delays are absorbed on the ground, with shut engines; or at optimum flight levels through speed or route management
Safety	Reduced occurrences of undesired sector overloads

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-40/TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route **Performance Improvement Area4: Efficient Flight Path – Through Trajectory-based Operations**					
3. ASBU B0-40/TBO : Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	Y	Y

4. ASBU B0-40/TBO: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. ADS-C over oceanic and remote areas	June 2018 Service provider
2. Continental CPDLC	June 2018 Service provider

7. ASBU B0-40/TBO: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. ADS-C over oceanic and remote areas	NIL	Implementation of ADS general aviation pending	Implementation of GOLD procedures pending	Lack of duly trained inspectors for operational approval
2. Continental CPDLC	NIL	Implementation of CPDLC general aviation pending	Implementation of GOLD procedures pending	Lack of duly trained inspectors for operational approval

8. ASBU B0-40/TBO: Performance Monitoring and Measurement **8A. ASBU B0-40/TBO: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
1. ADS-C over oceanic and remote areas	Indicators: Percentage of FIRs with ADS C implemented Supporting metric: Number of ADS C approved procedures over oceanic and remote areas
2. Continental CPDLC	Indicators: Percentage of CPDLC implemented at remote area FIRs Supporting metric: Number of CPDLC approved procedures over remote areas

8. ASBU B0-40/TBO: Performance Monitoring and Measurement **8 B. ASBU B0-40/TBO: Performance Monitoring**	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NA
Capacity	A better localization of traffic and reduced separation allow increased capacity. Reduced communication and better organization of controller workload allow improve sector capacity.
Efficiency	Routes/tracks and flights can be separated by reduced minima, allowing to apply flexible routings and vertical profiles closer to the user-preferred ones
Environment	Reduced emissions as a result of reduced fuel burn
Safety	ADS-C based safety nets supports cleared level adherence monitoring, route adherence monitoring, danger area infringement warning and improved search and rescue. Reduced occurrences of misunderstandings; solution to stuck microphone situations.

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

4. ASBU B0-65/APTA: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
9. APV with Baro VNAV	December 2016 – Service Providers and users
10. APV with SBAS (WAAS)	December 2018– Service Providers and users
11. APV with GBAS	December 2018 – Initial implementation at some States (services providers)

7. ASBU B0-65/APTA: Implementation Challenges				
Elements	**Implementation Area**			
	Ground system Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. APV with Baro VNAV	NIL	Insufficient number of equipped aircraft	Insufficient appropriate training	Lack of appropriate training
2. APV with SBAS (WAAS)	NIL	Lack of funding	NIL	Lack of training
3. APV with GBAS	Lack of cost benefit analysis Adverse ionosphere	Insufficient number of equipped aircraft	Insufficient appropriate training	Lack of appropriate training Evaluation of a real operational requirement

8. ASBU B0-65/APTA: Performance Monitoring and Measurement **8A. B0-65/APTA: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
3. APV with Baro VNAV	Indicator: Percentage of international aerodromes having instrument runways provided with APV with Baro VNAV procedure implemented Supporting metric: Number of international airports having approved APV with Baro VNAV procedure implemented

8. ASBU B0-65/APTA: Performance Monitoring and Measurement 8A. B0-65/APTA: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
4. APV with SBAS (WAAS)	Indicator: Percentage of international aerodromes having instrument runways provided with APV with SBAS/WAAS procedure implemented Supporting metric: Number of international airports having approved APV with SBAS/WAAS procedure implemented
5. APV with GBAS	Indicator: Percentage of international aerodromes having instrument runways provided with APV GBAS procedure implemented Supporting metric: Number of international airport having APV GBAS procedure implemented.

. ASBU B0-65/APTA: Performance Monitoring and Measurement 8 B. ASBU B0-65/APTA: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Increased aerodrome accessibility
Capacity	Increased runway capacity
Efficiency	Reduced fuel burn due to lower minima, fewer diversions, cancellations, delays
Environment	Reduced emissions due to reduced fuel burn
Safety	Increased safety through stabilized approach paths.

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

4. B0-75/SURF: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)	100 % of selected airports by June 2018 States/ANSPs
2. Surveillance system on board (SSR transponder, ADS B capacity)	June 2018 Aircraft operators
3. Surveillance system for vehicle	Selected airports by June 2018 Vehicle operators
4. Visual aids for navigation	December 2015 States/Airport operators
5. Aerodrome bird/wildlife organization and control programme	December 2018 Airport operators

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

7. ASBU B0-75/SURF: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
			training	
4. Visual aids for navigation	NIL	NIL	NIL	NIL
5. Reduction of bird/wildlife related events	NIL	NIL	Lack of training	NIL

8. ASBU B0-75/SURF: Performance Monitoring and Measurement 8A. ASBU B0-15/RSEQ: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
6. Surveillance system for ground surface movement (PSR, SSR, ADS B or Multilateration)	Indicator: Percentage of international aerodromes with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement Supporting metric: Number of international aerodrome with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement
7. Surveillance system on board (SSR transponder,ADS B capacity)	Indicator: Percentage of surveillance system on board (SSR transponder, ADS B capacity) Supporting metric: Number of aircraft with surveillance system on board (SSR transponder ,ADS B capacity)
8. Surveillance system for vehicle	Indicator Percentage of international aerodromes with a cooperative transponder systems on vehicles Supporting metric: Number of vehicles at international airports with surveillance system installed
9. Visual aids for navigation	Indicator: Percentage of international aerodromes complying with visual aid requirements as per Annex 14 Supporting metric: Number of international aerodromes complying with visual aid requirements as per Annex 14
10. Reduction of bird/wildlife related events	Indicator: Percentage of reduction of wildlife related events Supporting metric: Number of wildlife related events

8. ASBU B0-75/SURF: Performance Monitoring and Measurement 8 B. ASBU B0-75/SURF: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Improves portions of the manoeuvring area obscured from view of the control tower for vehicles and aircraft. Ensures equity in ATC handling of surface traffic regardless of the traffic's position on the international aerodrome
Capacity	Sustained level of aerodrome capacity during all weather conditions and peak hours
Efficiency	Reduced taxi times through diminished requirements for intermediate holdings based on reliance on visual surveillance only. Reduced fuel burn
Environment	Reduced emissions due to reduced fuel burn
Safety	Reduced runway incursions. Improved response to unsafe situations. Improved situational awareness leading to reduced ATC workload

2. REGIONAL PERFORMANCE OBJECTIVE – B0-80/ACDM **Improved Airport Operations through Airport - CDM** **Performance Improvement Area 1: Airport Operations**					
3. ASBU B0-80/ACDM: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	Y	N

4. ASBU B0-80/ACDM: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
12. Airport – CDM	Dec. 2016 – Airport Operator
13. Aerodrome certification	Dec 2018 – State CAA
14. Heliport Operations	Dec. 2018 – State CAA

7. ASBU B0-80/ACDM: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
4. Airport – CDM	Lack of funding	NIL	NIL	NIL
5. Aerodrome certification	NIL	NIL	NIL	NIL
6. Heliport Operations	NIL	NIL	NIL	NIL

8. ASBU B0-80/ACDM: Performance Monitoring and Measurement **8A. ASBU B0-80/ACDM: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
6. Airport –CDM	Indicator: Percentage of international aerodromes with Airport-CDM Supporting metric: Number of international aerodromes with Airport-CDM
7. Aerodrome certification	Indicator: Percentage of certified international aerodromes Supporting metric: Number of certified international aerodromes
8. Heliport Operations	Indicator: Percentage of Heliports with operational approval Supporting metric: Number of Heliports with operational approval

8A. ASBU B0-80/ACDM: Performance Monitoring and Measurement **8 B. ASBU B0-80/ACDM: Performance Monitoring**	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Enhanced equity on the use of aerodrome facilities.
Capacity	Enhanced use of existing Implementation of gate and stands (unlock latent capacity). Reduced workload, better organization of the activities to manage flights.

8A. ASBU B0-80/ACDM: Performance Monitoring and Measurement 8 B. ASBU B0-80/ACDM: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
	Enhanced aerodrome capacity according with the demand
Efficiency	Improved operational efficiency (fleet management); and reduced delay. Reduced fuel burn due to reduced taxi time and lower aircraft engine run time. Improved aerodrome expansion in accordance with Master Plan
Environment	Reduced emissions due to reduced fuel burn
Safety	Not applicable

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – ASBU B0-84/ASURF: Initial capability for ground surveillance Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
3. ASBU B0-84/ASURF: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	N	N	Y

4. ASBU B0-84/ASURF: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
5. Implementation of ADS B	Dec 2018
6. Implementation of Multilateration	80% in selected airports by June 2018
7. Automation system (Presentation)	100% of ACCs by Dec 2017

7. ASBU B0-84/ASURF: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. Implementation of ADS B	Lack of training and funding for ATM System upgrades	Lack of ADS B implementation in general aviation, and old commercial fleet	Lack of procedures	NIL
2. Implementation of multilateration	Lack of efficient communications networks for MLAT	NIL	NIL	NIL
3. Automation system (Presentation)	Lack of funding for System upgrades	NIL	NIL	NIL

8. ASBU B0-84/ASURF: Performance Monitoring and Measurement 8A. ASBU B0-84/ASURF: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
1. Implementation of ADS B	Indicator: Percentage of selected international aerodromes with ADS-B implemented Supporting metric: Number of ADS B implemented
2. Implementation of Multilateration	Indicator: Percentage of multilateration system implemented Supporting metric: Number of multilateration system implemented
3. Automation system (Presentation)	Indicator: Percentage of ACCs with automation system implemented Supporting metric: Number of automation system implemented in the ACCs

8. ASBU B0-84/ASURF: Performance Monitoring and Measurement 8 B. ASBU B0-84/ASURF: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NA
Capacity	Typical separation minima are 3 NM or 5 NM enabling an increase in traffic density compared to procedural minima TMA surveillance performance improvements are achieved through high accuracy, better velocity vector and improved coverage
Efficiency	NA
Environment	NA
Safety	Reduction of the number of major incidents. Support to search and rescue

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-101/ACAS: ACAS Improvements Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
3. ASBU B0-101/ACAS: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	N	N	Y

4. ASBU B0-101/ACAS: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air))**
1. ACAS II (TCAS Version 7.1)	Dec 2018

7. ASBU B0-101/ACAS: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. ACAS II (TCAS Version 7.1)	NIL	Lack of funding	NIL	NIL

8. ASBU B0-101/ACAS: Performance Monitoring and Measurement 8A. ASBU B0-101/ACAS: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
1. ACAS II (TCAS Version 7.1)	

8. ASBU B0-101/ACAS: Performance Monitoring and Measurement 8 B. ASBU B0-101/ACAS: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NA
Capacity	NA
Efficiency	N/A
Environment	NA
Safety	ACAS improvement will reduce unnecessary resolution advisory (RA) and then reduce trajectory deviations ACAS increases safety in the case of breakdown of separation

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-102/SNET: Increased Effectiveness of Ground-Based Safety Nets **Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM**					
3. ASBU B0-102/SNET: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	N	N	N	Y

4. ASBU B0-102/SNET: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
2. Short Term Conflict Alert implementation (STCA)	80% of FIRs by Dec 2014
3. Area Proximity Warning (APW)/ Minimum Safe Altitude Warning (MSAW)	70% of FIRs by Dec 2015
4. Medium Term Conflict Alert (MTCA)	80% of FIRs by Dec 2016
5.	

7. ASBU B0-102/SNET: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. Short Term Conflict Alert implementation (STCA)	ATM System upgrade	NIL	Procedure updates and approval	NIL
2. Area Proximity Warning (APW)/ Minimum Safe Altitude Warning (MSAW)	ATM System upgrade	NIL	Procedure updates and approval	NIL
3. Medium Term Conflict Alert (MTCA)	ATM System upgrade	NIL	Procedure updates and approval	NIL

8. ASBU B0-102/SNET: Performance Monitoring and Measurement **8A. ASBU B0-102/SNET: Implementation Monitoring**	
Elements	**Performance Indicators/Supporting Metrics**
1. Short Term Conflict Alert implementation (STCA)	Indicator Percentage of ATS units with ground based safety nets (STCA,) implemented Metric Support Number of safety NET (STCA) implemented
2. Area Proximity Warning (APW)/ Minimum Safe Altitude Warning (MSAW)	Indicator Percentage of ATS units with ground based safety nets (APW) implemented / Percentage of ATS units with ground based safety nets (MSAW) implemented Metric Support Number of safety NET (APW) implemented / Number of Safety NET (MSAW)

8. ASBU B0-102/SNET: Performance Monitoring and Measurement 8A. ASBU B0-102/SNET: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
3. Medium Term Conflict Alert (MTCA)	Indicator Percentage of ATS units with ground based safety nets (MTCA) implemented Metric Support: Number of Safety NET (MTCA)

8. ASBU B0-102/SNET: Performance Monitoring and Measurement 8 B. ASBU B0-102/SNET: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	NA
Capacity	NA
Efficiency	NA
Environment	NA
Safety	Significant reduction of the number of major incidents

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

4. ASBU B0-105/AMET: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. WAFS	Provider State, December 2014
2. IAVW	Volcanic Ash Advisory Centre, Washington USA, April 2014
3. Tropical cyclone watch	Tropical Cyclone Advisory Centre, Miami, USA, April 2014
4. Aerodrome warnings	MET provider services, July 2014
5. Wind shear warnings and alerts	MET provider services / July 2015
6. SIGMET	MET provider services / Dec. 2014

7. ASBU B0-105/AMET: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. WAFS	Connection to the AFS satellite and public Internet distribution systems	NIL	Prepare a contingency plan in case of public Internet failure	N/A
2. IAVW	Connection to the AFS satellite and public Internet distribution systems	NIL	Prepare a contingency plan in case of public Internet failure	N/A
3. Tropical cyclone watch	Connection to the AFS satellite and public Internet distribution systems	NIL	Prepare a contingency plan in case of public Internet failure	N/A

7. ASBU B0-105/AMET: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
4. Aerodrome warning	Connection to the AFTN	NIL	Local arrangements for reception of aerodrome warnings	N/A
5. Wind shear warning and alerts	Connection to the AFTN	NIL	Local arrangements for reception of wind shear warning and alerts	N/A
6. SIGMET	Connection to the AFTN	NIL	N/A	N/A

8. ASBU B0-105/AMET: Performance Monitoring and Measurement 8A. ASBU B0-105/AMET: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
1. WAFS	Indicator: States implementation of WAFS Internet File Service (WIFS) Supporting metric: Number of States implementing the WAFS Internet File Service (WIFS)
2. IAVW	Indicator: Percentage of international aerodromes/MWOs with IAVW procedures implemented Supporting metric: Number of international aerodromes/MWOs with IAVW procedures implemented
3. Tropical cyclone watch	Indicator: Percentage of international aerodromes/MWOs with tropical cyclone watch procedures implemented Supporting metric: Number of international aerodromes/MWOs with tropical cyclone watch implemented
4. Aerodrome warnings	Indicator: Percentage of international aerodromes/AMOs with Aerodrome warnings implemented Supporting metric: Number of international aerodromes/AMOs with Aerodrome warnings implemented
5. Wind shear warnings and alerts	Indicator: Percentage of international aerodromes/AMOs with wind shear warnings procedures implemented Supporting metric: Number of international aerodromes/AMOs with wind shear warnings and alerts implemented
6. SIGMET	Indicator: Percentage of international aerodromes/MWOs with SIGMET procedures implemented Supporting metric: Number of international aerodromes/MWOs with SIGMET procedures implemented

ASBU B0-105/AMET: Performance Monitoring and Measurement 8 B. ASBU B0-105/AMET: Performance Monitoring

Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Not applicable
Capacity	Optimized usage of airspace and aerodrome capacity due to MET support
Efficiency	Reduced arrival/departure holding time, thus reduced fuel burn due to MET support
Environment	Reduced emissions due to reduced fuel burn due to MET support
Safety	Reduced incidents/accidents in flight and at international aerodromes due to MET support.

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Chapter 4 Regional Performance Objectives (RPOs)

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

4.2 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.

4.3 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

4.4 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

4.5 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.

4.6 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.

4.7 The implementation programmes should define those tasks and activities that maintain 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.

4.8 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.

4.9 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.

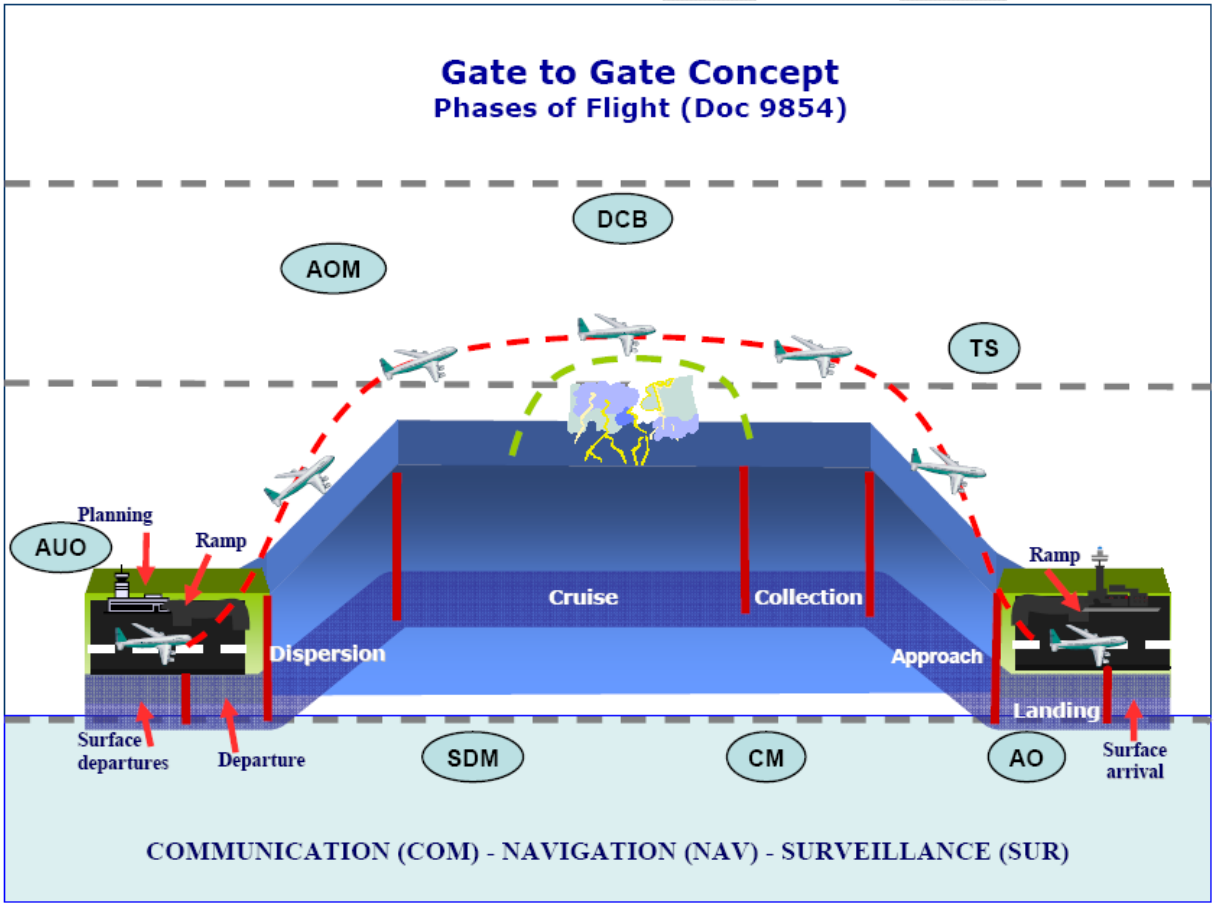
Identification of tasks

4.10 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
- **SDM** — ATM service delivery management

4.11 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.

4.12 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:



Status

4.13 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.

4.14 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 (GPIs)

4.15 The GPIs provide a global strategic framework and are designed to contribute to achieve the regional performance objectives and to support the logical progression of the regional implementation programmes. A set of operational improvements will be integrated once approved by the ICAO Council.

4.16 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

NATIONAL ACTION PLAN

4.17 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.

4.18 The strategic tasks 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.

4.19 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.

4.20 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.

4.21 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 managemen

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).

Appendix A NAM/CAR Air Navigation RPOs

1. IMPLEMENTATION OF PERFORMANCE BASED NAVIGATION (PBN)				
Benefits				
Environment **Efficiency**	• reductions in fuel consumption; • ability of aircraft to conduct flight more closely to preferred trajectories; • increase in airspace capacity; • 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) Implement collaborative decision making (CDM) process in coordination with stakeholders	2013- 2016	States, Territories, Int. Org	Valid
	b) Implement PBN airspace concept for oceanic, continental and terminal areas in accordance with the ICAO PBN Manual	2013- 2016	States, Territories, Int. Org	Valid
	c) Update Letters of Agreement between ATC units	2013- 2016	States, Territories, Int. Org	Valid
	d) Publish regulations and procedures for PBN operational approval	2013- 2016	States, Territories, Int. Org	Valid
	e) Evaluate and implement PBN requirements for ATC Automated Systems	2013- 2016	States, Territories, Int. Org	Valid
	f) Analyze and enhance air communication, navigation (ground navaids/ GNSS) and surveillance infrastructure in accordance with PBN requirements	2013- 2018	States, Territories, Int. Org	Valid
	g) Develop and implement PBN Training programme for Pilots, ATCOs, operators and regulators, as well as ~~training in the application and~~ implementation of GNSS technologies	2013- 2018	States, Territories, Int. Org	Valid
	h) Optimize the ATS route structure through implementation of RNAV Routes between major city pairs with navigation specification RNAV-5 /2 for en-route operations	2013- 2016	States, Territories, Int. Org	Valid

A -2 NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)

	i) Implement CDOs/CCOs for SIDs/STARS in terminal areas based on RNAV 1-2 and RNP 1-/2 navigation specification, *as required*	2013- 2016	States, Territories, Int. Org	Valid
	j) Design and implement PBN APV approach procedures in accordance with Assembly Resolution A37-11	2013- 2016	States, Territories, Int. Org	Valid
	k) Conduct PBN safety assessment based ATC simulations (fast time and/or real time), Live Trials, etc., as required .	2013- 2016	States, Territories, Int. Org	Valid
	l) Develop performance measurement programme	2013- 2016	States, Territories, Int. Org	Valid
	m) Develop post-implementation PBN Safety Assessment Programme	2013- 2016	States, Territories, Int. Org	Valid
	n) Monitor implementation progress	2013- 2018	States, Territories, Int. Org	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. IMPLEMENT FLEXIBLE USE OF AIRSPACE (FUA)				
Benefits				
Efficiency	• increase airspace capacity; • allow a more efficient ATS route structure • ensure safe and efficient action in the event of unlawful interference;			
Continuity	• make available military restricted airspace more hours of the day so that aircraft can fly on their preferred trajectories; and • **improve search and rescue services.**			
Strategy				
ATM Component	**TASK DESCRIPTION**	**START-END**	**RESPONSIBLE**	**STATUS**
	a) Establish civil/military coordination bodies.	2013- 2016	States, Territories	Valid
	b) Arrange for permanent liaison and close cooperation between civil ATS units and appropriate air defence units.	2013- 2016	States, Territories	Valid
	c) Conduct a regional review of special use airspace: i. assess use of airspace management processes; ii. improve current national airspace management to adjust dynamic changes in tactical stage to traffic flows; iii. introduce improvements in ground support systems and associated procedures for the extension of FUA with dynamic airspace management processes; and 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.	2013- 2016	States, Territories, Int. Org, ICAO	Valid
	d) Develop performance measurement programme	2013- 2016	States, Territories, Int. Org	Valid
	e) Monitor implementation progress.	2013- 2016	ICAO	Valid
GPIs	GPI/1: flexible use of airspace.			

A -4 NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)

3. IMPROVE DEMAND AND CAPACITY BALANCING (DCB)				
Benefits				
Environment	reduction in weather- and traffic-induced holding, leading to reduced fuel consumption and emissions;			
Efficiency	improve and smoother traffic flows; improve predictability; improve management of excess demand for service in ATC sectors and aerodromes; improve operational efficiency; enhance airport capacity; enhance airspace capacity; and			
Safety	improve 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 organisations) for purposes of coordination and cooperation, using a CDM process.	2013-2016	States, Territories, Int. Org	Valid
	b) Analyse traffic flow problems and develop methods for improving efficiencies on a gradual basis, as needed, in current: i. aerodrome capacity; ii. ATS capacity;; and iii. ATS letters of agreement.	2013-2016	States, Territories, Int. Org	Valid
	c) Define common elements of situational awareness between FMUs; i. common traffic displays, ii. common weather displays iii. communications (teleconferences, web), and, iv. daily teleconference/ messages methodology advisories.	2013-2016	States, Territories, Int. Org	Valid
	d) Develop methods to establish demand/capacity forecasting;	2013-2016	States, Territories, Int. Org	Valid

	e) Define common electronic information and minimum databases required for decision support and alerting systems for interoperable situational awareness between Centralized ATFM units.	2013-2016	States, Territories, Int. Org	Valid
	f) Develop regional procedures for efficient and optimum use of aerodrome and runway capacity.	2013-2016	States, Territories, Int. Org	Valid
	g) Develop a national ATFM procedural manual to manage demand/capacity balancing.	2013-2016	GREPECAS	Completed
	h) Develop a regional coordination for the implementation of ATFM units.	2013-2016	States, Territories, Int. Org	Valid
	i) Develop operational agreements between ATFM units for interregional demand/capacity balancing.	2013-2016	States, Territories, Int. Org	Valid
	j) Monitor implementation progress.	2013-2016	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/13: aerodrome design and management; GPI/14: runway operations; and GPI/16: decision support systems and alerting systems.			

A -6 NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)

4. IMPROVE SITUATIONAL AWARENESS				
Benefits				
Efficiency	• enhanced traffic surveillance; • enhanced collaboration between flight crew and the ATM system; • improved collaborative decision-making through sharing electronic aeronautical data information; • reduced of workload for both pilots and controllers; • improved operational efficiency; • enhanced airspace capacity; • improved implementation on a cost-effective basis;			
Safety	• improved available electronic terrain and obstacle data in the cockpit; • reduced of the number of controlled flight into terrain related accidents; and • improved safety management.			
Strategy				
ATM Component	**TASK DESCRIPTION**	**START-END**	**RESPON-SIBLE**	**STATUS**
SDM	a) Identify the automation level required according to the ATM service provided in airspace and international aerodromes, assessing i. operational architecture design, ii. characteristics and attributes for interoperability, iii. data bases and software, and iv. technical requirements	2013- 2018	States, Territories, Int. Org	Valid
	b) Implement flight plan data processing system and electronic transmission tools.	2013- 2018	States, Territories, Int. Org	Valid
	c) Implement radar data sharing programs where benefits can be obtained.	2013- 2017	States, Territories, Int. Org	Valid
	d) Develop situational awareness training programmes	2013- 2018	States, Territories, Int. Org	Valid
	e) Identify and implement additional ATM surveillance systems to improve accuracy and coverage of traffic situation information (ADS-B, MLAT, etc.) and associated procedures	2013- 2018	States, Territories, Int. Org	Valid

	f) Implement ATS automated message exchanges, as required (FPL, CPL, CNL, DLA, etc.)	2013- 2018	States, Territories, Int. Org	Valid
	g) Implement automated radar handovers, where possible.	2013- 2017	States, Territories, Int. Org	Valid
	h) Implement ground and air electronic warnings, as needed i. Conflict prediction ii. Terrain proximity iii. MSAW iv. DAIW v. Surveillance system for surface movement	2013- 2017	States, Territories, Int. Org	Valid
	i) Implement data link surveillance technologies and applications: ADS, CPDLC, AIDC, as required	2014- 2018	States, Territories, Int. Org	Valid
	j) Implement additional/advanced automation support tools to increase sharing of aeronautical information i. ETMS or similar ii. MET information iii. AIS/NOTAM dissemination iv. Surveillance tools to identify airspace sector constraints v. A-SMGC in specific aerodromes, as required.	2014- 2018	States, Territories, Int. Org	Valid
	k) Training in the application and implementation of automated surveillance technologies and ATS System automation.	2013-2018	States, Territories, Int. Org	Valid
	l) Enhancement of the training infrastructure of the region and the training programs related with surveillance and automated systems.	2013-2018	States, Territories, Int. Org	Valid
	m) Implement ACAS 7.1 system	2013-2018	States, Territories	Valid
	n) Monitor implementation progress	2013-2018	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.			

A -8 NAM/CAR Regional Performance-based Air Navigation Implementation Plan (RPBANIP)

5. ENHANCE CAPACITY AND EFFICIENCY OF AERODROME OPERATIONS				
Benefits				
Safety Environment	• Increase number of aerodromes certified in the region • Increased safety of aerodromes operations • Efficient use of aerodrome resources. • Safely manoeuvre in all weather conditions. • Precise surface movement and guidance in the movement area. • Reduced incident/accident factors. • Reduced number of deficiencies. • Increased runway usability factors • Reduce number of bird/wildlife events. • Enhanced land-use management around aerodromes			
Strategy				
ATM Components	**TASK DESCRIPTION**	**Start - End**	**Responsible**	**Status**
AO	a) Monitor and ensure promulgation of national standards for aerodromes including certification of aerodromes requirement in accordance with established criteria and certification process.	2013 - 2014	ICAO, States, Territories	Valid
	b) Monitor and ensure that aerodrome certification process include procedures for dealing with non-compliance with the established requirements, including aeronautical studies and risk assessment mechanism and notification procedure.	2013 - 2014	ICAO, States, Territories	Valid
	c) Provide training to personnel dealing with aerodrome certification from the regulatory staff and aerodrome operator.	2013 - 2016	ICAO	Valid
	d) Monitor the development and implementation of an SMS with agreed performance objectives by States, and ensure clearly define lines of safety accountability throughout a certified aerodrome.	2013 - 2016	ICAO, States, Territories	Valid
	e) Implement Airport Collaborative Decision Making (CDM), prioritizing the following aspects: • Collaborative management of the capacity of a CDM Airport during periods of a predicted or unpredicted reduction of capacity. • Determination of Turnaround and Variable Taxi Times • Apron Congestion	2014 - 2016	States, Territories	Valid
	f) Implement Advanced Surface Movement Guidance and Control System (A-SMGCS) according to their needs.	2014 - 2016	States, Territories	Valid

	g) Monitor and implementation of Wildlife/Bird hazard reduction measures by States.	2013 - 2016	ICAO States, Territories	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.			

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6. OPTIMIZATION AND MODERNIZATION OF COMMUNICATION INFRASTRUCTURE				
Benefits				
Efficiency **Continuity** **Safety**	• Improvements in ATS coordination • Increase availability of communications • Avoid misunderstandings in communications • Facilitate the utilization of advanced technologies • improvement of airspace interoperability and seamlessness; and • allow improvements to the provision of air traffic control services to all aircraft operations. • 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)	2013-2015	States, Territories	Valid
	b) Implementation of improvements to communication services in accordance to required RCPs.	2014-2018	States, Territories	Valid
	c) Develop Regional ATN Planning documents	2013-2015	GREPECAS	Válida
	d) Coordination and testing of ATN G-G Application implementation aspects (AMHS, AIDC, etc.)	2013-2018	States, Territories	Valid
	e) Planning, trial and implementation activities for A-G data Applications (DCL, D-ATIS, etc.)	2014-2018	States, Territories	Valid
	f) Technical review of Regional Telecommunication networks for ATN implementation	2013-2015	States, Territories	Valid
	g) Implement available technologies in to facilitate ground and airborne applications (CPDLC, ADS-C, ADS-B)	2013-2018	States, Territories	Valid
	h) Implement the neccesary communication network for ACDM	2014-2018	States, Territories	Valid

	i) Support ICAO Position during the WRCs and ensure Regional coordination for the protection of the aviation spectrum at WRCs	2013-2018	States, Territories	Valid
	j) Ensure Participation of Civil Aviation Experts in State's delegation to ITU WRC Meetings	2013-2015	States, Territories	Valid
	k) Disseminate ICAO policy statements of requirements for aeronautical radio frequency spectrum	2013-2015	States, Territories	Valid
	l) Implement frequency spectrum management for its protection and new services	2013-2018	States, Territories	Valid
	m) Training in the application and implementation of advanced communication related technologies and ATN	2013-2018	States, Territories	Valid
	n) Enhancement of the training infrastructure of the region and the training programs related with communications.	2013-2018	States, Territories	Valid
	o) Monitor the implementation and improvement of the telecommunications and ATN applications issues.	2013-2018	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; GP1-17: Data Link Application, GPI-21: Navigation Systems and GPI-22: Communications Infrastructure			

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7. IMPLEMENTATION OF THE AIM	
Benefits	
Efficiency	• implement standards and recommendations from Annex 15 and Doc. 8126, that apply to the wide range of aeronautical information products of the Integrated Aeronautical Information Package (IAIP), services and electronic aeronautical information technologies; • support the generation and distribution of aeronautical information which serves to improve the safety, accessibility and cost-effective of air traffic services in the CAR Region; the benefits are mentioned in performance objectives for PBN; • support to PBN
Safety	• improve aircraft operating limitations analysis • support aeronautical chart production (Annex 4 and Doc. 8697) and on-board databases (FMS) • support electronic aeronautical chart production and on-board databases (FMS); • improve situational awareness • ensure, to the greatest extent possible, that aeronautical information safety solutions are regionally harmonized • improve electronic terrain and obstacle data in display cockpit and electronic aeronautical charts data • CFIT reduction • support technologies of ground proximity and minimum safe altitude warning systems (GPWS)

Strategy

ATM Component	TASK DESCRIPTION	START END	RESPON-SIBLE	STATUS
CM, AUO, DCB, TS, AOM, AO, SDM	The tasks to implement the identified steps in the roadmap must be specified and conducted in accordance with the phases for the transition from AIS to AIM as follows: a) comply with the process to introduce and implementation of amendments of the Annexes 15 and 4 to the Chicago Convention;	2010–2013	States / Territories	Valid
	b) report periodically to the ICAO NACC Office on the generation and distribution of aeronautical information of the IAIP for improving the safety of air traffic services in the Region;	2010–2016	States / Territories	Valid
	c) develop a method to measure the performance and outcomes from States, Territories and International Organizations on the distribution of quality assured aeronautical information to better understand the ATM requirements, safety and effectiveness related to the electronic distribution of the information;	2011–2016	ICAO, GREPECAS	Valid

	d) assist States, Territories and International Organizations to take proper decisions related to their aeronautical information current services and the transition to AIM;	2010–2015	ICAO	Valid
	e) assist States, Territories and International Organizations in their process for the transition to AIM, in order to implement ICAO standards for aeronautical information products, services and technologies, as required;	2011–2016	ICAO, GREPECAS	Valid
	f) support AIM developments to achieve the ATM system foreseen in the *Global Air Traffic Management Operational Concept*; including the NOTAM contingency plans	2010–2015	States / Territories	Valid
	g) ensure that AIM solutions harmonize and integrate at a regional and international level, and to avoid unnecessarily requirements imposed by the transportation of equipments on board or the use of ground systems	2012–2016	ICAO States / Territories	Valid
	Electronic terrain and obstacle data (e-TOD) h) Share experience and resources in the implementation of e-TOD through the establishment of an e-TOD Regional working group	2010-2016	GREPECAS States / Territories	Valid
	i) Implement technical requirements of ICAO Doc 9881, as required	2010-2016	States / Territories	Valid
	j) Report requirements and monitor implementation status of e-TOD using electronic media to ICAO NACC Regional Office	2010-2016	States / Territories	Valid
	k) Develop a high level agreement for the management of a national e-TOD programme	2010-2016	States / Territories	Valid
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			

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8. IMPROVE AVAILABILITY OF METEOROLOGICAL INFORMATION				
Benefits				
Efficiency **Safety**	• improve aerodrome and airspace capacity • reduce unnecessary consumption of fuel and prevent unnecessary delays due to minimal meteorological conditions at the airports • 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 • 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 i) Increase AFTN and internet facilities to disseminate OPMET data at meteorological offices and stations. ii) Increase AFTN communications facilities to relay aircraft special reports from the air traffic control units to the meteorological offices iii) Maintain and expand the number of workstations used to receive meteorological products of the World Area Forecast System	2013- 2015	States, Territories	Valid
	b) Increase availability, timeliness and quality of OPMET data i) Improve the use of the METAR and TAF codes/templates used to disseminate meteorological reports and aerodrome forecasts ii) Enhance preparation and availability of SIGMET information on hazardous meteorological conditions and volcanic ash clouds iii) Enhance the availability of landing forecasts, TREND, considering user requirements	2013- 2015	States, Territories	Valid
	c) Ensure continuous operation of meteorological and communications equipment at the meteorological offices and stations, through: - Implement lightning, voltage spike and line protections to prevent damage to automatic meteorological stations	2013- 2015	States, Territories	Valid

	d) Establish contingency procedures to disseminate OPMET data, via Internet, in case of failure of the AFTN or WAFS facilities.	2013 - 2015	States, Territories ICAO	Valid
AO	e) Improve the quality of data, provided by meteorological sensors, used in meteorological reports • Establish verification and calibration programmes of data provided by meteorological instruments and automated weather systems at the aerodromes	2013 - 2015	States, Territories	Valid
AUO	f) Implement oversight programmes to ensure availability and quality of OPMET data issued by CAR States and Territories and Territories and provide assistance if required	2013 - 2015	States, Territories	Valid
	g) Improve participation of States and Territories in the International Airways Volcano Watch and provide assistance if necessary	2013 - 2015	ICAO Washington VAAC	Valid
	h) Improve participation of States and Territories in the International Tropical Cyclone Watch and provide assistance if necessary	2013 - 2015	ICAO Miami TCAC	Valid
AOM, DCB,AO, TS, AUO	i) Implement Quality Assurance Systems programmes for aeronautical meteorological service	2013-2015	States, Territories	Valid
AUO	j) Develop yearly staffing analysis and training programme on aeronautical meteorological matters for operational personnel	2013-2015	States, Territories ICAO, WMO AR IV	Valid
	k) Prepare monthly satellite and radar climatological images to detect areas of low frequency of cumulonimbus and thunderstorms to be used for air traffic flow planning	2013-2016	States, Territories ICAO	Valid
AO, TS	l) Increase the number of automated weather systems at the aerodromes	2013 - 2015	States, Territories	Valid
	m) Implement meteorological data downlinks at the MET and ATS units	2013-- 2015	States, Territories	Valid
	n) Implement meteorological data up links from automated meteorological stations and MET and ATS units for aircrafts	2013-- 2015	States, Territories	Valid
SDM	o) Monitor implementation progress	2013-2015	ICAO	Valid

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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.